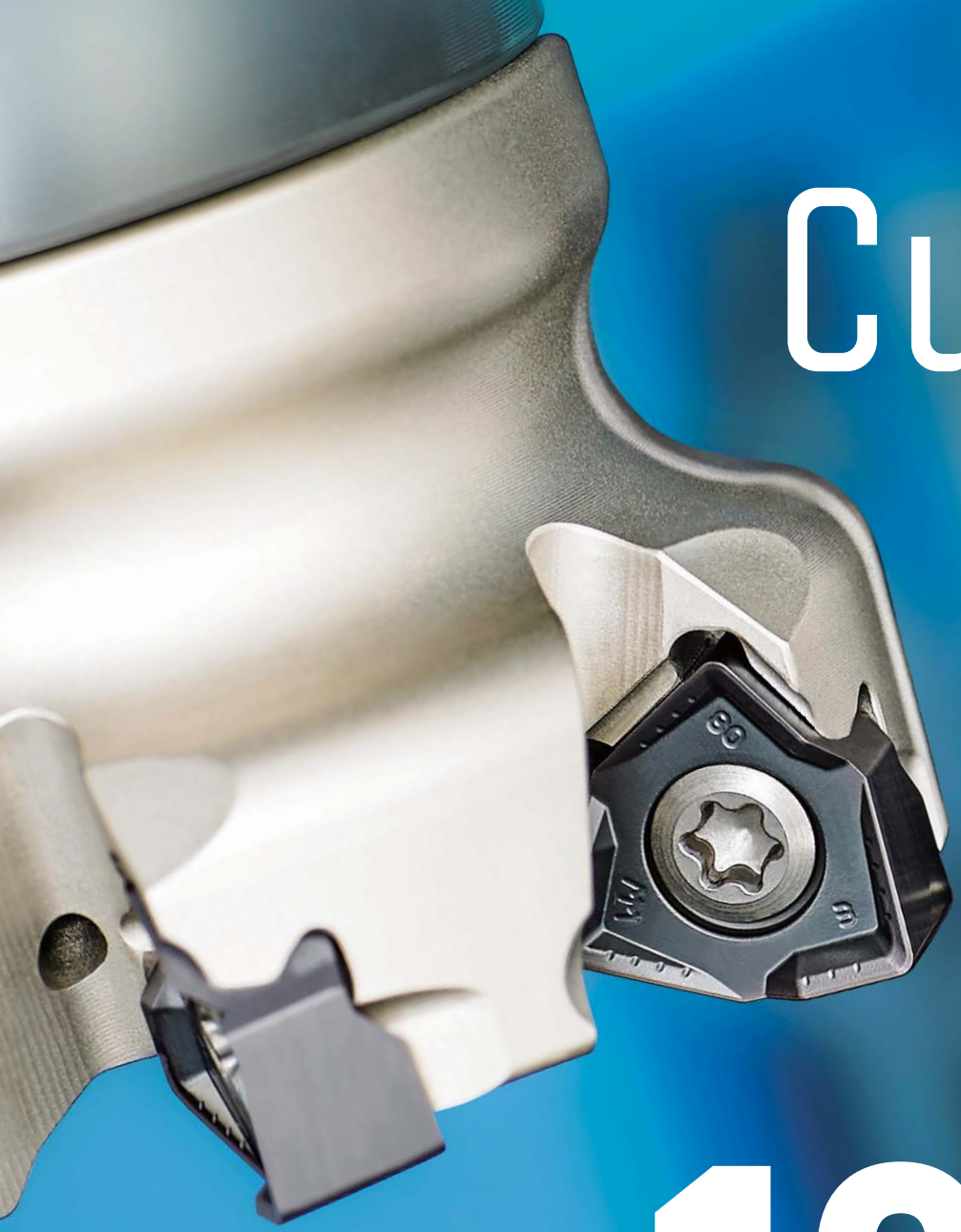
KORLOY Product Catalog - English EN

Cutting Tools



2018›19

Aerospace Industry

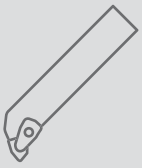
Automotive Industry

Medical Industry

Railway Industry

KORLOY

2018▸2019
KORLOY CUTTING TOOLS



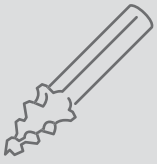
Turning



Milling



Holemaking



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SAFETY GUIDE OF CARBIDE PRODUCTS

KORLOY Inc. is continuously trying to develop safer and higher quality products
Please be aware of the safety guidelines below prior to using KORLOY Inc. products

- It is generally accepted that the proper handling of cemented carbide tools requires awareness of safety as noted above. For more information, please contact us.
- KORLOY does not accept any responsibility for any accident caused by inappropriate use, abuse of tools, or changes to the products.

1. PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached a WARNING label on the case of KORLOY products.
There is no warning on the surface of the tools. Please read this safety guidelines before using carbide tools and provide safety education to all users.

2. Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of Tungsten (W), Titanium (Ti), Alluninyum (Al), Silicon (Si), Tantalum (Ta), Boron (B) etc and metal omponent like Cobalt (Co), Nickel (Ni), Chrom (Cr), Molybdenum (Mo) as binder. Cemented carbides tools have high hardness and specific gravity. Generally there's no smell but according to usage and treatment, appreance and color could be changed

3. Precaution for CEMENTED CARBIDE tools

1) Cemented carbides are extremely hard and brittle at the same time. Impact shock or excessive clamping power could cause fracture or breaking of the tool.
2) Cemented carbides have large sepcific gravity, thus they require special attention as a heavy material when you handle big sizes or large quantities.
3) Cemented carbides have different thermal expansion coefficient with steel and ferrous materials. Shrink fit or swell fit products may cause trouble if they are used at undesirable conditions like extremly high or low temperatures.
4) There are several cemented carbide products having sharp cutting edges.Be careful not to handle the tools with bare hands which may cause cuts or injury, especially when removing the tools from the case, do not touch the cutting edge and be careful not to drop it.
5) Storing carbide tools in a corrosive atmosphere may cause erosion which can reduce toughness.
6) Please refer to the catalouge safety guidance prior to handling the tools.
7) Do not absue tools under inappropriate conditions.

4. Precaution for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

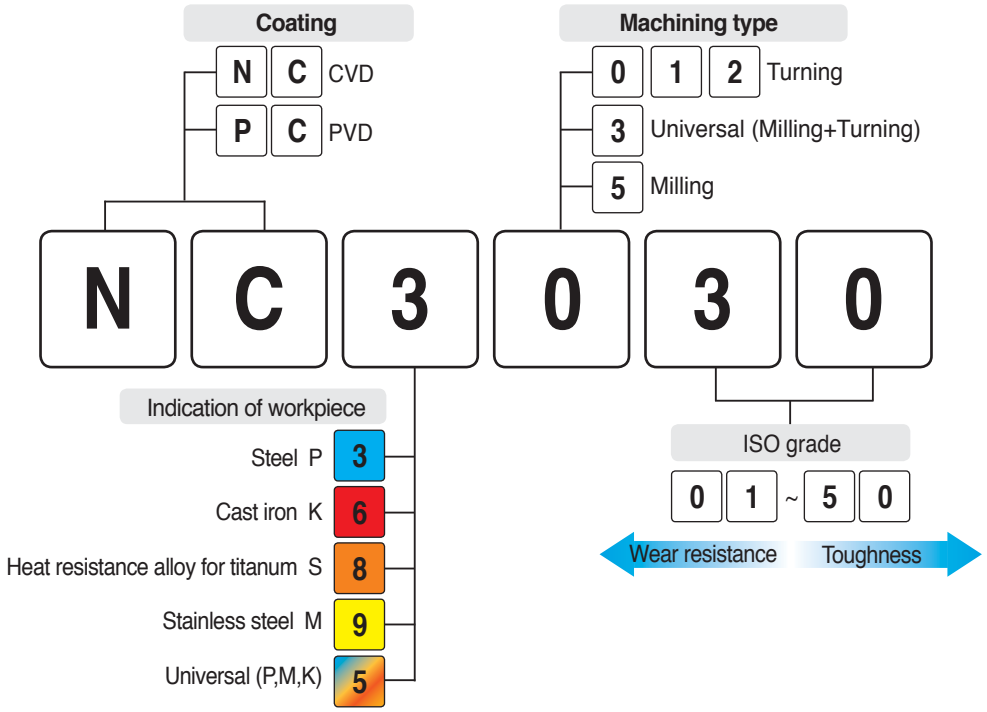
1) Surface condition can affect the toughness of the tool, so it is recommended to use a diamond grinding wheel.
2) Grinding of cemented carbide creates mist and dust. It contains harmful compositions like Cobalt (Co), thus it is recommended to use a mask, mist collection, and other protective facilities. If the dust gets in your skin or eye, rinse immeditely with continously running water.
3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problems. Handle the coolant according to the manufacturer's recommendations.
4) Check for cracks after re-grinding carbide tool and reuse.
5) Marking with laser or electric pen may cause cracks on the carbide tool. The crack can shortened tool life.
6) EDM of carbide may cause residual cracks on the carbide tool, so if necessary , remove the crack with a grinding process.
7) Brazing of carbide tools at extremly high or low temperatures compare with the melting point of brazing materials may cause loosening or breakage.
8) Overheating a oil base coolant may cause a fire or flames, thus be prepared for fire prevention.

5. METALCUTTING SAFETY

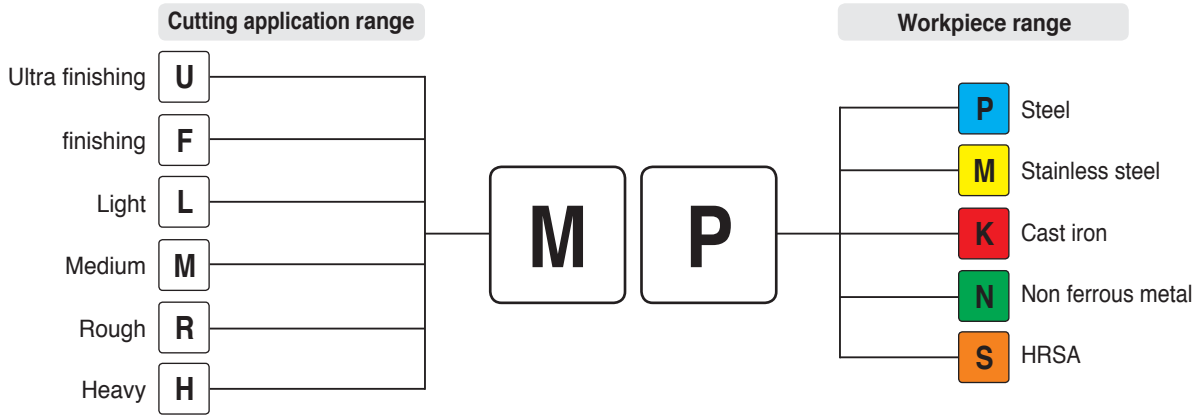
	DANGEROUS FACTOR	SAFETY COUNTERPLAN
Cutting tools	· Sharp cutting edge of cutting tools may cut your bare-hand	· Use gloves when pulling out the insert from the case or mounting it on the machine
	· Inappropriate conditions or usage may cause fragmentation and expel parts of tools which may cause injury	· Use glasses or safety cover for your safety · Use the tools within the recommended range · Please refer to catalogue and safety guidelines first
	· Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, causing fracture of the tool and may cause injury	· Use glasses or safety cover for your safety · Change the tool as required before excessive wear or fracture
	· Chips evacuated during cutting are hot and sharp and maycause burns and cuts	· Use glasses or safety cover for your safety · Stop machining and put safety glove on and use a hook tool to remove chips
	· Touching the workpiece immediately after cutting may cause burns	· Use gloves or safety cover for your safety
	· Be aware of sparks, fire, or explosion of hot chips generated during the cutting operation	· Do not use at the place where having explosive materials · Prepare for fire extinguishments
	· In case of high RPM machining, vibration and chattering may occur due to the improper balance of the machine	· Use glasses or safety cover for your safety · Check first if there's any chattering, vibration or strange noises prior to your main cutting operation
	· Touching a burr remaining on the workpiece with a bare-hand may cause a cut	· Do not touch the burr with bare-hand · Use gloves or safety cover for your safety
	· Loose clamping of the workpiece may cause the tool to fracture and result in damage to the cutter body and possible injury	· Clamp the workpiece tightly
	· Tools are operated to right-hand direction normally · Left-hand direction operation can cause fracture of tool and body damage	· Do not use left-hand direction without notice · Check the package of product to check the availability of left-hand operation
Indexable tools	· Loose clamping of inserts and parts may result in ejection of the tool during cutting and may cause serious injury	· Check the clamping of inserts and parts prior to machining,and use original parts only
	· Over loaded clamping of inserts by a lever (such as a pipe) may cause dangerous fracturing of parts and inserts	· Do not use lever inappropriately
	· In case of high speed machining, parts and inserts can be forced out by centrifugal force	· Use within recommended condition · Use glasses or safety cover for your safety
Rotating tools	· Since cutter has sharp cutting edges touching with a bare-hand may cause a cut	· Use gloves or safety cover for your safety
	· It is dangerous to use glove with rotating machine · Contact with body or clothes is dangerous with rotating parts	· Do not wear gloves when you work with rotating machine · Keep your body and clothes away from rotating machine
	· Vibration generated by balancing trouble may cause a fracture and ejection of the tool which may cause serious injury	· RPM should be controled within recommended condition · Check the balance of rotating part periodically
	· In case of drilling, the uncut bottom core can fly out of the part with high speed and cause serious injury	· Use gloves or safety cover for your safety
	· The edges of small diameter drill are sharp and easy to break	· Use gloves or safety cover for your safety
Brazed tools	· Fragmentation and ejection of brazed carbide tip may cause injury	· Check the brazed tip before using · Do not use at high temperature cutting condition
ETC	· There's a possibility of breaking the carbide tip after several brazing	· Do not use brazing a tip that has been brazed several times
	· Abusing may cause fragmentation of tool and is very dangerous	· Stick to safety regulations and guidelines

KORLOY Inc. Code System

Grade name for coated carbide



Chip breaker



The same chip breaker code is used for both negative type and positive type.

Terminology of tool formula

TERM	CODE	UNIT
Tool diameter	D	mm
Cutting speed	vc	m/min
Revolution per minute	n	min^{-1}
Feed per minute	vf	mm/min
Feed per revolution	fn	mm/rev
Feed per tooth	fz	mm/t
Tooth	z	
Axial depth of cut	ap	mm
Radial depth of cut	ae	mm
Peak feed	pf	mm

TERM	CODE	UNIT
Horse power requirement	Pc	kW
Specific cutting resistance	kc	MPa
Torque	Mc	N.m
Thrust	Tc	N
Cycle time	tc	min
Tool life	T	min
Flank wear	V_B	mm
Crater wear	Kt	mm
Nose radius	r	mm

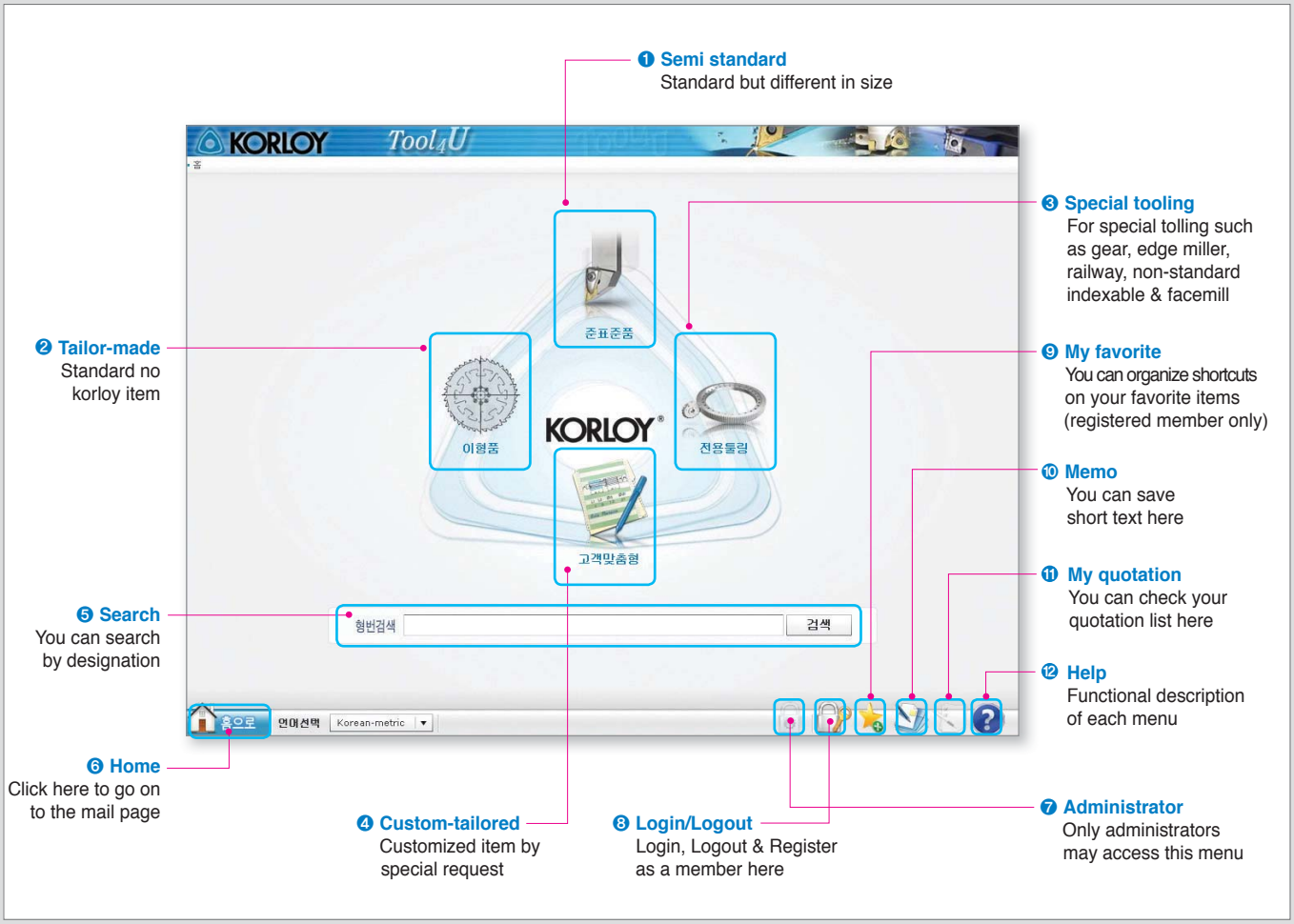
How to use Tool4U (Web quotation requriement)

1. Contact with Korloy Homepage

http://www.korloy.com (Korloy Homepage)

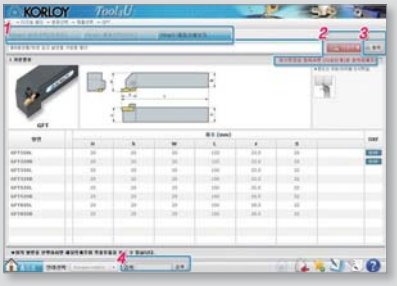
2. Click Tool4U banner-icon on the web site

3. Main page



4. Screen shot

Screen shot 1: Step3. Product detail



1. **Step**: Select category, product and check product detail
2. **Next step**: Open new window for changing dimension
3. **Print**: Print current page
4. **Search**: Search product by designation

Screen shot 2: Size input page



Enter essential information needed to quote and click “Quote” button to send e-mail

A

GRADES & CHIP BREAKERS

KORLOY's new grades are designed with optimal substrates for each application and are PVD coated for high temperature, high hardness and oxidation resistance, or CVD coated for high tempeure and wear resistance. Additionally, the improved post-coating treatment provides superior surface finishes to ensure the highest levels of quality and productivity.









Grades

A02 Grades system

Turing Grades

A04 Turning grade selections
A05 CVD coated grades
A14 PVD coated grades
A17 Uncoated carbide grades
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A22 Coated cermet grades

Milling Grades

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A26 CVD coated grades
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Solid Endmills & Solid Drills Grades

A35 Solid endmills grade selections
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Others (Turning/Milling/Endmills)

A39 Diamond coated grades
A41 DLC coated grades
A42 cBN inserts grades
A47 PCD Inserts grades

Chip Breakers

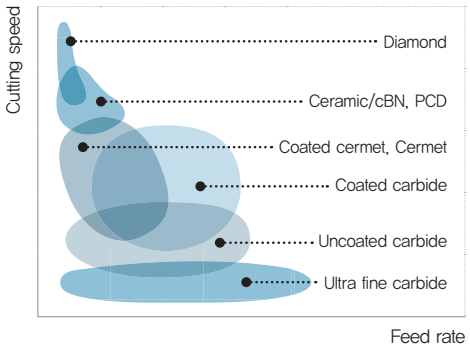
A48 Chip breaker for turning
A51 Chip breaker for milling
A55 Chip breaker for drilling

Grades system

Cutting tool

Uncoated carbide	P	Steel	ST10	ST20	ST30A							
	M	Stainless steel	U20									
	K	Cast iron	H01	H05	G10							
	S	Titanium alloy	H01	H05								
	N	Non-ferrous metal	H01	H05								
	H	Hardened steel	H01									
Coated carbide for turning	P	Steel	NC3215	NC3225	NC3120	NC3030	NC5330					
	M	Stainless steel	PC8105	PC8110	PC8115	NC9115	NC9125	NC5330	NC9135	PC5300	PC9030	PC5400
	K	Cast iron	NC6315	NC5330	PC5300	PC5400						
	S	HRSA	PC8105	PC8110	PC8115	NC9125	NC9135	PC5300	PC5400			
	N	Non-ferrous metal	ND3000	PD1000								
	H	Hardened steel	PC8105	PC8110	PC8115							
Coated carbide for milling	P	Steel	NC5330	NC5340	NCM325	PC3500	PC3600	PC5300	PC5400	NC5350	NCM335	
	M	Stainless steel	NC5330	NC5340	NCM325	PC5300	PC9530	NC5350	NCM335	PC5400		
	K	Cast iron	PC8110	PC6510	NC5330	PC5300	NC5340	PC5400				
	S	HRSA	PC5300	PC5400								
	N	Non-ferrous metal	ND3000	PD2000								
	H	Hardened steel	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510				
Coated carbide for drills, endmills	P	Steel	PC3500	PC5300	PC5335	PC5400	NC5330					
	M	Stainless steel	PC5300	PC5335	PC5400							
	K	Cast iron	PC6510	PC5300								
	S	HRSA	PC5300	PC5400								
	N	Non-ferrous metal	H01									
Turning cermet	P	Steel	CN1500	CN2000	CN2500							
	K	Cast iron	CN1500	CN2500								
Coated cermet	P	Steel	CC1500	CC2500								
Milling cermet	P	Steel	CN2000	CN30								

Application range



Grades system

Cutting tool

Solid endmills	P M K	General	PC203F	PC215F	PC303S	PC310U	PC315E	PC320	PC320S
	S	HRSA	PC320	PC320S					
	H	Hardened steel	PC203F	PC303S	PC310U				
	N	Non-ferrous metal	ND3000	ND2100	PD3000	PC210C	H01	H05S	
Solid drills	P M K	General	PC325U	PC215G	PC315G	PC230F			
	N	Non-ferrous metal	FG2	ND2100					
cBN	K	Cast iron	KB350	KB370	KB800				
	S	HRSA	KB370						
	H	Hardened steel	KB410	KB420	KB425	KB1000	KB2000	KB320	KB335	KB370
Coated cBN	H	Hardened steel	DNC100	DNC250	DNC350	DNC400			
PCD	N	Non-ferrous metal	DP90	DP150	DP200				

Wear resistance tool

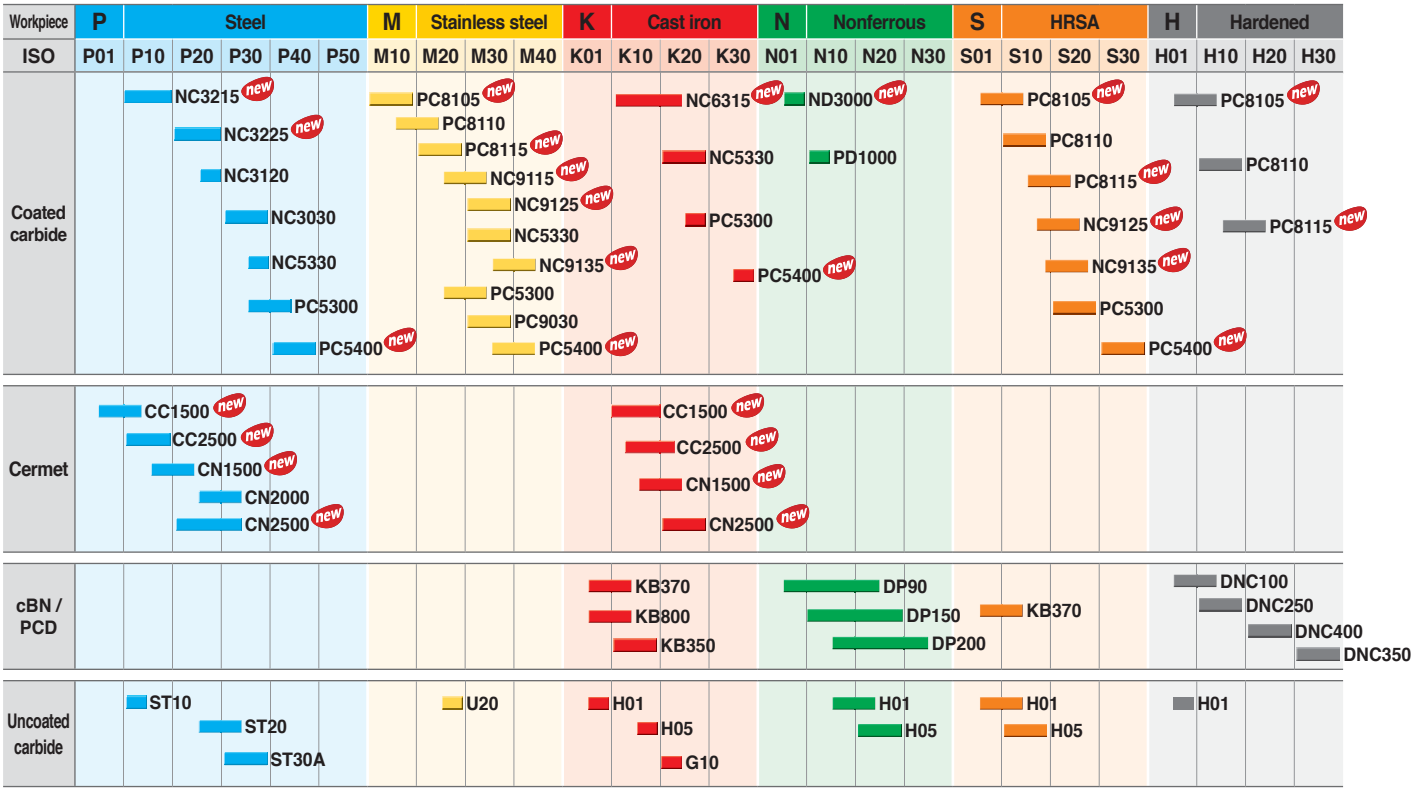
Ultra fine grain cemented carbide	Z	Ultra fine grain cemented carbide	FS1	FA1	FCC	
Uncoated carbide	V	Wear parts	D1	D2	D3	G5
	I	Corrosion resistance	IN10	IN20	IN40	

Mining tool

Uncoated carbide	E	General	GR10	GR20	GR30	GR35	GR40

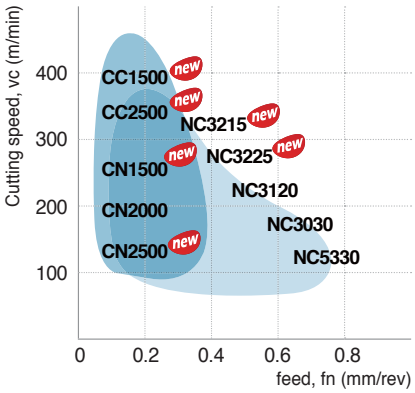
Turning grade selections

Selection system

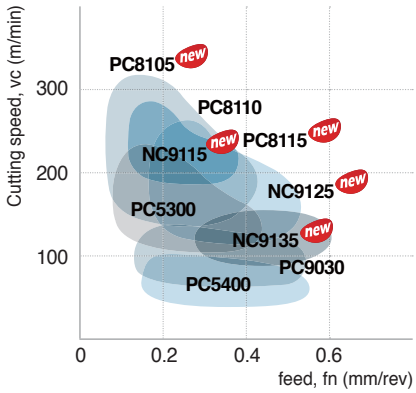


Application range of turning grades

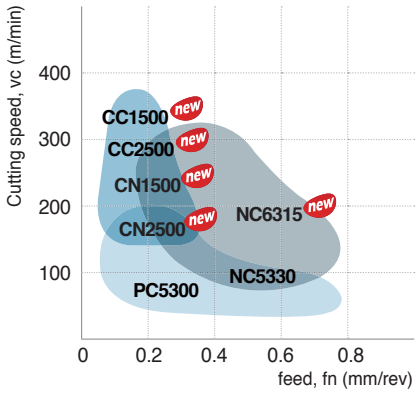
P Steel



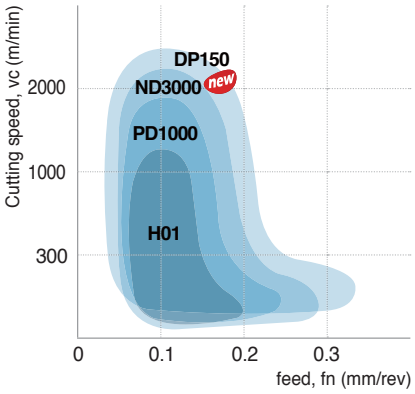
M Stainless steel



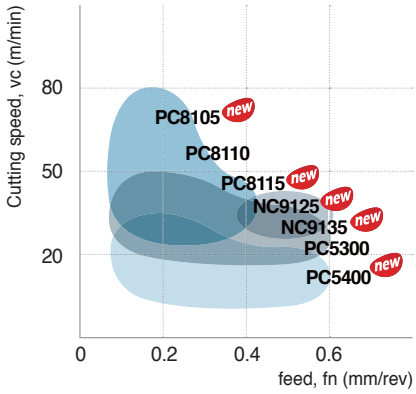
K Cast iron



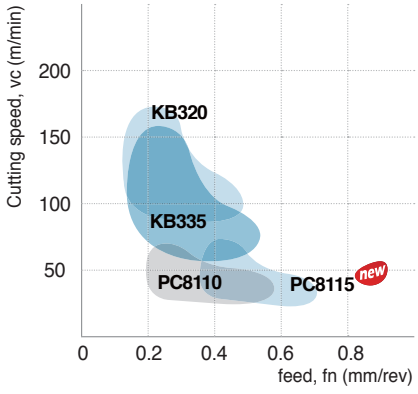
N Non-ferrous metal



S Heat resistant alloy



H Hardened steel



CVD coated grades

NC3215 new / NC3225 new

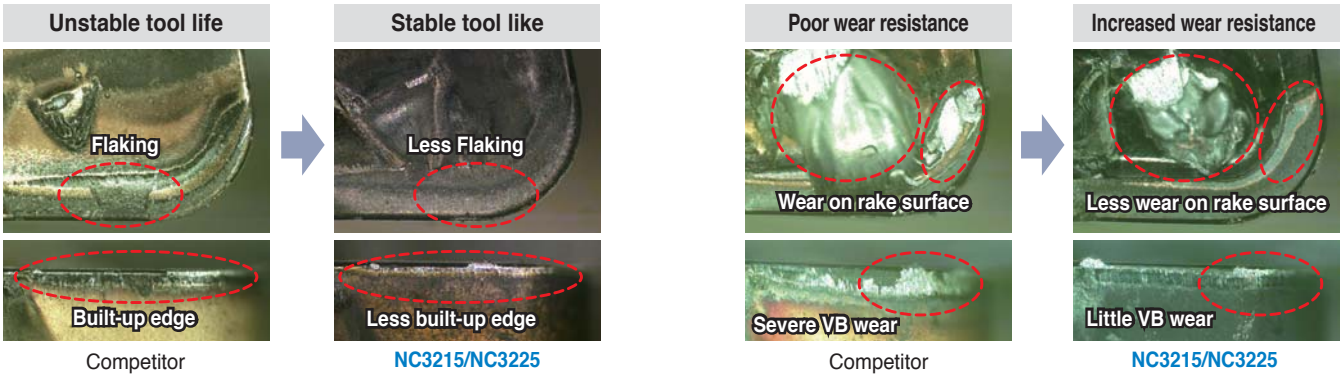
- Universal grade especially for machining forged automobile components and bearing steel both in continuous and interrupted cutting
- Available for all kinds of steels - carbon steel, alloy steel, rolled steel, tool steel, mild steel, bearing steel and other special kinds of steel
- New coating technology increases welding resistance and chipping resistance, which leads to longer tool life.

Features

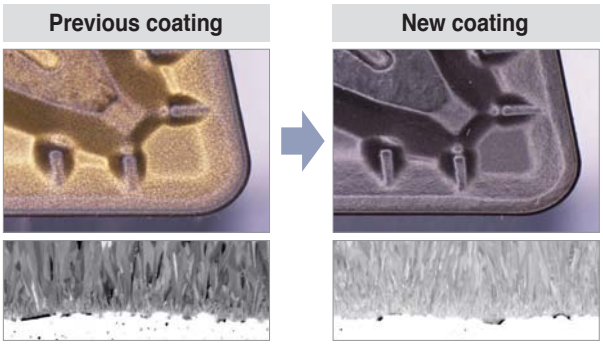
• Stable tool life
→ Higher production stability

• Longer tool life & Higher removal rate
→ High cutting conditions and shorter cutting time available

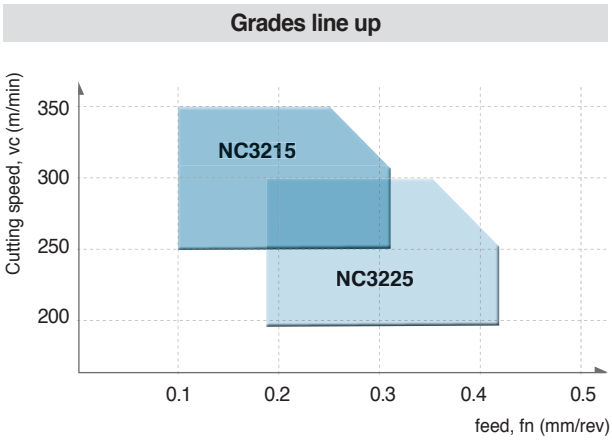
• Ideal combination of a grade and chip breakers
→ Prolongs tool life
→ Wide applications ranging from roughing to finishing

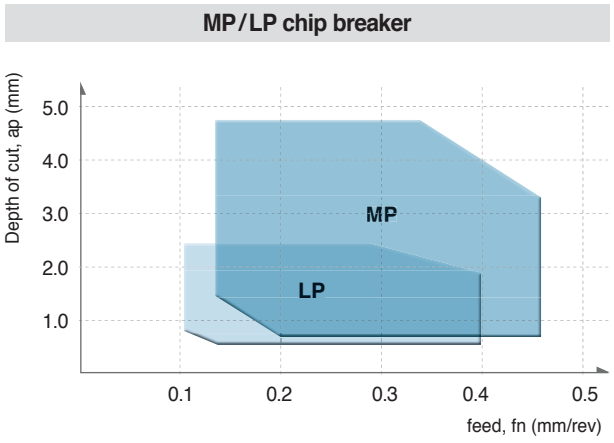


• Disperse cutting force ⟶ Reduce chipping ⟶ Increase tool life ⟶ Improved productivity



Application range





CVD coated grades

Universal grade for cast iron

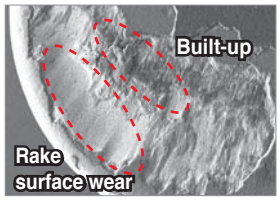
NC6315 new

- Higher wear and chipping resistance
  - CVD coated inserts with increased resistance to wear and chipping
- Solutions for most common Issues in cast Iron machining
  - Preventing excessive wear on rake and flank surfaces of insert, chipping and burr creation

Features

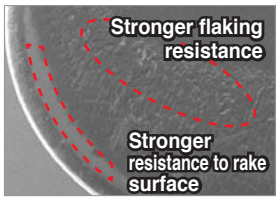
- Excellent wear resistance of rake surface in highly interrupted cutting of ductile / gray cast iron at high speeds over vc = 350m/min
- Improved alumina coating → Minimizes built-up edges
- Augmented tool life stability and wear resistance

Rake surface wear and built-up edge



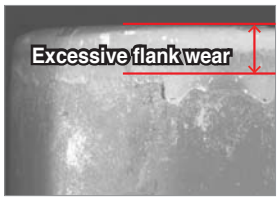
Competitor

Improved resistance to wear and flaking



NC6315

Excessive flank wear

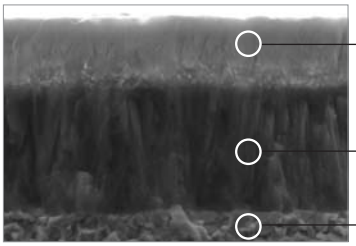


Competitor

Enhanced wear resistance



NC6315



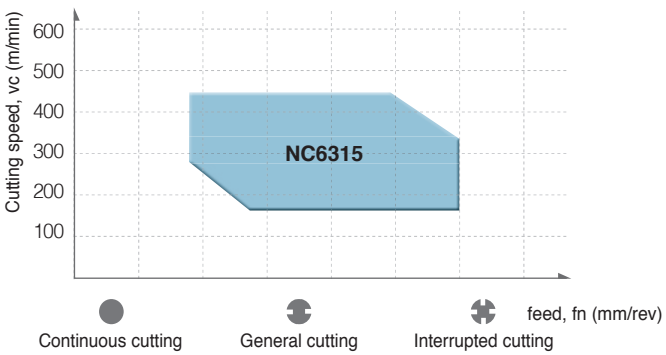
Alumina layer with better surface finish and increased resistance to wear and welding

Titanium layer with stronger anti-fracture

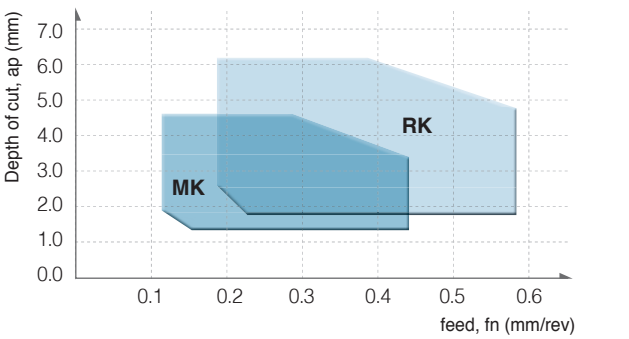
Functional substrate with optimized combination of hardness and toughness

Application range

Grades line up



MK/RK chip breaker



CVD coated grades

Turning grades for stainless steel

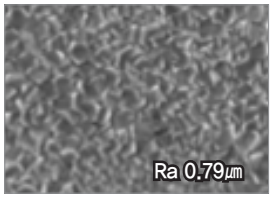
NC9115 new / NC9125 new / NC9135 new

- Optimized for reducing built-up edges, notch wear, plastic deformation and burrs, and for machining stainless steel
- Ideal combination of a grade and MM/RM chip breakers for stable tool life and wide applications ranging from roughing to finishing
- Stable tool life even at high speeds, feeds and depth of cuts (for STS316, vc over 150m/min available), shortening cutting time
- Excellent versatility responding to workpiece change, covering the austenite, the martensite and the ferrite

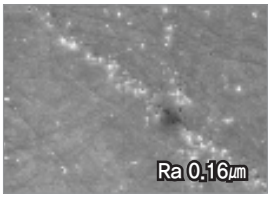
Features

• Improved surface finish thanks to the new lubricative CVD coating

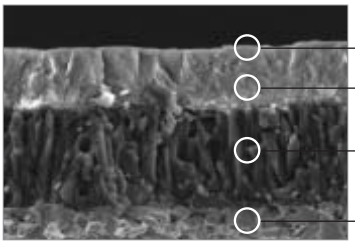
Lubricative coating layer to prevent built-up edge



Existing coating



NC9100 Series



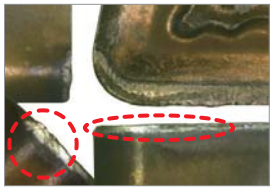
- Top coat with improved welding resistance
- Alumina coating layer for high speed cutting
- Titanium coating layer with stronger resistance to chipping
- Tough substrate optimized for continuous cutting and both light & heavy interruption

• Coated layers of stronger chipping resistance and the substrate of high toughness → Inhibits notch wear creation
• Lubricative coating layers → Improves welding resistance

Inhibited built-up edge and blade damage

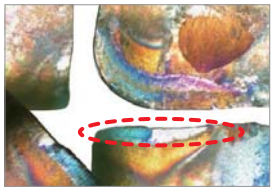


Competitor (M25)

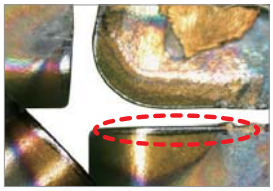


NC9125 (M25)

Inhibited wear on notch and relief surface



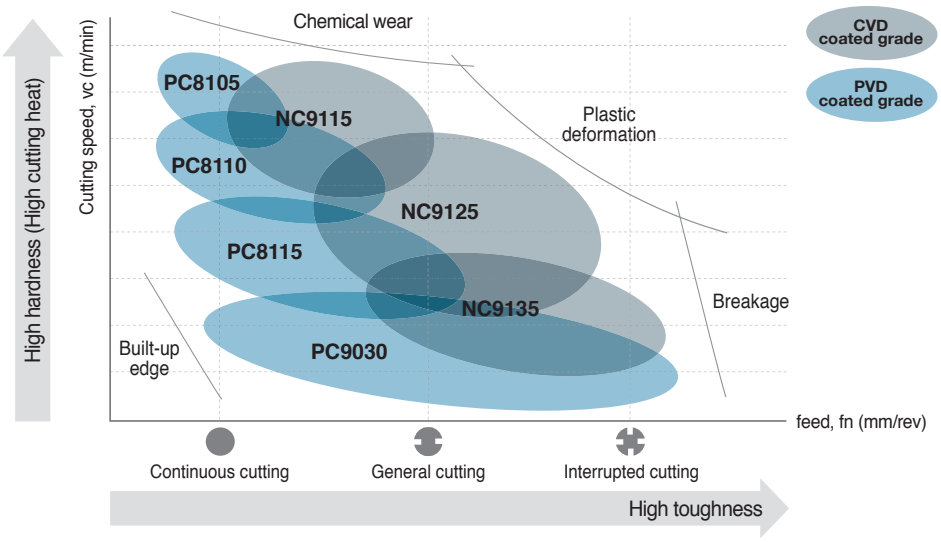
Competitor (M25)



NC9135 (M35)

CVD coated grades

Grades line up



Recommended grade and chip breaker per stainless steel type

[Austenitic stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115			160	220	
NC9125			150	200	
NC9135		100	150		

[Duplex stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115			120	160	
NC9125			100	140	
NC9135		60	100		

[Ferritic/Martensitic stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115			150	250	
NC9125			120	220	
NC9135		100	150		

[Precipitation hardened (PH) stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115	50	110			
NC9125	40	110			
NC9135	30	100			

Selection system of CVD coated grade

Workpiece		Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	NC3215 new	295 (170~420)	P10	NC3215 new
		Interrupted cutting	NC3225 new	260 (150~370)	P15	NC3225 new
					P20	NC3120
			NC3120	260 (120~370)	P25	NC3030
			NC3030	205 (120~290)	P30	NC5330 NC500H
			NC5330	205 (120~290)	P35	
			NC500H	205 (120~290)	P40	
M	Stainless steel	Continuous cutting	NC9115 new	240 (220~260)	M10	NC9115 new
			NC9125 new	210 (190~230)	M20	NC9125 new NC5330
		Interrupted cutting	NC9135 new	180 (160~200)	M30	NC9135 new
					M40	
K	Cast iron	Continuous cutting	NC6315 new	250 (130~370)	K10	NC6315 new
		Interrupted cutting		220 (130~310)	K20	NC5330
			NC5330	190 (110~270)	K30	
S	HRSA	Continuous cutting	NC9125 new	40 (20~60)	S10	NC9125 new
		Interrupted cutting	NC9135 new		S20	NC9135 new

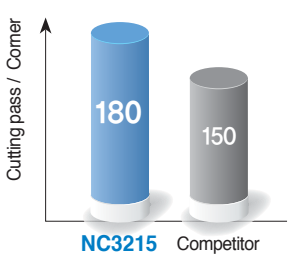
The features of CVD coated grades

CVD Coated grades	ISO	Features
NC3215 new	P10~P15	• Continuous machining of general steel and forged steel at high speed • Substrate with excellent thermal crack/plastic deformation resistance, coating with improved chipping resistance for continuous machining • MT-TiCN + Al_2O_3 + TiN
NC3225 new	P15~P25	• Universal grade for general steel and forged steel • 1st recommended grade for general machining with the use of high toughness substrate and coating layer with improved welding/chipping resistance • MT-TiCN + Al_2O_3 + TiN
NC3120	P20~P25	• Medium to roughing for steel • Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability • MT-TiCN + TiC + Al_2O_3
NC3030	P25~P35	• Medium to low speed machining of steel and interrupted roughing • Harmony between substrate with excellent wear/fracture resistance and Al2O3 film with excellent thermal/chipping resistance • Increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC5330	P30~P35 M25~M35 K15~K25 S15~S25	• Stainless Steel - General cutting for mild steel & forging steel • Excellent cutting performance in hard to cut materials which are vulnerable to built up edge, due to the high tough substrate with improved fracture resistance and the coated layers • MT-TiCN + Al_2O_3 + TiN
NC9115 new	M10~M20	• High speed cutting for ferritic and martensitic stainless steels • MT-TiCN + Al_2O_3 + TiN
NC9125 new	M20~M30	• General cutting of stainless steel and heat resistant alloys • MT-TiCN + Al_2O_3 + TiN
NC9135 new	M30~M40	• Interrupted cutting of stainless steel and heat resistant alloys • MT-TiCN + Al_2O_3 + TiN
NC500H	P25~P35	• Heavy interrupted cutting for steel • Plastic deformation and fracture resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al_2O_3 + TiN
NC6315 new	K10~K15	• Universal grade for ductile and gray cast Iron • Excellent performance thanks to the alumina (Al_2O_3) coating's improved grip on the tough substrate • MT-TiCN + Al_2O_3

Application examples (NC3215/NC3225)

P Carbon steel (SM20C)

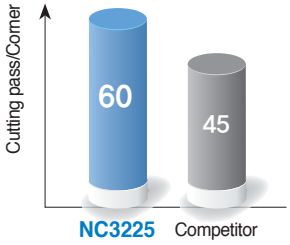
- **Workpiece** Part for fuel system
- **Cutting condition** vc (m/min) = 250~380, fn (mm/rev) = 0.2~0.3
  ap (mm) = 1.5~2.0, wet
- **Designation** **Insert** : CNMG120412-MP (NC3215)
  Holder: PCLNL2525-M12
- **Test result**

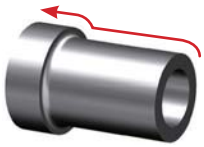




P Alloy steel (SNCM, cast)

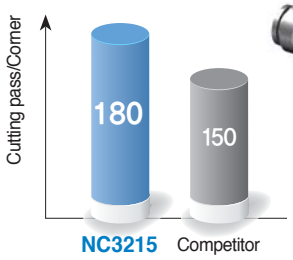
- **Workpiece** Part for engine
- **Cutting condition** vc (m/min) = 100, fn (mm/rev) = 0.15
  ap (mm) = 3.0, wet
- **Designation** **Insert** : CNMG120408-MP (NC3225)
  Holder: PCLNR2525-M12
- **Test result**

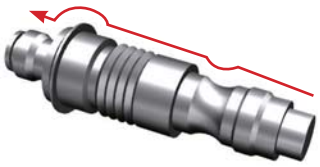




P Carbon steel (SM40C, cold forging)

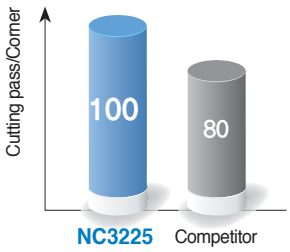
- **Workpiece** Part for steering
- **Cutting condition** vc (m/min) = 170, fn (mm/rev) = 0.3
  ap (mm) = 2.7~3.0, wet
- **Designation** **Insert** : DNMG150408-MP (NC3215)
  Holder: DDJNL2525-M15
- **Test result**





P Carbon steel (S55CR, hot forging)

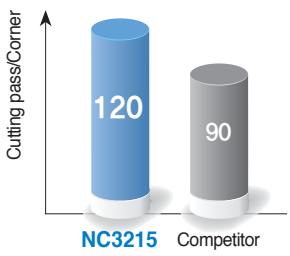
- **Workpiece** Part for steering
- **Cutting condition** vc (m/min) = 230, fn (mm/rev) = 0.3
  ap (mm) = 0.5~1.5, wet
- **Designation** **Insert** : CNMG120408-MP (NC3225)
  Holder: PCLNL2525-M12
- **Test result**

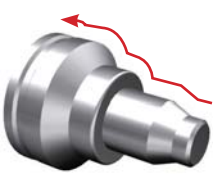




P Carbon steel (SM45C, cold forging)

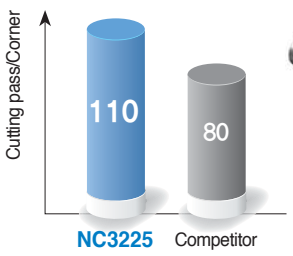
- **Workpiece** Part for steering
- **Cutting condition** vc (m/min) = 200~250, fn (mm/rev) = 0.25~0.35
  ap (mm) = 1.0~2.0, wet
- **Designation** **Insert** : DNMG150612-LP (NC3215)
  Holder: DDJNL2525-M15
- **Test result**

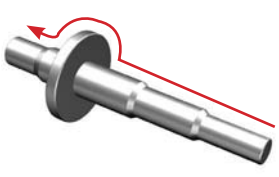




P Alloy steel (SCR420, cold forging)

- **Workpiece** Part for mission
- **Cutting condition** vc (m/min) = 160, fn (mm/rev) = 0.13
  ap (mm) = 1.0, wet
- **Designation** **Insert** : DNMG150608-LP (NC3225)
  Holder: DDJNL2525-M15
- **Test result**

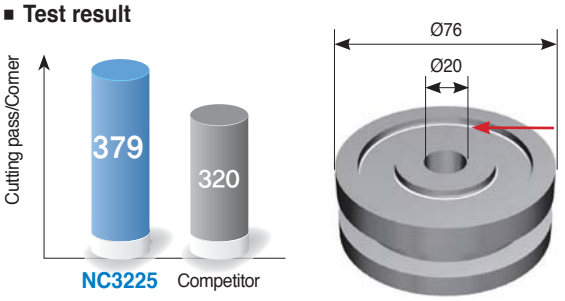




Application examples (NC3225)

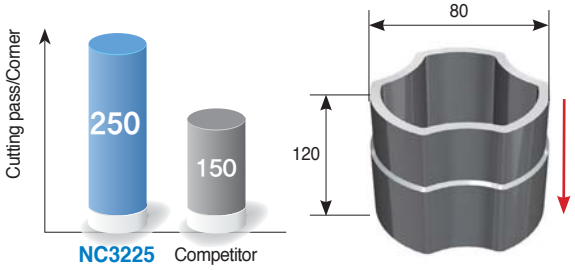
P Alloy steel (SCR420H, hot forging)

- **Cutting condition**: vc (m/min) = 360~430, fn (mm/rev) = 0.2
  ap (mm) = 1.2~1.5 (external machining/facing), wet
- **Designation**: **Insert** : CNMG120408-VB (NC3225)
  Holder: PCLNR2225-M12
- **Test result**



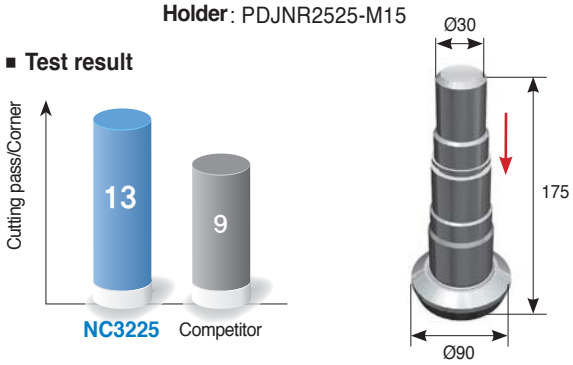
P Carbon steel (S48C, cold forging)

- **Cutting condition**: vc (m/min) = 280, fn (mm/rev) = 0.2~0.25
  ap (mm) = 1, dry
- **Designation**: **Insert** : CNMG120412-VB (NC3225)
  Holder: PCLNR2525-M12
- **Test result**



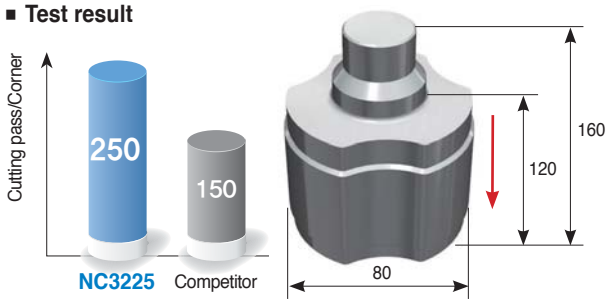
P Alloy steel (SCM420H, hot forging)

- **Cutting condition**: vc (m/min) = 80~500
  fn (mm/rev) = 0.15~0.3 (External machining/facing/grooving/tapping), ap (mm) = 0.7~1.5, wet
- **Designation**: **Insert** : DNMG150608-VB (NC3225)
  Holder: PDJNR2525-M15
- **Test result**



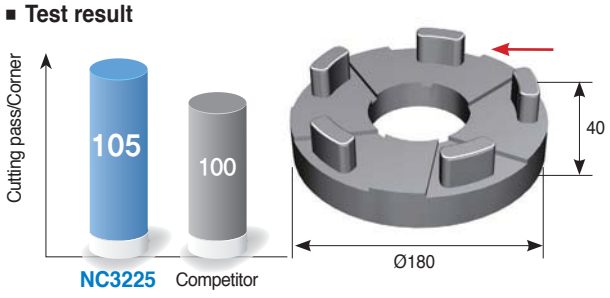
P Carbon steel (S53C, cold forging)

- **Cutting condition**: vc (m/min) = 280
  fn (mm/rev) = 0.2~0.25(External machining/internal machining), ap (mm) = 1, dry
- **Designation**: **Insert** : DNMG150608-VB (NC3225)
  Holder: PDJNR2525-M15
- **Test result**



P Alloy steel (SCR series, cold forging)

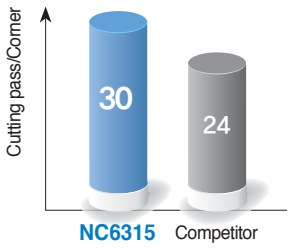
- **Cutting condition**: vc (m/min) = 314
  fn (mm/rev) = 0.25 (external machining/facing)
  ap (mm) = 1, wet
- **Designation**: **Insert** : CNMG120408-VM (NC3225)
  Holder: PCLNR2525-M12
- **Test result**



Application examples (NC6315)

K Gray cast iron (GC250)

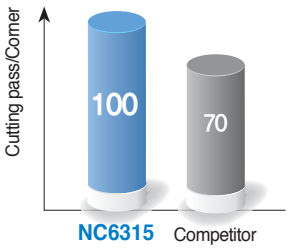
- **Workpiece** Break disc
- **Cutting condition** vc (m/min) = 550, n (rpm) = 547, fn (mm/rev) = 0.3, ap (mm) = 3, wet
- **Designation** **Insert** : CNMG120412-RK (NC6315) **Holder**: DCLNR2525
- **Test result**





K Ductile cast iron (GCD500)

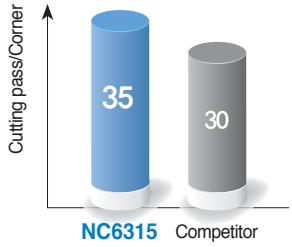
- **Workpiece** Diff. case mission
- **Cutting condition** vc (m/min) = 250, n (rpm) = 800, fn (mm/rev) = 0.25, ap (mm) = 1.5, wet
- **Designation** **Insert** : CNMG120408-MK (NC6315) **Holder**: DCLNR2525
- **Test result**





K Ductile cast iron (GCD500)

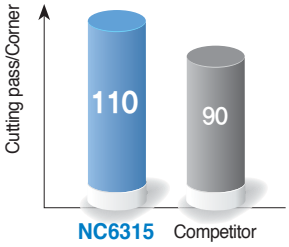
- **Workpiece** Fly wheel
- **Cutting condition** vc (m/min) = 400, n (rpm) = 398, fn (mm/rev) = 0.3, ap (mm) = 2, wet
- **Designation** **Insert** : CNMA120408 (NC6315) **Holder**: DCLNR2525
- **Test result**





K Ductile cast iron (GCD500)

- **Workpiece** Knuckle
- **Cutting condition** vc (m/min) = 200, n (rpm) = 1100, fn (mm/rev) = 0.25, ap (mm) = 2, wet
- **Designation** **Insert** : DNMG150608-MK (NC6315) **Holder**: DDJLNR2525
- **Test result**

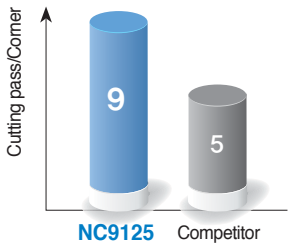




Application examples (NC9100 Series)

M Stainless steel (STS304)

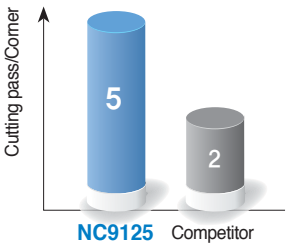
- **Workpiece** Hydraulics part (Mechanical seal)
- **Cutting condition** vc (m/min) = 140, fn (mm/rev) = 0.28
  ap (mm) = 3.0, wet
- **Designation** **Insert** : CNMG120408-MM (NC9125)
  Holder : S32S-PCLCR-12
- **Test result**

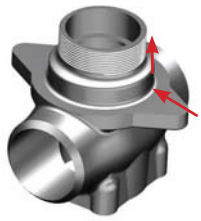




M Stainless steel (STS304)

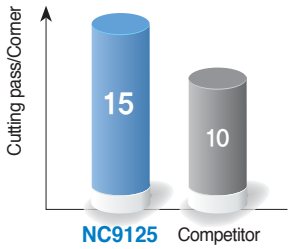
- **Workpiece** Valve part (Piston valve)
- **Cutting condition** vc (m/min) = 140, fn (mm/rev) = 0.28
  ap (mm) = 3.0, wet
- **Designation** **Insert** : CNMG120408-MM (NC9125)
  Holder : DCLNL2525-M12
- **Test result**





M Stainless steel (STS317L)

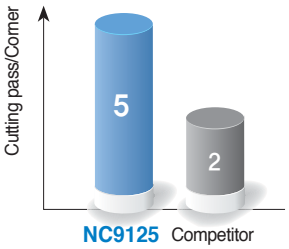
- **Workpiece** Wind power/offshore plant part (Flange)
- **Cutting condition** vc (m/min) = 150, fn (mm/rev) = 0.3~0.5
  ap (mm) = 4.0~6.0, wet
- **Designation** **Insert** : CNMG160616-MM (NC9125)
  Holder : PCLNR3232-P16
- **Test result**





M Stainless steel (STS316)

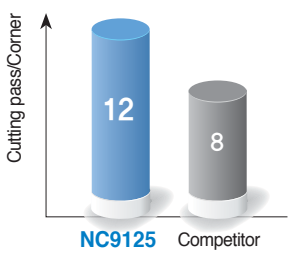
- **Workpiece** Wind power plant part (Flange)
- **Cutting condition** vc (m/min) = 175, fn (mm/rev) = 0.3~0.8
  ap (mm) = 0.5, wet
- **Designation** **Insert** : TNMG220416-RM (NC9135)
  Holder : PTFNR3232-P22
- **Test result**





M Stainless steel (Super duplex)

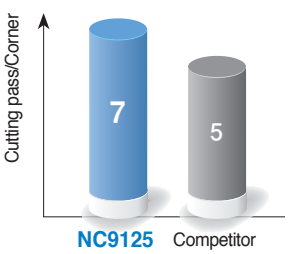
- **Workpiece** Plant part (Flange)
- **Cutting condition** vc (m/min) = 100, fn (mm/rev) = 0.5
  ap (mm) = 3, wet
- **Designation** **Insert** : CNMG160616-MM (NC9125)
  Holder : PCLNR323-P16
- **Test result**





M Stainless steel (Duplex)

- **Workpiece** Hydraulics part
- **Cutting condition** vc (m/min) = 120, fn (mm/rev) = 0.4
  ap (mm) = 6, wet
- **Designation** **Insert** : CNMG160616-RM (NC9125)
  Holder : DCLNR3232-P16
- **Test result**





PVD coated grades

Turning grade for heat resistant alloy and stainless steel

PC8105 new

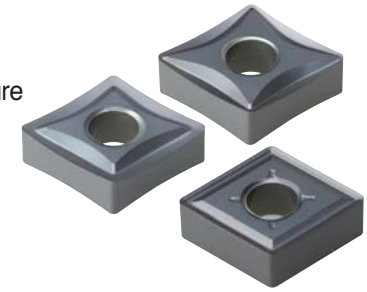
- Micro grain carbide minimizes chipping of cutting edge due to enhanced edge strength
- Latest PVD coating technology with high hardness and high temperature oxidation resistance
- Excellent tool life when finishing heat resistant alloys and stainless steels at high speeds

PC8110

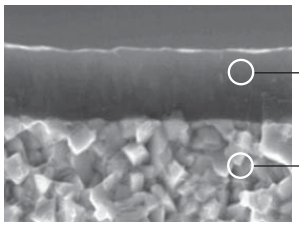
- Substrate with superior wear resistance and plastic deformation resistance at high temperature
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Long tool life when machining heat resistant alloy and stainless steel at high speed

PC8115 new

- Ultra fine matrix technology increases wear resistance and chipping resistance.
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Strong cutting edge and excellent chipping resistance guarantees stable machining
- Long tool life when machining heat resistant alloy and stainless steel at middle to low speed and medium cutting to roughing



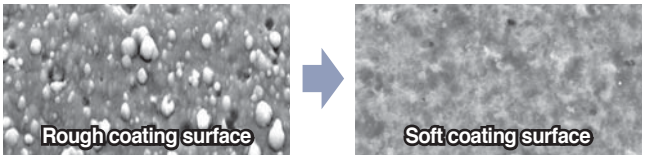
Features of PC8100 series



It prevents wear at a high temperature to apply excellent surface roughness and coating with oxidation resistance and high hardness

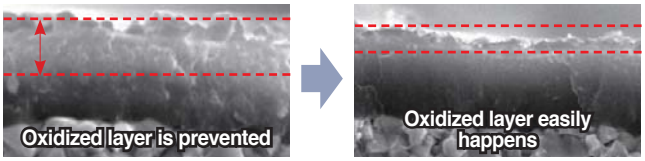
It improves wear resistance to equalize submicron matrix, secure stability between corners and improve chipping- and wear resistance

Coating surface treatment technology (Pictures of coating layer)



Conventional coating — Improved lubrication — PC8100 Series

Oxidation resistant coating technology (Pictures of coating layer heat-treated at 900°C)



Competitor — Improved oxidation resistance — PC8100 Series

Selection system of PVD coated grade

Workpiece		Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	PC5300	175 (100~250)	P30	PC5300 → PC5400 new
		Interrupted cutting		145 (80~120)	P40	
			PC5400 new	125 (80~160)	P50	
M	Stainless steel	Continuous cutting	PC8105 new	175 (120~230)	M01	PC8105 new → PC8110 → PC8115 new → PC5300 → PC9030 → PC5400 new
			PC8110	160 (110~210)	M10	
			PC8115 new	150 (100~200)	M20	
		Interrupted cutting	PC5300	135 (80~190)	M30	
			PC9030	130 (80~180)	M40	
			PC5400 new	110 (80~140)	M50	
S	Heat resistant alloy	Continuous cutting	PC8105 new	55 (40~70)	S01	PC8105 new → PC8110 → PC8115 new → PC5300 → PC5400 new
			PC8110	50 (35~65)	S10	
			PC8115 new	45 (30~60)	S20	
		Interrupted cutting	PC5300	40 (20~60)	S30	
			PC5400 new	35 (20~50)	S40	
H	Hardened	Interrupted cutting	PC8105 new	110 (80 ~140)	H01	PC8105 new → PC8110 → PC8115 new
			PC8110	100 (70~130)	H05	
			PC8115 new	90 (65~115)	H10	

The features of PVD coated grades

PVD Coated grades	ISO	Features
PC8105 new	M05~M15 S01~S10 H01~H05	• For high speed and continuous finishing of hard-to-cut materials and STS • Excellent cutting performance with high wear resistance and oxidation resistance • Ultra fine substrate and the new TiAlN coating layer
PC8110	M10~M20 S05~S15 H01~H10	• For high speed and continuous medium cutting of hard-to-cut materials and STS • Excellent tool life with high wear/plastic deformation resistance at high temperature • New TiAlN coating layer and substrate with excellent thermal resistance
PC8115 new	M15~M25 S10~S20 H05~H15	• For medium to low speed and medium to rough cutting of hard-to-cut materials and STS • Excellent tool life with high wear resistance and chipping resistance • Ultra fine substrate and the new TiAlN coating layer
PC5300	P30~P40 M20~M30 K20~K25 S15~S25	• Universal grade for stainless,HRSA,steel and interrupted cast iron machining • High chipping and welding resistance for longer tool life • New TiAlN coating and ultra fine grain substrate adopted
PC9030	M25~M35	• Medium,roughing and heavy interrupted cutting for stainless steel • TiAlN coating and ultra fine grain substrate adopted • High chipping and welding resistance for stable machining
PC5400 new	P35~P45 M30~M40 K30~K35 S25~S35	• For medium cutting for hard-to-cut materials, stainless steel, steel, and cast iron at medium or low speed • Stable machinability with chipping resistance, fracture resistance and welding resistance • Ultra fine substrate with high toughness and new AlCiN layer

Application examples (PC8105/PC8110/PC8115)

S Inconel 718

- **Cutting condition**: vc (m/min) = 50, fn (mm/rev) = 0.15, ap (mm) = 0.5, wet
- **Designation**: **Insert** : CNMG120408-VP3 (PC8105), **Holder**: PCLNR2525-M12
- **Test result**



PC8105 | Competitor A | Competitor B

S Inconel 718

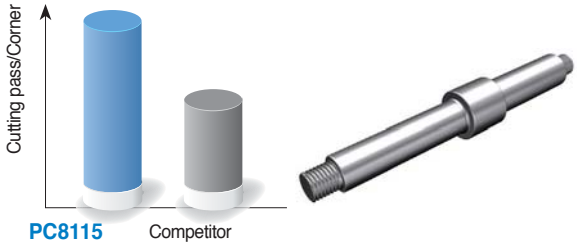
- **Cutting condition**: vc (m/min) = 50, fn (mm/rev) = 0.15, ap (mm) = 1.5, wet
- **Designation**: **Insert** : CNMG120408-VP3 (PC8115), **Holder**: PCLNR2525-M12
- **Test result**



PC8115 | Competitor | Conventional grade

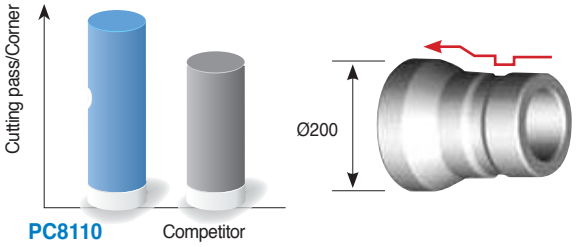
M Stainless steel (STS316L)

- **Cutting condition**: vc (m/min) = 80, fn (mm/rev) = 0.2, ap (mm) = 7.0, wet
- **Designation**: **Insert** : CNMG120408-VP3 (PC8115), **Holder**: PCLNR2525-M12
- **Test result**



S Inconel 625

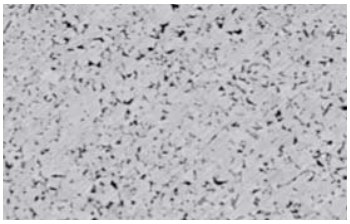
- **Cutting condition**: vc (m/min) = 60, fn (mm/rev) = 0.2, ap (mm) = 2, wet
- **Designation**: **Insert** : DNMG150608-HS (PC8110), **Holder**: DDLNL2525-M15
- **Test result**



Uncoated carbide grades

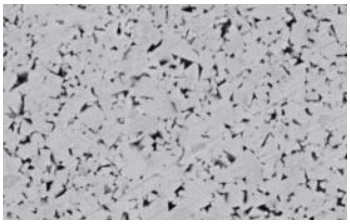
Uncoated carbide grades for turning application of titanium

H01



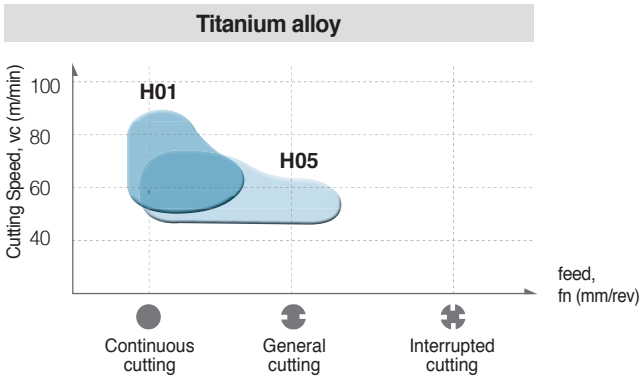
- Increased wear resistance and chipping resistance with the use of ultra fine substrate
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Excellent tool life when finishing titanium alloy at high speed

H05



- The 1st recommended grade for machining titanium alloy in a variety of cutting conditions
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Ideal for medium cutting of titanium alloy

Grades line up



Selection system of uncoated carbide grades

Workpiece		Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	ST10	110 (70~140)	P10	ST10
		ST20	80 (50 ~110)	P20	ST20
		ST30A	70 (40~90)	P30	ST30A
M	Stainless steel	U20	70 (40~90)	M25	U20
K	Cast iron	H01	105 (60~140)	K01	H01
		H05	105 (60~140)	K10	H05
		G10	90 (50~120)	K20	G10
N	Aluminum alloy	H01	600 (450~750)	N10	H01
	Copper alloys	H05	425 (320~530)	N20	H05
S	Titanium alloy	H01	55 (40~70)	S01	H01
		H05	50 (35~65)	S10	H05
H	High hardness steel	H01	80 (55~105)	H10	H01

Main composition and application range

Workpiece	Composition	Features	Workpiece
P	WC-TiC-TaC-Co	Heat resistance, excellent plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC-TiC-TaC-Co	General tools stable heat resistance with strength	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC-Co	High strength and superior wear resistance	Cast iron, Non-ferrous metal, Plastic, etc
S	WC-Co	Excellent wear resistance and chipping resistance	Titanium alloy

The physical properties of uncoated carbide grades

Workpiece	Grade	Hardness (HRA)	TRS (kgf/mm²)	Young's modulus (10^3kgf/mm²)	Thermal expansion coefficient (10^{-6}/°C)	Thermal conductivity (cal/cm · sec·°C
P	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
K	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105
S	H01	92.9	210	66	4.7	109
	H05	91.8	250	-	-	-

1KPa = 102kgf/m², 1w/mk = 2.39×10^{-3}cal/cm·sec·°C

Application examples (H01/H05)

S Titanium alloy (Ti-6Al-4V)

- **Cutting condition**: vc (m/min) = 100, fn (mm/rev) = 0.1, ap (mm) = 0.5, wet
- **Designation**: **Insert** : CNMG120408-VP1 (H01), **Holder** : PCLNR2525-M12
- **Test result**



H01 (VP1) | H01 (VP3) | Competitor

S Titanium alloy (Ti-6Al-4V)

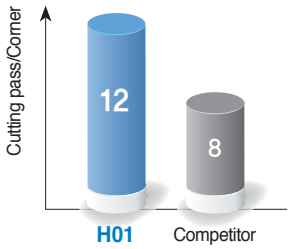
- **Cutting condition**: vc (m/min) = 80, fn (mm/rev) = 0.2, ap (mm) = 2.0, wet
- **Designation**: **Insert** : CNMG120408-VP3 (H05), **Holder** : PCLNR2525-M12
- **Test result**



H05 | Competitor A | Competitor B

S Titanium alloy (Ti-6Al-4V)

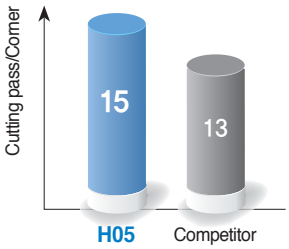
- **Workpiece**: Part of an industrial machine
- **Cutting condition**: vc (m/min) = 60, fn (mm/rev) = 0.2, ap (mm) = 0.8, wet
- **Designation**: **Insert** : CNMG120408-VP3 (H01), **Holder** : PCLNR2525-M12
- **Test result**





S Titanium alloy (Ti-6Al-4V)

- **Workpiece**: Part of an industrial machine
- **Cutting condition**: vc (m/min) = 50, fn (mm/rev) = 0.15, ap (mm) = 2.0, wet
- **Designation**: **Insert** : CNMG120408-VP3 (H05), **Holder** : PCLNL2525-M12
- **Test result**





Cermet grades

Solution for turning application of steel

CN1500 new

- For continuous machining of cold/hot forged steel and Sintered ferrous alloy at high speed and low depth of cut
- Excellent wear resistance and crater resistance
- Improved surface roughness acquired by optimized cutting edges

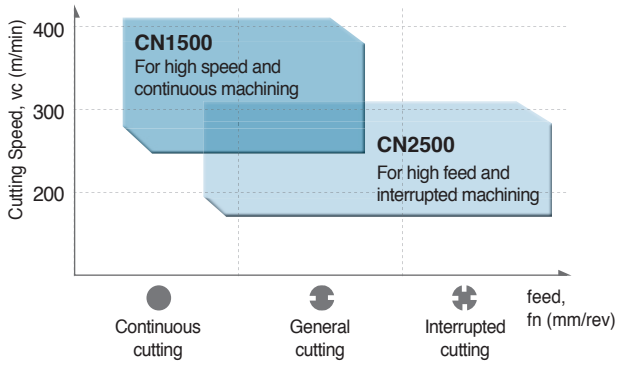
CN2500 new

- For high interrupted machining of cold/hot forged steel and Sintered ferrous alloy at high feed and high depth of cut
- Excellent resistance against chipping, fracture and thermal crack
- Improved surface roughness acquired by optimized cutting edges

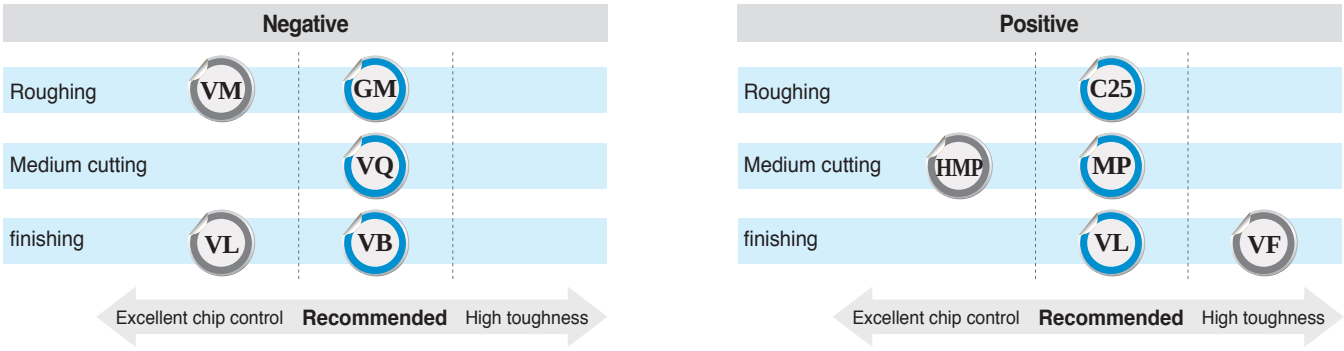
Recommended cutting condition

Division	Workpiece	Grade	Recommended cutting speed (m/min)		
			Minimum	Recommended	Maximum
Turning	SM10C, SS440	CN1500	150	**270**	400
		CN2500	130	**240**	350
	SM45C	CN1500	150	**250**	350
		CN2500	130	**220**	300
	SCM440, Sintered fe ferrous alloy	CN1500	120	**220**	300
		CN2500	100	**200**	250

Grades line up



Chip breakers line up



Selection system of cermet grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	CN1500 new	250 (150~350)	P10	CN1500 new
					P20	
		Interrupted cutting	CN2500 new	220 (130~300)	P30	CN2500 new

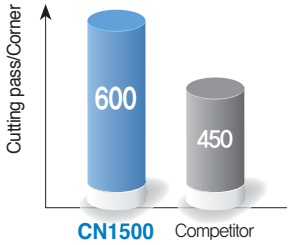
Comparison of chip breakers

Insert types	Machining types	Application range	Chip breakers				
			KORLOY	CompetitorA	CompetitorB	CompetitorC	CompetitorD
Nega type	Continuous cutting	For machining mild steel with enhanced chip control	**VL**	FA	GP	TF	FA
	General cutting	For low interrupted cutting with stronger cutting edges than VG chip breaker	**VB**	FG	XP CQ	TSF TS	LU SE
	General cutting	For medium cutting to finishing at low interruption	**VQ**	MC	HQ	AS, ZM	SU
	Interrupted cutting	For medium cutting to roughing at high interruption	**GM**	MT	HS	TM	GU
Posi type	Continuous cutting	For machining mild steel with enhanced chip control	**VL**	FA	GP	PF	FP
	Continuous cutting	Enhanced chip control when machining internal diameter with stronger cutting edges than VL chip breaker	**VF**	FG-PC	HQ	PS	LU
	General cutting	Stronger cutting edges than VF chip breaker	**MP**	FG	HQ	PS	LU
	General cutting	For medium cutting to finishing at low interruption	**HMP**	FG	HQ	PM	SU
	Interrupted cutting	For medium cutting to roughing at high interruption	**C25**	MT	GK	24	SC

Application examples (CN1500)

P Carbon steel (SM45C)

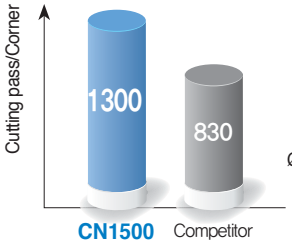
- **Cutting condition** vc (m/min) = 200, n (rpm) = 1,800
fn (mm/rev) = 0.1, ap (mm) = 0.3
wet
- **Designation** **Insert** : CCMT09T304-HMP (CN1500)
Holder : SCLCR2020-K09
- **Test result**

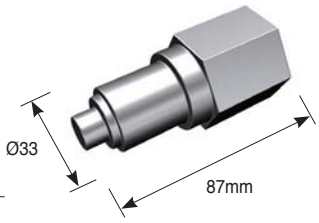




P Alloy steel (SCM430)

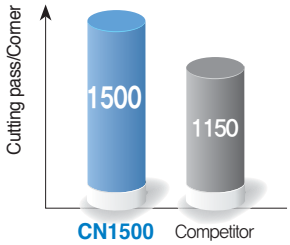
- **Cutting condition** vc (m/min) = 230, n (rpm) = 2,000
fn (mm/rev) = 0.12, ap (mm) = 0.8
wet
- **Designation** **Insert** : TNMG160404-VQ (CN1500)
Holder : DTGNR3232-P16
- **Test result**

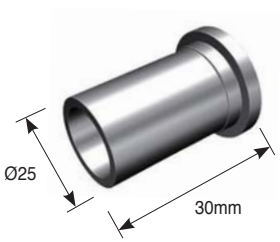




P Bearing steel (STB2)

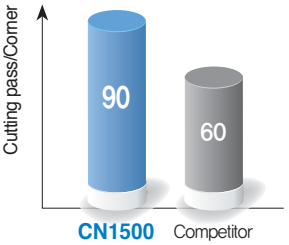
- **Cutting condition** vc (m/min) = 200, n (rpm) = 2,500
fn (mm/rev) = 0.1, ap (mm) = 0.3
wet
- **Designation** **Insert** : DCMT11T302-VF (CN1500)
Holder : SDJCR2525-M11
- **Test result**

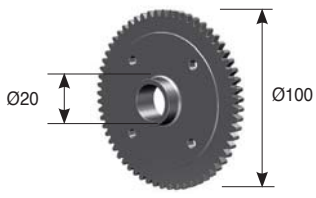




P Sintered ferrous alloy

- **Cutting condition** vc (m/min) = 160, n (rpm) = 1,200
fn (mm/rev) = 0.17, ap (mm) = 0.2
wet
- **Designation** **Insert** : SNMG120408-GM (CN1500)
Holder : MSRNR2525-M12
- **Test result**

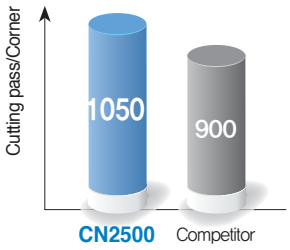




Application examples (CN2500)

P Carbon steel (SM45C)

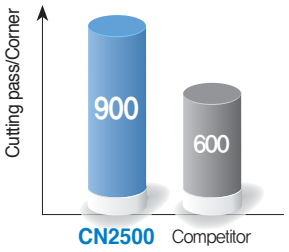
- **Cutting condition** vc (m/min) = 185, n (rpm) = 2,300
  fn (mm/rev) = 0.15, ap (mm) = 0.4
  wet
- **Designation** **Insert** : CCMT09T304-MP (CN2500)
  Holder : SCLCR2020-K09
- **Test result**





P Alloy steel (SCR420H)

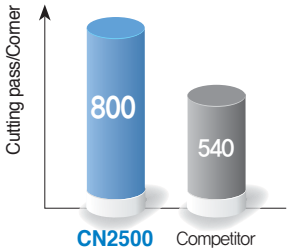
- **Cutting condition** vc (m/min) = 200, n (rpm) = 2,000
  fn (mm/rev) = 0.15, ap (mm) = 0.2
  wet
- **Designation** **Insert** : DCMT11T304-HMP (CN2500)
  Holder : SDJCR2525-M11
- **Test result**

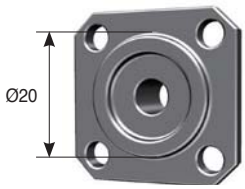




P Sintered ferrous alloy

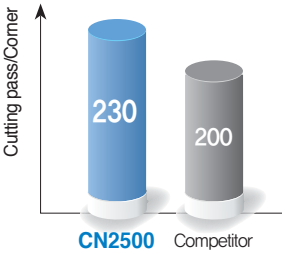
- **Cutting condition** vc (m/min) = 280, n (rpm) = 2,000
  fn (mm/rev) = 0.2, ap (mm) = 0.2
  wet
- **Designation** **Insert** : VBMT160404-MP (CN2500)
  Holder : SVABL-2020-K16
- **Test result**





P Alloy steel (SCM415)

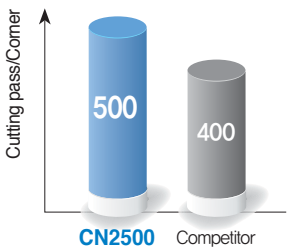
- **Cutting condition** vc (m/min) = 300, n (rpm) = 2,200
  fn (mm/rev) = 0.25, ap (mm) = 0.3
  wet
- **Designation** **Insert** : CNMG120408-GM (CN2500)
  Holder : PCLNR2525-M12
- **Test result**

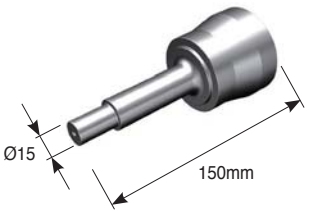




P Carbon steel (SM45C)

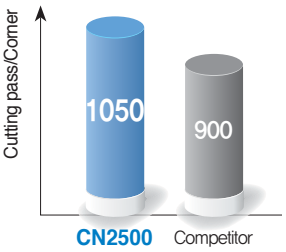
- **Cutting condition** vc (m/min) = 300, n (rpm) = 2,800
  fn (mm/rev) = 0.25, ap (mm) = 0.4
  wet
- **Designation** **Insert** : CNMG120404-VB (CN2500)
  Holder : PCLNR3232P-16
- **Test result**





P Alloy steel (SCR420)

- **Cutting condition** vc (m/min) = 200, n (rpm) = 2,300
  fn (mm/rev) = 0.2, ap (mm) = 0.3
  wet
- **Designation** **Insert** : CCMT09T304-HMP (CN2500)
  Holder : SCLCR2020-K09
- **Test result**





Coated cermet grades

Coated cermet for machining carbon steel, alloy steel and sintered ferrous components

CC1500 new

- Maximized resistance to built-up edge and oxidation in continuous cutting at high speeds and low depth of cuts
- Superior wear resistance vs. existing tools in continuous cutting of carbon steel and alloy steel

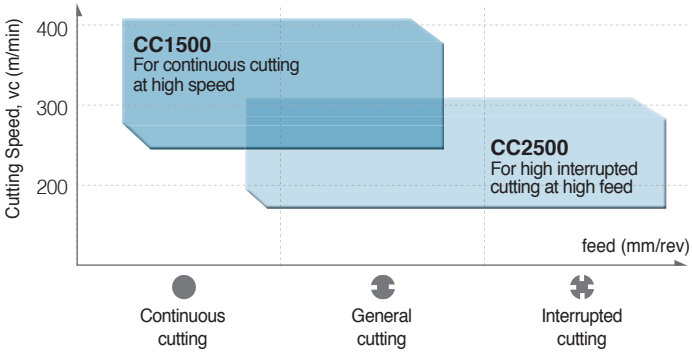
CC2500 new

- Maximized resistance to built-up edge and oxidation in interrupted cutting at high feeds and high depth of cuts
- Superior impact resistance vs. existing tools in interrupted cutting of carbon steel and alloy steel

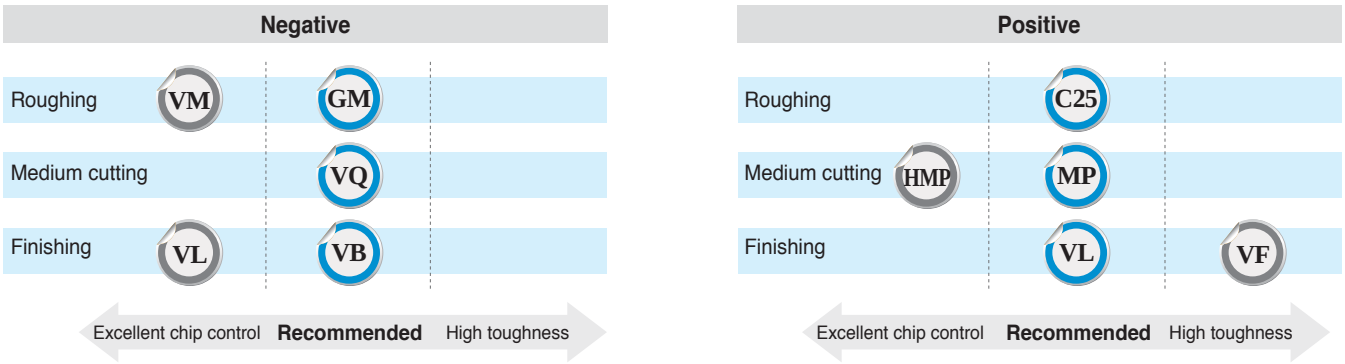
Recommended cutting condition

Division	Workpiece	Grade	Recommended cutting speed (m/min)
Turning	SM10C SS400	CC1500	200 < **350** < 450
		CC2500	180 < **290** < 400
	SM45C	CC1500	200 < **300** < 400
		CC2500	180 < **270** < 350
	SCM440, Sintered fe ferrous alloy	CC1500	180 < **270** < 350
		CC2500	150 < **250** < 300

Grades line up



Chip breakers line up



Selection system of coated cermet grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	CC1500 new	325 (200~450)	P10	CC1500 new
		Interrupted cutting	CC2500 new	265 (180~350)	P20	CC2500 new
					P30	

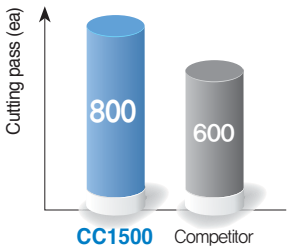
The features of coated cermet grade

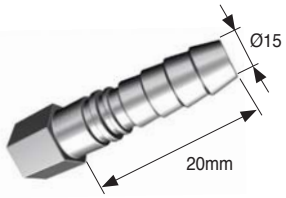
Coated cermet	ISO	Features
CC1500 new	P10~P20	• PVD coated Cermet • Light cutting for steel and cast iron in high speed machining • Optimized for precision boring
CC2500 new	P20~P30	• PVD coated Cermet • Light cutting for steel and cast iron in medium or high speed machining • Dry and wet cutting are available

Application examples (CC1500)

P Carbon steel (SM20C)

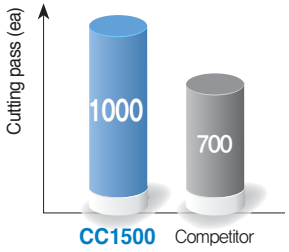
- **Workpiece** Nipple
- **Cutting condition** vc (m/min) = 170, n (rpm) = 2,000
  fn (mm/rev) = 0.12, ap (mm) = 0.12, wet
- **Designation** **Insert** : TPMT110304-MP (CC1500)
  Holder : S20R-STWPR-11
- **Test result**





P Alloy steel (SCM440)

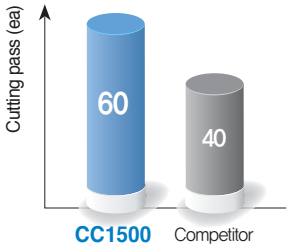
- **Workpiece** Plate carrier
- **Cutting condition** vc (m/min) = 450, n (rpm) = 2,500
  fn (mm/rev) = 0.2, ap (mm) = 0.2, wet
- **Designation** **Insert** : DCMT11T304-HMP (CC1500)
  Holder : SDJCR2525M11
- **Test result**

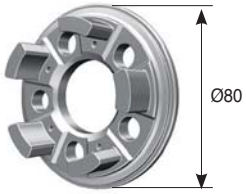




P Carbon steel (SM45C)

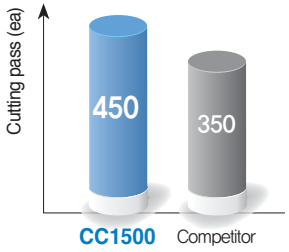
- **Workpiece** Cut plate carrier
- **Cutting condition** vc (m/min) = 300, n (rpm) = 2,500
  fn (mm/rev) = 0.3, ap (mm) = 0.4, wet
- **Designation** **Insert** : CCMT09T304-C25 (CC1500)
  Holder : SCACR1212-F09
- **Test result**

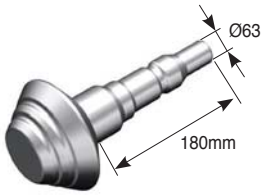




P Alloy steel (SCM420)

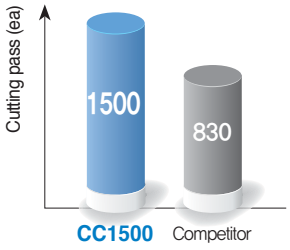
- **Workpiece** Pinion
- **Cutting condition** vc (m/min) = 250, n (rpm) = 2,500
  fn (mm/rev) = 0.2, ap (mm) = 0.5, wet
- **Designation** **Insert** : DNMG150604-VL (CC1500)
  Holder : PDJNR2525-M15
- **Test result**

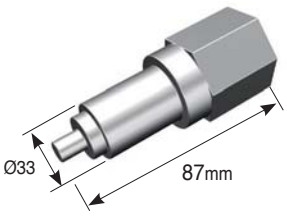




P Hot forging (SCM430)

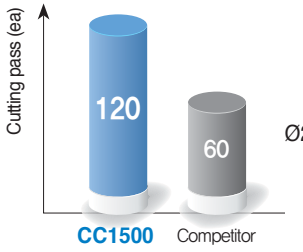
- **Workpiece** Valve
- **Cutting condition** vc (m/min) = 230, fn (mm/rev) = 0.8
  ap (mm) = 0.12, wet
- **Designation** **Insert** : TNMG160404-VQ (CC1500)
  Holder : PTTNR1616-H16
- **Test result**

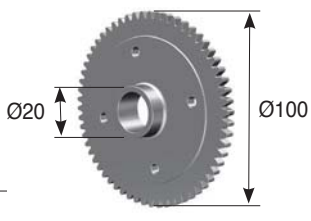




P Sintered ferrous alloy

- **Workpiece** Sprocket
- **Cutting condition** vc (m/min) = 160, fn (mm/rev) = 0.17
  ap (mm) = 0.2, wet
- **Designation** **Insert** : SNMG120408-VM (CC1500)
  Holder : MSKNR3232-P12
- **Test result**

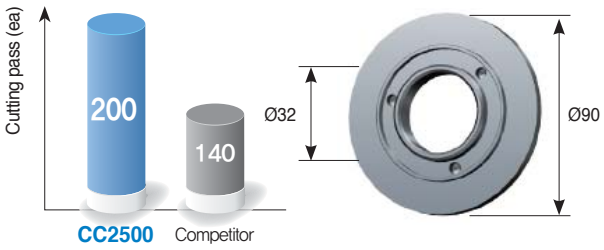




Application examples (CC2500)

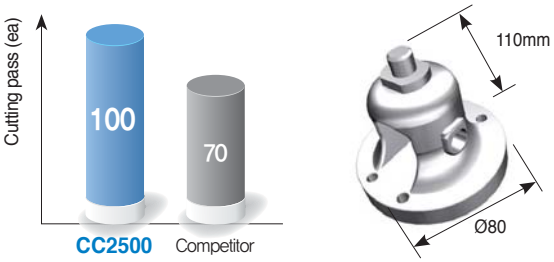
P Carbon steel (SM45C)

- **Workpiece** Swash-Plate
- **Cutting condition** vc (m/min) = 250, n (rpm) = 890
  fn (mm/rev) = 0.06, ap (mm) = 0.1, wet
- **Designation** **Insert** : DNMG110404-VQ (CC2500)
  Holder : SDJCR2525-M11
- **Test result**



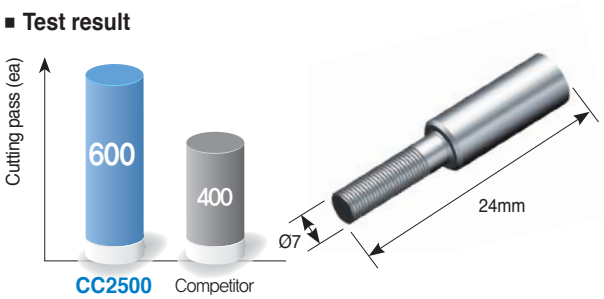
K Ductile cast iron (FCD400)

- **Workpiece** Diff. case
- **Cutting condition** vc (m/min) = 150, n (rpm) = 600
  fn (mm/rev) = 0.15, ap (mm) = 0.3, wet
- **Designation** **Insert** : VBMT160404-MP (CC2500)
  Holder : SVJBR2525-M16
- **Test result**



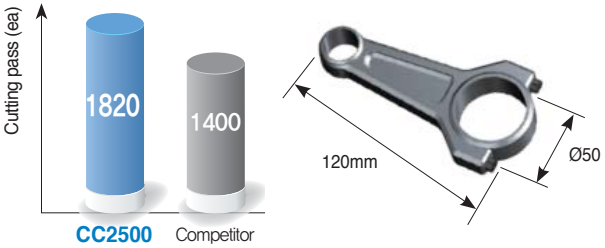
P Carbon steel (SM35C)

- **Workpiece** Piston Rod
- **Cutting condition** vc (m/min) = 122, n (rpm) = 4,800
  fn (mm/rev) = 0.15, ap (mm) = 2.0, wet
- **Designation** **Insert** : DNMG150604-GM (CC2500)
  Holder : MDQNR2525-M15
- **Test result**



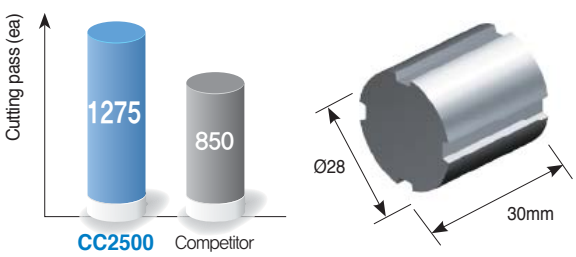
P Alloy steel (SCM420)

- **Workpiece** Connecting Rod
- **Cutting condition** vc (m/min) = 340, n (rpm) = 2,100
  fn (mm/rev) = 0.15, ap (mm) = 0.07, wet
- **Designation** **Insert** : TPMT110304-MP (CC2500)
  Holder : S10M-STFPR-11
- **Test result**



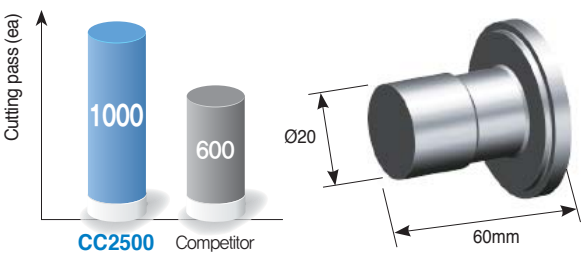
P Alloy steel (SCM415)

- **Workpiece** Bush
- **Cutting condition** vc (m/min) = 314, n (rpm) = 3,500
  fn (mm/rev) = 1, ap (mm) = 0.2, wet
- **Designation** **Insert** : CNMG120408-VQ (CC2500)
  Holder : MCLNR2525-M12
- **Test result**



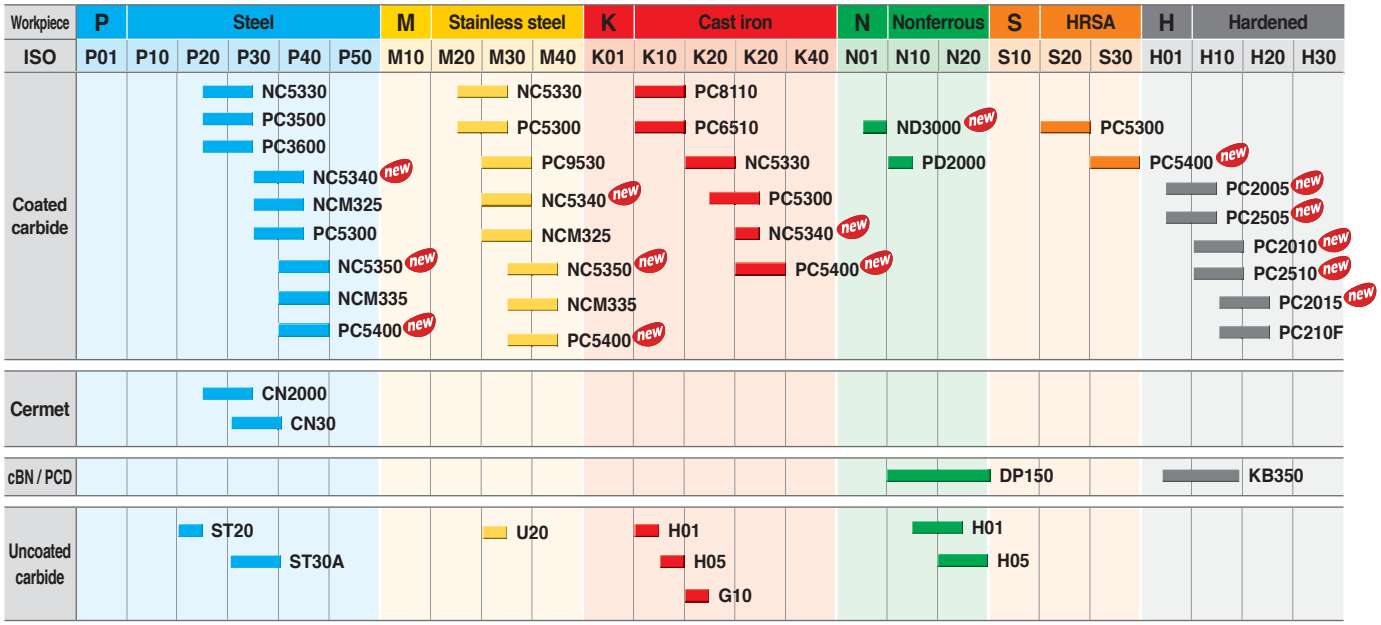
P Alloy steel (SWCH18A)

- **Workpiece** Shaft
- **Cutting condition** vc (m/min) = 367, n (rpm) = 5,800
  fn (mm/rev) = 0.02, ap (mm) = 1.55, wet
- **Designation** **Insert** : TBT4405R-D38-R0.25 (CC2500)
  Holder : TBH425-45R
- **Test result**



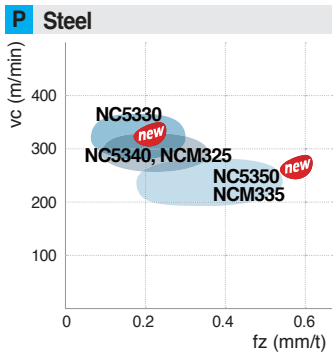
Milling grade selections

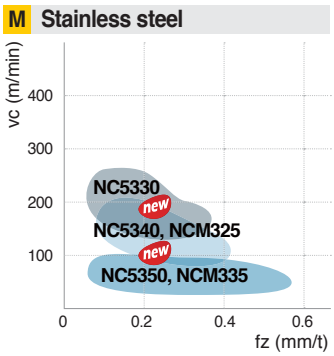
Selection system

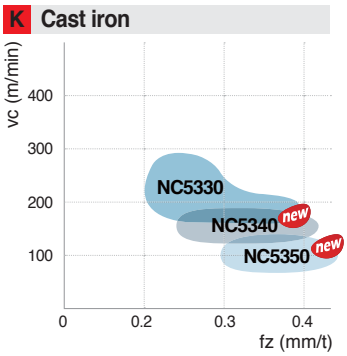


Application range of milling grades

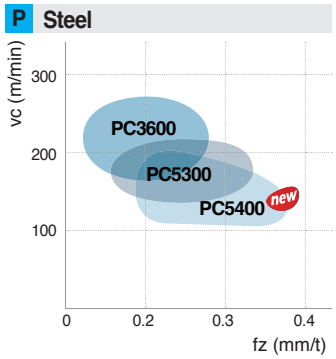
CVD

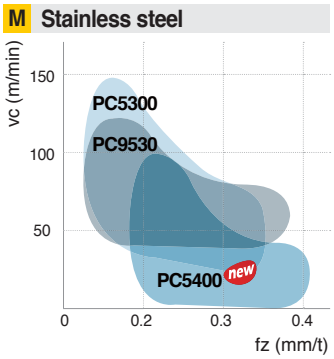


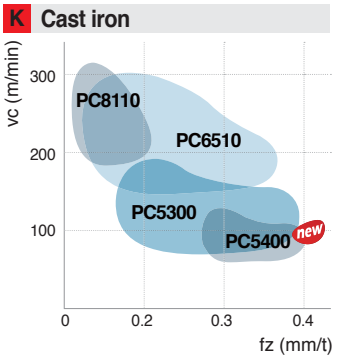


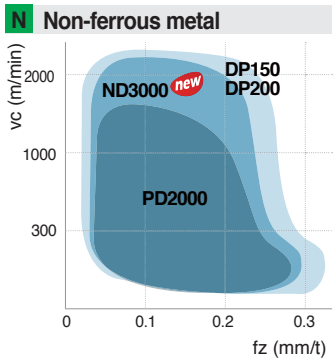


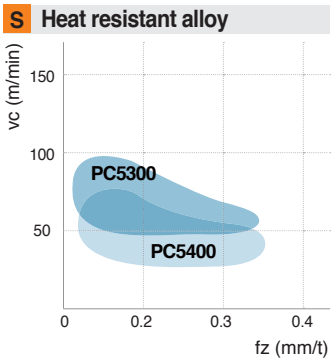
PVD

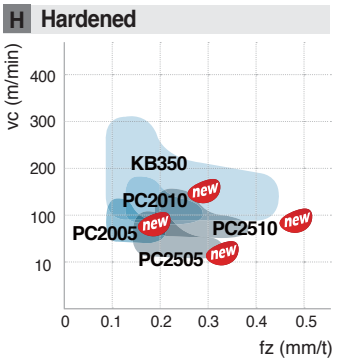












CVD coated grades

Universal Line up of CVD-coated grades

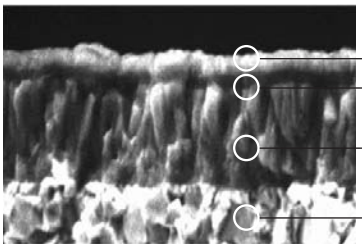
NC5330

- Excellent quality and a universal grade applicable to P, M, and K materials
- High toughness substrate and coating layer with excellent surface roughness and welding resistance

NC5340 new / NC5350 new

- Milling grades applicable to P, M, K
- Stable tool life due to its tough substrate and chipping-resistant coatings

Coating structure



- Lubricative coating with excellent surface finish and welding resistance
- Alumina coating with strong oxidation resistance
- Titanium coating with superb toughness and wear resistance
- High-tough substrate specialized for the coating films

Selection system of CVD coated grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	NC5330	205 (120~290)	P20	NC5330
					P25	
		Continuous cutting	NC5340 new NCM325	230 (130~330)	P30	NC5340 new, NCM325
					P35	
		Interrupted cutting	NC5350 new NCM335	205 (120~290)	P40	NC5350 new, NCM335
					P45	
M	Stainless steel	Continuous cutting	NC5330	140 (80~200)	M10	
					M20	
		Continuous cutting	NC5340 new NCM325	155 (90~220)	M25	NC5330, NC5340 new, NCM325
					M30	
		Interrupted cutting	NC5350 new NCM335	140 (80~200)	M35	NC5350 new, NCM335
					M40	
K	Cast iron	Continuous cutting	NC5330	190 (110~270)	K10	
					K20	NC5330
			NC5340 new	150 (80~250)	K30	NC5340 new

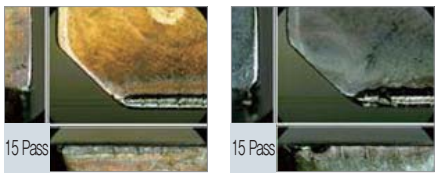
The features of CVD milling grades

CVD Coated grades	ISO	Features
NC5330	P20~P30 M20~M30 K15~K25	• For high speed milling of steel and stainless steel • Superior wear resistance and chipping resistance grade for steel and stainless steel • MT-TiCN + Al_2O_3 + TiN
NC5340 new NCM325	P30~P40 M25~M35 K25~K30	• For high speed milling of steel and stainless steel • Optimized grade for steel & stainless steel by employing proper substrate and hard coating • MT-TiCN + Al_2O_3 + TiN
NC5350 new NCM335	P35~P45 M30~M40	• For interrupted and rough milling of steel and stainless steel • Toughest substrate with hard coating provides stable cutting and tool life for severe interrupted cutting • MT-TiCN + Al_2O_3 + TiN

Application examples (NC5330/NC5340)

P Alloy steel (SCM440)

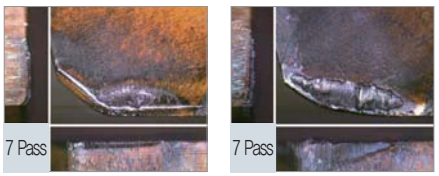
- **Cutting condition** vc (m/min) = 250, fz (mm/t) = 0.30
  ap (mm) = 2.0, dry
- **Designation** **Insert** : SDKN1504AESN-SU (NC5330)
  Holder : ADNM5125R
- **Test result**



NC5330 Competitor A

P Alloy steel (SCM440)

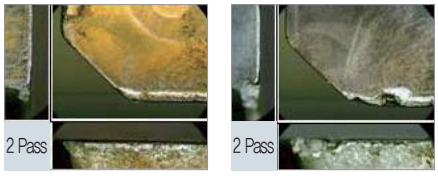
- **Cutting condition** vc (m/min) = 300, fn(mm/t) = 0.30
  ap (mm) = 2.0, wet
- **Designation** **Insert** : SPCN1203EDR (NC5340)
  Holder : EPN4125R
- **Test result**



NC5340 Competitor A

M Stainless steel (STS304)

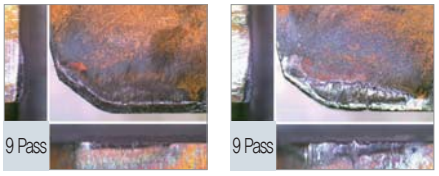
- **Cutting condition** vc (m/min) = 150, fz (mm/t) = 0.25
  ap (mm) = 2.0, dry
- **Designation** **Insert** : SDKN1504AESN-SU (NC5330)
  Holder : ADNM5125R
- **Test result**



NC5330 Competitor A

P Carbon steel (S45C)

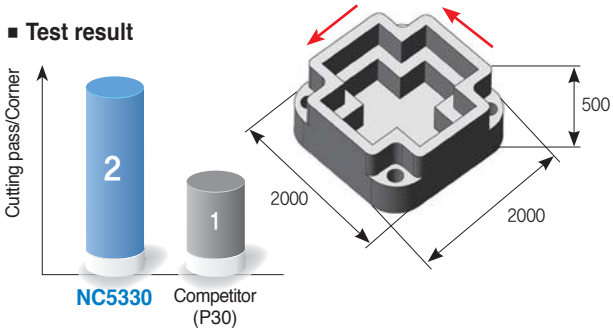
- **Cutting condition** vc (m/min) = 350, fn(mm/t) = 0.35
  ap (mm) = 2.0, wet
- **Designation** **Insert** : SPCN1203EDR (NC5340)
  Holder : EPN4125R
- **Test result**



NC5340 Competitor A

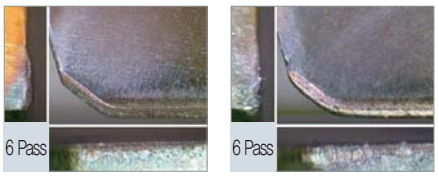
K Ductile cast iron (FCD500)

- **Cutting condition** vc (m/min) = 200, fz (mm/t) = 0.20
  ap (mm) = 5.0, dry
- **Designation** **Insert** : SDKN1504AESN-SU (NC5330)
  Holder : ADNM5100R
- **Test result**



K Gray cast iron (FC250)

- **Cutting condition** vc (m/min) = 400, fn(mm/t) = 0.20
  ap (mm) = 3.0, wet
- **Designation** **Insert** : SPCN1203EDR (NC5340)
  Holder : EPN4100R
- **Test result**



NC5340 Competitor A

PVD coated grades

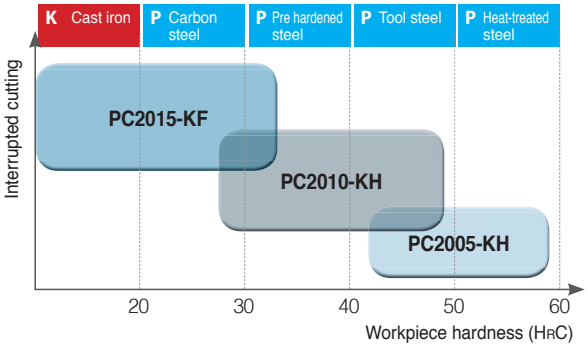
PVD coated grades for finishing high hardened steel

PC2005 new / PC2010 new / PC2015 new

- Finishing grade lineup for tool steel and plastic die steel
- PC2005 with extremely hard substrate and coatings
- PC2010 with high hardened cutting edges, ideally suited for pre-hardened steel and interrupted cutting
- PC2015 for carbon steel and casting machining, demonstrating excellent performance in hard-to-cut materials

Application guideline per workpiece

Recommended grade and chip breaker

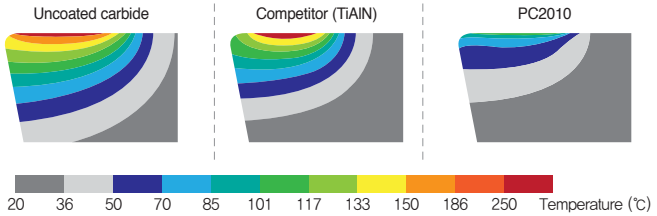


Features

Wear comparison



Result of heat conductivity



- Heat shield coating was applied to prevent thermal crack.
- Ultra fine WC was combined with high contents cobalt to be optimized for machining pre hardened steel.

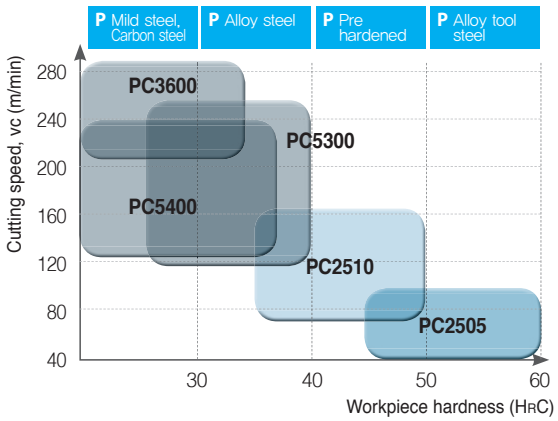
PVD coated grades for roughing high hardened steel

PC2505 new / PC2510 new

- Roughing grade series for high hardened steel
- PC2505 with excellent wear resistance, ideal for machining die steel and high hardened steels over HRC50
- PC2510 with stabilized toughness, ideal for interrupted cutting of high hardened steel and wet cutting accompanied by massive thermal shock

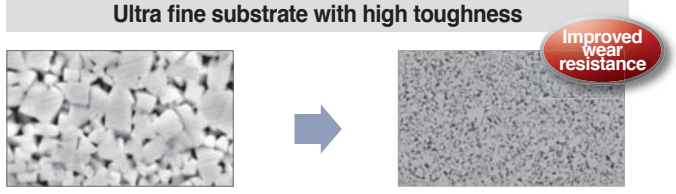
Application guideline per workpiece

Recommended grade and chip breaker



Features

Ultra fine substrate with high toughness



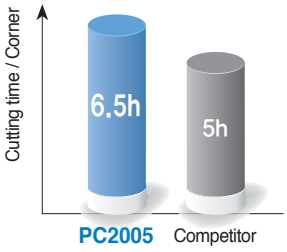
Surface Treatment



Application examples (PC2005/PC2010/PC2015)

H Alloy tool steel (SKD11, heat treated)

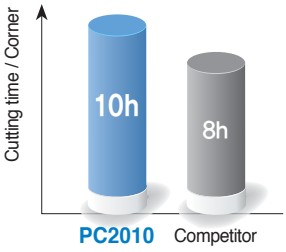
- **Workpiece** Automobile press mold
- **Cutting condition** vc (m/min) = 377, fz (mm/t) = 0.5
  ap (mm) = 0.5, ae (mm) = 0.2, dry
- **Designation** **Insert** : LBH250-KH (PC2005)
  Holder: LBE250140S-S25C
- **Test result**





P Mold steel (KP4M)

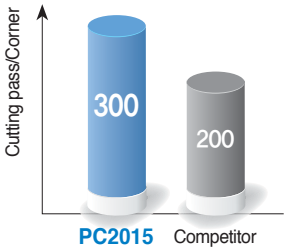
- **Workpiece** Automobile press mold
- **Cutting condition** vc (m/min) = 200, fz (mm/t) = 0.1
  ap (mm) = 0.1~0.5, ae (mm) = 0.1~0.5, wet
- **Designation** **Insert** : LBH160-KH (PC2010)
  Holder : LBE160100S-S16C
- **Test result**





P Carbon steel (SM53C)

- **Workpiece** CV Joint
- **Cutting condition** vc (m/min) = 200, fz (mm/t) = 0.25
  ap (mm) = 0.5~2.0, ae (mm) = 0.5~1.0, dry
- **Designation** **Insert** : LBH230-KF (PC2015)
  Holder: LBE230-HSKC63
- **Test result**

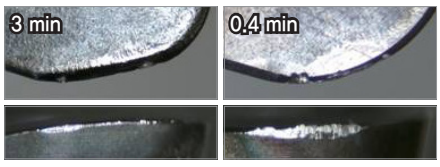




Application examples (PC2505/PC2510)

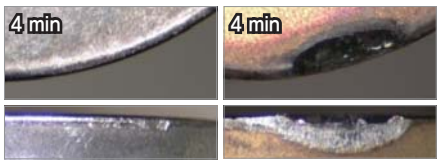
H Alloy tool steel (SKD11, heat treated)

- **Cutting condition** vc (m/min) = 80, fz (mm/t) = 0.5
  ap (mm) = 0.3, ae (mm) = 10, dry
- **Designation** **Insert** : LPEW040210R-C (PC2505)
  Holder : HFMS1010HR-2S10
- **Test result**



H Alloy tool steel (SKD11, heat treated)

- **Cutting condition** vc (m/min) = 30, fz (mm/t) = 0.4
  ap (mm) = 0.7, ae (mm) = 40, dry
- **Designation** **Insert** : RPMW1204M0S1 (PC2510)
  Holder : FMRPS4050HRP-4M40
- **Test result**



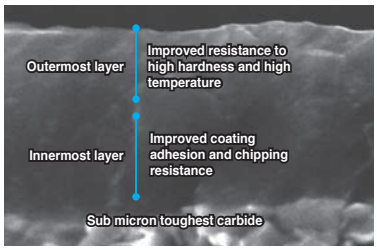
PVD coated grades

Universal PVD grade

PC5300

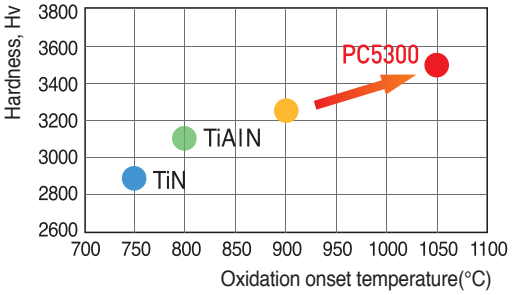
- Advanced PVD coating with high hardness and high temp stability
- High tough substrate and coating films produce excellent surface finish
- Universal tooling capability covering P, M, K, S with this single grade, PC5300
- Stable machining resulting from excellent edge hardness and chipping resistance

Features



- Latest PVD coating technology developed by KORLOY
- New concept of coating equipped with high temperature oxidation resistance and high hardness

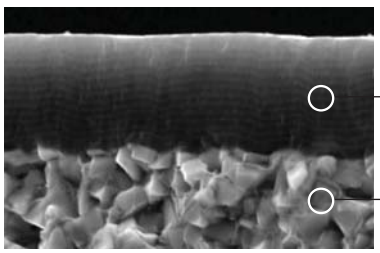
High temp properties



PC5400 new

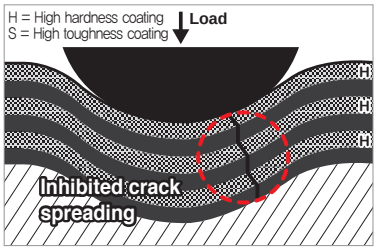
- New PVD coating layer with high toughness and lubrication
- High adhesive strength and toughness between the substrate and coating layer
- Excellent cutting edge strength and chipping resistance ensure stable machinability for P, M, K, S.

Features



Improved lubrication
High toughness and strong adhesion

Ultrafine substrate of high toughness



Crack creation on the coating surface after leaving an indentation by 60kg



Normal coating



High toughness coating

Selection system of PVD coated grades

Workpiece		Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	PC3600	235 (180~290)	P20	PC3600
			PC3500	235 (180~290)	P30	PC3500
		Interrupted cutting	PC5300	195 (150~240)	P40	PC5300
			PC5400 new	145 (80~210)		PC5400 new
M	Stainless steel	Continuous cutting	PC5300	130 (100~160)	M20	PC5300
			PC9530	125 (80~150)	M30	PC9530
		Interrupted cutting	PC5400 new	110 (80~140)	M40	PC5400 new
K	Cast iron	Continuous cutting	PC8110	180 (140~230)	K05	PC8110
			PC6510	180 (140~230)	K10	PC6510
		Interrupted cutting	PC5300	145 (110~180)	K20	PC5300
			PC5400 new	125 (85~160)	K30	PC5400 new
S	HRSA	Continuous cutting	PC5300	55 (40~70)	S10	
					S20	PC5300
		Interrupted cutting	PC5400 new	40 (30~50)	S30	PC5400 new
H	High hardness steel	Continuous cutting	PC2005 new	60 (40~80)	H01	PC2005 new
			PC2010 new	55 (40~70)	H10	PC2505 new, PC2010 new, PC2510 new
			PC2015 new	50 (35~65)	H20	PC2015 new, PC210F
			PC210F	50 (35~65)	H30	

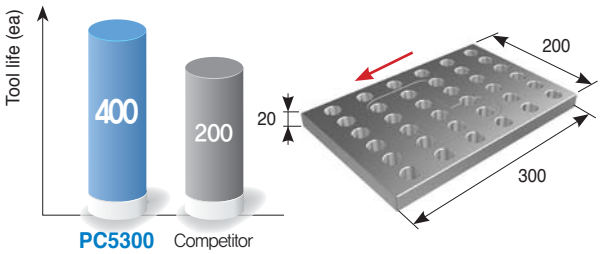
The features of PVD coated grades

PVD Coated grades	ISO	Features
PC3600	P20~P30	• Milling grade for medium and roughing of steel • New coating layer with superior wear resistance and oxidation resistance with high toughness substrate
PC3500	P25~P35	• Medium and rough milling for steel • K-Gold coating
PC5300	P30~P40 K20~K30 M20~M30 S15~S25	• Superior universal grade for steel, cast iron, hard to cut material, stainless steel • New coating and ultra fine grain provide wear resistance and oxidation resistance • TiAlN Series new coating
PC5400 new	P35~P45 K25~K35 M30~M40 S25~S35	• Universal grade for interrupted machining of steel, cast iron, hard-to-cut materials and stainless steel with stable machinability • New coating layer with high toughness and lubrication on ultra fine grain substrate with high toughness • AlCiN series new coating
PC8110	K05~K15	• Excellent wear resistance in cast iron milling finish applications • Superior wear resistance for finishing cast iron • New coating and ultra fine grain provide wear resistance and oxidation resistance • TiAlN Series new coating
PC6510	K05~K15	• High speed milling grade for cast iron and aluminum • K-Gold coating
PC9530	M25~M35	• Medium to rough cutting of hard to cut materials such as stainless steel, Cr-Ni steel, etc. • The toughest sub-micron substrate provides excellent cutting performance at high feed • TiAlN coating
PC2005 new	H01~H10	• Exclusive for Laser Mill in milling of high hardness workpieces and press mold steel • Utmost wear resistance due to high hardness substrate and coating • Ultra high hardness K-Brown coating
PC2010 new	H05~H15	• Exclusive for Laser Mill in milling of pre hardened steel and plastic mold steel • High hardness enhanced cutting edges due to ultra fine WC and high contents binder for expanding application range to high hardness steel and pre hardened steel • Ultra high hardness K-Brown coating
PC2015 new	H10~H20	• Exclusive for Laser Mill in milling of carbon steel and cast • Highly lubricative K-SILVER coating • Lubricative coating layer and high contents substrate for machining mild steel and hard-to-cut cast materials
PC210F	H10~H20 P25~P35 K15~K25 M15~M25 S10~S20	• High speed milling grade for hardened steel, cast iron, and stainless steel(Laser Mill) • New coating and ultra fine grain provide wear resistance and oxidation resistance • TiAlN Series new coating
PC2505 new	H01~H10	• Roughing grade for high hardened steel and pressed die steel • Excellent wear resistance ideal for machining die steel and high hardened steel over HRC50
PC2510 new	H05~H15	• Roughing grade for pre-hardened steel and plastic die steel • Stabilized toughness ideal for interrupted cutting of high hardened steel and wet cutting accompanied by massive thermal shock

Application examples (PC5300)

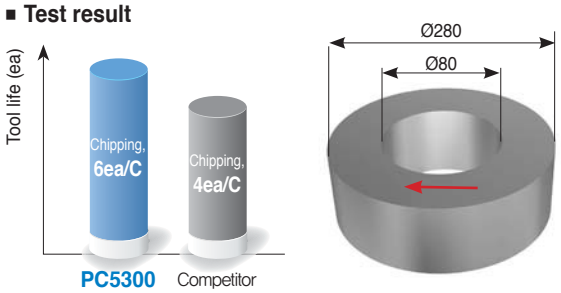
P Mold steel (KP4M)

- **Cutting condition** vc (m/min) = 250, fn (mm/rev) = 1.0
  ap (mm) = 1.0, dry
- **Designation** **Insert** : WNMX130520ZNN-MM (PC5300)
  Holder : HRMDCM13050HR-3
- **Test result**



M Stainless steel (STS316)

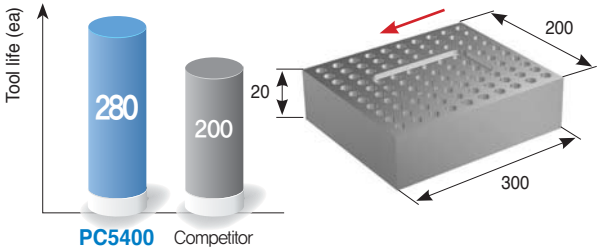
- **Cutting condition** vc (m/min) = 65, fn (mm/rev) = 0.14
  ap (mm) = 3.0, wet
- **Designation** **Insert** : SEET14M4AGSN-MM (PC5300)
  Holder : FMACM4100HR
- **Test result**



Application examples (PC5400)

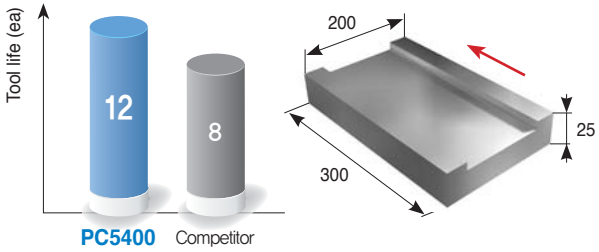
P Carbon steel (SM45C)

- **Cutting condition** vc (m/min) = 250, fz(mm/t) = 1.2
  ap (mm) = 1.0, dry
- **Designation** **Insert** : WNMX130520ZNN-MM (PC5400)
  Holder : HRMDCM13050HR-4
- **Test result**



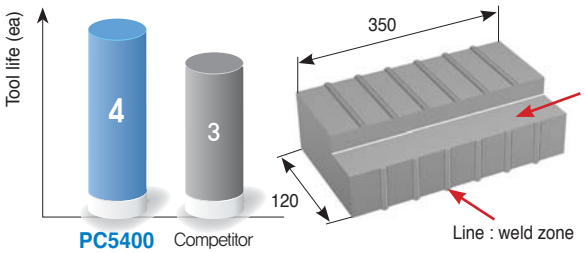
P Alloy steel (SCR440)

- **Cutting condition** vc (m/min) = 180, fz (mm/t) = 0.2
  ap (mm) = 2.0, dry
- **Designation** **Insert** : PDKT1605M0-MM (PC5400)
  Holder : FMRC5063HRD-H
- **Test result**



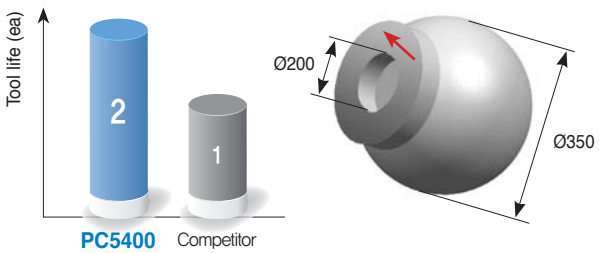
M Stainless steel (STS316)

- **Cutting condition** vc (m/min) = 50, fz (mm/t) = 0.1
  ap (mm) = 4.0, ae (mm) = 15.0, dry
- **Designation** **Insert** : APMT1604PDSR-MM (PC5400)
  Holder : AMC3063HS
- **Test result**



S Heat-resistant alloy (Inconel 718)

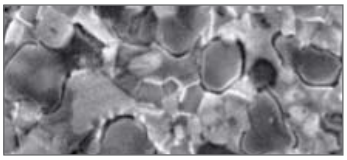
- **Cutting condition** vc (m/min) = 60, fz (mm/t) = 0.1
  ap (mm) = 2.5, wet
- **Designation** **Insert** : SNMX1206ANN-MM (PC5400)
  Holder : RM8AC4080HR
- **Test result**

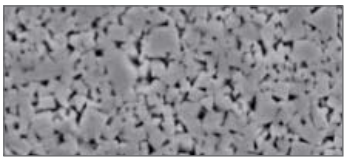


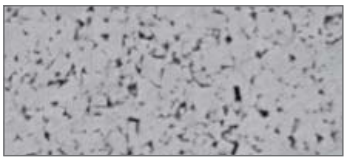
Uncoated carbide grades

Features

- Due to KORLOY's advanced sintering technology, our uncoated carbide grades have a fine alloy structure which is necessary to get superior quality from a uncoated cutting tool


P type


M type


K type

Advantages

- Consist of P,M,K carbide grades and can be used in all kinds of workpiece
- Excellent quality at machining with coolant, due to the superior thermal crack resistance of the carbide
- Due to the special design of carbides, it has fine micro structure and low affinity with workpiece
- It has excellent toughness and produces lower cutting loads

Selection system of uncoated carbide grade

Workpiece		Grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	ST30A	80 (60~100)	P30	ST30A
M	Stainless steel	U20	90 (70~110)	M20	U20
				M30	
K	Cast iron	H01, H05	150 (110~190)	K10	H01, H05
		G10	120 (90~150)	K20	G10
N	Aluminum alloy	H01	600 (450~750)	N10	H01
	Copper alloys	H05	425 (320~530)	N20	H05

Main composition and application range

Workpiece	Composition	Features	Workpiece
P	WC-TiC-TaC-Co	Excellent thermal shock resistance and plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC-TiC-TaC-Co	General grades with thermal shock resistance and hardness	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC-Co	High hardness and superior wear resistance	Cast iron, Non-ferrous metal, Non metal

The physical properties of uncoated carbide grades

Workpiece	Grade	Hardness (HRA)	TRS (kgf/mm^2)	Young's modulus ($10^3 kgf/mm^2$)	Thermal expansion coefficient(10^{-6}/°C)	Thermal conductivity (cal/cm·sec·°C)
P	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U20	91.1	210	-	-	88
K	H01	92.9	210	66	4.7	109
	G10E	90.9	250	63	-	105

1KPa = 102kgf/m², 1w/mk = 2.39×10^{-3}cal/cm·sec·°C

Cermet grades

Features

- High hardness substrate ensures long tool life in high speed milling
- High toughness cutting edge ensures long tool life even in high impact machining
- Chemically stable substrate provides excellent surface finish of the workpiece

Selection system of cermet grades

Workpiece		Machining types	Grade	Recommended cutting speed (m/min)	ISO	Application range
P	Steel	Continuous cutting	CN2000	250 (200~300)	P20	CN2000
		Interrupted cutting	CN30	150 (100~200)	P30	CN30

The features of cermet grades

Cermet Grade	ISO	Features
CN2000	P20~P30	• Universal grade from finishing to roughing of steel • Functionally Gradient Material
CN30	P25~P35	• For milling of steel • Cermet with high toughness

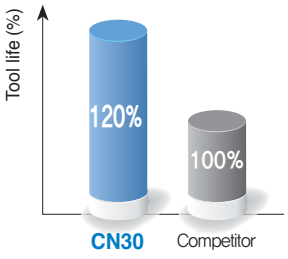
The physical properties of cermet grades

Workpiece	Grade	Hardness(Hv)	TRS(kgf/mm^2)	SG(g·cm^{-3})
P	CN2000	< 1800	210 <	6.8~7.0
	CN30	< 1500	240 <	7.0~7.3

Application examples (CN30)

P Carbon steel (SM45C)

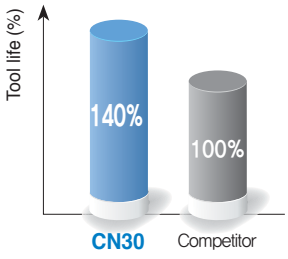
- **Cutting condition** vc (m/min) = 120~150, fz (mm/t) = 0.07~0.13
  ap (mm) = 2.0, dry
- **Designation** **Insert** : SDCN42MT (CN30)
  Holder : ADN4315R
- **Test result**





P Mold steel (KP4M)

- **Cutting condition** vc (m/min) = 230, fz (mm/t) = 0.1~0.15
  ap (mm) = 1.0, dry
- **Designation** **Insert** : SDCN42MT (CN30)
  Holder : ADN4315R
- **Test result**





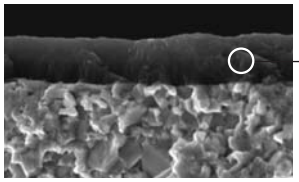
Solid endmills grade selection

Grades for H Endmill

PC303S new / PC310U new

- Ultrafine substrate & high hardness coatings for excellent wear resistance
- Special surface treatment provides higher chipping resistance

Features



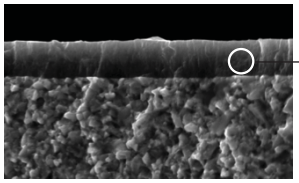
Exceptional wear resistance resulting from extremely hard coating layers

Grades for Z Endmill

PC315E new

- Fine substrate & lubricative coatings for stable machinability

Features



Lubricative coatings for excellent machinability

Selection system

Workpiece		Grade	ISO	Application range
P	Steel	PC303S new	P01	
		PC310U new	P10	PC303S new, PC203F
		PC315F new	P20	PC310U new
		PC320 new	P30	PC315E new, PC320 new, PC215F
			P40	
M	Stainless steel	PC303S new	M01	
		PC310U new	M10	PC303S new, PC203F, PC310U new
		PC320S new	M20	PC320S new, PC315F new, PC320, PC215F
		PC315E new	M30	
K	Cast iron	PC303S new	K01	
		PC310U new	K10	PC303S new, PC203F, PC310U new
		PC315F new	K20	
		PC320 new	K30	PC315E new, PC320 new, PC215F, PC220, FA2
			K40	
N	Nonferrous	ND3000 new	N01	ND3000 new
		ND2100 new	N05	ND2100 new, PD3000, H01, H05S, PC210C
		PD3000	N10	
		H01	N20	
S	HRSA	PC210	S10	
		PC320S new	S20	PC210, PC320S new, PC315E new, PC320, PC215F, PC220, FA2
		PC315E new	S30	
H	High hardness steel	PC303S new	H01	
		PC203F	H10	PC303S new, PC203F, PC310U new
		PC310U new	H20	

Solid endmills grade selection

Grade information for each product

Item	Grade	
	Coated	Uncoated
H Endmill new	PC303S, PC310U	-
V Endmill	PC215F	-
Z Endmill new	PC315E	-
F Endmill	PC203F	-
T Endmill new	PC2510, ND3000	-
I+ Endmill	PC320	-
Z+ Endmill new	PC320U	-
S+ Endmill	PC320S	-

Item	Grade	
	Coated	Uncoated
R+ Endmill new	HN30T, HC10T, HC20T, HC30T, PC10T, PC20T, PC30T, PC40T	FN30T
Aluminum solid endmill new	PD3000	H01
A+ Endmill	-	H05S
C-Max	PC210C	-
D Endmill new	ND3000	-
Composite Router Endmill new	ND2100	-
Brazed endmill	PC221F	FCC

The features of PVD coated grades

Workpiece	ISO	Features
PC303S new	P05~P15 M05~M15 K05~K15	• Excellent wear/chipping resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For high speed machining of high hardness steel • New film applied with excellent oxidation resistance and hardness at high temperature
PC310U new	P10~P20 M10~M20 K10~K20	• Excellent wear/chipping resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For high speed machining of high hardness steel • New film applied with excellent oxidation resistance and hardness at high temperature
PC315E new PC320 new	P20~P35/M20~M30 K20~K35/S20~S30	• Excellent wear/welding resistance in high speed machining due to the combination of ultra fine substrate and PVD coating • For low/medium speed machining of general steel • New film applied with excellent chipping/wear resistance
PC320S new	M15~M25 S15~S25	• Low to medium speed cutting of stainless steel and heat resistant alloys • Advanced coating layers with increased resistance to built-up edge and oxidation • Excellent resistance to wear and built-up edge at high speeds due to the ultrafine substrate and dedicated coating layers
PC210C	N10~N20	• Medium to high speed cutting of copper and copper electrode • Medium to high speed cutting of acrylic materials • K-Silver coating with excellent lubrication and wear and chipping resistant substrate
ND3000 new	N01~N05	• For electrode machining of graphite at medium to high speeds • Dia. coating layer with high wear resistance and lubrication
ND2100 new	N05~N10	• For composite materials • Diamond-coated layers with excellent adhesion
PD3000	N05~N10	• For Non-ferrous metals(Aluminum alloy) machining • DLC(Diamond Like Carbon) coating layer with high wear resistance and lubrication

Features of KORLOY endmills

Index	Features
H Endmill (Endmill for high hardness steel)	• Negative cutting edges proper to machine high hardness heat-treated workpiece under HRC70 • Longer tool life with the use of ultra fine substrate and high hardness film
Z Endmill/I+ Endmill (Endmill for general cutting)	• Excellent in machining various workpieces such as carbon steel, alloy steel, cast iron, pre hardened steel, etc. under HRC45 • Longer tool life with the use of ultra fine substrate and new coating technology
T Endmill (For dental purpose)	• Endmill for dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, and glass ceramic • Custom-made tools for each type of milling machines for dental purpose
Z+ Endmill	• Universal endmill applicable to a variety of workpiece materials under HRC47 • Roughing and finishing availability • Improved tool life thanks to the new substrate and the most advanced coating • Inhibited chipping and longer cutting time due to the optimized blade design
SSEA/A+ Endmill (Endmill for aluminum)	• Suitable for high speed machining in aluminum and other Non-ferrous materials • Can accomplish excellent surface finishing, superior chip removal in high feed rate
S+ Endmill (Endmill for hard-to-cut materials)	• Sharp cutting edge and high rake angle with streamline chip pocket shows good cutting performance in stainless steel machining where work hardening is a problem
R+ Endmill	• High efficient roughing endmill for medium to rough cutting • Excellent machining efficiency thanks to the high efficient roughing edge design • Reduced cutting force thanks to specifically designed corners, and irregular flute spacing and lead angle
D Endmill	• Diamond-coated endmill for graphite and ceramic • Excellent wear resistance thanks to the diamond coating of high hardness and high purity • Optimized for high speed and heavy duty cutting thanks to the strong grip of coating • Excellent cutting performance and finish thanks to the optimized blade design of high rake
Composite Router Endmill	• Router endmill for machining composite materials (CFRP & GFRP) • Minimized machining defects thanks to its design to prevent flaking, peeling off and burrs • Excellent resistance to wear and flaking thanks to the nano-crystalline diamond coating of high hardness and high purity
C-Max	• Ideally suited for machining copper, brass, bronze, and Non-ferrous materials thanks to the optimized combination between K-Silver coating with excellent lubrication and resistance to wear and chipping, and the dedicated substrate

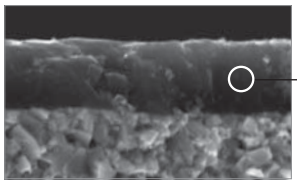
Solid drills grades selection

Grades for Mach Solid Drill (MSD)

PC325U new

- Special surface treatment provides improved lubrication and reduced cutting loads
- Stable tool life thanks to increased welding resistance

Features



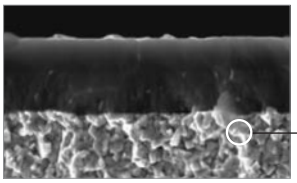
Increased welding resistance in medium to high speed cutting due to highly lubricative coating layers
Increased wear resistance in carbon steel machining

Grades for Mach Long Drill (MLD)

PC215G new / PC315G new

- Improved wear resistance due to the ultrafine substrate
- Reduced friction resistance and smooth chip flow due to improved coating lubrication

Features



Exceptional wear resistance due to the ultrafine substrate

Selection system

Workpiece		Grade	ISO	Application range
P	Steel	PC215G new	P01	
		PC315G new	P10	
		PC325U new	P20	PC215G new, PC315G new, PC325U new, PC230F
		PC230F	P30	
M	Stainless steel	PC215G new	M01	
		PC315G new	M10	
		PC205F	M20	PC215G new, PC315G new, PC205F, PC325U new
		PC325U new	M30	
K	Cast iron	PC215G new	K01	
		PC315G new	K10	
		PC205F	K20	PC215G new, PC315G new, PC205F, PC325U new
		PC325U new	K30	
N	Nonferrous	ND2100 new	N05	ND2100 new
		FG2	N10	FG2
			N20	

Solid drills grades selection

Grade information for each product

Item	Grade	
	Coated	Uncoated
MSD Plus new	PC325U	FU25
MSD Plus CFRP new	ND2100	FK02
MSFD new	PC325U	FU25
MLD Plus new	PC215G, PC315G	FG2
VZD	PC230F	ST30N
SSD Plus new	-	FA1, FG2

The features of PVD coated grades

Workpiece	ISO	Features
PC325U new	P20~P35 M20~M30 K20~K35	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
PC215G new	P15~P30 M15~M25 K15~K30	• Universal grade for machining steel, cast iron, etc. • Stable cutting performance with excellent wear/chipping resistance
PC315G new	P15~P30 M15~M25 K15~K30	• Universal grade for machining steel, cast iron, stainless steel, etc. • Stable cutting performance with excellent wear/chipping resistance • Increased welding resistance due to lubricative new coating at medium to high speed
PC230F	P25~P35	• For machining general steel at medium to high speed • Stable cutting performance with excellent wear/chipping resistance
ND2100 new	N05~N10	• For machining composite materials • Diamond-coated layers with excellent adhesion
FG2	N05~N25	• Increased wear/chipping resistance with the use of ultra fine substrate

Features of KORLOY drills

Index	Features
MSD Plus	• Increased welding resistance in medium to high speed cutting due to highly lubricative coating layers • Increased wear resistance in carbon steel machining • Reduced friction resistance around corners and flutes
MSD Plus CFRP	• The best tool for hole making of CFRP workpieces • Excellent wear resistance due to the diamond-coated grade • Reduced burr creation in CFRP machining due to high rake cutting edges
MSFD	• High quality hole making capability with 180° point angle • Improved anti-chipping and welding resistance by edge honing and chamfering • Minimized creation of burrs compared to general drills
MLD Plus	• Higher rigidity due to straight-edge design • Smooth chip flow due to wider chip pockets and improved surface finish on flutes • Double margin system for stable machinability
MSD Plus	• Improved chip control due to newly developed design • Improved surface finish and design for high quality machining • Increased productivity due to stable tool life

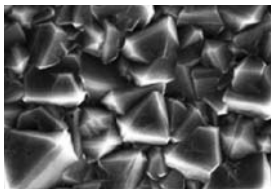
Diamond coated grades

Grade for graphite and ceramic

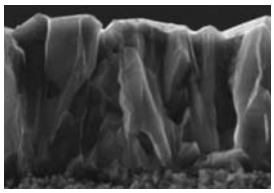
ND3000 new

- SP3-crystalline diamond coatings of high purity and high hardness
- Improved adhesion between coated layers and the substrate that is specialized for diamond coatings
- Excellent tool life when machining graphite and ceramic

Surface of ND3000



Cross section of ND3000's coated layers

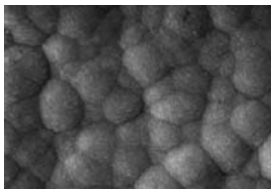


Grade for composite materials

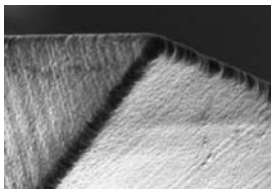
ND2100 new

- Improved surface finish and wear resistance due to the control technology of nano-crystalline diamond particles
- Improved flaking resistance due to the substrate that is specialized for diamond coatings
- High quality and high precision machining availability thanks to sharp edges
- Excellent tool life when machining composite materials

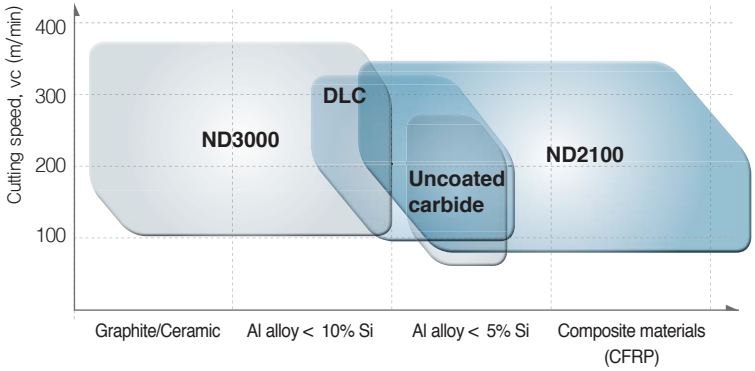
Surface of ND2100



Sharp edges of ND2100



Application range



Selection system

Workpiece			Grade	ISO	Application range
N	Nonferrous	Graphite/Ceramic	ND3000 new	N01	ND3000 new
		Al alloy	ND3000 new ND2100 new	N05	ND2100 new
		Composite materials	ND2100 new	N10	

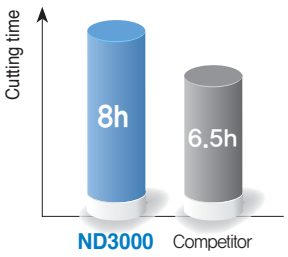
The features of diamond coated grades

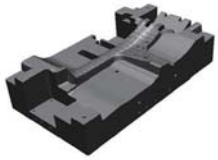
Grade	ISO	Features
ND3000 new	N01~N05	• For continuous roughing of graphite, ceramic, and Al alloy at high speeds • Exceptional cutting performance due to high resistance to wear and flaking • High hardness diamond coatings of high purity SP3-crystalline structure
ND2100 new	N05~N10	• For continuous finishing of composite materials and Al alloy at high speeds • Stable machinability due to durable sharp edges • Nano-crystalline diamond coatings under particle control

Application examples (ND3000/ND2100)

N Graphite mold

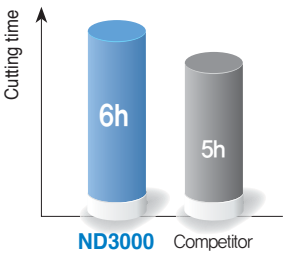
- **Cutting condition** vc (m/min) = 100, fz (mm/t) = 0.11, ap (mm) = 0.26, dry
- **Designation** **Endmill** : DBE4060-110-N250S06 (ND3000)
- **Test result**





N Graphite mold

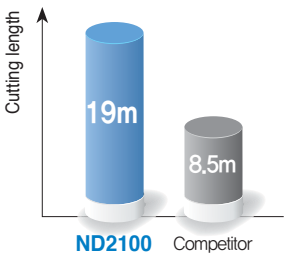
- **Cutting condition** vc (m/min) = 300, fz (mm/t) = 0.1 ap (mm) = 0.15, dry
- **Designation** **Endmill** : DBE2060-080-N250S06 (ND3000)
- **Test result**





N CFRP

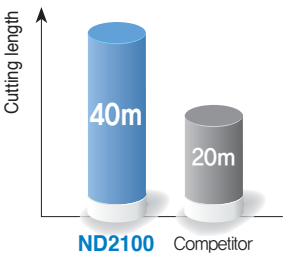
- **Cutting condition** vc (m/min) = 200, fn (mm/rev) = 0.21, ap (mm) = 10, ae (mm) = 2.8
- **Designation** **Endmill** : CCR2080-075 (ND2100)
- **Test result**





N CFRP

- **Cutting condition** vc (m/min) = 200, fz (mm/t) = 0.17 ap (mm) = 10, ae (mm) = 1.2
- **Designation** **Endmill** : CCLR4080-075 (ND2100)
- **Test result**

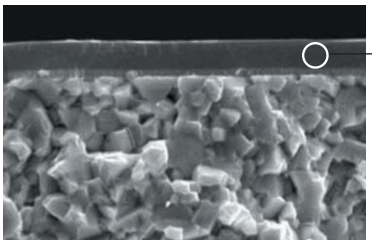




DLC coated grades

Features

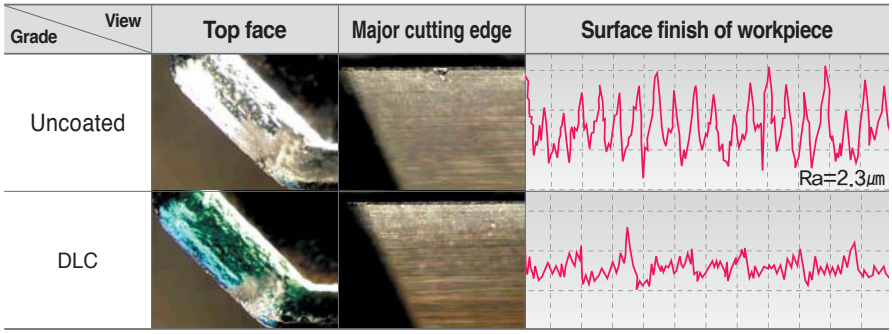
- Hardness of film is up to Hv 7000, tool life is 3~6times of cemented carbide cutting tool
- Good surface finish can be acquired due to the lubrication effect that led from low friction co-efficient (<0.1)
- Suitable for Non-ferrous material machining



Application

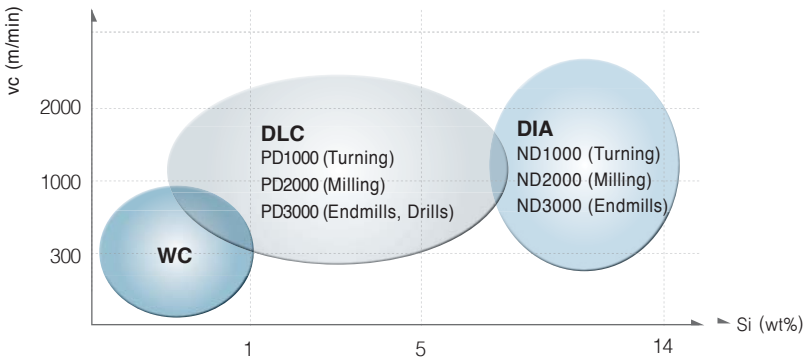
- For aluminum, carbon, plastic, wood/Insert, drill, endmill

Cutting performance (Built- up edge / surface finish, FMACM3100R)



• Workpiece: AC2B
• Cutting length: 12m • Cutting condition: vc = 1500m/min, fz = 0.15mm/t, ap = 2mm, Dry

Application range

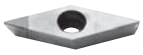
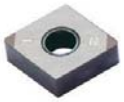
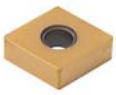


cBN inserts grades

Features

- Excellent hardness and thermal resistance by sintering KORLOY's main constituents and special ceramic binder at high pressure and high temperature
- Excellent hardness and wear resistance for higher productivity in machining cast iron and heat-treated alloy at high speed

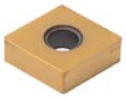
▶ Insert type

High presicion		Wear resistance		Productivity	
					
For regrinding type	One use type	Multi-corner type	Multi-corner type (coated)	Solid type	Grooving type

cBN inserts

Multi edge coated type



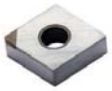


2NU-CNGA120408

- Easy handling of corners • Strong Brazing
- Excellent tool life compared to non-coated insertse

One use type



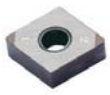


NU-CNGA120408

- Economic price • Easy handling of tools • A wide variety of series
- Smaller than expensive cBN and dramatic cost down
- Strong weld face and stable cutting performance

Multi edge type



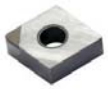


2NU-CNGA120408

- Price per edge is more reasonable compare to normal single cornered, one-used type • Insert with several brazed cBN
- Wide application of continuous to interrupted machining

Regrinding type

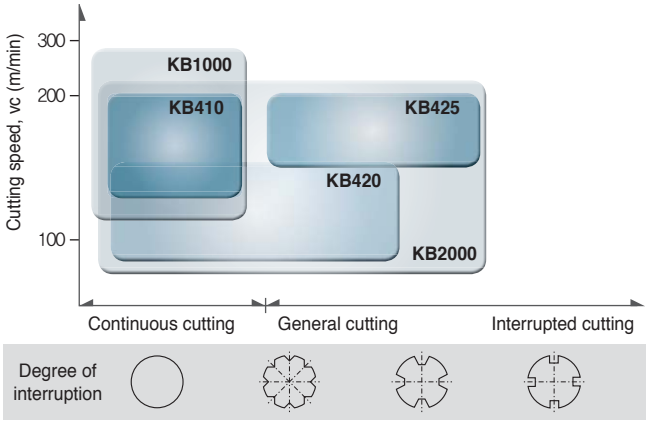




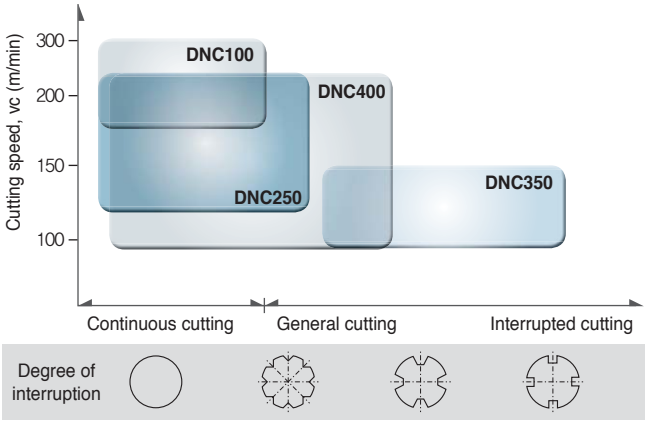
CNMA120408

- Long tool life
- Excellent wear resistance, High hardness
- Saved tool cost due to the regrinding insert 3~4 time

cBN application range



Coated cBN application range



Cutting condition of cBN grades

ISO	Grades		Insert color	Application	Cutting speed, vc (m/min) 50 100 150 200 250 300	feed, fn (mm/rev)	Depth of cut, ap (mm)
H Heat-treated steel	Coated	DNC100 new		Continuous cutting at high speed	180 – 300	0.03~0.3	0.03~0.3
		DNC250		Continuous and low interrupted cutting at high speed	120 – 220	0.05~0.3	0.05~0.3
		DNC350		Medium and high interrupted cutting	90 – 150	0.05~0.3	0.05~0.3
		DNC400 new		Continuous and medium interrupted cutting	90 – 220	0.05~0.3	0.05~0.5
	Non-coated	KB410		Continuous cutting at high speed	150 – 200	0.03~0.13	0.03~0.2
		KB1000		Continuous cutting at high speed	130 – 250	0.03~0.15	0.03~0.2
		KB420		Highly efficient cutting	120 – 150	0.03~0.3	0.03~0.5
		KB425		Interrupted cutting at high speed	150 – 200	0.03~0.3	0.03~0.5
		KB320		Medium and low interrupted cutting	80 – 120	0.03~0.2	0.03~0.3
		KB2000		Medium and low interrupted cutting	80 – 200	0.03~0.2	0.03~0.3
		KB335		High interrupted cutting	80 – 110	0.03~0.2	0.03~0.3
		KB400		High speed and high depth of cut	120 – 220	0.10~0.3	0.5

Solid type cBN

KB400

Features

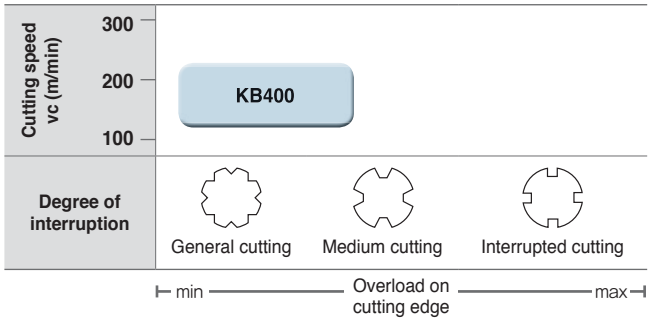
- For medium and light interrupted cutting of heat-treated steel
- Balanced grade of wear resistance and shock resistance
- Solid type for highly efficient machining

Features of solid type

- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and machining the welds
- Stable welding with the use of 3-face blazing
- Excellent performance at varying depth of cuts



Application range



Recommended cutting condition

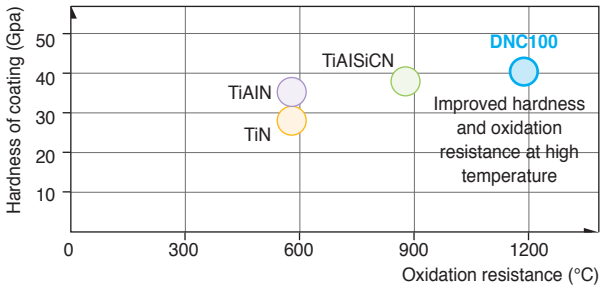
Cutting speed vc (m/min)	120 – 220
feed fn (mm/rev)	0.1 – 0.3
Depth of cut per time ap (mm)	0.5

Coated cBN

DNC100 new

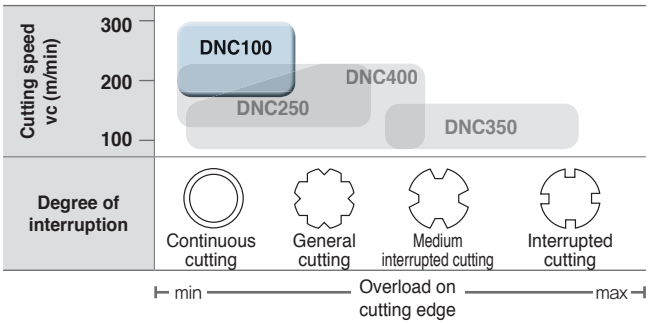
Features

- Excellent thermal resistance
- Coating layer with high hardness, oxidation resistance and chipping resistance





Application range



Recommended cutting condition

Cutting speed vc (m/min)	180 – 300
feed fn (mm/rev)	0.03 – 0.3
Depth of cut per time ap (mm)	0.03 – 0.3

- Increased oxidation resistance and wear resistance due to high hardness coating layer
- Dramatically improved fracture resistance and chipping resistance

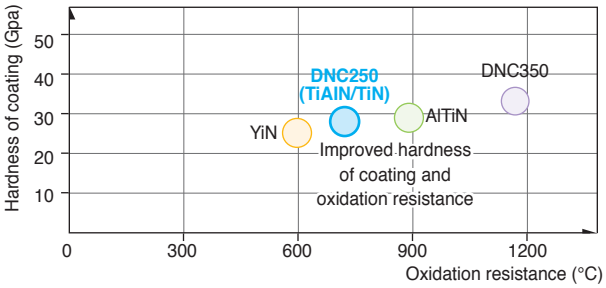
Multi-corner coated cBN for high efficient cutting of heat-treated alloy

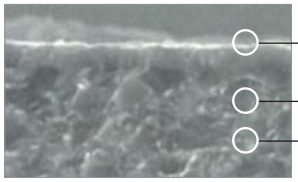
DNC250

Features

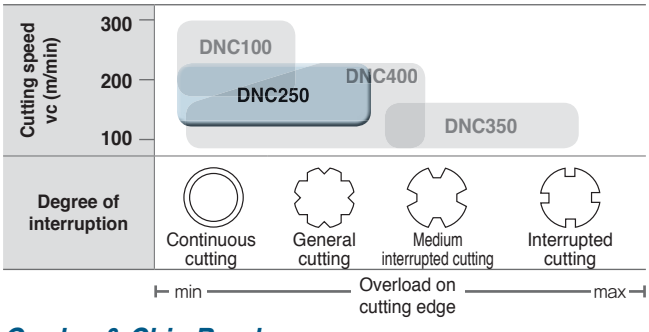
- Stable and long tool life
- Cost effective by multi-cornered one-use insert







Application range



Recommended cutting condition

Cutting speed vc (m/min)	120 – 220
feed fn (mm/rev)	0.05 – 0.3
Depth of cut per time ap (mm)	0.05 – 0.3

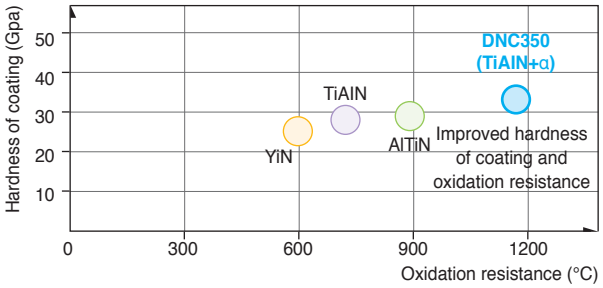
Coated cBN for high interrupted cutting

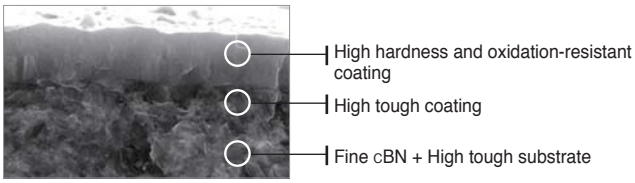
DNC350

Features

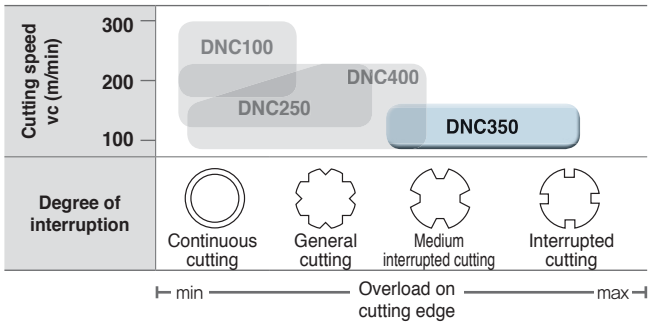
- Excellent tool life and productivity in interrupted cutting
- New PVD coating applied with high hardness and oxidation resistance







Application range



Recommended cutting condition

Cutting speed vc (m/min)	90 – 150
feed fn (mm/rev)	0.05 – 0.3
Depth of cut per time ap (mm)	0.05 – 0.3

Solid type coated cBN

DNC400 new

Features

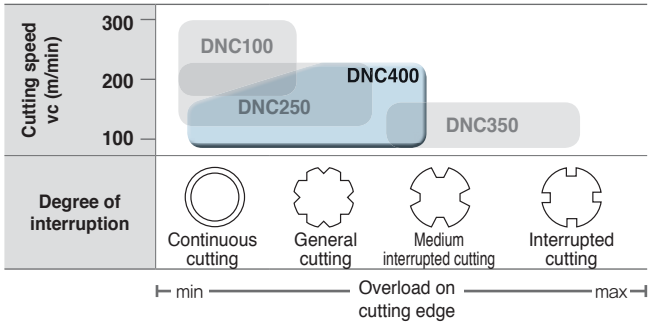
- For machining heat-treated steel in continuous and medium interrupted cutting
- Longer tool life due to coating layer
- Solid type for universal purpose

Features of solid type cBN

- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and the welds
- Better welding stability due to 3-face blazing
- Excellent cutting performance at varying depth of cuts



Application range



Recommended cutting condition

feed fn (mm/rev)	**DNC400**	**0.05 – 0.3**
	DNC250	0.05 – 0.3
	DNC350	0.05 – 0.3
Depth of cut ap (mm)	**DNC400**	**0.05 – 0.5**
	DNC250	0.05 – 0.3
	DNC350	0.05 – 0.3

Non-coated cBN
KB1000

Features

- Non-coated cBN with the highest wear resistance at high speed
- Excellent tool life in continuous to light interrupted cutting
- Improved fracture resistance along with high wear resistance
  - Higher thermal resistance and hardness due to pure TiCN ceramic binder



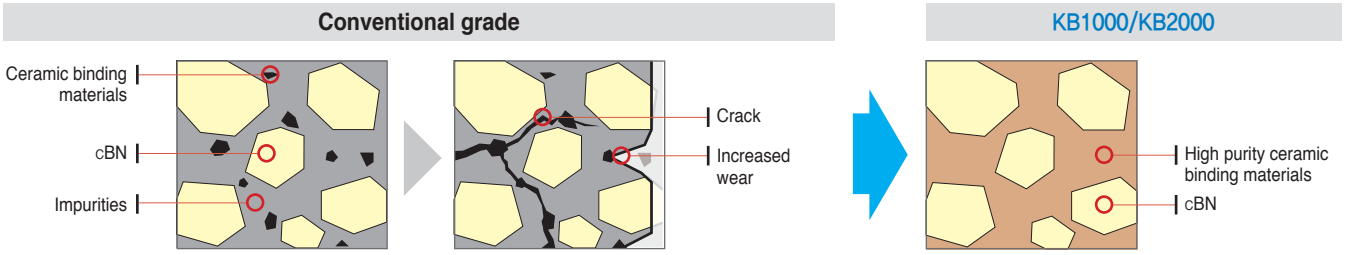
Non-coated cBN
KB2000

Features

- Universal grade for overall machining of heat-treated
  - Stable tool life in continuous to low/medium interrupted cutting
- Both fracture resistance and wear resistance acquired with the use of pure ceramic binder
- Stable surface roughness



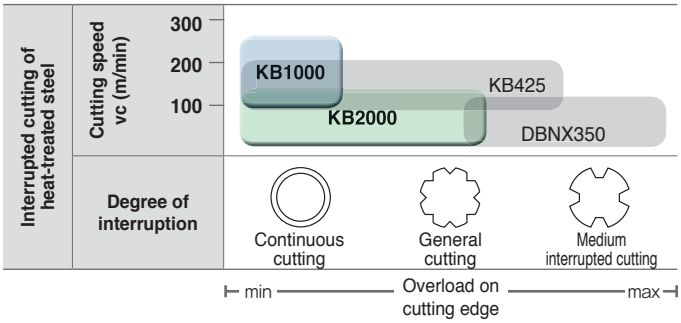
New technology of high purity ceramic binding materials



Impurities included in conventional grade's ceramic binder caused inferior thermal resistance and hardness of sintered compounds, which led to crack (fracture) and wear

KB2000 dramatically minimizes impurities with the use of high purity ceramic binding materials and enhances thermal resistance and toughness.

Application range



Recommended cutting condition (KB1000)

Cutting speed vc (m/min)	130 – 250
feed fn (mm/rev)	0.03 – 0.15
Depth of cut ap (mm)	0.03 – 0.2

Recommended cutting condition (KB2000)

Cutting speed vc (m/min)	80 – 200
feed fn (mm/rev)	0.03 – 0.2
Depth of cut ap (mm)	0.03 – 0.3

PCD inserts grades

Features

KORLOY PCD products are manufactured by using high quality PCD tips under ultra high temperatures and pressure. The PCD tip is welded on the qualified KORLOY carbide insert KORLOY high quality PCD products meet a wide range of application needs in turning, milling, and endmills.

- Excellent tool life for aluminum alloy and copper alloy
- Excellent tool life for Ceramic, high-silicon aluminum and rock or stone
- Excellent tool life for rubber, carbon, graphite and wood

PCD grade

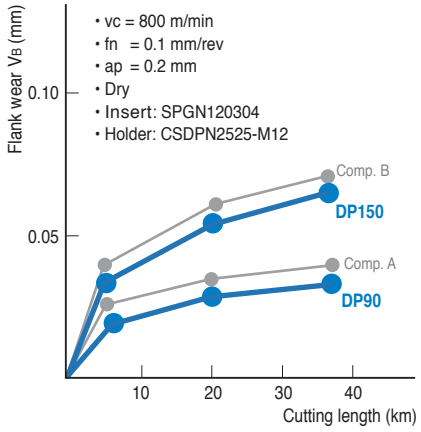
Grade	Features	Application	Grain size (㎛)	Hardness (Hv)	TRS (kgf/mm²)
DP90	Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy	Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone	50	10,000~12,000	110
DP150	By use of fine diamond grain having good bonding property, it is suitable for machining of Non-ferrous metal, graphite	High Si aluminum alloy Copper, Bronze alloy Rubber, Wood, Carbon	5	10,000~12,000	200
DP200	By use of ultra fine diamond grain, it is possible to make sharp cutting edge. Thus it is appropriate grade to machine Non-ferrous material	Plastic Wood Precise finishing of aluminum	0.5	8,000~10,000	220

Recommended cutting condition

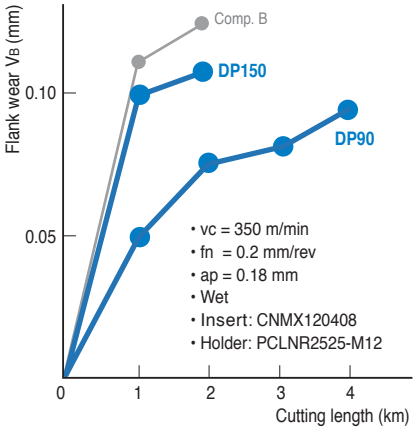
Workpiece	Cutting speed (m/min)	Feed (mm/rev)	Depth of cut (mm)	Recommended grade	
				1st	2nd
Aluminum alloy (4%~8% Si)	1000~3000	0.1~0.6	~ 3	DP150	DP200
Aluminum alloy (9%~14% Si)	600~2500	0.1~0.5	~ 3	DP150	DP200
Aluminum alloy (15%~18% Si)	300~700	0.1~0.4	~ 3	DP150	DP200
Copper, Bronze alloy	~ 1000	0.05~0.2	~ 3	DP150	DP200
Reinforced plastic	~ 1000	0.1~0.3	~ 2	DP150	DP200
Wood	~ 4000	0.1~0.4	-	DP150	DP200
Cemented carbide	10~30	~ 0.2	~ 0.5	DP90	DP150

Cutting performance

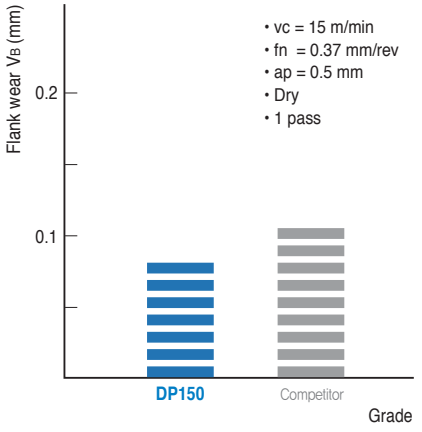
Continuous cutting test (Workpiece: Al-25%Si)



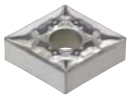
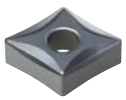
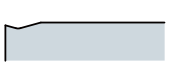
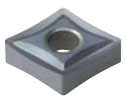
Interrupted cutting test (Workpiece: Al-20%Si)



Cutting test of cemented carbide



Chip breaker for turning

Geometry	Cutting edge	Application range	Features
V series		feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13	
VQ 		0.10~0.40 1.0~3.0	**For Medium to finish cutting** • Medium to finishing cutting edges offer improved edge hardness
VL 		0.10~0.35 0.2~1.5	**For Finishing** • Stable chip control in high toughness material; low carbon steel, pipe steel & steel plates • Improved chip control for facing, copy machining and better surface finish
VF 		0.05~0.35 0.5~1.5	**For Finishing** • Good chip control quality on varied depth of cut • Excellent cutting edge strength has been acquired due to the special chip-breaker
VB 		0.15~0.45 0.5~2.0	**For Finishing** • Improved chip control for smaller depth of cuts • Excellent chip control in copying, corner R machining
VC 		0.12~0.45 0.5~3.5	**For Medium to finish cutting** • Stable chip control in copying and internal machining with various depths of cut
VM 		0.10~0.50 1.0~5.0	**For Medium cutting** • Wide available chip control range from medium-finishing to medium-roughing • Suitable chip breaker for CNC machining
VH 		0.70~1.40 6.0~15.0	**For Heavy duty cutting** • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
VT 		0.75~1.60 7.0~17.0	**For Heavy duty cutting** • Designed specifically for heavy machining • Specialized chip breaker for the heavy industries like Ship building, Power plant industry
VP1 		0.05~0.20 0.1~1.5	**For Finishing** • High positive cutting edge • Reduced contract chip minimizes temperature to improve tool life
VP2 		0.05~0.40 0.5~4.0	**For Medium to finish cutting** • Stable chip control and high machinability in copying with various depths of cut

Notice: Application ranges are based on main cutting material

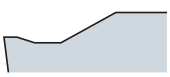
Chip breaker for turning

	Geometry	Cutting edge	Application range	Features
V series	VP3		0.05~0.45 0.5~4.5	**For Medium cutting** • High positive cutting edge with wide land • Stable cutting performance in interrupted machining with high toughness • Stable machinability and chip control in machining with high depth of cut
	VP4		0.15~0.45 1.0~4.5	**For Inconel medium cutting and medium to rough cutting of stainless steel** • The first recommended chip breaker for inconel cutting • High hard and resistant rake angle to prevent notch wear in roughing of rugged surfaces
	VR		0.25~0.55 1.2~7.0	**For Medium cutting of cast iron and medium to roughing of steel** • High feed machining with the combination of wide land and pockets • Shallow chip breaker design prevents chip blocking at high feed • Decreased wear on major cutting edge due to special treatment on blade
-P series	LP		0.10~0.40 0.5~2.5	**For Medium to finish cutting of steel** • Angle land decreases cutting resistance for better surface roughness • Special dot design prevents chip blocking by clear chip breaking
	MP		0.15~0.45 0.5~4.5	**For Medium cutting of steel** • Increased productivity due to excellent chip control in various conditions • Stable tool life by reducing cutting load at high speed and high feed
-M series	MM		0.12~0.45 0.5~5.5	**For Medium cutting of steel** • The first recommended chip breaker for continuous stainless applications cutting • Improved tool life and surface finish due to dual lands combining both machinability and toughness • Wide chip pockets for stable chip evacuation at high depth of cuts and high feeds
	RM		0.15~0.55 2.0~6.0	**For Roughing of steel** • The first recommended chip breaker for interrupted cutting or roughing of stainless steel • Inhibited notch wear and burr creation at high depth of cuts and feeds • Reduced cutting loads and longer tool life at high feeds
-K series	MK		0.10~0.50 1.0~5.0	**For Medium cutting of steel** • Suitable for continuous cutting of ductile and gray cast iron • Excellent tool life and surface finish thanks to angle lands improving cutting performance
	RK		0.20~0.60 1.5~6.0	**For Roughing of steel** • Suitable for machining ductile and gray cast iron at high speeds and high feeds • Improved toughness and chipping resistance due to flat lands
H series	HA		0.03~0.30 0.5~2.5	**For Light-alloy, stainless steel machining** • Sharp cutting edge generates low cutting force • Specially designed tough main cutting edge • Suitable for cutting of low carbon steel, stainless steel, aluminum

Application range: feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3; depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13

Notice: Application ranges are based on main cutting material

Chip breaker for turning

Geometry		Cutting edge	Application range	Features
G series	GR		0.30~0.80 3.0~8.0	**For Medium to roughing** • Suitable for deep depth of cut and high feed cutting of steel and cast iron • Suitable for intermittent cutting
	GH		0.30~1.30 3.0~11.0	**For Heavy duty cutting** • Suitable for heavy duty cutting due to strong cutting edge • Wide chip control range with low cutting force
B series	B25		0.50~1.00 4.0~10.0	**For General cutting** • Suitable for general cutting condition cutting
V-Posi series	VF		0.05~0.25 0.1~1.5	**For Finishing** • Improved surface finish and size accuracy due to stable inner boring
	VL		0.05~0.20 0.1~1.0	**For Finishing** • Superior chip control in low carbon steel, pipes, and steel plates
	VP1		0.01~0.25 0.1~1.5	**For Finishing** • Excellent chip control in application with micro depth of cut and low feed • Low cutting load and superb surface finish • Optimal for both internal and external machining
H-Posi series	HMP		0.08~0.40 0.5~3.5	**For Medium cutting** • Excellent chip control at wide range of cutting conditions • Machining versatility over a wide range of materials
C series	C25		0.10~0.35 1.0~3.0	**For Medium cutting** • Suitable for interrupted cutting and cast iron machining • Good surface finish due to low cutting force • Suitable for both boring and outer diameter turning
P-Posi series	MP		0.05~0.30 0.3~3.0	**For Medium cutting** • Sharp cutting edge and wide chip pocket for low cutting load • Stable chip control at varying depth of cuts • Excellent cutting performance when machining automobile components
AL series	AK		0.03~0.40 0.1~4.0	**For Aluminum cutting** • High rake angle and low resistance cutting edge secures long tool life in continuous cutting of aluminum turning • High speed of finishing operation

Application range — feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 — depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13

Notice: Application ranges are based on main cutting material

Chip breaker for turning

	Geometry	Cutting edge	Application range	Features
AL series	AR		0.05~0.50 0.5~4.0	For Aluminum cutting • High stability of cutting edge secures great performance in high speed and interrupted machining • High speed of medium and interrupted operation
Auto tool series	KF		0.01~0.12 0.01~1.0	For Finishing • Shallow depth of cut with sharp edge • Longer tool life at high speed cutting due to low cutting force • Good surface finish
	KM		0.04~0.15 0.05~1.5	For Medium to finish cutting • Improved chip control makes tool life long and better machining
Wiper tool series	LW		0.15~0.60 1.0~5.0	For Medium cutting (Wiper) • Guarantees excellent surface roughness and good chip controls at high feed machining
	VW		0.15~0.50 0.5~3.5	For Finishing (Wiper) • Improved surface roughness at shallow depth of cut and high feed due to strong cutting edge

feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3

depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13

Chip breaker for milling

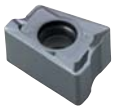
	Geometry	Cutting edge	Application range	Features
MX series	MX		0.10~0.30 1.0~5.0	For Roughing • Possible to increase productivity through increase feed and depth • Excellent heat resistance due to the special chip breaker design of top face of insert
Rich Mill series-RM3	MA		0.05~0.40 1.0~8.0	For Aluminum milling • Sharp cutting edge for low cutting load, which is ideal for machining steel, hard-to-cut materials and aluminum
	ML		0.05~0.30 1.0~8.0	For machining hard-to-cut materials • Low cutting resistance for light cutting and machining hard-to-cut materials with excellent tool life and surface roughness

feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3

depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13

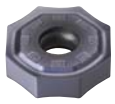
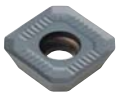
Notice: Application ranges are based on main cutting material

Chip breaker for milling

Geometry		Cutting edge	Application range (feed rate fn (mm/rev): 0.04, 0.063, 0.10, 0.16, 0.25, 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3; depth of cut ap (mm): 0.1, 0.16, 0.25, 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3, 10.0, 11.6, 13)	Features
Rich Mill series-RM3	MM 		0.05~0.35 1.0~8.0	**For Medium to roughing** • Available for most of applications with universal design for general milling
Rich Mill series-RM4	MA 		0.05~0.25 0.3~14.0	**For Aluminum milling** • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult- tocut materials, aluminum and light machining
	MF 		0.05~0.30 0.5~14.0	**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM 		0.05~0.30 1.0~14.0	**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
Rich Mill series-RM8	MA 		0.05~0.35 0.3~6.0	**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
	MF 		0.05~0.35 0.3~6.0	**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	ML 		0.05~0.30 0.3~6.0	**For Machining hard-to-cut materials** • Low cutting resistance for excellent tool life and surface roughness in machining hard-to-cut materials
	MM 		0.10~0.40 0.5~6.0	**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
Rich Mill series-RMT	MF 		0.05~0.20 0.5~5.0	**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM 		0.05~0.30 0.5~8.0	**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining

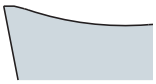
Notice: Application ranges are based on main cutting material

Chip breaker for milling

	Geometry	Cutting edge	Application range (feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 / depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13)	Features
RichMill series-RM16	MA 		0.05~0.30 0.3~5.5	**For Aluminum** • Sharp cutting edge design ensures low cutting resistance and excellent machining in difficult- tocut materials, aluminum and light machining
	MF 		0.05~0.40 0.3~5.5	**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	ML 		0.05~0.35 0.3~5.5	**For Machining hard-to-cut materials** • Low cutting resistance for excellent tool life and surface roughness in machining hard-to-cut materials
	MM 		0.10~0.45 0.5~5.5	**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
	W 		0.05~0.30 0.3~2.0	**For Finishing of milling (Wiper)** • Wiper insert provides improved surface roughness due to special cutting edge
Alpha Mill series	MA 		0.10~0.40 0.5~16	**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
	MF 		0.05~0.15 0.5~16	**For Finishing of milling** • Low cutting force chip breaker design ensures longer tool life and excellent machining in difficult-to-cut material and light machining
	MM 		0.10~0.25 0.5~16	**For Medium to roughing of milling** • Suitable geometry design for general milling has wider ranges of machining
	ML 		0.05~0.15 0.5~16	**For Hard-to-cut material machining** • The chip breaker with low cutting resistance ensures superior machinability in hard-to-cut materials
Future Mill series	MF 		0.05~0.20 0.5~5.0	**For Finishing of milling** • Special design for light cutting of gummy materials like stainless steel and hard to machine material provide fine surface finish and longer tool life

Notice: Application ranges are based on main cutting material

Chip breaker for milling

	Geometry	Cutting edge	Application range	Features
Future Mill series	MM		feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13 0.05~0.30 1.0~5.0	**For Medium cutting of milling** • Chip breaker design to cover general cutting condition provides wide available application range • Ground type and as sintered type is available
	MR		0.05~0.35 1.5~5.0	**For Roughing of milling** • Strongest cutting edge strength provide stable tool life even in case of severe cutting with heavy intermittent and heavy roughing
	MA		0.10~0.35 0.5~5.0	**For Aluminum** • Sharp cutting edge and lubricated top face show excellent chip flow and welding resistance in aluminum machining
Future Mill series P-posi	MA		0.30~0.60 0.3~6.0	**For Aluminum milling** • Excellent surface roughness due to buffed surface in machining aluminum
	ML		0.30~0.50 0.3~3.0	**For Machining titanium and inconel** • Low cutting resistance and high hardness cutting edges for excellent surface roughness in machining titanium and Inconel
	MF		0.12~0.50 0.3~6.0	**For Finishing of milling** • Low cutting resistance for light cutting
	MM		0.20~0.70 0.3~6.0	**For Medium to rough milling** • Universal purpose for most of milling applications
	None C/B		0.30~0.50 0.3~0.5	**For Machining high hardness steel** • Ideal for machining high hardness mold steel and heat resistant alloy

Notice: Application ranges are based on main cutting material

Chip breaker for drilling

	Geometry	Cutting edge	Application range	Features
King Drill series	PD		feed rate fn (mm/rev): 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 depth of cut ap (mm): 0.1 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 10.0 11.6 13 0.04~0.20 60~300	**For General steel machining** • Chip breaker with strong cutting edge for universal applications with steel, stainless steel, and cast iron
	LD		0.04~0.15 40~250	**For General steel (mild steel and forged steel)** • Superior chip control in machining of mild steel, forged steel and stainless steel
	RD		0.04~0.20 60~300	**General steel and heat-treated steel** • Improved central chipping resistance due to reinforced corners of the King Drill central inserts • Excellent cutting performance even in machining where there is frequent corner breakage of central inserts • e.g. Machining heat-treated steel or stainless steel, and high feed machining, etc.
	ND		0.04~0.10 100~400	**Non-ferrous metals** • Chip breaker with sharp and polished cutting edge for aluminum and Non-ferrous metals. Machining with King Drill ensures good chip flow and resistance to chip welding.

Notice : Application ranges are based on main cutting material

Turning Chip Breakers

B02 Application range of KORLOY Main Chip Breakers

B04 Recommended Chip Breakers for workpiece

B12 Feature of Chip Breakers

Inserts

B24 Turning Insert Code System (ISO)

B26 Turning Insert (Negative)

B62 Turning Insert (Positive)

B86 Aluminum Insert (Positive)

B94 cBN Insert

B98 PCD Insert

SAVE TURN

B100 Technical Information for Save Turn

B101 Save Turn Insert

B102 Save Turn Holder

B105 Save Turn Boring Bar

Auto Tools

B107 Technical Information for Auto Tools

B108 ISO Type

B115 Blade Type

B118 Multi Utility Type

B121 KGT / MGT Type

B124 MSB Tool

B130 Sleeve

Multi Turn

B131 Technical Information for Multi Turn

B133 Multi Turn

Bearing Solutions

B134 Technical Information for Bearing Solution

B135 Bearing Solution

B141 Special Order Form for Bearing Inserts



External Tool Holder

B142 External Tool Holder Code System (ISO)
B143 Index for External Holder
B146 Instruction of External Holder
B147 Features of Double Clamp / Lever lock System
B148 Double Clamp System
B153 Lever Lock System
B161 Wedge Clamp System
B163 Clamp On System
B165 Multi Lock System
B172 Screw On System
B179 Ceramic Holder

Boring Bar

B181 Boring Bar Code System (ISO)
B182 Index for Boring Bar
B184 Instruction of Boring Bar assembly
B185 Double Clamp System
B187 Lever Lock System

Boring Bar

B191 Clamp On System
B192 Multi Lock System
B194 Screw On System
B194 Carbide shank Boring Bar
B204 Compact Mini

HSK/KM Tooling System

B207 Technical Information for HSK / KM Tooling System
B209 Index for HSK / KM Tooling System
B210 HSK Tooling System
B216 KM Tooling System

Cartridges

B220 Cartridge Code System (ISO)
B221 Index for Cartridge
B222 Clamp On System
B224 Screw On System



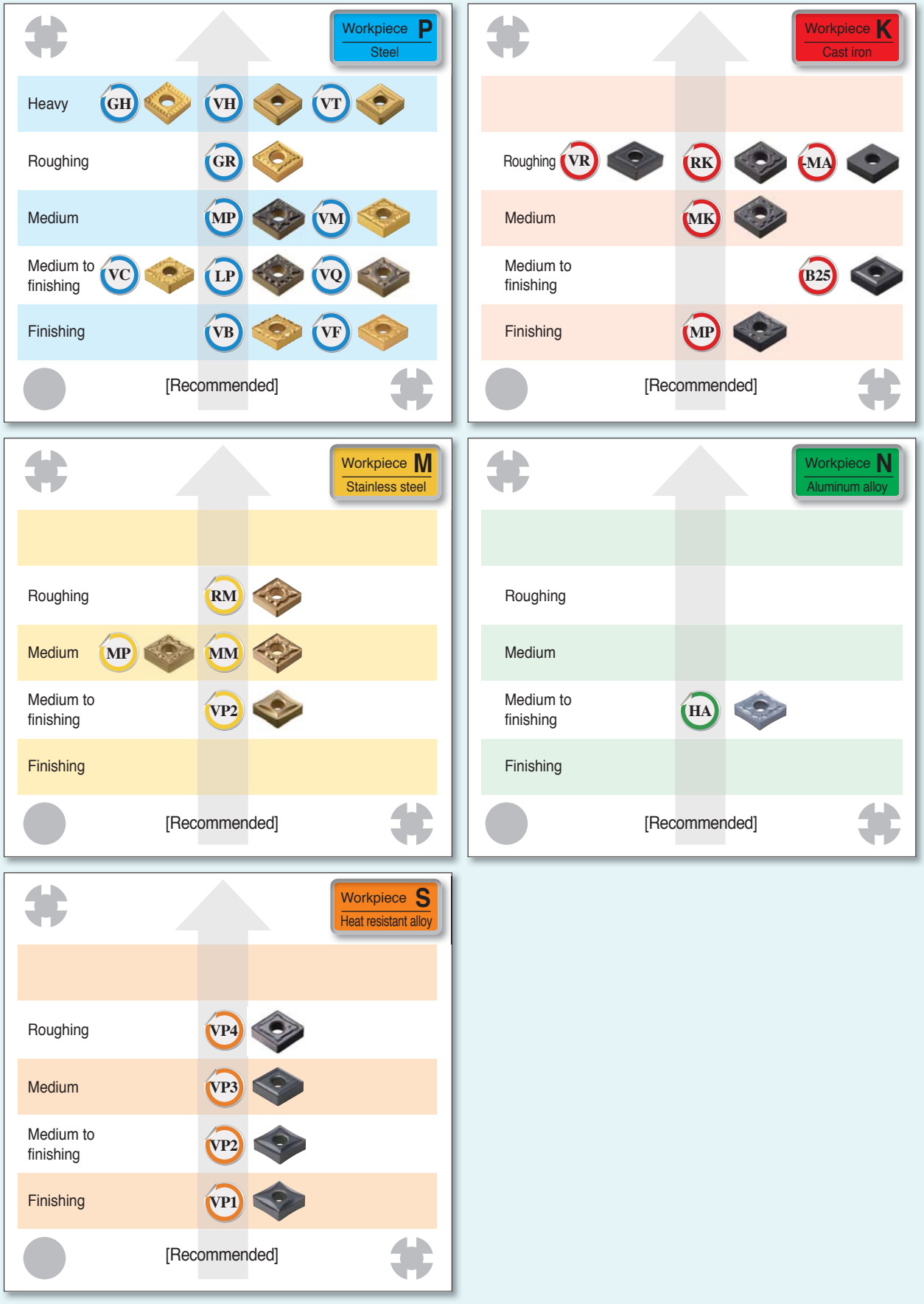
TURNING

Korloy turning tools cover a wide application range with a full line-up of ISO tools that produce high quality and high precision parts for all manufacturers' requirements.

B

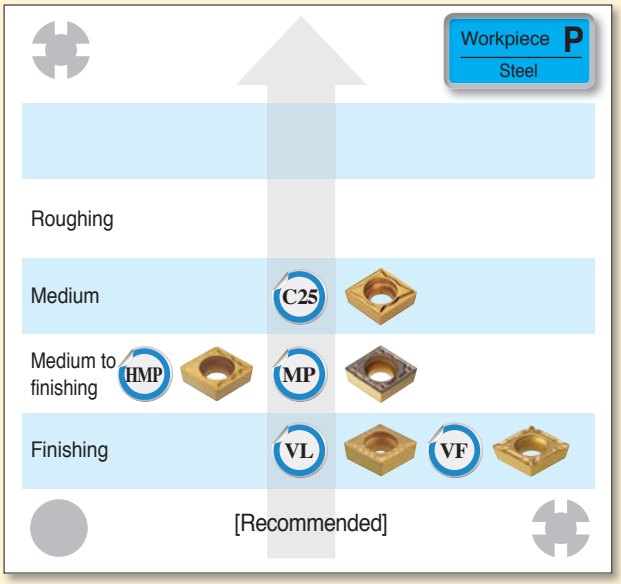
Applications range of chip breakers

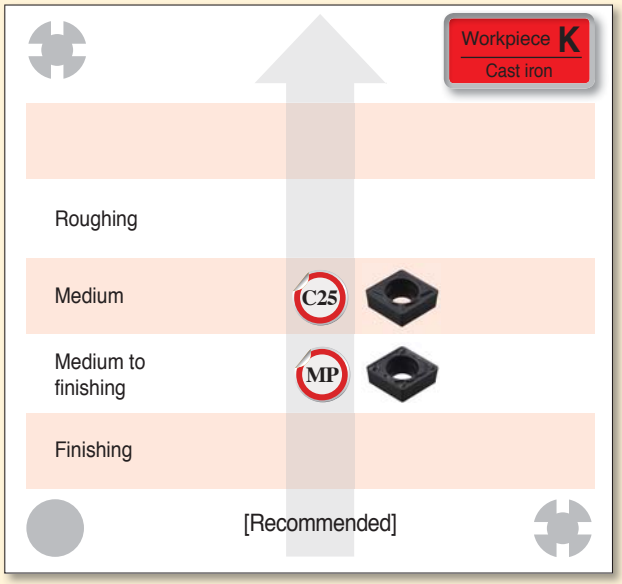
Negative inserts

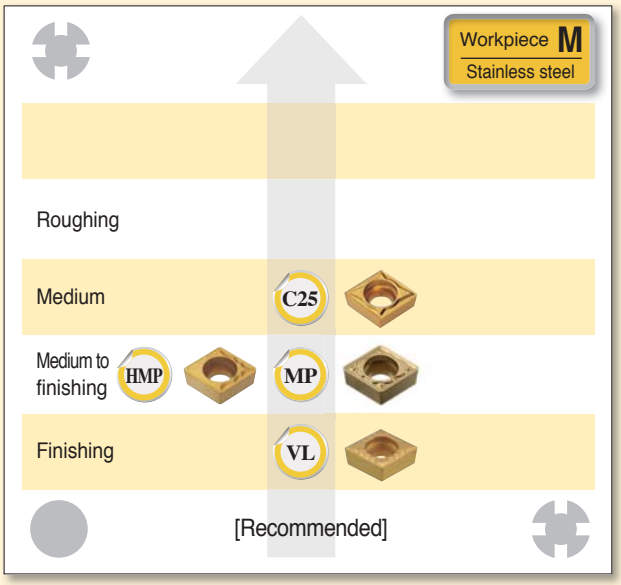


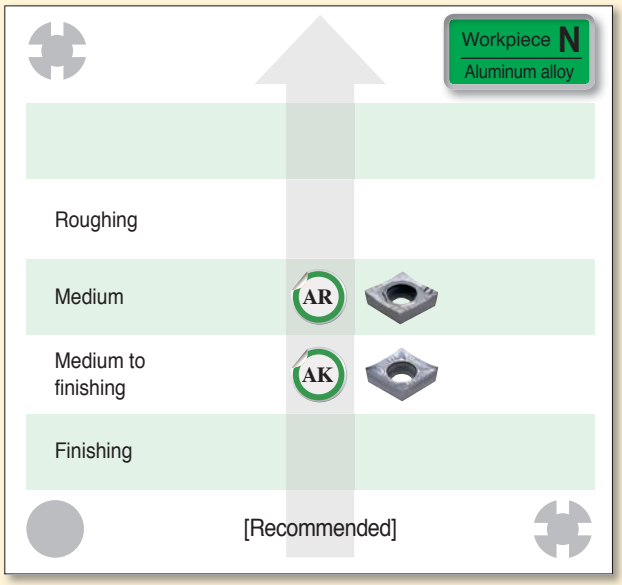
Applications range of chip breakers

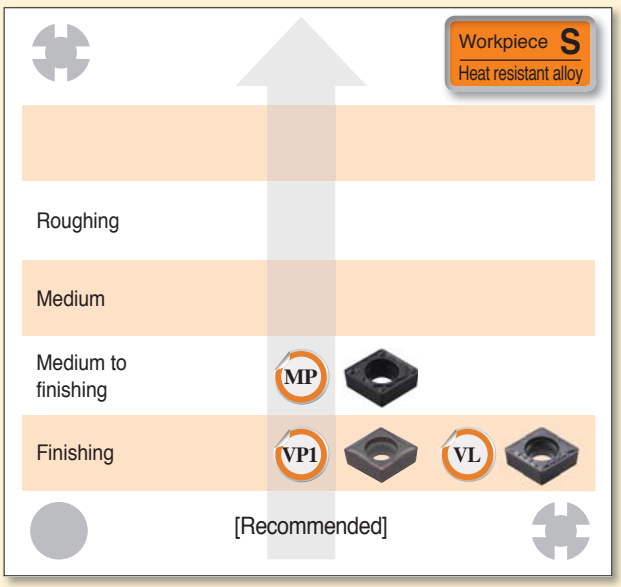
Positive inserts











Recommended chip breaker for workpiece

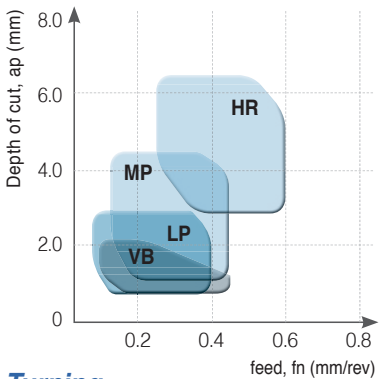
Workpiece **P** Steel

Materials: SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel
Hardness: under 180HB

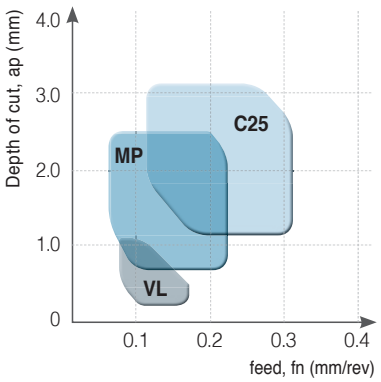
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.2 ~ **0.8** ~ 1.5 Finishing	VL		0.1 ~ **0.2** ~ 0.35	NC3215 **NC3225** CN1500 CN2500	305 **250** 260 230	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.5 ~ **1.0** ~ 1.5 Finishing	VF		0.05 ~ **0.15** ~ 0.35	NC3215 NC3220 **NC3225** NC5330	305 270 **270** 210	CNMG p. B26	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.5 ~ **1.0** ~ 2.0 Finishing	VB		0.15 ~ **0.2** ~ 0.4	NC3215 **NC3225** CN1500 CN2500	340 **250** 240 210	CNMG p. B26	DNMG p. B33		TNMG p. B50		WNMG p. B58
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC		0.12 ~ **0.25** ~ 0.45	NC3215 **NC3220** **NC3225** NC5330	285 **250** **255** 200	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B52	VNMG p. B56	WNMG p. B59
	0.5 ~ **1.0** ~ 2.5 Medium	LP		0.10 ~ **0.25** ~ 0.40	NC3215 **NC3225** NC5330	300 **250** 200	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B59
	0.5 ~ **1.5** ~ 4.5 Medium	MP		0.15 ~ **0.30** ~ 0.45	NC3215 **NC3225** NC5330	300 **265** 200	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ **2.5** ~ 5.0 Medium	VM		0.10 ~ **0.25** ~ 0.50	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	295 260 **260** 205 220 200	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR		0.20 ~ **0.35** ~ 0.50	NC6205 **NC6210** NC6215	180~370 **150~330** 130~280	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B60
	6.0 ~ **10.0** ~ 15.0 Heavy (general)	VH		0.7 ~ **1.0** ~ 1.4	**NC3215** NC3030 NC500H NC5330	**50~250** 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
	7.0 ~ **12.0** ~ 17.0 Heavy (high feed cutting)	VT		0.75 ~ **1.2** ~ 1.6	**NC3215** NC3030 NC500H NC5330	**50~250** 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			

●: The first recommended cutting condition

P Negative



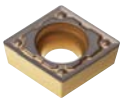
P Positive



Recommended chip breaker for workpiece

Workpiece P Steel

Materials: SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel
Hardness: under 180HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	VL 		0.05 ~ **0.1** ~ 0.2	NC3215 **NC3220** **NC3225** NC5330 CN1500 CN2500	305 **270** **270** 210 260 240	CCMT  p. B64	DCMT  p. B69	SCMT  p. B71	TCMT  p. B75	VB(C)MT  p. B81	
	0.1 ~ **0.5** ~ 1.5 Finishing	VF 		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 **NC3225** NC5330 CC1500 CN1500 CN2500	305 270 **270** 210 260 250 230	CCMT  p. B64	DCMT  p. B68	SCMT  p. B70	TC(P)MT  p. B75	VB(C)MT  p. B80	
	0.5 ~ **1.0** ~ 3.0 Medium to finishing	MP 		0.1 ~ **0.2** ~ 0.35	NC3215 **NC3225** CN1500 CN2500	300 **250** 240 200	CCMT  p. B65	DCMT  p. B69	SCMT  p. B71	TC(P)MT  p. B76	VB(C)MT  p. B81	
	0.5 ~ **1.5** ~ 3.0 Medium to finishing	HMP 		0.08 ~ **0.20** ~ 0.40	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	320 285 **285** 225 240 220	CCMT  p. B64	DCMT  p. B69	SCMT  p. B71	TCMT  p. B75	VB(C)MT  p. B81	
	1.0 ~ **2.0** ~ 3.0 Medium	C25 		0.10 ~ **0.25** ~ 0.35	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	320 285 **285** 225 230 210	CCMT  p. B65	DCMT  p. B69	SCMT  p. B71	TCMT  p. B76		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: S45C, S55C, SCM430, SCM440, etc. General steel
Hardness: under 180~260HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **1.0** ~ 1.5 Finishing	VF		0.05 ~ **0.15** ~ 0.35	NC3215 NC3225 NC5330	305 270 250	CNMG p. B26	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.5 ~ **1.0** ~ 2.0 Finishing	VB		0.15 ~ **0.2** ~ 0.4	NC3215 NC3225 CN1500 CN2500	340 250 230 190	CNMG p. B26	DNMG p. B33		TNMG p. B50		WNMG p. B58
	0.5 ~ **1.0** ~ 2.5 Medium	LP		0.10 ~ **0.25** ~ 0.40	NC3215 NC3225 NC5330	300 250 200	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B59
	0.5 ~ **1.5** ~ 4.5 Medium	MP		0.15 ~ **0.30** ~ 0.45	NC3215 NC3225 NC5330	300 250 200	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC		0.12 ~ **0.25** ~ 0.45	NC3215 NC3220 NC3225 NC5330	285 255 250 200	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B52	VNMG p. B56	WNMG p. B59
	1.0 ~ **2.5** ~ 5.0 Medium	VM		0.10 ~ **0.25** ~ 0.50	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	260 245 245 205 210 170	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR		0.20 ~ **0.35** ~ 0.50	NC6205 NC6210 NC6215	180~370 150~330 130~280	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B60
	6.0 ~ **10.0** ~ 15.0 Heavy (general)	VH		0.7 ~ **1.0** ~ 1.4	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
	7.0 ~ **12.0** ~ 17.0 Heavy (high feed cutting)	VT		0.75 ~ **1.2** ~ 1.6	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	VL		0.05 ~ **0.1** ~ 0.2	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	345 310 310 240 250 210	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VB(C)MT p. B81	
	0.1 ~ **0.5** ~ 1.5 Finishing	VF		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	265 300 300 230 260 240 210	CCMT p. B64	DCMT p. B68	SCMT p. B70	TC(P)MT p. B75	VCMT p. B80	
	0.30 ~ **1.5** ~ 3.0 Medium to finishing	MP		0.05 ~ **0.15** ~ 0.35	NC3215 NC3225	300 250	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	1.0 ~ **2.0** ~ 3.0 Medium	C25		0.1 ~ **0.15** ~ 0.35	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 230 200	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: SNC415, SNC815, SNCM240, SNCM439, STS12, STS61, etc
SCM440, Hardened steel
Hardness: 260~350HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **1.0** ~ 1.5 Finishing	VF		0.08 ~ **0.15** ~ 0.30	NC3215 **NC3220** NC3225	180 **159** 159	CNMG p. B26	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
	0.5 ~ **1.0** ~ 2.0 Finishing	VB		0.15 ~ **0.2** ~ 0.4	NC3215 **NC3225** CN1500 CN2500	200 **148** 220 200	CNMG p. B26	DNMG p. B33		TNMG p. B50		WNMG p. B58
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC		0.12 ~ **0.25** ~ 0.45	NC3215 **NC3220** **NC3225** NC5330	168 **148** **150** 200	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B52	VNMG p. B56	WNMG p. B59
	0.5 ~ **1.0** ~ 2.5 Medium	LP		0.10 ~ **0.25** ~ 0.40	NC3215 **NC3225** NC5330	250 **200** 200	CNMG p. B27	DNMG p. B35	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B59
	0.5 ~ **1.5** ~ 4.5 Medium	MP		0.15 ~ **0.30** ~ 0.45	NC3215 **NC3225** NC5330	250 **200** 200	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ **2.5** ~ 5.0 Medium	VM		0.15 ~ **0.25** ~ 0.50	NC3215 NC3220 **NC3225** CN1500 CN2500	174 153 **153** 120 100	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR		0.20 ~ **0.35** ~ 0.50	NC6205 **NC6210** NC6215	180~370 **150~330** 130~280	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B60
	6.0 ~ **10.0** ~ 15.0 Heavy (general)	VH		0.7 ~ **1.0** ~ 1.4	**NC3215** NC3030 NC500H NC5330	**50~250** 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
	7.0 ~ **12.0** ~ 17.0 Heavy (high feed cutting)	VT		0.75 ~ **1.2** ~ 1.6	**NC3215** NC3030 NC500H NC5330	**50~250** 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	VL		0.05 ~ **0.1** ~ 0.2	NC3215 **NC3220** **NC3225** NC5330 CN1500 CN2500	305 **310** **310** 240 210 190	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VB(C)MT p. B81	
	0.1 ~ **0.5** ~ 1.5 Finishing	VF		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 **NC3225** NC5330 CC1500 CN1500 CN2500	330 300 **300** 230 260 250 240	CCMT p. B64	DCMT p. B68	SCMT p. B70	TC(P)MT p. B75	VB(C)MT p. B80	
	0.30 ~ **1.5** ~ 3.0 Medium to finishing	MP		0.05 ~ **0.15** ~ 0.35	NC3215 **NC3225** NC5300 CN1500 CN2500	305 **285** 225 240 220	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	1.0 ~ **2.0** ~ 3.0 Medium	C25		0.1 ~ **0.15** ~ 0.35	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	320 285 **285** 225 100 80	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

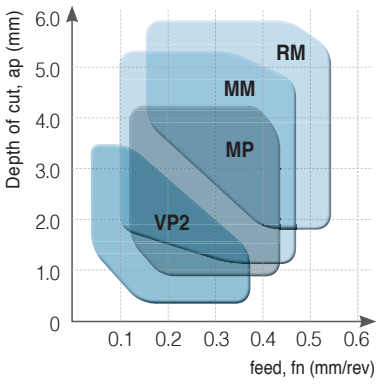
Workpiece **M** Stainless steel

Materials: STS304, STS316, STS430, STS630
Ferrite, austenite, martensite, precipitation hardening stainless steels
Hardness: 135~300HB

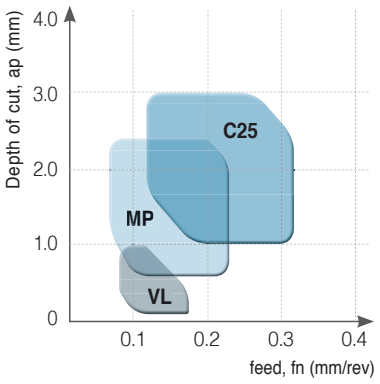
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 1.5 ~ 4.0 Medium to finishing	VP2		0.10 ~ 0.20 ~ 0.40	PC8105 PC8110 PC8115 PC5300 PC5400	185 170 160 135 120	CNMG p. B28	DNMG p. B35	SNMG p. B43	TNMG p. B52		WNMG p. B59
	1.0 ~ 2.0 ~ 4.5 Medium	MP		0.15 ~ 0.23 ~ 0.45	PC8105 PC8110 PC8115 PC5300 PC5400	175 160 150 130 110	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	0.50 ~ 3.0 ~ 5.5 Medium	MM		0.12 ~ 0.25 ~ 0.45	NC9115 NC9125 NC9135 PC8110 PC8115 PC5300	190 170 130 160 150 130	CNMG p. B29	DNMG p. B36	SNMG p. B44	TNMG p. B52	VNMG p. B57	WNMG p. B59
	2.0 ~ 4.0 ~ 6.0 Roughing	RM		0.15 ~ 0.30 ~ 0.55	NC9115 NC9125 NC9135 PC8110 PC8115 PC5300	190 170 130 160 150 130	CNMG p. B31	DNMG p. B39	SNMG p. B46	TNMG p. B54	VNMG p. B57	WNMG p. B61
Positive	0.1 ~ 0.5 ~ 1.0 Finishing	VL		0.05 ~ 0.1 ~ 0.2	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	215 195 190 165 135 165 165	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VB(C)MT p. B81	
	0.30 ~ 1.5 ~ 3.0 Medium to finishing	MP		0.05 ~ 0.15 ~ 0.35	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	190 175 170 135 120 150 150	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	1.0 ~ 1.5 ~ 3.0 Medium	C25		0.08 ~ 0.13 ~ 0.25	PC8110 PC5300 PC9030	170 155 155	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

M Negative



M Positive



Recommended chip breaker for workpiece

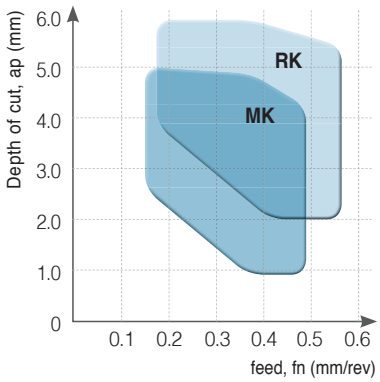
Workpiece **K** Cast iron

Materials: GC250, GC300, GCD400, GCD700, etc : Gray cast iron, Ductile cast iron
Hardness: 135~185HB
Tensile strengt: 450N/mm²

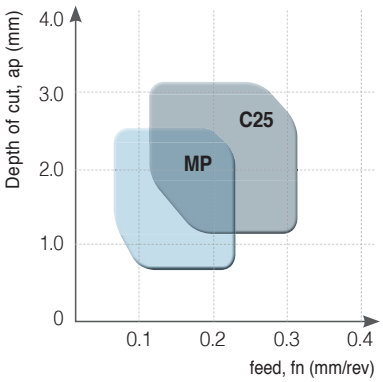
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	1.0 ~ 2.5 ~ 6.0 Roughing	C/B 無		0.15 ~ 0.30 ~ 0.60	DBNX10 DBN500 DBN700 NC6205 NC6210 NC6215	150 ~ 200 200 ~ 500 500 ~ 2000 170 ~ 420 140 ~ 350 120 ~ 290	CNMA p. B26	DNMA p. B33	SNMA p. B42	TNMA p. B50		
	1.5 ~ 3.0 ~ 6.0 Roughing	RK		0.20 ~ 0.30 ~ 0.60	NC6315	150~450	CNMG p. B31	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B61
	1.0 ~ 3.0 ~ 4.5 Roughing	VR		0.2 ~ 0.35 ~ 0.60	NC6215	200~250	CNMG p. B31	DNMG p. B39	SNMG p. B47	TNMG p. B54		WNMG p. B61
	0.5 ~ 2.0 ~ 3.5 Medium to finishing	B25		0.2 ~ 0.35 ~ 0.60	NC6205 NC6210 NC6215	170~380 140~320 120~290	CNMG p. B30	DNMG p. B38	SNMG p. B45	TNMG p. B53		
	1.0 ~ 2.5 ~ 5.0 Medium to finishing	MK		0.10 ~ 0.25 ~ 0.50	NC6315	150~450	CNMG p. B28	DNMG p. B36	SNMG p. B44	TNMG p. B52	VNMG p. B57	WNMG p. B59
Positive	0.30 ~ 1.5 ~ 3.0 Medium to finishing	MP		0.1 ~ 0.2 ~ 0.35	NC6215	200-250	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	1.0 ~ 2.0 ~ 3.5 Medium	C25		0.10 ~ 0.25 ~ 0.40	NC6205 NC6210 NC6215	340 285 200	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

K Negative



K Positive



Recommended chip breaker for workpiece

Workpiece N Aluminum alloy

Materials: Aluminum alloy
Hardness: 20~110HB

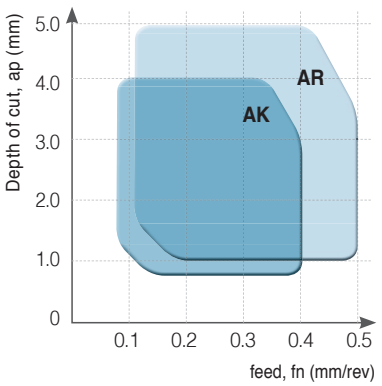
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 2.0 ~ 6.0 Medium	HA		0.1 ~ 0.2 ~ 0.5	H01	500	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
Positive	0.1 ~ 1.0 ~ 4.0 Medium to finishing	AK		0.03 ~ 0.2 ~ 0.4	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89
	0.5 ~ 1.5 ~ 4.0 Medium	AR		0.05 ~ 0.3 ~ 0.5	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89

Materials: Copper Bronze alloy
Hardness: 20~110HB

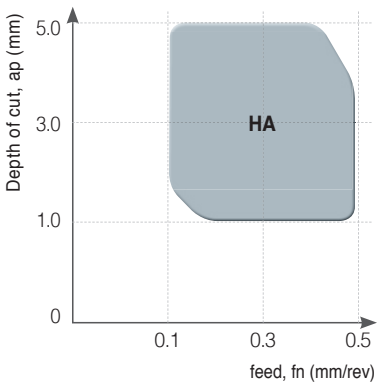
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 2.0 ~ 4.0 Medium to finishing	HA		0.1 ~ 0.2 ~ 0.5	H01	1000	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
Positive	0.1 ~ 1.0 ~ 3.0 Medium to finishing	AK		0.03 ~ 0.2 ~ 0.3	H01	1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89
	0.5 ~ 1.5 ~ 3.0 Medium	AR		0.05 ~ 0.25 ~ 0.4	H01	1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89

●: The first recommended cutting condition

N Negative



N Positive



Recommended chip breaker for workpiece

Workpiece S Heat resistant alloy

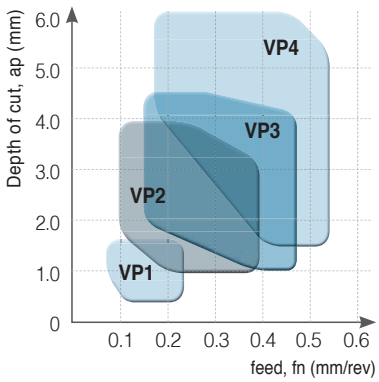
Materials: Inconel, Nimonic, Stellite, Ti alloy

Hardness: 160~350HB

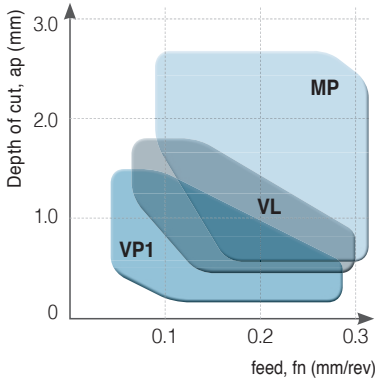
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.1 ~ 0.5 ~ 1.5 Finishing	VP1		0.05 ~ 0.10 ~ 0.20	PC8110 PC5300 NC5330	60 50 50	CNGG p. B26	DNGG p. B33				
	0.5 ~ 1.5 ~ 4.0 Medium to finishing	VP2		0.10 ~ 0.20 ~ 0.40	PC8110 PC5300	60 45	CNMG p. B28	DNMG p. B35	SNMG p. B43	TNMG p. B52		WNMG p. B59
	0.05 ~ 2.0 ~ 3.0 Medium	VP3		0.05 ~ 1.15 ~ 0.25	PC8110 PC5300	60 40	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ 2.5 ~ 4.0 Roughing	VP4		0.15 ~ 0.20 ~ 0.35	PC8115	60 40	CNMG p. B31	DNMG p. B39	SNMG p. B46	TNMG p. B54		WNMG p. B61
Positive	0.1 ~ 0.5 ~ 1.5 Finishing	VP1		0.05 ~ 0.10 ~ 0.20	PC8110 PC5300	60 45	CCGT p. B63	DCGT p. B68			VCGT p. B82	
	0.1 ~ 0.5 ~ 1.0 Finishing	VL		0.05 ~ 0.1 ~ 0.2	PC8110 PC8115	60 50	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VCMT p. B83	
	0.5 ~ 1.0 ~ 3.0 Medium	MP		0.1 ~ 0.2 ~ 0.35	PC8110 PC8115	60 50	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81(B83)	

●: The first recommended cutting condition

S Negative



S Positive



Features of Chip Breaker

LP Chip Breaker new [For medium cutting to finishing]

- Chip breaker for forged steel of automobile parts and normal steel
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

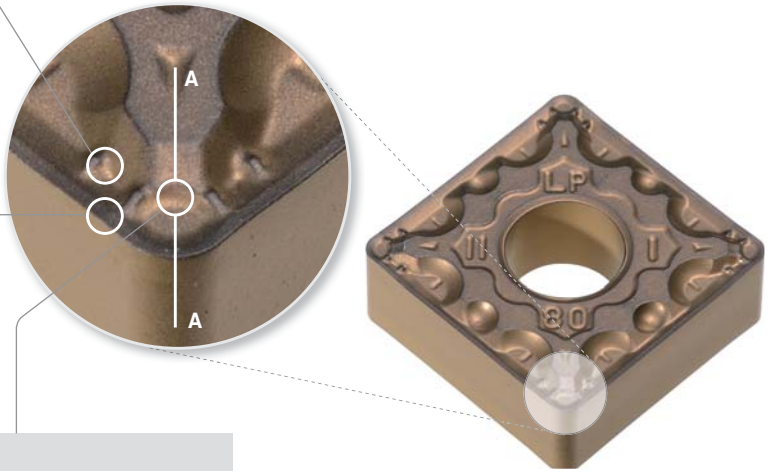
Features of LP chip breaker

▶ Front dot

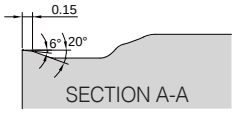
- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at low depth of cut and high feed

▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge



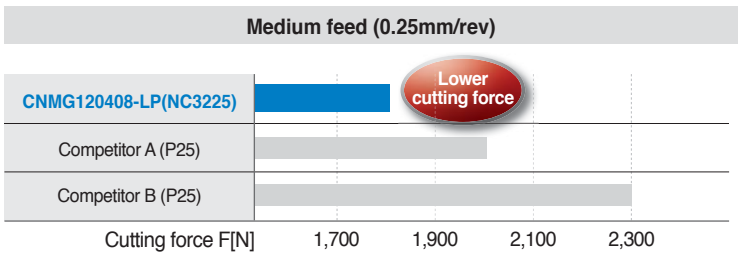
▶ Flat zone

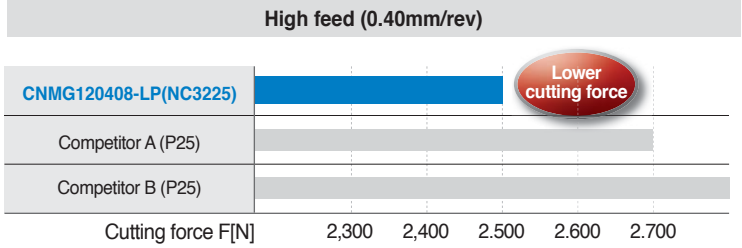


- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

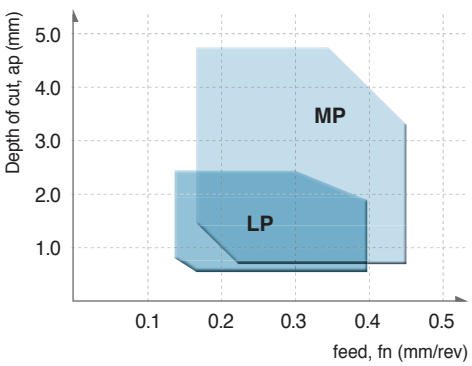
Performance evaluation (Evaluation of cutting force)

- **Workpiece** SM45C (Carbon steal), Ø100, External machining
- **Cutting condition** vc (m/min) = 250, ap (mm) = 1.0, fn (mm/rev) = 0.25/0.40, wet
- **Tools** CNMG120408-□□





Application range



Features of Chip Breaker

MP Chip Breaker new [For medium cutting]

- Chip breaker for forged steel of automobile parts and all other steels
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

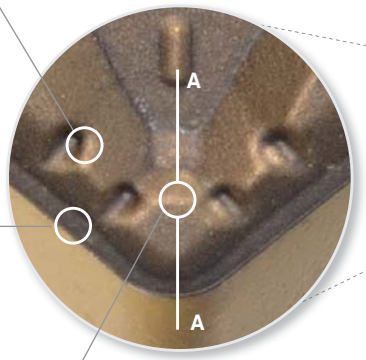
Features of MP chip breaker

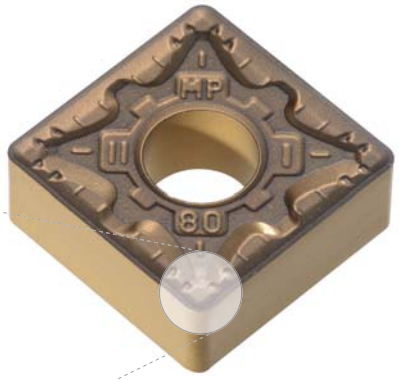
▶ Front two step dot

- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at high depth of cut

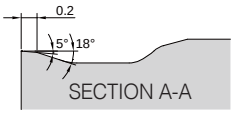
▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge
- Higher toughness at high depth of cut and interrupted cutting





▶ Flat zone

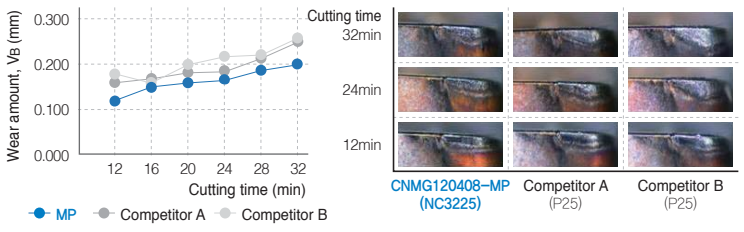


- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

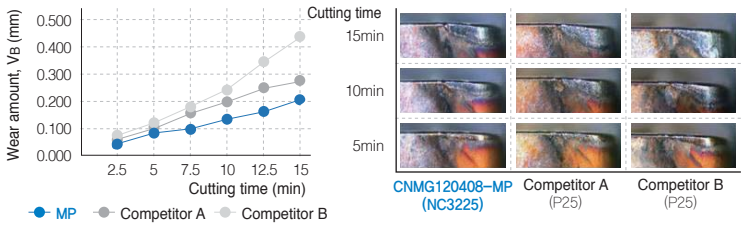
Performance evaluation (Evaluation of wear resistance)

- **Workpiece** SCM440 (Alloy steel), Ø100, Outer diameter machining
- **Cutting condition** vc (m/min) = 280, ap (mm) = 1.5, fn (mm/rev) = 0.25/0.40, wet
- **Tools** CNMG120408-□□

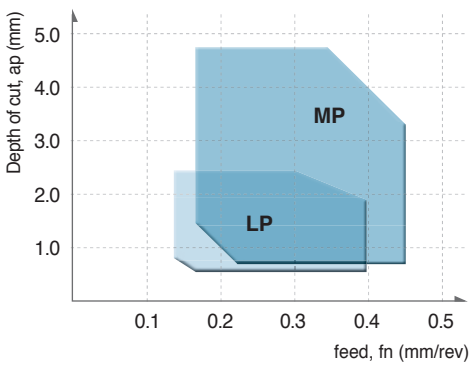
Medium feed (0.25mm/rev)



High feed (0.40mm/rev)



Application range



Features of Chip Breaker

MM Chip Breaker new [For medium cutting]

- The 1st recommended chip breaker for stainless steel machining
- Change to: A dual land achieves sharp cutting performance and insert toughness
- Wide chip pockets for stable chip evacuation at high feeds/depths of cut

Features of MM chip breaker

▶ Variable Land

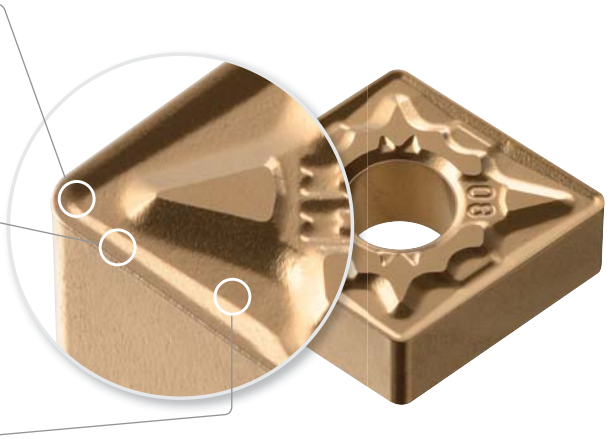
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ Dual Land

- Balance between requirements of sharp and tough cutting edges
- Sharp cutting edge for high speed machining
- Prevents chipping in interrupted machining

▶ Wide Chip Pocket

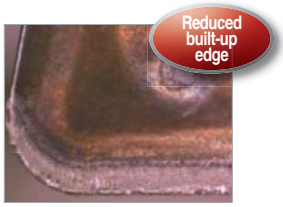
- Stable chip evacuation at high speeds/feeds
- Improved surface finishes by reduced workpiece scratches caused by work-hardened chips at high depths of cut
- Prevents built-up edge



Performance evaluation

Built-up edge

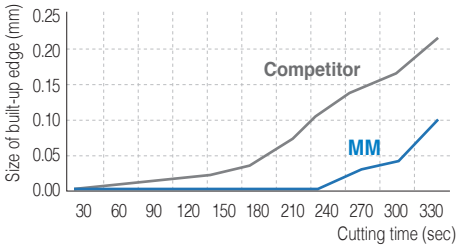
- **Workpiece** X6CrAl13 (Ferrite)
- **Cutting condition** vc (m/min) = 180, fn (mm/rev) = 0.3, ap (mm) = 3.0, wet
- **Tools** **Insert** : CNMG120408-MM (NC9125)
  Holder : PCLNL2525-M12



MM (NC9125)

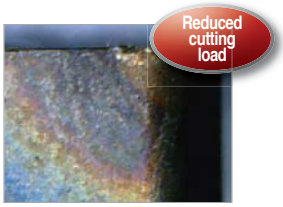


Competitor

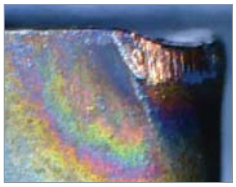


Plastic deformation

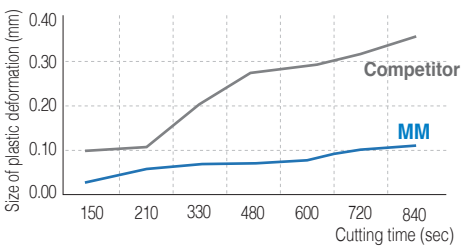
- **Workpiece** X5CrNiMo17-12-2 (Austenite)
- **Cutting condition** vc (m/min) = 200, fn (mm/rev) = 0.35, ap (mm) = 2.0, dry
- **Tools** **Insert** : CNMG120408-MM (NC9135)
  Holder : PCLNL2525-M12



MM (NC9135)



Competitor



Features of Chip Breaker

RM Chip Breaker new [For rough cutting]

- The 1st recommended chip breaker for rough and interrupted machining of stainless steel
- Prevents notch wear and burrs at high feeds and depths of cut
- Reduced cutting force extends tool life in high feed machining

Features of RM chip breaker

▶ Variable Land

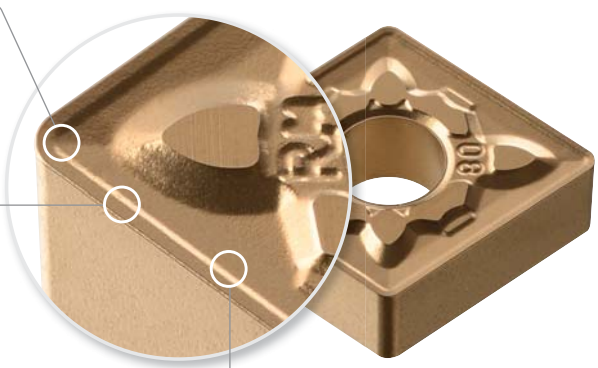
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ Wide land & Gentle front angle

- Sharp cutting edges and a wide land reduce cutting force
- Reduced burrs
- Dispersed cutting load enables higher toughness

▶ Stepped Design

- Stepped design makes chip evacuation easier
- Smooth chip evacuation prevents plastic deformation



Performance evaluation

Notch wear

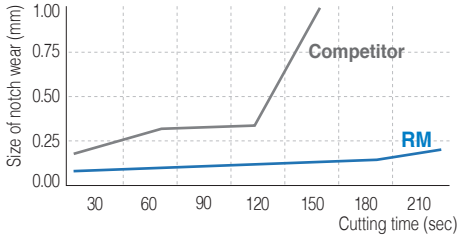
- **Workpiece** X12Cr13 (Martensite)
- **Cutting condition** vc (m/min) = 150, fn (mm/rev) = 0.25, ap (mm) = 3.0, wet
- **Tools** **Insert** : CNMG120408-RM (NC9115)
  Holder : PCLNL2525-M12



RM (NC9115)

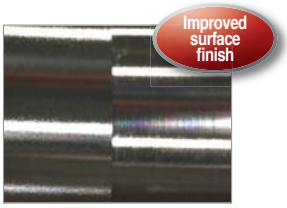


Competitor

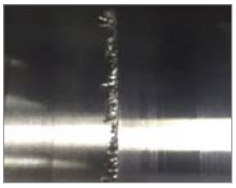


Burr

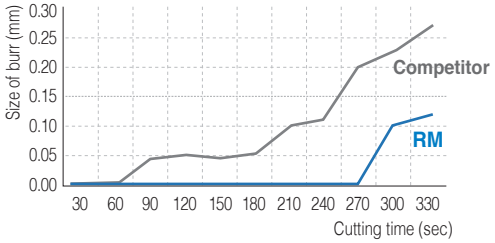
- **Workpiece** Duplex
- **Cutting condition** vc (m/min) = 120, fn (mm/rev) = 0.2, ap (mm) = 2.0, dry
- **Tools** **Insert** : CNMG120408-RM (NC9125)
  Holder : PCLNL2525-M12



RM (NC9125)



Competitor



Features of Chip Breaker

MK Chip Breaker new [For medium cutting]

- Ideally suited for continuous cutting of ductile cast iron and gray cast iron
- Angle lands provide upgraded surface finish

Features of MK chip breaker

Angle land



- Angle lands provide sharper cutting performance
- Maximized wear resistance in continuous cutting
- High quality results in surface finish



Wide supporting area

- Higher clamping stability
- Prevents chipping at vibrations during operation

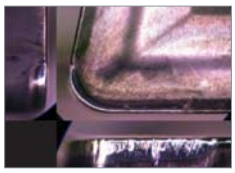
Performance evaluation

Wear resistance test

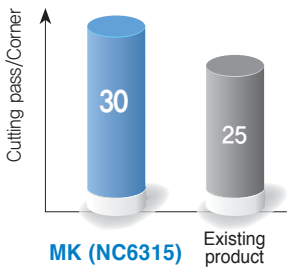
- **Workpiece** 500-7 (ISO), Ø90 (Spherical tube) → Ø30 machining
- **Cutting conditions** vc (m/min) = 400, fn (mm/rev) = 0.35, ap (mm) = 2.5, wet
- **Cutting time** 30 passes with results of normal wear on rake/flank surface
- **Tools** **Insert** : CNMG120408-MK (NC6315)
  Holder : DCLNR2525-M12



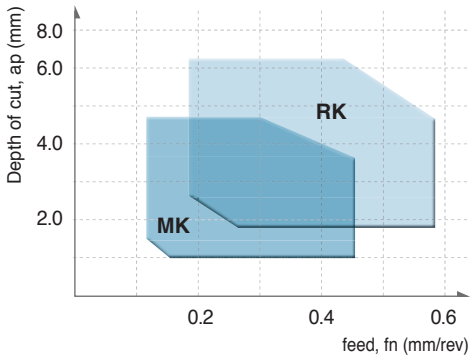
MK (NC6315)



Existing product



Recommended cutting range



Features of Chip Breaker

RK Chip Breaker new [For roughing]

- Ideally suited for high speed / high feed cutting of ductile cast iron and gray cast iron
- Flat lands provide upgraded toughness and chipping resistance

Features of RK chip breaker

Flat land



- Flat lands provide upgraded toughness and chipping resistance
- Stable machining availability under high cutting loads at high depth of cuts or interrupted cutting
- Optimized land width for high feed machining

Wide supporting area

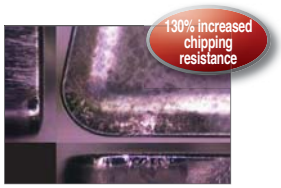
- Higher clamping stability
- Minimizes vibration and chipping.



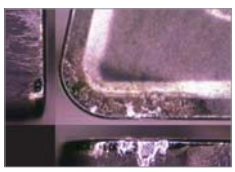
Performance evaluation

Impact resistance test

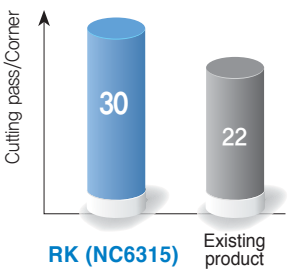
- **Workpiece** 500-7 (ISO), Ø90 (Triangular tube) → Ø30 machining
- **Cutting conditions** vc (m/min) = 380, fn (mm/rev) = 0.35, ap (mm) = 2, wet
- **Cutting time** 15 passes with results of normal rake surface wear and good chipping resistance
- **Tools** **Insert** : CNMG120408-RK (NC6315)
  Holder : DCLNR2525-M12



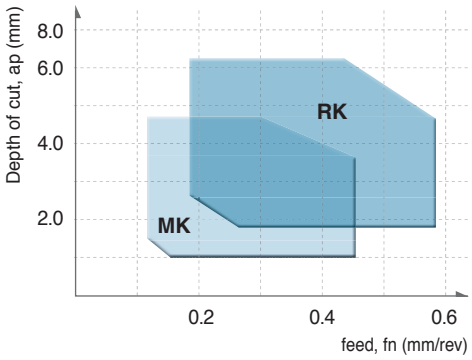
RK (NC6315)



Existing product



Recommended cutting range



Features of Chip Breaker

VP1 Chip Breaker

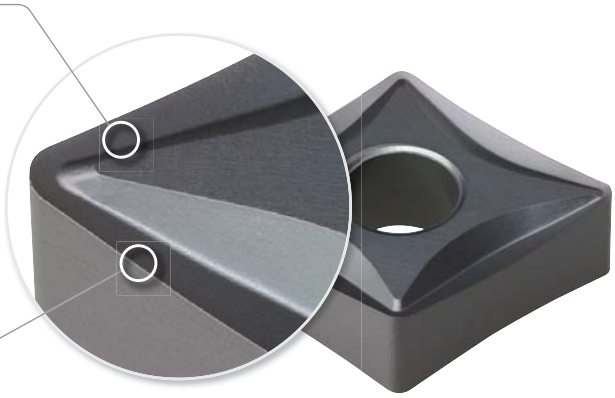
- Cutting edges designed in high-positive
  - Reduced contact area between rake surface and chip minimizes cutting heat and improved tool life
- Recommended cutting conditions: fn (mm/rev) = 0.05~0.2, ap (mm) = 0.1~1.5

Features of VP1 chip breaker

Optimized design for finishing



- Obtains excellent cutting performance and quality surface finish at low depth of cut and high speed



High-positive blade design

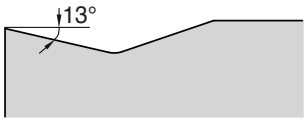
- Minimizes cutting heat by reducing the contact area between flank surface and chips
- Prevents built-up edge and extends tool life

VP2 Chip Breaker

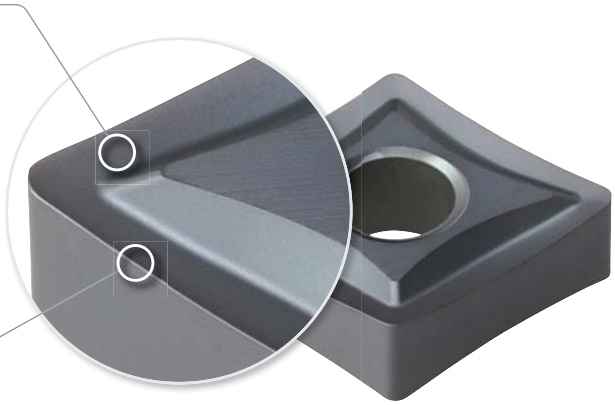
- High-positive cutting edge design/Side rake angle applied
  - Stable chip control improves machinability when ball machining at variable depths of cut
- Recommended cutting conditions: fn (mm/rev) = 0.1~0.4, ap (mm) = 0.5~4.5

Features of VP2 chip breaker

Sharp blades and wide chip pockets



- Increase productivity
- Ideal for medium to finish cutting



High-positive blade design

- Improves cutting performance with its stable chip control at varying depth of cuts

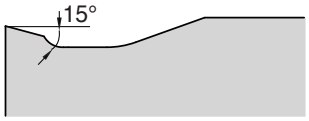
Features of Chip Breaker

VP3 Chip Breaker

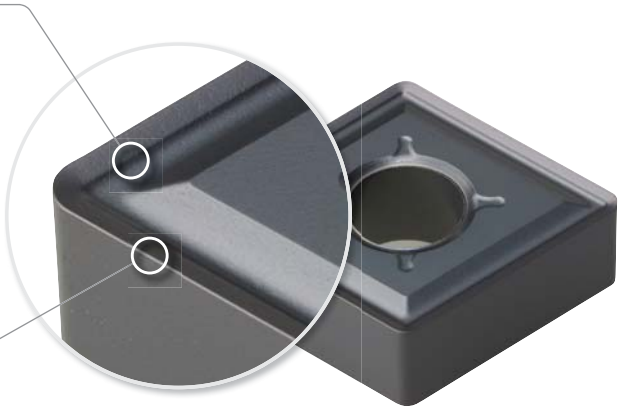
- High-positive cutting edge design/Wide land applied
  - Improved stability at interrupted cutting when toughness is required. Stable chip control and machinability at high depth of cut
- Recommended cutting conditions: fn (mm/rev) = 0.1~0.45, ap (mm) = 0.5~5.0

Features of VP3 chip breaker

Chip pocket design leading to a R-shaped cutting edge



- Creates a stepped space between edge and land to make smooth chip flow at low and high depth of cuts



High-positive blade design / Wide land

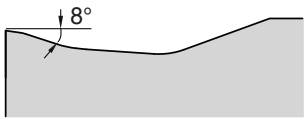
- Minimize heat concentration at high depth of cut
- Improves stability in interrupted machining of a tough workpiece

VP4 Chip Breaker new

- The 1st recommended chip breakers for machining Inconel which remains highly resistant to and hard at high temperature
- Rough machining stability resulting from reinforced cutting edges and wide chip pockets

Features of VP4 chip breaker

Rake angle design resistant to high hardness cutting



- Reinforces cutting edges and prevents notch wear in rough surface machining
- Prevents chipping in interrupted cutting

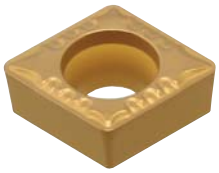


Wide chip pockets

- Reduce cutting loads and improve stability even at high depth of cut in roughing

Features of Chip Breaker

Single-sided VL Chip Breaker



[For medium to finish cutting]

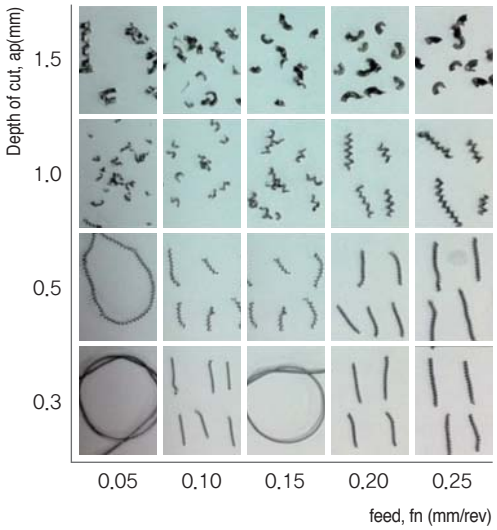
- The sharp flank surface and the chip breaker design significantly improve chip control when machining tough materials such as low carbon steel, pipe steel, and iron plates
- Sharp cutting edges reduce cutting resistance and provide excellent chip control at low depth of cuts, leading to stable machining on automated production lines

Features of VL chip breaker

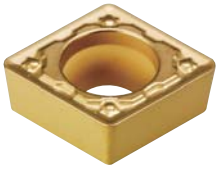
- **Sharp cutting edges**
  - High rake cutting edges provide improved surface finishes
  - Low cutting resistance reduces cutting heat
- **2-step rear rake angle**
  - Stable chip control regardless of varying feed rates
  - Excellent machinability even when machining mild workpieces

Chip control test

■ **Workpiece**	SCM440(Alloy steel), Ø50, Internal diameter turning
■ **Cutting condition**	vc = 250 m/min, ap = 0.3~1.5 mm, fn = 0.05~0.25 mm/rev
■ **Tools**	CCMT09T304-VL



Single-sided MP Chip Breaker



[For medium cutting]

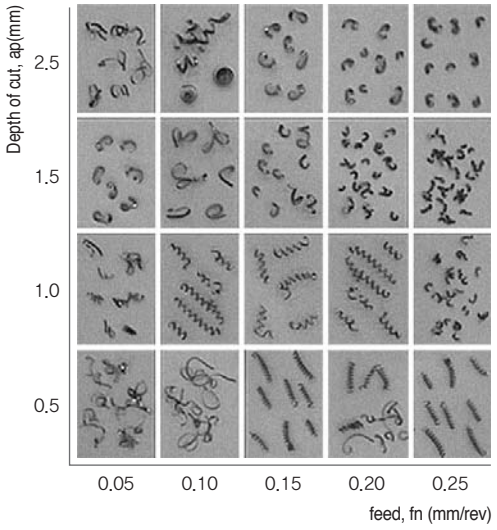
- For continuous cutting of forged steel at high feed
- Turning insert for internal machining of automobile components

Features of MP chip breaker

- **Three-dimensional 2 step chip breaker**
  - Stable chip control in unstable internal machining
  - Prevents chip blocking at internal diameter at varying depth of cut and feed.
- **Stronger cutting edge and wide chip pocket**
  - Increased chipping resistance in unstable internal machining

Chip control test

■ **Workpiece**	SCM440
■ **Cutting condition**	vc = 200 m/min, ap = 0.5~2.5 mm, fn = 0.05~0.25 mm/rev
■ **Tools**	CCMT09T304-MP



Features of Chip Breaker

VL Chip Breaker [For mild steel]



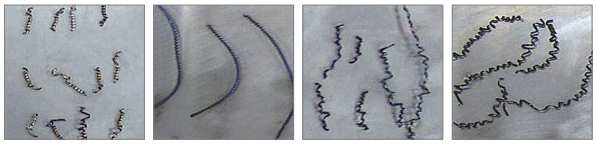
- Improved chip control for machining material that have high toughness such as low carbon steel, pipe, steel plate etc
- Improved chip control and decreased cutting load on external, facing, and copying applications
- Improved strength of the cutting edge for measurable efficiency in automated production

Features of VC chip breaker

- **2 steps designed chip-breaker** - Suitable Mild steel
  - Stable chip control on the low feed and cutting depth
- **Designed with special dots** - Stable chip breaking on the low cutting depth
- **Applied side rake angle** - Improved chip control on facing, copying applications
  - Decreased cutting load and better surface finish

Chip control test

- **Workpiece** SM20C
- **Cutting conditions** vc = 250 m/min, ap = 0.5 mm, fn = 0.2 mm/rev (Side), wet
- **Tools** DNMG150408-VL



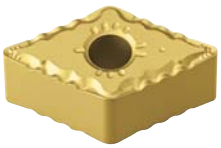
VL Chip Breakers | Competitor A | Competitor B | Competitor C

FEM Cutting simulation analysis in the design

- For design of geometry, chip shapes and chip flow are predictable
- Optimal chip breaker design by various cutting conditions and workpieces



VB Chip Breaker [For copying]



- Excellent chip evacuation in continuous and high speed machining of various workpieces
- 3-dimensional chip breaker achieves lower cutting resistance, high rigidity of the cutting edge, and longer tool life
- Stable chip control in copying and internal machining

Features of VB chip breaker

- **6 bumps on the insert corner** - Superior chip control and chip cutting in copying with various depths of cut
- **Side rake angle** - Superb chip cutting in facing and copying. Superior tool life due to improved surface roughness and lower cutting resistance
- **Cutting edge on 100° part for medium machining (For CNMG)** - Excellent chip evacuation and toughness in machining with high depth of cut

Performance



VB Chip Breakers

Conventional chip breaker

Features of Chip Breaker

VC Chip Breaker [For medium to finish cutting]

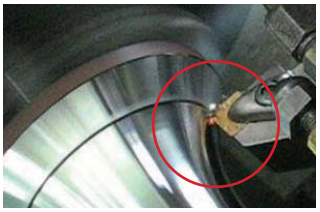
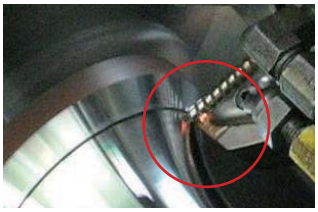


- Superior chip evacuation in high speed and continuous machining of various workpieces (carbon steel, alloy steel etc.)
- Korloy 3 dimensional chip breaker ensures longer tool life due to low cutting load and improved cutting edge strength
- Stable chip control in copying and internal machining

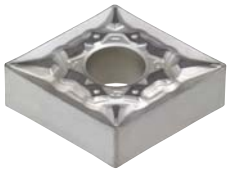
Features of VC chip breaker

• 4 bums on the insert corner
- Excellent chip control in various depths of cut and superb chip cutting in external, internal, copy machining and facing

Evaluation of chip control (Copying)

VC Chip Breakers		Conventional chip breaker	
			

VQ Chip Breaker [For medium to finish cutting]



- Excellent cutting performance and reinforced cutting edges
- Improved chip control at low depth of cuts

Features of VQ chip breaker

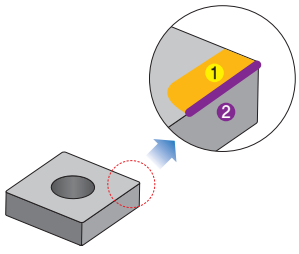
• Three dimensional rake angle
- Improved surface finish thanks to sharp cutting performance
- Less cutting heat and longer tool life thanks to low cutting resistance

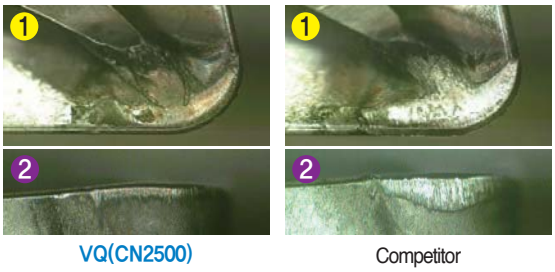
• Beveled protruding structure
- Smooth chip flow at low depth of cuts
- Wide application range

Performance evaluation

- **Workpiece** SCM440(Alloy steel), Ø100, External diameter turning
- **Cutting condition** vc = 280 m/min, ap = 1.5 mm, fn = 0.25 mm/rev
- **Tools** CNMG120408-VQ

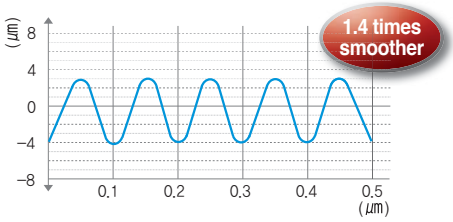
Wear comparison



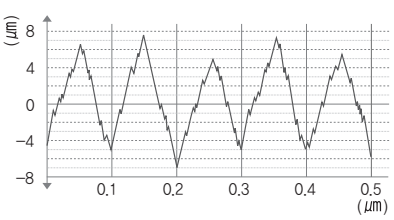


VQ(CN2500) Competitor

Surface roughness comparison



VQ (CN2500) (Ra 3.0μm)



Competitor (Ra 7.0μm)

Features of Chip Breaker

VH/VT Chip Breaker [For heavy duty machining]

- Heavy duty chip breaker suitable for Heavy machining in the ship building and power plant industries
- Suitable for large vertical machines when machining shafts, rollers, rotors and optimal for the big flange machining

Features of VH chip breaker

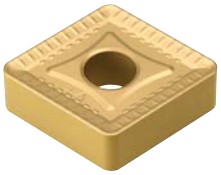
• For good chip control in heavy machining (comprehensive type)



- Designed from the study of heavy cutting mechanism
- Smooth chip control from the high rake angle
- Wider cutting edge land provides stronger cutting
- Unique cutting edge treatment provides smooth cutting
- Optimized chip pocket design provides smooth chip flow

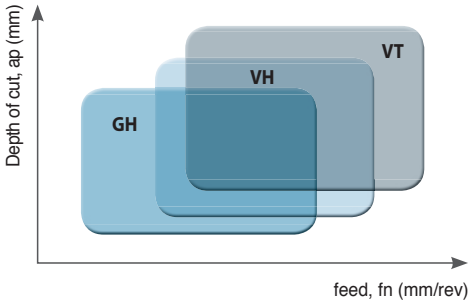
Features of VT chip breaker

• For long tool life and stable cutting (higher feeds, big depth) in heavy machining



- Designed from the study of heavy cutting mechanism
- Strong edge design provides long and stable cutting (2 step rake angle of cutting edge)
- Varied cutting edge land strengthens the cutting edge
- The positioning of the chip breaking convex dot deflect the machining heat, optimizes inserts wear & absorb shock

Applications range of Chip breakers

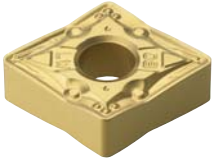


GH : ap (mm) = 5.0~12.0, fn (mm/rev) = 0.55~1.20
VH : ap (mm) = 6.0~15.0, fn (mm/rev) = 0.70~1.40
VT : ap (mm) = 7.0~17.0, fn (mm/rev) = 0.75~1.60

LW/VW Chip Breaker [For high feed cutting]

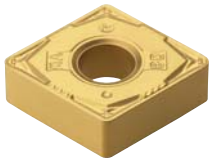
- Improved productivity with higher feed rates and surface finishes
- Improved wear resistance and toughness

Features of LW chip breaker



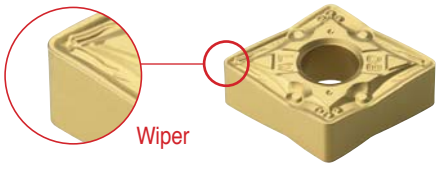
- **Curvilinear cutting edge**
  - Reduces cutting force
- **Cutting edge design able to handle deeper depth of cuts**
  - lower cutting load & reduces heat
- **Greater chip control at shallow depths of cuts**
  - Chip pocket design improves smooth chip flow
- **For shallow depth cutting and low speed machining**
  - 3D design at the corner

Features of VW chip breaker

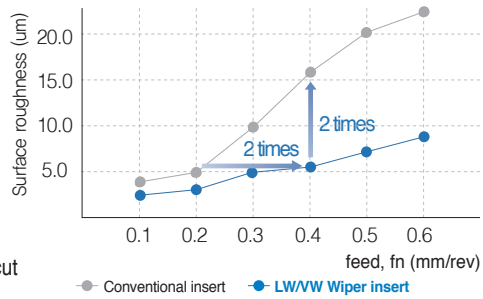


- **Excellent Finishing applications**
  - Excellent chip control
- **Insert design great for stable clmaping**
  - Chip breaker designed close to the cutting edge
- **Similar cutting edge to C/B for medium**
  - strong cutting edge
- **3 Dimensional dot design on cutting corner**
  - reduces cutting force and good chip control at shallow depth of cut

Wiper Insert



- High productivity
- Improved surface roughness
- High feed-reducing machining time
- Improved tool life due to reduce cutting force

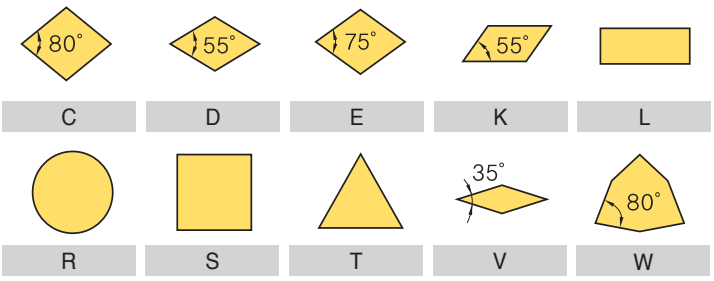


C N M G 12

1	2	3	4	5
Insert Shape	Relief Angle	Tolerance	Cross Section Type	Cutting Edge Length, Diameter of Inscribed Circle

1 Insert Shape

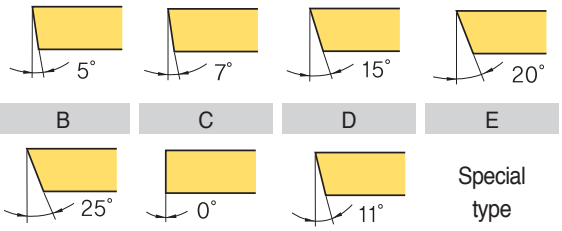
C N M G 12 04 08 - MP



C	D	E	K	L
R	S	T	V	W

2 Relief Angle

C N M G 12 04 08 - MP



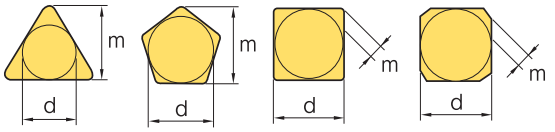
B	C	D	E
F	N	P	O

Special type

3 Tolerance

C N M G 12 04 08 - MP

d : Inscribed circle
t : Thickness
m : Refer to figure



(mm)

Class	d	m	t
A	± 0.025	± 0.005	± 0.025
C	± 0.025	± 0.013	± 0.025
H	± 0.013	± 0.013	± 0.025
E	± 0.025	± 0.025	± 0.025
G	± 0.025	± 0.025	± 0.13
J *	± 0.05~± 0.15	± 0.005	± 0.025
K *	± 0.05~± 0.15	± 0.013	± 0.025
L *	± 0.05~± 0.15	± 0.025	± 0.025
M *	± 0.05~± 0.15	± 0.08~± 0.20	± 0.13
N *	± 0.05~± 0.15	± 0.08~± 0.18	± 0.025
U *	± 0.08~± 0.25	± 0.13~± 0.38	± 0.13

* Sides are based on unground insert

Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (Exceptional case)

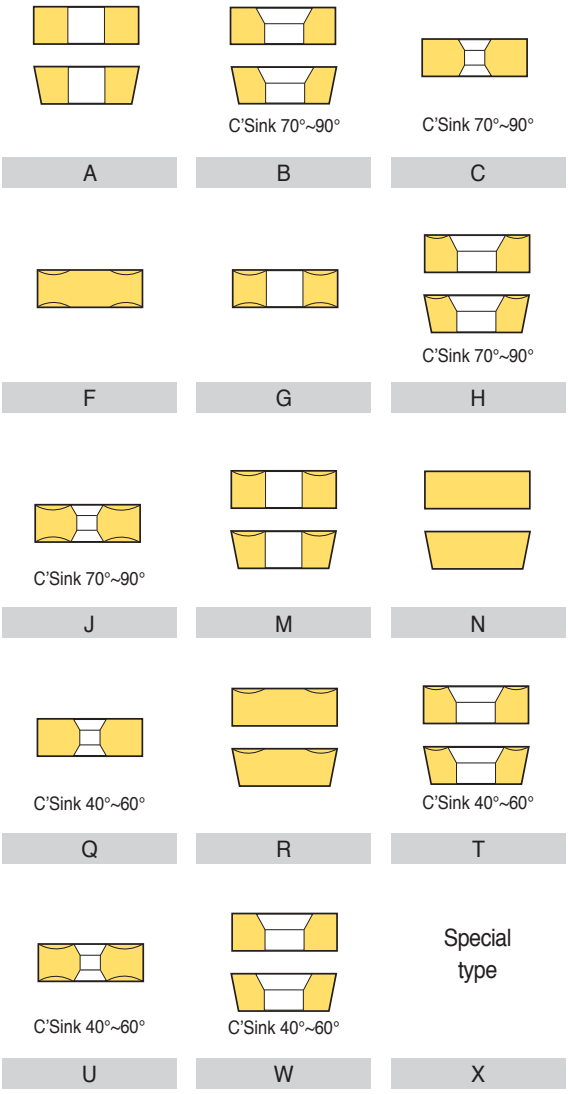
d	Tolerance on d		Tolerance on m	
	J, K, L, M, N	U	M, N	U
6.35	± 0.05	± 0.08	± 0.08	± 0.13
9.525	± 0.05	± 0.08	± 0.08	± 0.13
12.7	± 0.08	± 0.13	± 0.13	± 0.20
15.875	± 0.10	± 0.18	± 0.15	± 0.27
19.05	± 0.10	± 0.18	± 0.15	± 0.27
25.4	± 0.13	± 0.25	± 0.18	± 0.38

Tolerance on D Insert Shape (Exceptional case)

d	Tolerance on d	Tolerance on m
6.35	± 0.05	± 0.11
9.525	± 0.05	± 0.11
12.7	± 0.08	± 0.15
15.875	± 0.10	± 0.18
19.05	± 0.10	± 0.18

4 Cross Section Type

C N M G 12 04 08 - MP



A	B	C
F	G	H
J	M	N
Q	R	T
U	W	X

Special type

04 08 - MP

6 Height of Cutting Edge | 7 Nose Radius (Nose R) | 8 Chip Breaker for Turning

5 Cutting Edge Length, Diameter of Inscribed Circle

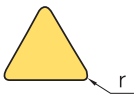
C N M G **12** 04 08 - MP

Symbol							Inch	IC
C	d	S	T	R	V	W		
Metric								d (mm)
03	04	03	06	03	-	02	1.2 (5)	3.97
04	05	04	08	04	08	S3	1.5 (6)	4.76
05	06	05	09	05	09	03	1.8 (7)	5.56
-	-	-	-	06	-	-	-	6.00
06	07	06	11	06	11	04	2	6.35
08	09	07	13	07	13	05	2.5	7.94
-	-	-	-	08	-	-	-	8.00
09	11	09	16	09	16	06	3	9.525
-	-	-	-	10	-	-	-	10.00
11	13	11	19	11	19	07	3.5	11.11
-	-	-	-	12	-	-	-	12.00
12	15	12	22	12	22	08	4	12.70
14	17	14	24	14	24	09	4.5	14.29
16	19	15	27	15	27	10	5	15.875
-	-	-	-	16	-	-	-	16.00
17	21	17	30	17	30	11	5.5	17.46
19	23	19	33	19	33	13	6	19.05
-	-	-	-	20	-	-	-	20.00
22	27	22	38	22	38	15	7	22.225
-	-	-	-	25	-	-	-	25.00
25	31	25	44	25	44	17	8	25.40
32	38	31	54	31	54	21	10	31.75
-	-	-	-	32	-	-	-	32.00

( ) Symbol for small size insert

7 Nose Radius (Nose R)

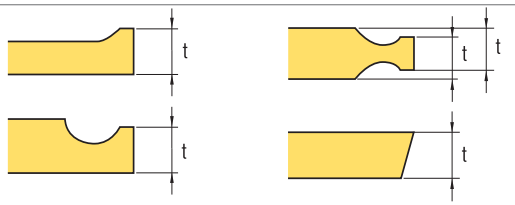
C N M G 12 04 **08** - MP



Symbol		Corner Radius	
Metric	Inch	Metric	Inch
01	0	0.1	0.004
02	0.5	0.2	0.008
04	1	0.4	1/64
08	2	0.8	1/32
12	3	1.2	3/64
16	4	1.6	1/16
20	5	2.0	5/64
24	6	2.4	3/32
28	7	2.8	7/64
32	8	3.2	1/8
00	-	Round insert (Inch)	
M0	-	Round insert (Metric)	

6 Height of Cutting Edge

C N M G 12 **04** 08 - MP



Symbol		Height of Cutting Edge (t)	
Metric	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8	12.70	1/2

( ) Symbol for small size insert

8 Chip Breaker for Turning

C N M G 12 04 08 - **MP**

Negative Insert Chip Breaker



VL VF VB VC VQ VW



VM VR VH VT VP1 VP2



VP3 VP4 HA GR GH B25



LP MP MM RM MK RK

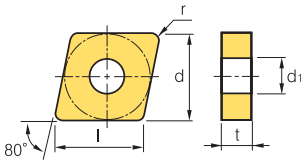
Positive Insert Chip Breaker



VL HMP C25 MP AK AR

CN○○

Rhombic 80° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16
16	15.875	6.35	6.35
19	19.05	6.35	7.93

Workpiece			Machining types
Steel	P	● ⬣ ✱ ● ⬣ ● ⬣ ⬣ ✱ ✱ ● ⬣ ✱	● Continuous cutting
Stainless steel	M	⬣ ✱ ⬣ ⬣ ✱ ● ⬣ ✱ ⬣ ✱ ● ⬣	⬣ General cutting
Cast iron	K	● ⬣ ✱ ● ⬣ ⬣ ⬣ ✱ ⬣ ●	✱ Interrupted cutting
Non-ferrous metal	N	● ⬣
Heat resistant alloy, Titanium alloy	S	● ● ⬣ ✱ ● ● ⬣ ⬣ ✱ ● ⬣
Hardened steel	H	⬣ ✱ ● ⬣

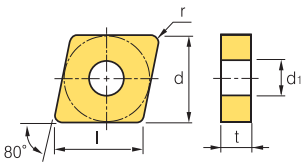
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VP1	CNGG	120402-VP1																						0.01~0.10	0.10~1.00
			120404-VP1																						0.05~0.15	0.10~1.50
			120408-VP1																						0.07~0.20	0.10~1.50
Medium	VP3	CNGG	120404-VP3																	●	●	●		●		0.05~0.30	0.10~3.00
			120408-VP3																	●	●	●		●		0.10~0.40	0.50~4.50
			120412-VP3																	●	●	●		●		0.12~0.50	0.50~5.00
Roughing		CNMA	090308																							0.10~0.30	0.50~3.00
			120404											●										●		0.15~0.60	1.00~5.00
			120408											●										●		0.15~0.60	1.00~6.00
			120412											●												0.15~0.70	1.50~6.00
			120416											●												0.20~0.80	2.00~6.00
			160608																							0.15~0.70	2.00~6.00
			160612											●												0.15~0.70	2.00~6.00
			160616											●												0.15~0.70	2.00~6.00
			190608											●												0.15~0.70	2.00~10.00
			190612											●												0.15~0.70	2.00~10.00
			190616											●												0.20~1.00	3.00~10.00
Finishing	VB	CNMG	120404-VB	●		●	●	●	●		●		●													0.15~0.35	0.30~2.00
			120408-VB	●		●	●	●	●		●		●													0.15~0.45	0.50~2.00
			120412-VB						●		●		●													0.20~0.50	0.50~2.00
Finishing	VF	CNMG	090304-VF							●	●															0.07~0.30	0.50~1.50
			090308-VF																							0.10~0.30	0.50~1.50
			120404-VF							●			●													0.07~0.30	0.50~1.50
			120408-VF										●													0.10~0.40	0.50~1.50
			120412-VF																							0.10~0.50	0.60~1.50
Finishing	VP1	CNMG	120404-VP1																	●	●			●		0.05~0.15	0.10~1.50
			120408-VP1																	●	●			●		0.07~0.20	0.10~1.50

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

CN○○

Rhombic 80° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing (Mild steel)	VL	CNMG	120404-VL	●		●							●													0.05~0.25	0.10~1.00
			120408-VL	●		●					●		●													0.10~0.35	0.20~1.50
			120412-VL						●																	0.10~0.35	0.20~1.50
Finishing (wiper)	VW	CNMG	120404-VW																							0.10~0.30	0.50~3.00
			120408-VW																							0.15~0.50	0.50~4.00
Medium to finishing	HA	CNMG	120404-HA																					●		0.05~0.20	0.80~3.50
			120408-HA																					●		0.10~0.40	0.80~3.50
			120412-HA																							0.13~0.55	0.80~3.50
Medium to finishing	LP new	CNMG	090308-LP																							0.10~0.30	0.30~1.50
			120404-LP						●		●		●													0.10~0.35	0.30~2.00
			120408-LP						●		●		●													0.10~0.40	0.50~2.50
			120412-LP						●		●		●													0.13~0.45	0.80~3.00
Medium to finishing	VC	CNMG	120404-VC						●		●		●													0.10~0.35	0.30~2.00
			120408-VC						●		●		●													0.15~0.40	0.50~3.00
			120412-VC						●		●															0.15~0.45	0.50~3.00

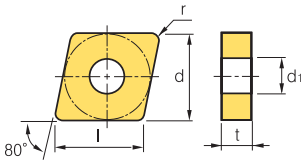
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

CN○○

Rhombic 80° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16
16	15.875	6.35	6.35
19	19.05	6.35	7.93

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated											Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing	VP2	CNMG	120404-VP2															●	●	●	●	●		●		0.05~0.30	0.10~3.00
			120408-VP2															●	●	●	●	●		●		0.10~0.40	0.50~4.50
Medium to finishing	VQ	CNMG	090304-VQ																							0.05~0.30	0.50~3.50
			090308-VQ																							0.08~0.30	0.80~4.00
			120404-VQ	●	●	●	●	●																		0.05~0.30	0.80~4.00
			120408-VQ	●	●	●	●	●																		0.08~0.40	0.80~4.00
			120412-VQ																							0.10~0.40	0.80~4.00
Medium	MK new	CNMG	120404-MK											●												0.05~0.30	0.90~4.00
			120408-MK											●												0.10~0.50	1.00~5.00
			120412-MK											●												0.13~0.60	1.30~5.00
			120416-MK																							0.15~0.60	1.30~5.00
			160608-MK																							0.28~0.70	1.80~7.00
			160612-MK																							0.28~0.72	2.00~8.00
			160616-MK																							0.28~0.74	2.00~8.00
			190608-MK																							0.33~0.78	2.50~9.00
			190612-MK											●												0.35~0.78	2.60~9.50
			190616-MK																							0.35~0.80	2.60~10.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

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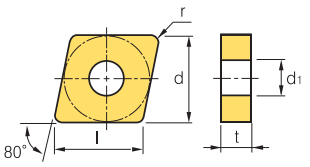
Rhombic 80° Negative



Dimensions (mm)			
Size	d	t	d1
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19	19.05	6.35	7.93

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	⧔ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated											Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	MM new	CNMG	090304-MM																			●			0.08~0.35	0.50~5.00
			090308-MM																			●			0.10~0.40	0.50~5.00
			090312-MM																						0.12~0.45	0.50~5.00
			120404-MM													●	●	●				●	●		0.10~0.40	0.50~5.50
			120408-MM												●	●	●	●				●	●		0.12~0.45	0.50~5.50
			120412-MM												●	●	●	●				●	●		0.15~0.60	0.50~5.50
			120416-MM													●	●	●				●			0.20~0.65	0.50~5.50
			160608-MM													●	●	●				●			0.12~0.45	0.50~7.00
			160612-MM													●	●	●				●	●		0.15~0.60	0.50~7.00
			160616-MM													●	●	●				●	●		0.18~0.65	0.50~7.00
			190608-MM													●	●	●				●			0.12~0.45	0.50~8.50
			190612-MM													●	●	●				●	●		0.15~0.60	0.50~8.50
			190616-MM													●	●	●				●	●		0.18~0.65	0.50~8.50
Medium	MP new	CNMG	090304-MP						●		●		●												0.10~0.40	0.40~3.80
			090308-MP						●		●		●												0.15~0.40	0.50~4.00
			090312-MP																						0.15~0.50	0.80~4.20
			120404-MP						●		●		●		●	●	●			●	●	●			0.10~0.40	0.40~4.00
			120408-MP						●		●		●		●	●	●			●	●	●			0.15~0.45	0.50~4.50
			120412-MP						●		●		●		●	●	●			●	●				0.15~0.50	0.80~5.00
			120416-MP						●		●		●		●	●	●								0.28~0.55	1.00~5.00
			160608-MP						●		●		●		●	●	●								0.15~0.50	0.50~7.00
			160612-MP						●		●		●		●	●	●								0.18~0.60	0.80~7.00
			160616-MP						●		●		●												0.15~0.60	1.00~7.00
			190608-MP																						0.15~0.60	0.50~8.50
			190612-MP																						0.10~0.40	0.40~3.80
			190616-MP												●	●	●								0.15~0.40	0.50~4.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	**MCRNR/L**	B166
MCLNR/L	B165	**PCBNR/L**	B153
MCMNN	B165	**PCLNR/L**	B154

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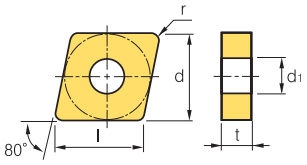
Rhombic 80° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16
16	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	9.52	9.12

Workpiece			Machining types
Steel	P	● ⬬ ✱ ● ⬬ ● ⬬ ⬬ ✱ ✱ ● ⬬ ✱	● Continuous cutting
Stainless steel	M	✱ ✱ ⬬ ⬬ ⬬ ● ⬬ ✱ ⬬ ✱ ● ⬬ ⬬	⬬ General cutting
Cast iron	K	● ⬬ ✱ ● ⬬ ⬬ ✱ ⬬ ● ● ⬬ ⬬ ●	✱ Interrupted cutting
Non-ferrous metal	N	● ⬬	
Heat resistant alloy, Titanium alloy	S	● ● ⬬ ✱ ● ● ⬬	
Hardened steel	H	⬬ ✱ ● ⬬	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	VM	CNMG	090304-VM																						0.05~0.30	0.90~3.50
			090308-VM							●		●													0.10~0.45	1.00~3.50
			120404-VM	●	●	●				●		●	●					●	●				●		0.05~0.30	0.90~5.00
			120408-VM	●	●	●				●		●	●					●	●				●		0.10~0.50	1.00~5.00
			120412-VM							●		●	●					●	●						0.13~0.60	1.30~5.00
			120416-VM										●												0.20~0.60	1.50~5.50
			160608-VM										●												0.10~0.50	1.00~6.70
			160612-VM																						0.13~0.60	1.30~6.70
			190608-VM									●													0.13~0.65	1.30~7.00
			190612-VM										●												0.15~0.70	1.50~7.00
			190616-VM																						0.18~0.75	1.80~7.00
Medium	VP3	CNMG	120404-VP3															●	●	●	●	●		●	●	0.05~0.30	0.10~3.00
			120408-VP3															●	●	●	●	●		●	●	0.10~0.40	0.50~4.50
			120412-VP3															●	●	●	●	●		●	●	0.12~0.50	0.50~5.00
Medium (wiper)	LW	CNMG	120408-LW										●													0.15~0.60	1.00~5.00
			120412-LW																							0.20~0.70	1.00~6.00
Medium to roughing	B25	CNMG	120404-B25	●	●	●			●		●	●	●					●								0.17~0.45	1.00~5.00
			120408-B25	●	●	●			●	●	●	●	●					●	●		●		●			0.23~0.60	1.50~5.00
			120412-B25			●			●		●	●	●													0.25~0.60	2.00~5.00
			160608-B25						●		●	●	●													0.25~0.60	2.00~6.50
			160612-B25						●		●		●													0.27~0.60	2.00~6.50
			160616-B25						●		●		●													0.27~0.60	2.00~6.50
			190604-B25									●	●													0.20~0.45	3.00~8.00
			190608-B25						●	●	●	●	●													0.25~0.60	3.00~8.00
			190612-B25						●	●	●	●	●					●	●		●					0.30~0.60	3.00~8.00
			190616-B25						●		●															0.23~0.70	3.00~8.00
Roughing	GR	CNMG	120408-GR							●		●	●													0.20~0.50	1.00~7.00
			120412-GR							●		●	●													0.25~0.50	1.30~7.00
			120416-GR																							0.25~0.60	1.80~6.00
			160608-GR									●														0.20~0.70	1.00~8.00
			160612-GR							●		●	●													0.25~0.70	1.30~8.00
			160616-GR									●														0.25~0.75	1.80~8.00
			190608-GR							●		●	●													0.20~0.70	1.70~10.00
			190612-GR							●		●	●													0.30~0.75	1.70~10.00
			190616-GR							●		●	●													0.30~0.80	1.80~10.00
			190624-GR																							0.35~0.85	2.00~12.00
			250724-GR																							0.40~1.00	2.30~15.00
			250924-GR									●	●													0.40~1.00	2.30~15.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

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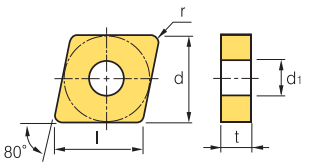
Rhombic 80° Negative



Dimensions (mm)			
Size	d	t	d1
12	12.7	4.76	5.16
16	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	9.52	9.12

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing	RK new	CNMG	120404-RK																						0.20~0.47	1.30~6.00
			120408-RK											●											0.20~0.50	1.50~6.00
			120412-RK											●											0.28~0.53	1.80~6.00
			120416-RK											●											0.28~0.63	2.00~6.00
			160608-RK											●											0.28~0.70	1.80~7.00
			160612-RK											●											0.28~0.72	2.00~8.00
			160616-RK											●											0.28~0.74	2.00~8.00
			190612-RK											●											0.35~0.78	2.60~9.50
			190616-RK											●											0.35~0.80	2.60~10.00
Roughing	RM new	CNMG	120404-RM													●	●	●				●	●		0.10~0.50	2.00~6.00
			120408-RM												●	●	●	●				●	●		0.15~0.55	2.00~6.00
			120412-RM												●	●	●	●				●	●		0.20~0.60	2.00~6.00
			120416-RM													●	●	●				●			0.25~0.70	2.00~6.00
			160608-RM													●	●	●				●			0.15~0.55	2.00~8.00
			160612-RM													●	●	●				●			0.20~0.60	2.00~8.00
			160616-RM													●	●	●				●			0.25~0.70	2.00~8.00
			190608-RM													●	●	●				●			0.15~0.55	2.00~10.00
			190612-RM													●	●	●				●			0.20~0.60	2.00~10.00
			190616-RM													●	●	●				●			0.25~0.70	2.00~10.00
			250924-RM																						0.40~1.20	0.40~14.00
Roughing	VP4 new	CNMG	120408-VP4																			●			0.15~0.35	1.00~4.00
			120412-VP4																			●			0.20~0.40	1.00~4.00
			190608-VP4																			●			0.15~0.45	1.00~8.00
			190612-VP4																			●			0.20~0.50	1.20~8.50
Roughing	VR	CNMG	120408-VR																						0.25~0.55	1.20~7.00
			120412-VR																						0.30~0.60	1.50~7.00
			120416-VR																						0.35~0.65	1.70~7.00
			160612-VR																						0.35~0.70	2.00~8.00
			160616-VR																						0.35~0.75	2.20~8.00
			190612-VR																						0.35~0.70	2.00~10.00
			190616-VR																						0.35~0.75	2.20~10.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	**MCRNR/L**	B166
MCLNR/L	B165	**PCBNR/L**	B153
MCMNN	B165	**PCLNR/L**	B154

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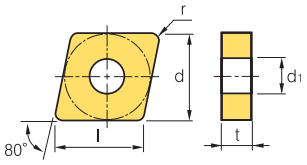
Rhombic 80° Negative



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16	15.875	4.76~6.35	6.35
19	19.05	6.35	7.93
25	25.4	7.94~9.52	9.12

Workpiece			Machining types
Steel	P	● ⬬ ✱ ● ⬬ ● ⬬ ⬬ ✱ ✱ ● ⬬ ✱	● Continuous cutting
Stainless steel	M	⬬ ✱ ⬬ ⬬ ✱ ● ⬬ ✱ ⬬ ✱ ● ⬬ ⬬	⬬ General cutting
Cast iron	K	● ⬬ ✱ ● ⬬ ⬬ ⬬ ⬬ ● ⬬ ✱ ⬬ ✱ ● ⬬ ⬬ ● ⬬	✱ Interrupted cutting
Non-ferrous metal	N	● ⬬
Heat resistant alloy, Titanium alloy	S	● ● ⬬ ✱ ● ⬬ ⬬ ⬬
Hardened steel	H	⬬ ✱ ● ⬬

Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing	HA	CNMM 120408-HA																						0.10~0.40	0.80~3.50
Roughing	GR	CNMM 120408-GR																						0.20~0.50	1.00~7.00
		120412-GR																						0.25~0.50	1.30~7.00
		190612-GR									●													0.30~0.75	1.70~10.00
		190616-GR																						0.30~0.80	1.80~10.00
Heavy	GH	CNMM 120408-GH									●	●												0.30~0.60	2.50~8.00
		120412-GH							●		●													0.30~0.70	2.50~8.00
		160412-GH																						0.30~0.70	2.50~8.00
		160424-GH																						0.30~1.20	2.50~8.00
		160612-GH									●													0.30~0.90	2.50~8.00
		160616-GH																						0.30~1.20	2.50~8.00
		160624-GH																						0.30~1.50	2.50~8.00
		190608-GH										●												0.30~0.60	2.50~8.00
		190612-GH						●	●		●	●												0.30~0.70	3.00~8.00
		190616-GH						●	●		●	●												0.45~0.90	3.00~8.00
		190624-GH						●	●			●												0.55~1.20	4.00~9.00
		250716-GH																						0.50~1.00	4.50~10.00
		250724-GH						●	●															0.55~1.20	5.00~12.00
		250924-GH						●	●		●	●												0.55~1.20	5.00~12.00
		250950-GH																						0.65~1.30	6.00~12.00
Heavy (General)	VH	CNMM 190612-VH						●																0.50~0.90	5.00~10.00
		190616-VH						●																0.50~1.10	5.00~10.00
		190624-VH						●																0.60~1.20	6.00~12.00
		250724-VH						●																0.70~1.40	6.00~15.00
		250924-VH						●																0.70~1.40	6.00~15.00
Heavy (High feed cutting)	VT	CNMM 190612-VT						●			●	●												0.60~1.00	6.00~13.00
		190616-VT						●																0.60~1.10	5.00~10.00
		190624-VT						●																0.60~1.60	7.00~13.00
		250724-VT						●																0.75~16.0	7.00~17.00
		250924-VT						●																0.75~16.0	7.00~17.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B165	MCRNR/L	B166
MCLNR/L	B165	PCBNR/L	B153
MCMNN	B165	PCLNR/L	B154

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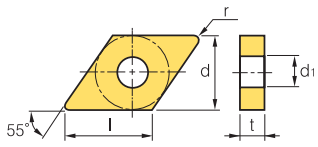
Rhombic 55° Negative



Dimensions (mm)			
Size	d	t	d1
11	9.525	3.18~4.76	3.81
15	12.7	4.76~6.35	5.16

Workpiece		
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱ ✱ ⬌ ✱ ● ⬌ ⬌ ⬌ ● ⬌
Stainless steel	M	✱ ⬌ ✱ ⬌ ⬌ ⬌ ⬌ ● ⬌ ✱ ⬌ ✱ ● ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ⬌ ⬌ ● ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ● ⬌
Non-ferrous metal	N	⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ● ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ● ⬌ ● ● ⬌ ⬌ ● ● ⬌ ● ⬌
Hardened steel	H	⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ● ⬌

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VP1	DNGG	150404-VP1																						0.05~0.15	0.10~1.50
			150408-VP1																						0.07~0.20	0.10~1.50
			150604-VP1																						0.05~0.15	0.10~1.50
			150608-VP1																						0.07~0.20	0.10~1.50
Medium	VP3	DNGG	150404-VP3																	●	●	●		●		0.05~0.30	0.10~3.00
			150408-VP3																	●	●	●		●		0.10~0.45	0.50~5.00
			150412-VP3																	●	●	●		●		0.12~0.50	0.50~5.00
			150604-VP3																	●	●	●		●		0.05~0.30	0.10~3.00
			150608-VP3																	●	●	●		●		0.10~0.45	0.50~5.00
			150612-VP3																	●	●	●		●		0.12~0.50	0.50~5.00
Roughing		DNMA	110408																							0.17~0.45	0.80~3.00
			150404																							0.17~0.55	0.40~4.00
			150408																							0.25~0.55	0.80~4.00
			150412											●												0.25~0.65	0.50~4.00
			150604																							0.17~0.55	0.40~4.00
			150608											●												0.25~0.55	0.80~4.00
			150612											●												0.25~0.65	1.20~4.00
			190608																							0.30~0.80	2.50~13.00
Finishing	VB	DNMG	150404-VB	●		●	●	●			●															0.10~0.35	0.30~2.00
			150408-VB	●		●	●	●	●		●		●													0.15~0.45	0.50~2.00
			150412-VB						●		●		●													0.15~0.45	0.50~2.00
			150604-VB	●		●	●	●	●		●		●													0.10~0.35	0.30~2.00
			150608-VB	●		●	●	●	●		●		●													0.15~0.45	0.50~2.00
			150612-VB						●		●		●													0.20~0.50	0.50~2.50

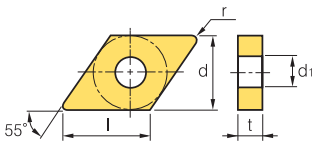
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	**PDJNR/L**	B154, 212
MDNNN	B166	**PDNNR/L**	B155
MDQNR/L	B167	**PDSNR/L**	B187
MDUNR/L	B192	**PDUNR/L**	B188

DN○○

Rhombic 55° Negative



Dimensions (mm)			
Size	d	t	d1
11	9.525	3.18~4.76	3.81
15	12.7	4.76~6.35	5.16

Workpiece			Machining types
Steel	P	● ⬣ ✱	● Continuous cutting
Stainless steel	M	⬣ ✱ ● ⬣ ✱	⬣ General cutting
Cast iron	K	● ⬣ ✱ ● ⬣ ⬣ ⬣ ✱ ⬣ ● ⬣ ✱ ⬣ ✱ ● ⬣ ● ⬣	✱ Interrupted cutting
Non-ferrous metal	N	● ⬣
Heat resistant alloy, Titanium alloy	S	● ● ⬣ ✱ ● ● ⬣ ✱ ● ⬣
Hardened steel	H	✱ ● ⬣

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VF	DNMG	110402-VF																						0.05~0.20	0.20~1.00
			110404-VF										●												0.07~0.30	0.50~1.50
			110408-VF																						0.10~0.40	0.50~1.50
			150404-VF																						0.07~0.30	0.50~1.50
			150408-VF																						0.10~0.40	0.50~1.50
			150412-VF																						0.15~0.50	0.60~1.50
			150604-VF							●			●												0.13~0.30	0.50~1.50
			150608-VF							●			●												0.10~0.40	0.50~1.50
			150612-VF																						0.15~0.50	0.60~1.50
Finishing (Mild steel)	VL	DNMG	110408-VL																						0.05~0.20	0.10~1.00
			150404-VL								●		●												0.05~0.25	0.10~1.50
			150408-VL								●		●												0.05~0.30	0.20~1.50
			150412-VL																						0.10~0.30	0.25~1.50
			150604-VL	●																					0.05~0.25	0.10~1.50
			150608-VL	●									●												0.05~0.30	0.20~1.50
			150612-VL																						0.10~0.30	0.25~1.50
Finishing	VP1	DNMG	150404-VP1																	●	●	●		●	0.05~0.15	0.10~1.50
			150408-VP1																	●	●	●		●	0.07~0.20	0.10~1.50
			150604-VP1																	●	●	●		●	0.05~0.15	0.10~1.50
			150608-VP1																	●	●	●		●	0.07~0.20	0.10~1.50
Finishing (wiper)	VW	DNMG	150404-VW																						0.10~0.35	0.30~3.00
			150408-VW																						0.10~0.40	0.30~3.00
			150604-VW																						0.10~0.35	0.30~3.00
			150608-VW																						0.10~0.40	0.30~3.00
Medium to finishing	HA	DNMG	150404-HA																					●	0.05~0.30	0.80~3.50
			150408-HA																					●	0.10~0.40	0.80~3.50
			150604-HA																					●	0.05~0.30	0.80~3.50
			150608-HA																					●	0.10~0.40	0.80~3.50

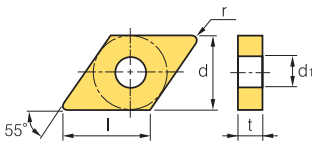
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	PDJNR/L	B154, 212
MDNNN	B166	PDNNR/L	B155
MDQNR/L	B167	PDSNR/L	B187
MDUNR/L	B192	PDUNR/L	B188

DN○○

Rhombic 55° Negative



Dimensions (mm)			
Size	d	t	d1
11	9.525	4.76	3.81
15	12.7	4.76~6.35	5.16

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	⬌ ⬌ ✱ ● ⬌ ✱ ✱ ● ⬌ ⬌ ✱ ✱	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ✱ ⬌ ✱ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	● ● ● ✱ ● ⬌ ⬌	
Hardened steel	H	⬌ ✱ ● ⬌	

Inserts	Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Mdium to finishing	LP new	DNMG 110404-LP																						0.07~0.30	0.30~1.50
		110408-LP																						0.10~0.40	0.30~1.50
		150404-LP						●		●		●												0.10~0.35	0.30~2.00
		150408-LP						●		●		●												0.10~0.40	0.50~2.50
		150412-LP						●		●		●												0.13~0.45	0.80~3.00
		150604-LP						●		●		●												0.10~0.35	0.30~2.00
		150608-LP						●		●		●												0.10~0.40	0.50~2.50
		150612-LP						●		●		●												0.13~0.45	0.80~3.00
Mdium to finishing	VC	DNMG 150404-VC																						0.10~0.35	0.30~2.00
		150408-VC						●		●		●												0.15~0.40	0.50~3.00
		150412-VC																						0.15~0.45	0.50~3.00
		150604-VC						●		●														0.10~0.35	0.30~2.00
		150608-VC						●		●		●												0.15~0.40	0.50~3.00
		150612-VC																						0.15~0.45	0.50~3.00
Mdium to finishing	VP2	DNMG 150404-VP2															●	●	●	●	●		●		0.05~0.30	0.10~3.00
		150408-VP2															●	●	●	●	●		●		0.10~0.40	0.50~4.50
		150604-VP2															●	●	●	●	●		●		0.05~0.30	0.10~3.00
		150608-VP2															●	●	●	●	●		●		0.10~0.40	0.50~4.50
Mdium to finishing	VQ	DNMG 110404-VQ	●																						0.05~0.30	0.50~3.50
		110408-VQ																							0.08~0.40	0.80~4.00
		110412-VQ																							0.10~0.40	1.00~4.00
		150404-VQ	●	●	●	●	●																		0.05~0.30	0.80~3.50
		150408-VQ	●		●	●	●																		0.08~0.40	0.80~4.00
		150412-VQ																							0.10~0.40	0.50~4.20
		150604-VQ	●	●	●	●	●																		0.05~0.30	0.80~4.00
		150608-VQ	●	●	●	●	●																		0.08~0.40	0.80~4.00
		150612-VQ																							0.10~0.40	0.50~4.20

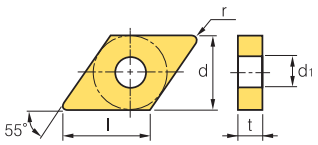
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	**PDJNR/L**	B154, 212
MDNNN	B166	**PDNNR/L**	B155
MDQNR/L	B167	**PDSNR/L**	B187
MDUNR/L	B192	**PDUNR/L**	B188

DN○○

Rhombic 55° Negative



Dimensions (mm)			
Size	d	t	d1
11	9.525	3.18~4.76	3.81
15	12.7	4.76~6.35	5.16

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	MK new	DNMG	150404-MK											●												0.05~0.30	0.90~5.00
			150408-MK											●												0.10~0.50	1.00~5.00
			150412-MK											●												0.13~0.60	1.30~5.00
			150604-MK											●												0.05~0.30	0.90~5.00
			150608-MK											●												0.10~0.50	1.00~5.00
			150612-MK											●												0.13~0.60	1.30~5.00
Medium	MM new	DNMG	110404-MM																				●			0.08~0.35	0.50~5.00
			110408-MM																				●			0.10~0.40	0.50~5.00
			110412-MM																							0.12~0.45	0.50~5.00
			150404-MM													●	●	●				●	●			0.10~0.40	0.50~6.40
			150408-MM												●	●	●	●				●	●			0.12~0.45	0.50~6.40
			150412-MM												●	●	●	●				●				0.15~0.60	0.50~6.40
			150604-MM													●	●	●				●	●			0.10~0.40	0.50~6.40
			150608-MM												●	●	●	●				●	●			0.12~0.45	0.50~6.40
			150612-MM												●	●	●	●				●	●			0.15~0.60	0.50~6.40
Medium	MP new	DNMG	110404-MP						●		●		●													0.10~0.40	0.40~3.80
			110408-MP						●		●		●													0.15~0.40	0.50~4.00
			110412-MP																							0.15~0.50	0.80~4.20
			150404-MP						●		●		●		●	●	●				●					0.10~0.40	0.40~4.00
			150408-MP						●		●		●		●	●	●			●	●					0.15~0.45	0.50~4.50
			150412-MP						●		●		●		●	●	●			●	●					0.15~0.50	0.80~5.00
			150604-MP						●		●		●		●	●	●			●	●					0.10~0.40	0.40~4.00
			150608-MP						●		●		●		●	●	●			●	●					0.15~0.45	0.50~4.50
			150612-MP						●		●		●		●	●	●			●	●					0.15~0.50	0.80~5.00

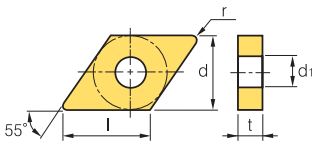
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	PDJNR/L	B154, 212
MDNNN	B166	PDNNR/L	B155
MDQNR/L	B167	PDSNR/L	B187
MDUNR/L	B192	PDUNR/L	B188

DN○○

Rhombic 55° Negative



Dimensions (mm)			
Size	d	t	d1
11	9.525	4.76	3.81
15	12.7	4.76~6.35	5.16

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	⬌ ⬌ ✱ ⬌ ⬌ ✱ ⬌ ● ⬌ ✱ ⬌ ✱ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ✱ ● ⬌ ● ⬌ ✱ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	● ● ⬌ ✱ ● ⬌ ⬌ ● ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	VM	DNMG	110404-VM																						0.05~0.30	0.90~4.00
			110408-VM							●			●												0.10~0.50	1.00~4.00
			110412-VM																						0.13~0.50	1.30~4.00
			150404-VM	●									●					●	●						0.05~0.30	0.90~5.00
			150408-VM	●		●						●	●					●	●						0.10~0.50	1.00~5.00
			150412-VM										●					●	●						0.13~0.60	1.30~5.00
			150604-VM	●		●				●		●	●					●	●				●			0.05~0.30	0.90~5.00
			150608-VM	●						●		●	●					●	●				●			0.10~0.50	1.00~5.00
			150612-VM										●					●	●							0.13~0.60	1.30~5.00
Medium	VP3	DNMG	150404-VP3															●	●	●	●	●		●	●	0.05~0.30	0.10~3.00
			150408-VP3															●	●	●	●	●		●	●	0.10~0.45	0.50~5.00
			150412-VP3															●	●	●	●	●		●	●	0.12~0.50	0.50~5.00
			150604-VP3															●	●	●	●	●		●	●	0.05~0.30	0.10~3.00
			150608-VP3															●	●	●	●	●		●	●	0.10~0.45	0.50~5.00
			150612-VP3															●	●	●	●	●		●	●	0.12~0.50	0.50~5.00
Medium (wiper)	LW	DNMG	150408-LW																							0.15~0.50	0.70~4.50
			150412-LW																							0.20~0.60	1.00~5.00
			150608-LW																							0.15~0.50	0.70~4.50
			150612-LW																							0.20~0.60	1.00~5.00

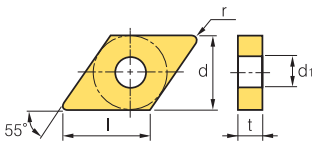
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	**PDJNR/L**	B154, 212
MDNNN	B166	**PDNNR/L**	B155
MDQNR/L	B167	**PDSNR/L**	B187
MDUNR/L	B192	**PDUNR/L**	B188

DN○○

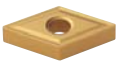
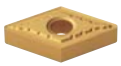
Rhombic 55° Negative



Dimensions (mm)			
Size	d	t	d1
15	12.7	4.76~6.35	5.16
19	15.875	6.35	7.93

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
	Stainless steel	M									✱	✱		●	⬌	✱	⬌	✱		●	⬌	⬌		
	Cast iron	K	●	⬌	✱	●	⬌	⬌				✱	⬌										●	⬌
	Non-ferrous metal	N																					●	⬌
	Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌		●	⬌
	Hardened steel	H																		⬌	✱		●	⬌

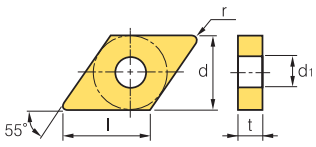
Machining types
● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to roughing	B25 	DNMG	150402-B25																						0.15~0.40	0.50~3.50
			150404-B25			●			●		●		●												0.17~0.45	1.00~4.00
			150408-B25			●			●		●		●												0.17~0.55	1.50~4.00
			150412-B25						●		●		●												0.25~0.55	1.50~4.00
			150425-B25																						0.35~0.65	2.50~5.50
			150602-B25																						0.15~0.40	0.50~3.50
			150604-B25	●					●		●	●	●												0.17~0.55	1.50~4.00
			150608-B25	●					●		●	●	●									●			0.17~0.55	1.50~4.00
			150612-B25						●		●		●												0.25~0.55	1.50~4.00
			150625-B25																						0.35~0.65	2.50~5.50
Roughing	GR 	DNMG	150408-GR									●													0.20~0.50	1.00~7.00
			150412-GR																						0.25~0.90	1.30~7.00
			150416-GR																						0.30~0.75	1.80~7.00
			150608-GR									●	●												0.20~0.50	1.00~7.00
			150612-GR									●													0.25~0.70	1.30~7.00
			150616-GR										●												0.20~0.75	1.80~7.00
Roughing	RK new 	DNMG	150408-RK																						0.15~0.50	1.50~5.00
			150412-RK										●												0.20~0.60	1.80~5.00
			150608-RK										●												0.15~0.50	1.50~5.00
			150612-RK										●												0.20~0.60	1.80~5.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	PDJNR/L	B154, 212
MDNNN	B166	PDNNR/L	B155
MDQNR/L	B167	PDSNR/L	B187
MDUNR/L	B192	PDUNR/L	B188

DN○○

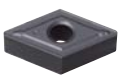


Dimensions (mm)			
Size	d	t	d1
15	12.7	4.76~6.35	5.16

Rhombic 55° Negative

Workpiece																									
Steel	P	●	⬍	✱	●	⬍	●	⬍	⬍	✱	✱	●	⬍		✱										
Stainless steel	M									⬍	⬍		●	⬍	✱	⬍	✱		●	⬍	⬍				
Cast iron	K	●	⬍	✱	●	⬍	⬍				⬍	⬍										●	⬍		
Non-ferrous metal	N																					●	⬍		
Heat resistant alloy, Titanium alloy	S										●			●	●	⬍	✱	●	●	⬍		●	⬍		
Hardened steel	H																		⬍	✱		●	⬍		

Machining types
- ● Continuous cutting
- ⬍ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	Coated NC3120	Coated NC3225	Coated NC3030	Coated NC5330	Coated NC6315	Coated NC9115	Coated NC9125	Coated NC9135	Coated PC5300	Coated PC5400	Coated PC8105	Coated PC8110	Coated PC8115	Coated PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (mm/rev)	Cutting Condition ap (mm)
Roughing	RM new 	DNMG	150404-RM													●	●	●				●				0.10~0.50	2.00~6.00
			150408-RM												●	●	●	●				●				0.15~0.55	2.00~6.00
			150412-RM												●	●	●	●				●				0.20~0.60	2.00~6.00
			150604-RM													●	●	●				●	●			0.10~0.50	2.00~6.00
			150608-RM												●	●	●						●			0.15~0.55	2.00~6.00
			150612-RM												●	●	●									0.20~0.60	2.00~6.00
Roughing	VP4 new 	DNMG	150408-VP4																							0.15~0.35	1.00~4.00
			150412-VP4																							0.20~0.40	1.00~4.00
			150608-VP4																			●				0.15~0.35	1.00~4.00
			150612-VP4																			●				0.20~0.40	1.00~4.00
Roughing	VR 	DNMG	150408-VR																							0.25~0.55	1.20~7.00
			150412-VR																							0.30~0.60	1.50~7.00
			150608-VR																							0.25~0.55	1.20~7.00
			150612-VR																							0.30~0.60	1.50~7.00
Medium (Shaft)	SH 	DNMX	150404R-SH																							0.15~0.30	1.00~4.00
			150408R-SH																							0.15~0.50	1.50~5.00
			150604R-SH						●		●															0.15~0.30	1.00~4.00
			150608R-SH						●		●															0.15~0.50	1.50~5.00
			150404L-SH																							0.15~0.30	1.00~4.00
			150408L-SH																							0.15~0.50	1.50~5.00
			150604L-SH						●		●															0.15~0.30	1.00~4.00
			150608L-SH						●		●															0.15~0.50	1.50~5.00

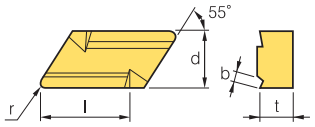
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MDJNR/L	B166	PDJNR/L	B154, 212
MDNNN	B166	PDNNR/L	B155
MDQNR/L	B167	PDSNR/L	B187
MDUNR/L	B192	PDUNR/L	B188

KN○○

Parallelogram 55° Negative



Dimensions (mm)		
Size	d	t
16	9.525	4.76

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types
● Continuous cutting
Ⓒ General cutting
✱ Interrupted cutting

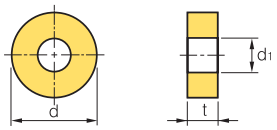
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	11	KNUX	160405R11						●	●	●	●	●										●			0.20~0.35	1.00~6.00
			160410R11						●		●	●	●													0.30~0.60	1.50~6.00
			160405L11						●	●	●	●	●													0.20~0.35	1.00~6.00
			160410L11						●		●	●	●													0.30~0.60	1.50~6.00
Roughing	12	KNUX	160405R12						●		●	●	●													0.25~0.35	1.50~6.00
			160410R12						●		●	●	●													0.40~0.70	1.50~6.00
			160405L12																							0.25~0.35	1.50~6.00
			160410L12									●														0.40~0.70	1.50~6.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ●: Stock item

Available tool holders			
Designation	Page	Designation	Page
CKJNR/L	B163	**CKUNR/L**	B192
CKNNR/L	B163		

RN○○

Round Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16
15	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	6.35~9.52	9.12
31	31.75	9.52	12.7

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

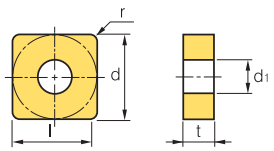
Machining types
● Continuous cutting
Ⓒ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to roughing	B25	RNMG	090300-B25																							0.90~4.50	0.09~0.90
			120400-B25									●														1.20~4.80	0.12~1.20
			150600-B25									●														1.15~1.50	1.50~7.50
			190600-B25																							1.90~7.60	0.19~1.90
			250600-B25																							2.50~10.0	0.25~2.50
			250900-B25									●														2.50~10.0	0.25~2.50
			310900-B25																							3.50~13.0	0.30~2.50

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ●: Stock item

SN○○

○ Square 90° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16
15	15.875	6.35	6.35
19	19.05	6.35	7.93

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⇕ General cutting
	Cast iron	K	⇳ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing		SNGA 090304																						0.17~0.50	0.50~4.50
		090308																						0.17~0.50	0.50~4.50
		120404																						0.15~0.60	1.50~8.00
		120408																						0.15~0.60	1.50~8.00
		120412																						0.20~0.80	1.50~8.00
		150608																						0.20~0.80	2.00~10.00
		150616																						0.20~0.90	2.00~10.00
		190608																						0.15~0.60	3.00~12.00
		190612																						0.20~0.80	3.00~12.00
Medium		SNGG 090304R																						0.12~0.35	1.00~3.00
		090308R																						0.15~0.35	1.00~3.00
		120404R		●																				0.15~0.35	1.00~4.00
		120408R																						0.15~0.35	1.00~4.00
		120412R																						0.15~0.35	1.00~4.00
		090304L																						0.12~0.35	1.00~3.00
		090308L																						0.15~0.35	1.00~3.00
		120404L																						0.15~0.35	1.00~4.00
		120408L																						0.15~0.35	1.00~4.00
		120412L																						0.15~0.35	1.00~4.00
Medium	VP3	SNGG 120404-VP3																	●	●	●		●	0.05~0.30	0.10~3.00
		120408-VP3																	●	●	●		●	0.10~0.45	1.00~5.00
		120412-VP3																	●	●	●		●	0.12~0.50	1.00~5.00

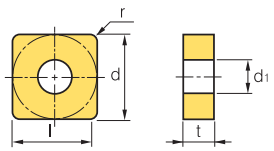
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

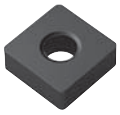
SN○○

○ Square 90° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	3.18~4.76	5.16
15	15.875	4.76~6.35	6.35
19	19.05	4.76~6.35	7.93
25	25.4	6.35~9.52	9.12

Workpiece			Machining types
Steel	P	● ⬬ ✱ ● ⬬ ● ⬬ ⬬ ✱ ✱ ● ⬬ ✱	● Continuous cutting
Stainless steel	M	⬬ ✱ ⬬ ⬬ ● ⬬ ✱ ⬬ ⬬ ● ⬬	⬬ General cutting
Cast iron	K	● ⬬ ✱ ● ⬬ ⬬ ⬬ ✱ ⬬ ⬬ ⬬ ● ⬬	✱ Interrupted cutting
Non-ferrous metal	N	⬬ ⬬ ● ⬬ ⬬
Heat resistant alloy, Titanium alloy	S	● ⬬ ✱ ● ● ⬬ ✱ ● ⬬ ⬬ ⬬ ● ⬬
Hardened steel	H	⬬ ✱ ● ⬬

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing		SNGN	090302																						0.05~0.30	0.50~4.00
			090304																						0.10~0.35	0.50~4.00
			090308																						0.10~0.40	1.00~4.00
			120304																						0.13~0.50	1.30~5.00
			120308																						0.15~0.60	1.50~6.00
			120312																						0.17~0.60	1.70~6.00
			120402																						0.10~0.45	1.00~5.00
			120404																						0.13~0.50	1.30~5.00
			120408																						0.15~0.60	1.50~6.00
			120412																						0.17~0.60	1.70~6.00
			120424																						0.20~0.65	2.00~6.00
			150402																						0.10~0.50	0.50~6.00
			150408																						0.15~0.60	1.50~8.00
			150412																						0.17~0.60	2.00~8.00
			150416																						0.20~0.65	2.50~8.50
			190402																						0.10~0.60	2.00~8.50
			190412																						0.17~0.70	2.50~10.00
			190416																						0.20~0.75	2.50~10.00
			250604																						0.30~0.80	3.00~12.00
			250616																						0.35~1.00	4.00~12.00
Medium		SNGX	120408R																						0.15~0.35	1.00~4.00
Roughing		SNMA	090304																						0.10~0.45	0.50~4.50
			090308																						0.15~0.50	0.50~4.50
			090312																						0.20~0.50	0.50~4.50
			120402																						0.10~0.50	1.00~4.50
			120404																						0.15~0.60	1.00~5.00
			120408											●											0.15~0.70	1.00~6.00
			120412											●											0.20~0.80	1.50~6.00
			120416											●											0.30~1.00	2.00~6.00
			120430																						0.30~0.70	2.50~5.00
			150612																						0.20~0.80	2.00~8.00
			150616											●											0.25~0.85	2.50~10.00
			190608																						0.20~0.80	2.00~10.00
			190612											●											0.20~0.80	2.00~10.00
			190616											●											0.25~0.85	2.50~10.00
			190624																						0.35~0.90	3.00~10.00
			250724																						0.40~1.00	3.00~13.00
			250924																						0.40~1.00	3.00~13.00

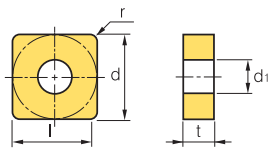
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	3.18~4.76	5.16

Workpiece																							Machining types
	Steel	P	●	⧓	⧔	●	⧓	●	⧓	⧓	⧔	⧔	●	⧓		⧔							● Continuous cutting
	Stainless steel	M									⧓	⧓		●	⧓	⧔	⧓	⧔		●	⧓	⧓	⧓ General cutting
	Cast iron	K	●	⧓	⧔	●	⧓	⧓				⧓	⧓									●	⧔ Interrupted cutting
	Non-ferrous metal	N																				●	⧓
	Heat resistant alloy, Titanium alloy	S									●			●	●	⧓	⧔	●	●	⧓		●	⧓
	Hardened steel	H																	⧓	⧔		●	⧓

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VB	SNMG	120404-VB	●			●	●																	0.15~0.35	0.30~2.00
			120408-VB	●		●	●	●																	0.15~0.40	0.50~2.00
Finishing	VF	SNMG	090304-VF																						0.07~0.30	0.50~1.50
			090308-VF																						0.07~0.30	0.50~1.50
			120404-VF																						0.07~0.30	0.50~1.50
			120408-VF										●												0.10~0.40	0.50~1.50
			120412-VF																						0.20~0.50	0.50~1.50
Finishing (Mild steel)	VL	SNMG	120408-VL																						0.10~0.35	0.20~1.50
Medium to finishing	HA	SNMG	120404-HA																					●	0.10~0.35	0.80~3.50
			120408-HA																					●	0.10~0.40	0.80~3.50
			120412-HA																						0.13~0.55	0.80~3.50
Medium to finishing	LP new	SNMG	090308-LP																						0.10~0.30	0.30~1.50
			120404-LP						●		●		●												0.10~0.35	0.30~2.00
			120408-LP						●		●		●												0.10~0.40	0.50~2.50
			120412-LP																						0.13~0.45	0.80~3.00
Medium to finishing	VC	SNMG	120408-VC								●		●												0.15~0.40	0.50~3.50
Medium to finishing	VP2	SNMG	120404-VP2															●	●	●	●	●		●	0.05~0.35	0.10~3.00
			120408-VP2															●	●	●	●	●		●	0.10~0.45	0.50~4.50
			120412-VP2															●	●	●	●	●		●	0.10~0.50	0.50~5.00

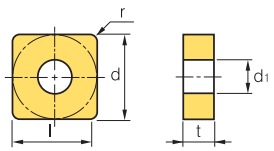
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.81
12	12.7	4.76	5.16
15	15.875	4.76~6.35	6.35
19	19.05	4.76~6.35	7.93

Workpiece			Machining types
Steel	P	● ⬬ ✱ ● ⬬ ● ⬬ ⬬ ✱ ✱ ● ⬬ ✱	● Continuous cutting
Stainless steel	M	⬬ ✱ ⬬ ⬬ ✱ ⬬ ⬬ ● ⬬ ✱ ⬬ ✱ ● ⬬ ⬬	⬬ General cutting
Cast iron	K	● ⬬ ✱ ● ⬬ ⬬ ⬬ ⬬ ● ⬬ ● ⬬ ● ⬬	✱ Interrupted cutting
Non-ferrous metal	N	● ⬬	
Heat resistant alloy, Titanium alloy	S	● ● ⬬ ✱ ● ⬬ ⬬ ● ⬬	
Hardened steel	H	⬬ ✱ ● ⬬	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing	VQ	SNMG	090304-VQ																						0.05~0.30	0.50~3.50
			090308-VQ																						0.08~0.30	0.80~4.00
			090312-VQ																						0.10~0.30	1.00~4.00
			120404-VQ	●		●																			0.05~0.30	0.80~4.00
			120408-VQ	●		●																			0.08~0.40	0.80~4.00
Medium	MK	SNMG	090308-MK																						0.17~0.45	0.80~3.50
			120404-MK																						0.08~0.45	0.80~4.00
			120408-MK											●											0.10~0.50	1.00~5.00
			120412-MK											●											0.13~0.60	1.30~5.00
			120416-MK																						0.15~0.63	1.50~6.00
			150608-MK																						0.25~0.60	1.80~6.00
			150612-MK																						0.20~0.70	1.80~7.00
			150616-MK																						0.23~0.70	2.00~7.50
			190608-MK																						0.31~0.75	2.30~9.50
			190612-MK																						0.33~0.78	2.50~10.00
			190616-MK																						0.35~0.78	2.70~10.00
Medium	MM new	SNMG	090304-MM																				●		0.08~0.35	0.50~5.00
			090308-MM																						0.10~0.40	0.50~5.00
			090312-MM																						0.12~0.45	0.50~5.00
			120404-MM												●	●	●	●				●	●		0.10~0.40	0.50~6.40
			120408-MM												●	●	●	●				●	●		0.12~0.45	0.50~6.40
			120412-MM													●	●	●				●	●		0.15~0.60	0.50~6.40
			120416-MM																						0.18~0.65	0.50~6.40
			150608-MM																						0.12~0.45	0.50~8.00
			150612-MM													●	●	●				●	●		0.15~0.60	0.50~8.00
			150616-MM																						0.18~0.65	0.50~8.00
			190608-MM													●	●	●				●			0.12~0.45	0.50~9.50
			190612-MM													●	●	●				●	●		0.15~0.60	0.50~9.50
			190616-MM																				●		0.18~0.65	0.50~9.50

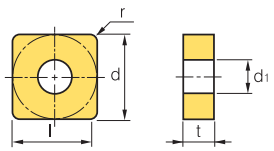
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (mm)			
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15	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	7.94	9.12

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	MP 	SNMG 090304-MP						●		●		●													0.10~0.40	0.40~3.80
		090308-MP						●		●		●													0.15~0.40	0.50~4.00
		120404-MP						●		●		●		●	●	●			●	●					0.10~0.40	0.40~4.00
		120408-MP						●		●		●		●	●	●			●	●					0.15~0.45	0.50~4.50
		120412-MP						●		●		●		●	●	●									0.15~0.50	0.80~5.00
		120416-MP						●		●		●													0.18~0.60	0.80~7.00
Medium	VM 	SNMG 090304-VM																							0.05~0.30	0.90~3.50
		090308-VM																							0.10~5.00	1.00~3.50
		120404-VM	●									●					●	●							0.05~0.30	0.90~5.00
		120408-VM	●						●		●	●					●	●		●		●			0.10~0.50	1.00~5.00
		120412-VM										●					●	●							0.13~0.60	1.30~5.00
		190612-VM																							0.25~0.60	2.50~7.50
		190616-VM																							0.25~0.60	2.50~7.50
Medium	VP3 	SNMG 120404-VP3															●	●	●	●	●		●	●	0.05~0.30	0.10~3.00
		120408-VP3															●	●	●	●	●		●	●	0.10~0.45	1.00~5.00
		120412-VP3															●	●	●	●	●			●	0.12~0.50	1.00~5.00
Medium to roughing	B25 	SNMG 090308-B25																							0.17~0.45	0.80~3.50
		120404-B25	●		●			●		●	●	●													0.17~0.45	1.00~3.50
		120408-B25	●		●			●		●	●	●					●	●				●			0.23~0.60	1.50~5.00
		120412-B25			●			●		●	●	●													0.25~0.60	2.00~5.00
		120416-B25						●		●	●	●													0.35~0.70	2.50~5.00
		120420-B25																							0.40~0.70	3.00~5.00
		150608-B25									●														0.25~0.60	1.50~6.00
		150612-B25																							0.25~0.60	2.00~6.00
		150616-B25																							0.35~0.70	2.00~6.00
		190608-B25						●		●	●														0.25~0.60	3.00~8.00
		190612-B25						●		●	●	●													0.30~0.60	3.00~8.00
		190616-B25						●		●	●									●					0.35~0.70	3.00~8.00
		250716-B25																							0.35~0.70	4.00~12.00
		250724-B25						●				●													0.50 ~1.00	5.00~12.00
		250924-B25						●																	0.50~1.00	5.00~12.00

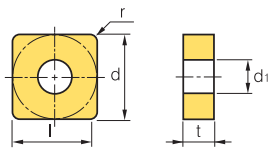
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (mm)			
Size	d	t	d1
12	12.7	4.76	5.16
15	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	7.94	9.12

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ⬌ ✱ ⬌ ⬌ ⬌ ● ✱ ⬌ ⬌ ✱ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ⬌ ⬌ ● ⬌ ⬌ ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	⬌ ✱ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌
Heat resistant alloy, Titanium alloy	S	⬌ ✱ ⬌ ⬌ ⬌ ● ⬌ ● ● ⬌ ✱ ● ● ⬌
Hardened steel	H	⬌ ✱ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌ ● ⬌

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing	GR	SNMG	120404-GR									●														0.15~0.45	0.08~6.00
			120408-GR									●	●													0.20~0.50	1.00~7.00
			120412-GR									●														0.20~0.50	1.00~7.00
			150608-GR									●														0.25~0.60	1.00~7.00
			150612-GR							●		●														0.29~0.75	1.40~7.00
			190608-GR									●														0.30~0.80	1.70~9.00
			190612-GR							●		●	●													0.30~0.80	1.70~9.00
			190616-GR							●		●	●													0.31~0.82	1.90~12.30
			250724-GR									●														0.45~1.20	2.60~14.00
			250924-GR							●		●														0.50~1.20	2.60~14.00
Roughing	RK new	SNMG	120408-RK											●												0.23~0.53	1.50~6.00
			120412-RK											●												0.28~0.53	1.80~6.00
			120416-RK											●												0.28~0.53	2.00~6.00
			150612-RK																							0.20~0.70	1.80~7.00
			150616-RK																							0.23~0.70	2.00~7.50
			190612-RK																							0.33~0.78	2.50~10.00
			190616-RK																							0.35~0.78	2.70~10.00
Roughing	RM new	SNMG	120404-RM												●	●	●	●				●				0.10~0.50	2.00~6.00
			120408-RM												●	●	●	●				●	●			0.15~0.55	2.00~6.00
			120412-RM													●	●	●				●				0.20~0.60	2.00~6.00
			120416-RM																							0.25~0.70	2.00~6.00
			150612-RM													●	●	●				●				0.20~0.60	2.00~8.00
			150616-RM																							0.25~0.70	2.00~8.00
			190608-RM													●	●	●				●				0.20~0.60	2.00~10.00
			190612-RM													●	●	●				●				0.20~0.60	2.00~10.00
			190616-RM																							0.27~0.70	2.00~10.00
			250924-RM																							0.40~1.20	4.00~14.00
Roughing	VP4 new	SNMG	120408-VP4																			●				0.15~0.35	1.00~4.00
			120412-VP4																			●				0.20~0.40	1.00~4.00
			150612-VP4																			●				0.20~0.45	1.00~5.00
			190608-VP4																			●				0.20~0.50	1.00~9.00
			190612-VP4																			●				0.23~0.55	1.00~9.00
			190616-VP4																			●				0.27~0.60	1.00~9.00

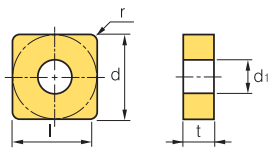
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



Dimensions (mm)			
Size	d	t	d1
12	12.7	4.76	5.16
15	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	7.94~9.52	9.12

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing	VR	SNMG 120408-VR																						0.25~0.55	1.20~7.00
		120412-VR																						0.30~0.60	1.50~7.00
		190612-VR																						0.35~0.70	2.00~10.00
		190616-VR																						0.35~0.75	2.20~10.00
Roughing	GR	SNMM 120408-GR																						0.20~0.50	1.00~7.00
		120412-GR									●													0.25~0.65	1.30~7.00
		190612-GR									●													0.25~0.65	1.30~11.50
		190616-GR									●													0.32~0.85	1.80~11.50
Heavy	GH	SNMM 120408-GH									●	●												0.30~0.60	2.50~8.00
		120412-GH									●													0.30~0.70	2.50~8.00
		150612-GH									●													0.30~0.70	2.50~8.00
		190612-GH						●	●		●	●												0.30~0.70	3.00~8.00
		190616-GH						●	●		●	●												0.45~1.00	4.00~9.00
		190624-GH						●	●		●	●												0.55~1.20	4.00~9.00
		250724-GH						●	●		●	●												0.55~1.20	5.00~12.00
		250924-GH						●	●		●	●												0.55~1.20	5.00~12.00
		250932-GH																						0.55~1.20	5.00~12.00
Heavy (General)	VH	SNMM 190612-VH						●																0.50~0.90	5.00~10.00
		190616-VH						●																0.50~1.10	5.00~10.00
		190624-VH						●																0.60~1.20	6.00~12.00
		250724-VH						●			●													0.70~1.40	6.00~15.00
		250920-VH																						0.70~1.40	6.00~15.00
		250924-VH						●																0.70~1.40	6.00~15.00
		250716-VH																						0.70~1.50	6.00~14.00
Heavy (High feed cutting)	VT	SNMM 190612-VT						●				●												0.60~1.00	6.00~13.00
		190616-VT						●			●													0.60~1.10	6.00~13.00
		190624-VT						●																0.60~1.60	7.00~13.00
		250724-VT						●			●													0.75~1.60	7.00~15.00
		250920-VT																						0.75~1.60	7.00~15.00
		250924-VT						●			●													0.75~1.60	7.00~17.00
		250716-VT																						0.75~1.60	7.00~15.00

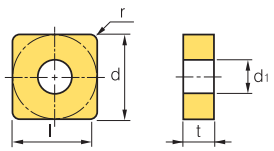
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

SN○○

○ Square 90° Negative



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15	15.875	4.76	-
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Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

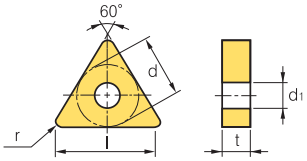
Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to roughing		SNMN	120304																					0.17~0.45	1.00~3.50
			120308																					0.23~0.60	1.50~6.00
			120312																					0.25~0.60	2.00~5.00
			120404																					0.17~0.45	1.00~3.50
			120408																					0.23~0.60	1.50~5.00
			120412																					0.25~0.60	2.00~5.00
			150404																					0.20~0.50	1.50~6.00
			150408																					0.25~0.60	1.50~6.00
			150412																					0.25~0.60	2.00~6.00
			190416																					0.35~0.70	2.00~6.00
Medium		SNMX	120408R																					0.15~0.35	1.00~4.00
Medium to roughing		SNUN	120408																					0.23~0.60	1.50~5.00
			120412																					0.25~0.60	2.00~5.00
			190412																					0.30~1.00	3.00~10.00
			120412TN																					0.25~0.60	2.00~5.00
			250724TN																					0.30~1.20	3.00~12.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B167	**MSRNR/L**	B168	**PSDNN**	B157
MSDNN	B167	**MSSNR/L**	B169	**PSKNR/L**	B158, 189
MSKNR/L	B168	**PSBNR/L**	B157	**PSSNR/L**	B158

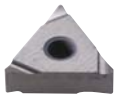
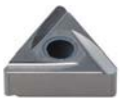
TN○○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.40
16	9.525	3.18~4.76	3.81
22	12.7	4.76	5.16
27	15.875	6.35	6.35

Workpiece																							Machining types
	Steel	P	●	⇔	⇕	●	⇔	●	⇔	⇔	⇕	⇕	●	⇔		⇕							● Continuous cutting
	Stainless steel	M									⇔	⇔		●	⇔	⇕	⇔	⇕		●	⇔	⇔		⇔ General cutting
	Cast iron	K	●	⇔	⇕	●	⇔	⇔				⇔	⇔										●	⇔	⇕ Interrupted cutting
	Non-ferrous metal	N																					●	⇔	
	Heat resistant alloy, Titanium alloy	S										●			●	●	⇔	⇕	●	●	⇔		●	⇔	
	Hardened steel	H																		⇔	⇕		●	⇔	

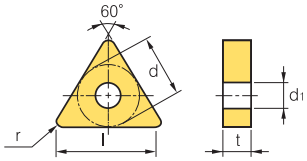
Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing		TNGA	110302																						0.05~0.30	0.20~3.00
			110304																						0.05~0.30	0.40~3.00
			160304																						0.10~0.35	0.40~4.00
			160402																						0.10~0.30	0.20~4.00
			160404																						0.10~0.35	0.40~5.00
			160408																						0.12~0.40	0.50~5.00
			220304																						0.10~0.35	0.50~5.00
			220402																						0.05~0.30	0.20~3.00
			220404																						0.10~0.35	0.40~5.00
			220408																						0.10~0.40	0.50~5.00
			220412																						0.12~0.45	1.00~5.50
			270612																						0.12~0.45	1.00~7.00
			270624																						0.20~0.55	2.00~7.00
Finishing	SC 	TNGG	160402R-SC		●																				0.03~0.20	0.10~1.50
			160404R-SC		●																				0.05~0.25	0.30~2.00
			160402L-SC																						0.03~0.20	0.10~1.50
			160404L-SC																						0.05~0.25	0.30~2.00
Medium		TNGG	110304R																						0.05~0.30	0.50~2.50
			160402R		●																				0.08~0.30	0.50~3.50
			160404R	●	●																				0.12~0.30	1.00~3.50
			160408R		●																				0.15~0.35	1.30~3.50
			220404R		●																				0.12~0.30	1.00~5.00
			220408R		●																				0.15~0.35	1.30~5.00
			220412R																						0.17~0.40	1.50~5.00
			110304L																						0.05~0.30	0.50~2.50
			160402L																						0.08~0.30	0.50~3.50
			160404L	●	●																				0.12~0.30	1.00~3.50
			160408L		●																				0.15~0.35	1.30~3.50
			220404L																						0.12~0.30	1.00~5.00
			220408L																						0.15~0.35	1.30~5.00
			220412L																						0.17~0.40	1.50~5.00
Medium	VP3 	TNGG	160404-VP3																	●	●	●	●		0.05~0.30	0.10~3.00
			160408-VP3																	●	●	●	●		0.10~0.45	0.50~5.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

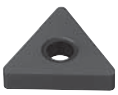
TN○○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.40
16	9.525	3.18~4.76	3.81
22	12.7	4.76	5.16
27	15.875	6.35	6.35
33	19.05	9.52	7.93

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium		TNGN	110302																						0.05~0.25	0.20~2.50
			110304																						0.10~0.30	0.50~2.50
			110308																						0.10~0.30	0.80~2.50
			160302																						0.05~0.30	0.20~3.00
			160304																						0.10~0.30	0.50~4.00
			160308																						0.10~0.40	0.80~4.00
			160404																						0.10~0.40	0.50~4.00
			160408																						0.10~0.40	1.00~4.00
			160412																						0.10~0.50	1.50~4.50
			220404																						0.10~0.35	1.00~4.00
			220408																						0.15~0.40	1.50~5.00
			220412																						0.20~0.50	1.50~5.00
			220416																						0.25~0.55	1.50~5.00
			220424																						0.30~0.65	2.00~5.00
			270630																						0.35~0.70	2.00~5.00
Roughing		TNMA	110308																						0.05~0.30	0.50~3.00
			160404											●											0.10~0.30	1.00~4.00
			160408											●											0.10~0.40	1.00~4.00
			160412											●											0.10~0.50	1.50~4.50
			160416											●											0.15~0.55	1.50~4.50
			220404																						0.10~0.35	1.00~4.00
			220408											●											0.15~0.40	1.50~5.00
			220412											●											0.20~0.50	1.50~5.00
			220416											●											0.25~0.55	1.50~5.00
			220420																						0.30~0.65	2.00~5.00
			220432																						0.35~0.70	2.00~5.00
			270608																						0.20~0.45	2.00~7.00
			270612																						0.25~0.55	3.00~7.00
			270616																						0.30~0.65	3.00~7.00
			330924																						0.35~0.75	3.00~9.00
Finishing	VB 	TNMG	160404-VB	●		●	●	●																	0.10~0.35	0.30~1.50
			160408-VB	●		●	●	●	●		●		●												0.15~0.45	0.50~7.00
			220408-VB								●		●												0.15~0.45	0.50~2.50
			220412-VB																						0.20~0.50	0.70~2.50

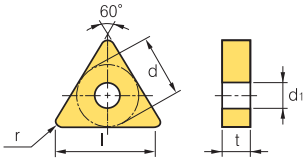
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

TN○○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.40
16	9.525	4.76	3.81
22	12.7	4.76	5.16

Workpiece																								
Steel	P	●	⇕	⇔	●	⇕	●	⇕	⇕	⇔	⇔	●	⇕		⇔									
Stainless steel	M									⇕	⇕		●	⇕	⇔	⇕	⇔		●	⇕	⇕			
Cast iron	K	●	⇕	⇔	●	⇕	⇕				⇕	⇕										●	⇕	
Non-ferrous metal	N																					●	⇕	
Heat resistant alloy, Titanium alloy	S										●			●	●	⇕	⇔	●	●	⇕		●	⇕	
Hardened steel	H																		⇕	⇔		●	⇕	

Machining types
- ● Continuous cutting
- ⇕ General cutting
- ⇔ Interrupted cutting

Inserts		Designation		Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	Coated NC3120	Coated NC3225	Coated NC3030	Coated NC5330	Coated NC6315	Coated NC9115	Coated NC9125	Coated NC9135	Coated PC5300	Coated PC5400	Coated PC8105	Coated PC8110	Coated PC8115	Coated PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (mm/rev)	Cutting Condition ap (mm)
Finishing	VL 	TNMG	160404-VL	●																						0.05~0.25	0.10~1.00
			160408-VL	●									●													0.10~0.35	0.20~1.50
			160412-VL																							0.15~0.40	0.20~1.50
			220408-VL																							0.10~0.35	0.20~1.50
			220412-VL																							0.10~0.35	0.50~2.00
Finishing	VF 	TNMG	110304-VF	●	●								●													0.05~0.20	0.20~1.00
			160404-VF	●						●			●													0.07~0.30	0.50~1.50
			160408-VF						●	●			●													0.10~0.40	0.50~1.50
			160412-VF																							0.15~0.50	0.50~1.50
			220404-VF										●													0.10~0.40	0.50~1.50
			220408-VF																							0.10~0.40	0.50~1.50
Finishing (wiper)	VW 	TNMG	160404-VW																							0.10~0.35	0.30~3.00
			160408-VW																							0.10~0.40	0.30~3.00
Medium to finishing	HA 	TNMG	160404-HA																					●		0.05~0.30	0.80~3.50
			160408-HA																					●		0.10~0.40	0.80~3.50
			160412-HA																							0.13~0.55	0.80~3.50
			220408-HA																							0.10~0.40	0.80~5.30
Medium to finishing	LP  new	TNMG	160404-LP						●		●		●													0.10~0.35	0.30~2.00
			160408-LP						●		●		●													0.10~0.40	0.50~2.50
			160412-LP																							0.13~0.45	0.80~3.00

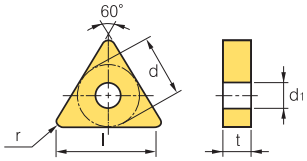
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	PTFNR/L	B159, 189	WTJNR/L	B161
MTFNR/L	B169	PTGNR/L	B159	WTXNR/L	B161
MTGNR/L	B170	PTTNR/L	B160		
MTJNR/L	B170	WTENN	B161		

TN○○

△ Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.40
16	9.525	3.18~4.76	3.81
22	12.7	4.76	5.16

Workpiece			Machining types
Steel	P	● ⬌ ✱	● Continuous cutting
Stainless steel	M	⬌ ✱	⬌ General cutting
Cast iron	K	● ⬌ ✱	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	● ⬌ ✱	
Hardened steel	H	⬌ ✱	

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing	VC	TNMG	160404-VC								●		●												0.10~0.35	0.30~2.00
			160408-VC						●		●		●												0.15~4.00	0.50~3.00
			160412-VC								●		●												0.15~4.50	0.50~3.00
			220408-VC								●														0.15~0.40	0.50~3.00
			220412-VC																						0.15~0.45	0.50~3.00
Medium to finishing	VP2	TNMG	160404-VP2															●	●	●	●	●		●	0.05~0.30	0.10~3.00
			160408-VP2															●	●	●	●	●		●	0.10~0.45	0.50~5.00
			160412-VP2																●	●	●	●		●	0.13~0.55	0.80~3.30
			220404-VP2															●	●		●				0.05~0.30	0.80~5.00
			220408-VP2															●	●		●				0.10~0.40	0.80~5.00
Medium to finishing	VQ	TNMG	110304-VQ																						0.05~0.30	0.50~3.00
			160404-VQ	●	●	●	●	●																	0.05~0.30	0.80~3.50
			160408-VQ	●		●	●	●																	0.08~0.40	0.80~3.50
			160412-VQ																						0.10~0.40	0.80~3.50
			220404-VQ																						0.05~0.35	0.80~4.00
Medium	MK	TNMG	160404-MK											●											0.05~0.30	0.90~3.50
			160408-MK											●											0.10~0.50	1.00~4.00
			160412-MK											●											0.12~0.60	1.20~4.50
			160416-MK																						0.13~0.60	1.20~4.50
			220404-MK																						0.17~0.45	1.50~5.00
			220408-MK																						0.21~0.50	1.30~5.50
			220412-MK																						0.23~0.52	1.40~5.50
			220416-MK																						0.25~0.53	1.60~6.00
			270612-MK																						0.25~0.55	3.00~7.00
Medium	MM	TNMG	160404-MM												●	●	●	●				●	●		0.10~0.40	0.50~4.80
			160408-MM												●	●	●	●				●	●		0.12~0.45	0.50~4.80
			160412-MM																				●		0.18~0.65	0.50~4.80
			160416-MM																						0.18~0.65	0.50~4.80
			220404-MM																						0.10~0.40	0.50~6.50
			220408-MM													●	●	●				●	●		0.12~0.45	0.50~6.50
			220412-MM													●	●	●				●	●		0.15~0.60	0.50~6.50

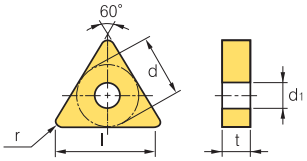
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

TN○○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.40
16	9.525	4.76	3.81
22	12.7	4.76	5.16
27	15.875	6.35	6.35
33	19.05	7.94~9.52	7.93

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	MP	TNMG	160404-MP						●		●		●		●	●	●			●	●					0.10~0.40	0.40~3.50
			160408-MP						●		●		●		●	●	●			●	●					0.15~0.45	0.50~4.00
			160412-MP						●		●		●		●	●	●			●	●					0.15~0.50	0.80~4.50
			220404-MP						●		●		●		●	●	●									0.10~0.35	0.40~5.00
			220408-MP						●		●		●		●	●	●									0.15~0.45	0.50~5.50
			220412-MP						●		●		●		●	●	●									0.15~0.50	0.80~6.00
			220416-MP						●		●		●													0.20~0.55	1.00~6.00
Medium	VM	TNMG	110308-VM																							0.05~0.30	0.80~4.00
			160404-VM	●						●		●	●					●	●							0.05~0.30	0.90~5.00
			160408-VM	●		●			●	●		●	●					●	●				●			0.10~0.50	1.00~5.00
			160412-VM	●					●	●								●	●							0.13~0.60	1.30~5.00
			220404-VM															●	●							0.05~0.30	0.90~6.60
			220408-VM							●			●					●	●		●					0.10~0.50	1.00~6.60
			220412-VM																							0.13~0.60	1.30~6.60
Medium	VP3	TNMG	160404-VP3															●	●	●	●	●		●	●	0.05~0.30	0.10~3.00
			160408-VP3															●	●	●	●	●		●	●	0.10~0.45	0.50~5.00
Medium (wiper)	LW	TNMG	160408-LW																							0.15~0.50	0.70~4.50
			160412-LW																							0.20~0.60	1.00~5.00
Medium to roughing	B25	TNMG	110308-B25																							0.17~0.40	1.50~3.00
			160404-B25	●		●			●		●	●	●													0.17~0.45	2.00~3.50
			160408-B25	●		●			●		●	●	●										●			0.17~0.55	2.00~3.50
			160412-B25			●			●		●		●													0.25~0.55	2.00~3.50
			160416-B25																							0.30~0.60	2.50~3.00
			220404-B25						●		●	●	●													0.17~0.45	1.50~5.00
			220408-B25						●		●	●	●													0.17~0.55	2.00~5.00
			220412-B25						●		●	●	●													0.25~0.55	2.00~5.00
			220416-B25						●		●		●													0.30~0.60	2.00~5.00
			220424-B25																							0.35~0.70	3.00~7.00
			220432-B25																							0.40~0.75	3.50~7.00
			270608-B25									●														0.17~0.55	2.00~5.00
			270612-B25								●	●	●													0.25~0.55	3.00~7.00
			270616-B25																							0.30~0.60	3.00~7.00
			330716-B25						●		●															0.35~0.70	3.00~9.00
			330924-B25																							0.40~0.80	3.00~9.00

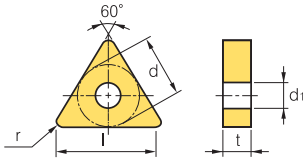
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

TN○○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d1
16	9.525	4.76	3.81
22	12.7	4.76	5.16
27	15.875	6.35	6.35
33	19.05	7.94~9.52	7.93

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱							●	⬌
	Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
	Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌
	Non-ferrous metal	N																					●	⬌
	Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌		●	⬌
	Hardened steel	H																		⬌	✱		●	⬌

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing	GR	TNMG	160408-GR									●														0.20~0.50	1.00~7.00
			160412-GR																							0.23~0.54	1.20~8.00
			220408-GR									●	●													0.22~0.61	1.10~7.80
			220412-GR							●		●														0.28~0.78	1.20~7.80
			220416-GR									●														0.31~0.75	1.50~7.80
			270608-GR									●														0.31~0.75	1.50~7.80
			270612-GR									●														0.31~0.75	1.50~7.80
			270616-GR									●														0.36~1.00	1.60~7.80
			330924-GR									●														0.40~1.00	2.00~9.00
Roughing	RK new	TNMG	160408-RK											●												0.23~0.53	1.50~5.00
			160412-RK											●												0.28~0.53	1.80~5.00
			160416-RK											●												0.28~0.53	1.80~5.00
			220408-RK											●												0.23~0.53	1.50~6.00
			220412-RK											●												0.28~0.53	1.80~6.00
			220416-RK											●												0.28~0.63	2.00~6.00
Roughing	RM new	TNMG	160404-RM												●	●	●	●				●	●			0.10~0.50	2.00~5.50
			160408-RM												●	●	●	●				●	●			0.15~0.55	2.00~5.50
			160412-RM																							0.20~0.60	2.00~5.50
			220408-RM													●	●	●				●				0.10~0.50	2.00~7.50
			220412-RM													●	●	●				●				0.15~0.55	2.00~7.50
Roughing	VP4 new	TNMG	160408-VP4																			●				0.15~0.35	1.00~4.00
			160412-VP4																			●				0.20~0.40	1.00~4.00
Roughing	VR	TNMG	160408-VR																							0.25~0.55	1.20~7.00
			160412-VR																							0.35~0.65	1.70~7.00
			160416-VR																							0.35~0.70	2.00~10.0
			220408-VR																							0.35~0.70	2.00~10.0
			220412-VR																							0.35~0.70	2.00~10.0
			220416-VR																							0.35~0.75	2.20~10.0

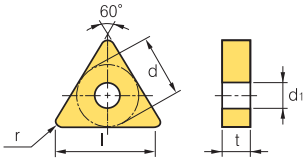
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

TN○○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d1
16	9.525	4.76	3.81
22	12.7	4.76	5.16
27	15.875	6.35	6.35
33	19.05	7.94~9.52	7.93

Workpiece			Machining types
Steel	P	● ⬌ ⧓	● Continuous cutting
Stainless steel	M	⬌ ⧓	⬌ General cutting
Cast iron	K	● ⬌ ⧓	⧓ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	● ⬌ ⧓	
Hardened steel	H	⬌ ⧓	

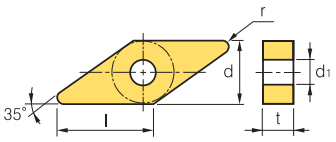
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing	GR	TNMM	220408-GR																						0.22~0.61	1.10~7.80
			220412-GR																						0.28~0.78	1.20~7.80
			220416-GR																						0.31~0.75	1.50~7.80
Heavy	GH	TNMM	160408-GH																						0.20~0.50	1.00~7.00
			220408-GH																						0.25~0.60	1.30~7.00
			220412-GH																						0.20~0.50	1.00~8.00
			220416-GH																						0.25~0.60	1.30~8.00
			270616-GH																						0.32~0.70	1.80~8.00
			270624-GH																						0.35~0.50	1.80~13.00
			330924-GH																						0.35~0.70	2.30~13.00
Medium to roughing		TNMN	160408																						0.10~0.30	1.00~4.00
			220408																						0.15~0.40	1.50~5.00
			220412																						0.20~0.50	1.50~5.00
Medium (Shaft)	SH	TNMX	160404R-SH						●		●														0.15~0.30	0.50~4.00
			160408R-SH						●		●														0.15~0.45	1.00~4.00
			160404L-SH						●		●														0.15~0.30	0.50~4.00
			160408L-SH						●		●														0.15~0.45	1.00~4.00
Medium to roughing		TNMX	160402R		●	●																			0.10~0.30	0.50~3.00
			160404R		●					●		●	●												0.12~0.30	1.00~3.50
			160408R									●													0.15~0.35	1.30~3.40
			220404R																						0.12~0.30	1.00~5.00
			220408R																						0.15~0.35	1.30~5.00
			160404L							●		●													0.12~0.30	1.00~3.50
			160408L							●		●													0.15~0.35	1.30~3.40

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B169	**PTFNR/L**	B159, 189	**WTJNR/L**	B161
MTFNR/L	B169	**PTGNR/L**	B159	**WTXNR/L**	B161
MTGNR/L	B170	**PTTNR/L**	B160		
MTJNR/L	B170	**WTENN**	B161		

VN○○



Dimensions (mm)			
Size	d	t	d1
16	9.525	4.76	3.81

Rhombic 35° Negative

Workpiece																									
Steel	P	●	⇄	✱	●	⇄	●	⇄	⇄	✱	✱	●	⇄		✱										
Stainless steel	M									⇄	⇄		●	⇄	✱	⇄	✱		●	⇄	⇄				
Cast iron	K	●	⇄	✱	●	⇄	⇄				⇄	⇄											●	⇄	
Non-ferrous metal	N																						●	⇄	
Heat resistant alloy, Titanium alloy	S										●			●	●	⇄	✱	●	●	⇄			●	⇄	
Hardened steel	H																		⇄	✱			●	⇄	

Machining types
- ● Continuous cutting
- ⇄ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	Coated NC3120	Coated NC3225	Coated NC3030	Coated NC5330	Coated NC6315	Coated NC9115	Coated NC9125	Coated NC9135	Coated PC5300	Coated PC5400	Coated PC8105	Coated PC8110	Coated PC8115	Coated PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (mm/rev)	Cutting Condition ap (mm)
Medium to finishing	HA 	VNGG	160408-HA																							0.10~0.40	0.80~3.50
Medium	VP3 	VNGG	160404-VP3																	●	●	●		●		0.05~0.30	0.10~3.00
			160408-VP3																							0.10~0.45	0.50~5.00
Finishing	VB 	VNMG	160404-VB	●		●	●	●	●		●		●													0.10~0.35	0.30~1.50
			160408-VB	●		●	●	●	●		●		●													0.15~0.45	0.50~2.00
			160412-VB																							0.20~0.45	0.80~2.50
Finishing	VF 	VNMG	160402-VF		●					●																0.06~0.20	0.30~1.00
			160404-VF	●	●					●			●													0.08~0.30	0.50~1.50
			160408-VF	●						●	●		●													0.10~0.40	0.50~1.50
			160412-VF																							0.15~0.50	0.50~1.50
Finishing (Mild steel)	VL 	VNMG	160404-VL	●		●							●													0.05~0.20	0.10~1.00
			160408-VL	●		●					●		●													0.10~0.25	0.20~1.50
			160412-VL																							0.15~0.30	0.50~2.00
Medium to finishing	HA 	VNMG	160404-HA																					●		0.08~0.35	0.50~3.00
			160408-HA																							0.10~0.40	0.80~3.50
Medium to finishing	LP new 	VNMG	160404-LP																							0.10~0.35	0.30~1.50
			160408-LP																							0.10~0.40	0.50~2.00
			160412-LP																							0.10~0.45	0.80~2.50
Medium to finishing	VC 	VNMG	160404-VC	●			●				●															0.10~0.35	0.30~2.00
			160408-VC	●							●															0.15~4.00	0.50~3.00
			160412-VC																							0.15~0.40	0.80~3.00

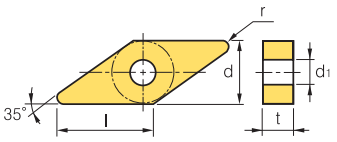
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MVJNR/L	B170	MVVNN	B171
MVQNR/L	B171	MVUNR/L	B193

VN○○

Rhombic 35° Negative



Dimensions (mm)			
Size	d	t	d1
16	9.525	4.76	3.81
22	12.7	4.76	5.16

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

Inserts		Designation		Cermet			Coated		Coated											Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing (Cermet)	VQ	VNMG	160404-VQ	●	●	●	●	●																		0.10~0.40	0.50~3.50
			160408-VQ	●	●	●	●	●																		0.12~0.45	0.50~3.50
			160412-VQ																							0.15~0.45	0.80~3.50
Medium	MK new	VNMG	160404-MK											●												0.08~0.45	0.50~3.00
			160408-MK											●												0.10~0.50	1.00~3.50
			160412-MK											●												0.20~0.50	1.50~4.00
Medium	MM new	VNMG	160404-MM													●	●					●	●			0.10~0.40	0.50~4.80
			160408-MM													●	●					●	●			0.12~0.45	0.50~4.80
			160412-MM																							0.15~0.60	0.50~4.00
Medium	MP new	VNMG	160404-MP						●		●		●		●	●	●			●	●					0.10~0.40	0.40~3.50
			160408-MP						●		●		●		●	●	●			●	●					0.15~0.45	0.50~4.00
			160412-MP						●				●													0.15~0.50	0.80~4.50
Medium	RM new	VNMG	160404-RM																							0.10~0.50	2.00~5.00
			160408-RM																							0.15~0.55	2.00~5.00
			160412-RM																							0.20~0.60	2.00~5.00
Medium	VM	VNMG	160404-VM	●								●	●					●	●							0.08~0.45	0.50~3.50
			160408-VM	●						●	●	●	●					●	●		●		●			0.10~0.50	1.00~4.00
			160412-VM																							0.20~0.50	1.50~4.00
			220404-VM																							0.08~0.45	1.00~5.00
			220408-VM																							0.10~0.50	1.50~5.00
Medium	VP3	VNMG	160404-VP3															●	●	●	●	●			●	0.05~0.30	0.10~3.00
			160408-VP3															●	●	●	●	●		●	●	0.10~0.45	0.50~5.00

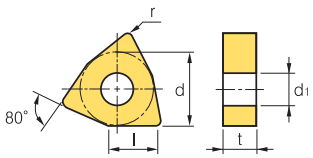
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MVJNR/L	B170	MVVNN	B171
MVQNR/L	B171	MVUNR/L	B193

WN○○

Trigon 80° Negative



Dimensions (mm)			
Size	d	t	d1
06	9.525	4.76	3.81
08	12.7	4.76	5.16

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ⬌ ⬌ ✱ ✱ ● ⬌ ✱ ⬌ ✱ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ⬌ ● ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	● ● ⬌ ✱ ● ● ⬌ ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	VP3 	WNGG	080404-VP3																	●	●	●		●		0.10~0.45	0.50~5.00
Roughing		WNMA	060404																							0.10~0.30	0.50~3.00
			060408											●												0.10~0.30	0.50~3.00
			060412																							0.10~0.40	1.00~3.00
			080404											●												0.15~0.60	1.00~5.00
			080408											●												0.15~0.60	1.00~6.00
			080412											●												0.15~0.70	1.50~6.00
			080416																							0.15~0.70	1.50~6.00
Finishing	VB 	WNMG	080404-VB						●		●		●													0.10~0.35	0.30~1.50
			080408-VB						●		●		●													0.15~0.45	0.50~2.00
			080412-VB																							0.18~0.45	0.80~2.50
Finishing	VF 	WNMG	060404-VF		●								●													0.07~0.30	0.50~1.50
			060408-VF																							0.10~0.40	0.50~1.50
			080404-VF							●			●													0.07~0.30	0.50~1.50
			080408-VF										●													0.10~0.40	0.50~1.50
			080412-VF																							0.20~0.50	0.50~1.50
Finishing (Mild steel)	VL 	WNMG	060404-VL																							0.05~0.25	0.20~1.50
			080404-VL																							0.05~0.25	0.10~1.00
			080408-VL						●		●		●													0.10~0.35	0.20~1.50
Finishing (wiper)	VW 	WNMG	080404-VW																							0.10~0.30	0.50~3.00
			080408-VW																							0.15~0.50	0.50~4.00
Medium to finishing	HA 	WNMG	060404-HA																					●		0.05~0.30	0.10~3.00
			060408-HA																					●		0.10~0.40	0.80~3.50
			080404-HA																					●		0.05~0.30	0.80~3.50
			080408-HA																					●		0.10~0.40	0.80~3.50
			080412-HA																							0.13~0.55	0.80~3.50

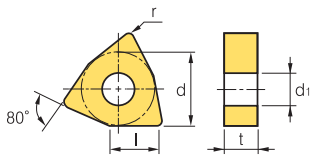
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	WWLNR/L	B162
PWLNR/L	B190		

WN○○

Trigon 80° Negative



Dimensions (mm)			
Size	d	t	d1
06	9.525	4.76	3.81
08	12.7	4.76	5.16

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⧓ General cutting
Cast iron	K		⧑ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

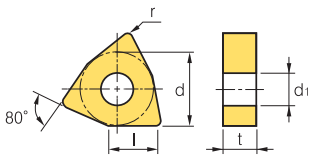
Inserts		Designation	Cermet			Coated		Coated												Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing	LP new	WNMG 060408-LP																						0.10~0.30	0.30~1.50
		080404-LP						●		●		●												0.10~0.35	0.30~2.00
		080408-LP						●		●		●												0.10~0.40	0.50~2.50
		080412-LP						●		●		●												0.13~0.45	0.80~3.00
Medium to finishing	VC	WNMG 080404-VC																						0.15~0.40	0.15~4.00
		080408-VC						●		●														0.15~0.45	0.15~4.50
		080412-VC						●		●		●												0.15~0.45	0.15~4.50
Medium to finishing	VP2	WNMG 080404-VP2															●	●		●				0.10~0.45	0.50~5.00
		080408-VP2															●	●	●	●	●		●	0.12~0.50	0.50~5.00
		080412-VP2															●	●	●	●	●		●	0.05~0.30	0.10~3.00
Medium to finishing (Cermet)	VQ	WNMG 060404-VQ																						0.05~0.30	0.50~4.00
		060408-VQ																						0.08~0.30	0.80~4.00
		060412-VQ																						0.10~0.30	1.00~4.00
		080404-VQ	●		●	●	●																	0.05~0.30	0.50~4.00
		080408-VQ	●		●	●	●																	0.08~0.40	0.80~4.00
		080412-VQ																						0.10~0.35	0.80~3.50
Medium	MK new	WNMG 060408-MK											●											0.08~0.30	0.80~2.50
		080404-MK											●											0.10~0.45	1.00~3.00
		080408-MK											●											0.10~0.50	1.00~3.50
		080412-MK											●											0.10~0.50	1.00~4.00
		080416-MK																						0.13~0.50	1.20~4.20
Medium	MM new	WNMG 060404-MM																				●		0.08~0.35	0.50~4.00
		060408-MM																				●		0.10~0.40	0.50~4.00
		060412-MM																				●		0.12~0.45	0.50~4.00
		080404-MM													●	●	●				●	●		0.10~0.40	0.50~4.00
		080408-MM												●	●	●	●				●	●		0.12~0.45	0.50~4.00
		080412-MM												●	●	●	●				●	●		0.15~0.60	0.50~4.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	WWLNR/L	B162
PWLNR/L	B190		

WN○○



Dimensions (mm)			
Size	d	t	d1
06	9.525	4.76	3.81
08	12.7	4.76	5.16

Trigon 80° Negative

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	MP	WNMG	060404-MP						●		●		●												0.10~0.40	0.40~2.80
			060408-MP						●		●		●												0.15~0.45	0.50~3.00
			060412-MP																						0.15~0.50	0.80~3.20
			080404-MP						●		●		●		●	●	●			●	●	●			0.10~0.40	0.40~4.00
			080408-MP						●		●		●		●	●	●			●	●	●			0.15~0.45	0.50~4.50
			080412-MP						●		●		●		●	●	●			●	●				0.15~0.50	0.80~5.00
			080416-MP																						0.18~0.55	0.10~5.00
Medium	VM	WNMG	060404-VM										●					●	●						0.10~0.45	1.00~3.50
			060408-VM							●	●		●					●	●						0.10~0.50	1.00~4.00
			060412-VM																						0.13~0.60	1.30~4.00
			080404-VM							●			●					●	●						0.05~0.30	0.90~5.00
			080408-VM							●		●	●					●	●		●		●		0.10~0.50	1.00~5.00
			080412-VM							●			●					●	●						0.10~0.50	1.00~5.00
			080416-VM																						0.10~0.50	1.20~5.00
Medium	VP3	WNMG	080404-VP3															●	●	●	●	●		●	●	0.10~0.45	0.50~5.00
			080408-VP3															●	●	●	●	●		●	●	0.12~0.50	0.50~5.00
			080412-VP3															●	●	●	●	●		●	●	0.05~0.30	0.10~3.00
Medium (wiper)	LW	WNMG	060408-LW																						0.15~0.60	0.50~3.50
			060412-LW																						0.20~0.70	0.80~3.50
			080408-LW										●												0.15~0.60	1.00~5.00
			080412-LW																						0.20~0.70	1.00~6.00
Medium to roughing	B25	WNMG	080404-B25						●		●		●												0.17~0.45	1.00~5.00
			080408-B25						●		●	●	●												0.23~0.60	1.50~5.00
			080412-B25						●		●		●												0.25~0.60	2.00~5.00
Roughing	GR	WNMG	080404-GR																						0.15~0.50	0.08~6.00
			080408-GR							●		●	●												0.20~0.50	1.00~7.00
			080412-GR							●		●	●												0.25~0.50	1.30~7.00
			080416-GR																						0.25~0.60	1.80~6.00

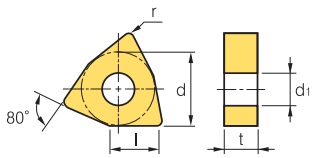
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	WWLNR/L	B162
PWLNR/L	B190		

WN○○

Trigon 80° Negative



Dimensions (mm)			
Size	d	t	d1
06	9.525	4.76	3.81
08	12.7	4.76	5.16
10	15.875	6.35	6.35
13	19.05	6.35	7.93

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation	Cermet			Coated		Coated												Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Roughing	RK new	WNMG 080404-RK											●												0.23~0.50	1.50~6.00
		WNMG 080408-RK											●												0.23~0.53	1.50~6.00
		WNMG 080412-RK											●												0.28~0.53	1.80~6.00
		WNMG 080416-RK											●												0.25~0.60	2.00~6.00
Roughing	RM new	WNMG 060404-RM																							0.10~0.50	1.50~3.00
		WNMG 060408-RM																							0.15~0.55	1.50~3.00
		WNMG 060412-RM																							0.20~0.60	1.50~3.00
		WNMG 080404-RM													●	●	●				●	●			0.10~0.50	2.00~4.00
		WNMG 080408-RM												●	●	●	●				●	●			0.15~0.55	2.00~4.00
		WNMG 080412-RM												●	●	●	●				●				0.20~0.60	2.00~4.00
Roughing	VP4 new	WNMG 080408-VP4																			●				0.15~0.35	1.00~4.00
		WNMG 080412-VP4																			●				0.20~0.40	1.00~4.00
Roughing	VR	WNMG 080408-VR																							0.25~0.55	1.20~7.00
		WNMG 080412-VR																							0.30~0.60	1.50~7.00
Medium to roughing	B25	WNMM 100608-B25									●														0.30~0.80	3.00~8.00
		130612-B25																							0.40~0.90	4.00~10.00
Medium (Shaft)	SH	WNMX 080404R-SH																							0.15~0.30	1.00~4.00
		080408R-SH																							0.15~0.50	1.50~5.00
		080404L-SH																							0.15~0.30	1.00~4.00
		080408L-SH																							0.15~0.50	1.50~5.00

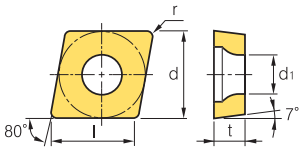
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNR/L	B171	WWLNR/L	B162
PWLNR/L	B190		

CC○○

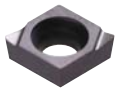
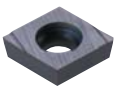
Rhombic 80° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
03	3.5	1.39	1.9
04	4.3	1.79	2.3
06	6.35	2.38	2.8
09	9.525	3.97	4.4

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⬬	✱	●	⬬	●	⬬	⬬	✱	✱	●	⬬		✱								
	Stainless steel	M									⬬	✱		●	⬬	✱	⬬	✱		●	⬬	⬬		
	Cast iron	K	●	⬬	✱	●	⬬	⬬				✱	⬬										●	⬬
	Non-ferrous metal	N																					●	⬬
	Heat resistant alloy, Titanium alloy	S										●			●	●	⬬	✱	●	●	⬬		●	⬬
	Hardened steel	H																		⬬	✱		●	⬬

Machining types
- ● Continuous cutting
- ⬬ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing		CCET	0301005R																							0.01~0.05	0.10~0.30
			030101R																							0.01~0.05	0.10~0.30
			030102R																							0.01~0.05	0.10~0.30
			030104R																							0.01~0.05	0.10~0.30
			0401005R																							0.01~0.10	0.10~0.50
			040101R																							0.01~0.10	0.10~0.50
			040102R																							0.01~0.10	0.10~0.50
			040104R																							0.01~0.10	0.10~0.50
			0301005L																							0.01~0.05	0.10~0.30
			030101L																							0.01~0.05	0.10~0.30
			030102L		●																		●	●		0.01~0.05	0.10~0.30
			030104L																							0.01~0.05	0.10~0.30
			0401005L																							0.01~0.10	0.10~0.50
			040101L																							0.01~0.10	0.10~0.50
			040102L		●																		●	●		0.01~0.10	0.10~0.50
			040104L																							0.01~0.10	0.10~0.50
Finishing (High precision)	KF 	CCET	0602005MFR-KF																							0.01~0.06	0.04~1.30
			060201MFR-KF																		●					0.02~0.08	0.05~1.50
			060202MFR-KF																		●					0.03~0.11	0.06~1.70
			09T3005MFR-KF																							0.02~0.08	0.05~1.50
			09T301MFR-KF																		●					0.03~0.11	0.06~1.70
			09T302MFR-KF																		●					0.04~0.15	0.08~2.00
			0602005MFL-KF																							0.01~0.06	0.04~1.30
			060201MFL-KF																							0.02~0.08	0.05~1.50
			060202MFL-KF																							0.03~0.11	0.06~1.70
			09T3005MFL-KF																							0.02~0.08	0.05~1.50
			09T301MFL-KF																							0.03~0.11	0.06~1.70
			09T302MFL-KF																							0.04~0.15	0.08~2.00
Medium to finishing (High precision)	KM 	CCET	0602005MFR-KM																							0.01~0.06	0.04~1.30
			060201MFR-KM																		●					0.02~0.08	0.05~1.50
			060202MFR-KM																		●					0.03~0.11	0.06~1.70
			09T3005MFR-KM																							0.02~0.08	0.05~1.50
			09T301MFR-KM																		●					0.03~0.11	0.06~1.70
			09T302MFR-KM																		●					0.04~0.15	0.08~2.00
			0602005MFL-KM																							0.01~0.06	0.04~1.30
			060201MFL-KM																							0.02~0.08	0.05~1.50
			060202MFL-KM																							0.03~0.11	0.06~1.70
			09T3005MFL-KM																							0.02~0.08	0.05~1.50
			09T301MFL-KM																							0.03~0.11	0.06~1.70
			09T302MFL-KM																							0.04~0.15	0.08~2.00

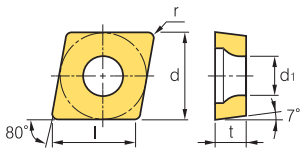
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	**SCLCR/L**	B109, 172, 194, 204

CC○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
09	9.525	3.97	4.4

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ⬌ ✱ ⬌ ⬌ ● ⬌ ✱ ⬌ ✱ ● ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ⬌ ● ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	⬌ ● ⬌ ⬌ ● ⬌ ⬌
Heat resistant alloy, Titanium alloy	S	● ⬌ ✱ ● ⬌ ⬌ ✱ ⬌ ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	KF	CCGT 0602003R-KF																						0.01~0.06	0.04~1.30
		060201R-KF																						0.02~0.08	0.05~1.50
		060202R-KF																						0.03~0.11	0.06~1.70
		09T3003R-KF																						0.02~0.08	0.05~1.50
		09T301R-KF																						0.03~0.11	0.06~1.70
		09T302R-KF																						0.04~0.15	0.08~2.00
		0602003L-KF																						0.01~0.06	0.04~1.30
		060201L-KF																						0.02~0.08	0.05~1.50
		060202L-KF																						0.03~0.11	0.06~1.70
		09T3003L-KF																						0.02~0.08	0.05~1.50
		09T301L-KF																						0.03~0.11	0.06~1.70
		09T302L-KF																						0.04~0.15	0.08~2.00
Finishing	VP1	CCGT 060201-VP1															●		●	●	●		●		0.05~0.06	0.06~1.00
		060202-VP1															●		●	●	●		●		0.03~0.10	0.08~1.50
		060204-VP1															●		●	●	●		●		0.05~0.12	0.10~1.50
		09T301-VP1															●		●	●	●		●		0.03~0.13	0.06~1.00
		09T302-VP1															●		●	●	●		●		0.04~0.15	0.08~1.50
		09T304-VP1															●		●	●	●		●		0.06~0.20	0.10~1.50
Finishing (High precision)	VP1	CCGT 060201MFN-VP1																		●					0.03~0.06	0.06~1.00
		060202MFN-VP1																		●					0.03~0.10	0.08~1.50
		060204MFN-VP1																		●					0.05~0.12	0.10~1.50
		09T301MFN-VP1																		●					0.03~0.13	0.06~1.00
		09T302MFN-VP1																		●					0.04~0.15	0.08~1.50
		09T304MFN-VP1																		●					0.06~0.20	0.10~1.50
Medium to finishing	KM	CCGT 0602003R-KM																							0.01~0.06	0.04~1.30
		060201R-KM																							0.02~0.08	0.05~1.50
		060202R-KM																				●			0.03~0.11	0.06~1.70
		09T3003R-KM																							0.02~0.08	0.06~1.50
		09T301R-KM																							0.03~0.11	0.06~1.70
		09T302R-KM																							0.04~0.15	0.08~2.00
		0602003L-KM																							0.01~0.06	0.04~1.30
		060201L-KM																							0.02~0.08	0.05~1.50
		060202L-KM																							0.03~0.11	0.06~1.70
		09T3003L-KM																							0.02~0.08	0.06~1.50
		09T301L-KM																							0.03~0.11	0.06~1.70
		09T302L-KM																							0.04~0.15	0.08~2.00

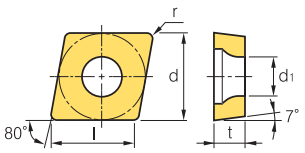
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	**SCLCR/L**	B109, 172, 194, 204

CC○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Workpiece																							Machining types
Steel	P	●	⬬	✱	●	⬬	●	⬬	⬬	✱	✱	●	⬬		✱								● Continuous cutting
Stainless steel	M									⬬	⬬		●	⬬	✱	⬬	✱		●	⬬	⬬		⬬ General cutting
Cast iron	K	●	⬬	✱	●	⬬	⬬				⬬	⬬									●	⬬	✱ Interrupted cutting
Non-ferrous metal	N																				●	⬬	
Heat resistant alloy, Titanium alloy	S									●			●	●	⬬	✱	●	●	⬬		●	⬬	
Hardened steel	H																	⬬	✱		●	⬬	

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VF	CCMT	060202-VF								●							●								0.05~0.20	0.30~1.00
			060204-VF	●		●					●							●								0.10~0.25	0.30~1.00
			09T302-VF								●															0.04~0.16	0.80~1.50
			09T304-VF	●	●	●					●							●								0.05~0.20	0.30~1.50
			09T308-VF			●					●		●					●								0.10~0.25	0.30~1.50
			120404-VF								●															0.07~0.22	0.10~2.00
Finishing	VL	CCMT	060204-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.04~0.10	0.08~0.90
			060208-VL						●		●		●													0.06~0.12	0.10~1.00
			09T304-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●		●	●	0.05~0.10	0.10~1.00
			09T308-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●		●	●	0.08~0.15	0.10~1.00
Finishing	VP1	CCMT	09T304-VP1																							0.06~0.20	0.10~1.50
			09T308-VP1																							0.08~0.20	0.50~2.00
			120404-VP1																							0.08~0.22	0.20~2.00
			120408-VP1																							0.10~0.25	0.50~2.00
			120412-VP1																							0.10~0.30	0.80~2.50
Medium to finishing	HMP	CCMT	060202-HMP																							0.03~0.12	0.10~1.50
			060204-HMP																							0.06~0.17	0.20~2.40
			060208-HMP																							0.08~0.23	0.40~2.40
			09T302-HMP																							0.07~0.22	0.10~2.00
			09T304-HMP																							0.08~0.23	0.30~3.00
			09T308-HMP																							0.10~0.30	0.50~3.00
			120404-HMP																							0.09~0.27	0.30~3.60
			120408-HMP																							0.24~0.36	1.00~3.60
			120412-HMP																							0.14~0.43	0.70~3.60

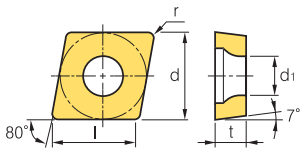
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	**SCLCR/L**	B109, 172, 194, 204

CC○○

Rhombic 80° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
08	7.94	3.18	3.4
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

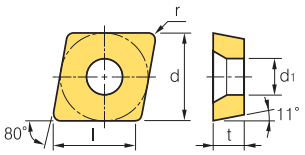
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	C25	CCMT	060202-C25	●	●	●	●	●	●		●	●	●					●	●		●					0.03~0.12	0.40~2.00
			060204-C25	●	●	●	●	●	●	●	●	●	●	●				●	●		●		●			0.05~0.15	0.60~2.30
			060208-C25	●		●	●	●	●		●	●	●	●				●	●		●					0.07~0.20	0.80~2.30
			080308-C25																							0.08~0.25	0.80~2.30
			09T302-C25																							0.05~0.20	0.50~2.50
			09T304-C25	●	●	●	●	●	●	●	●	●	●	●				●	●		●		●			0.08~0.25	0.80~3.00
			09T308-C25	●	●	●	●	●	●	●	●	●	●	●				●	●		●		●			0.10~0.30	1.00~3.00
			120404-C25						●		●	●	●	●				●	●		●					0.10~0.32	0.80~3.00
			120408-C25	●		●	●	●	●	●	●	●	●	●				●	●		●					0.12~0.36	1.20~3.50
			120412-C25						●		●		●	●												0.15~0.40	1.40~3.50
Medium	MP	CCMT	060202-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.04~0.12	0.20~1.50
			060204-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.05~0.15	0.30~1.50
			060208-MP											●												0.07~0.15	0.50~2.00
			09T302-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.07~0.15	0.30~2.00
			09T304-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.08~0.25	0.50~2.50
			09T308-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.10~0.30	0.50~2.50
			120404-MP											●												0.10~0.30	0.50~3.50
			120408-MP											●												0.15~0.35	0.80~3.50
			120412-MP																							0.25~0.40	1.00~3.50

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	**SCLCR/L**	B109, 172, 194, 204

CP ○○

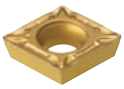
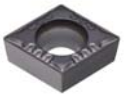


Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
08	7.94	2.38	3.4
09	9.525	3.18	4.4

Rhombic 80° Positive
Relief Angle: 11°

Workpiece																								
Steel	P	●	⇕	✱	●	⇕	●	⇕	⇕	✱	✱	●	⇕		✱									
Stainless steel	M									⇕	⇕		●	⇕	✱	⇕	✱		●	⇕	⇕			
Cast iron	K	●	⇕	✱	●	⇕	⇕				⇕	⇕										●	⇕	
Non-ferrous metal	N																					●	⇕	
Heat resistant alloy, Titanium alloy	S										●			●	●	⇕	✱	●	●	⇕		●	⇕	
Hardened steel	H																		⇕	✱		●	⇕	

Machining types
● Continuous cutting
⇕ General cutting
✱ Interrupted cutting

	Inserts	Designation		Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (mm/rev)	Cutting Condition ap (mm)
Finishing		CPGT	080202																							0.06~0.20	0.10~2.00
			080204	●	●																					0.08~0.20	0.30~2.00
			080208																							0.10~0.25	0.50~2.00
			090302																							0.04~0.20	0.30~1.50
			090304	●	●																					0.06~0.25	0.50~2.00
			090308																							0.08~0.30	0.70~2.50
Medium to finishing	HMP 	CPGT	090308-HMP																							0.05~0.20	0.70~2.00
Finishing	VF 	CPMT	080204-VF																							0.05~0.20	0.30~1.20
			080208-VF																							0.10~0.25	0.30~1.20
			090304-VF										●													0.05~0.20	0.30~1.50
			090308-VF										●													0.10~0.25	0.30~1.50
Finishing	VL 	CPMT	080204-VL																							0.03~0.08	0.08~1.00
			080208-VL																							0.04~0.12	0.10~1.00
			090304-VL																							0.05~0.10	0.10~1.00
			090308-VL																							0.08~0.15	0.10~1.00
Medium	C25 	CPMT	060204-C25																							0.05~0.15	0.60~2.30

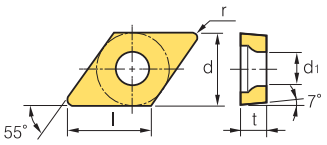
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCLPR/L	B195		

DC○○

Rhombic 55° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌	● Continuous cutting
Stainless steel	M	⬌ ✱ ⬌ ⬌ ✱ ● ⬌ ✱ ⬌ ⬌ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ✱ ⬌ ● ⬌ ✱ ⬌ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	● ● ⬌ ✱ ● ⬌ ⬌ ● ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing (High precision)	KF	DCET	0702005MFR-KF																						0.01~0.06	0.04~1.30
			070201MFR-KF																		●				0.02~0.08	0.05~1.50
			070202MFR-KF																		●				0.03~0.11	0.06~1.70
			11T3005MFR-KF																						0.02~0.08	0.05~1.50
			11T301MFR-KF																		●				0.03~0.11	0.06~1.70
			11T302MFR-KF																		●				0.04~0.15	0.08~2.00
			0702005MFL-KF																						0.01~0.06	0.04~1.30
			070201MFL-KF																		●				0.02~0.08	0.05~1.50
			070202MFL-KF																						0.03~0.11	0.06~1.70
			11T3005MFL-KF																						0.02~0.08	0.05~1.50
			11T301MFL-KF																						0.03~0.11	0.06~1.70
			11T302MFL-KF																						0.04~0.15	0.08~2.00
Medium to finishing (High precision)	KM	DCET	0702005MFR-KM																						0.01~0.06	0.04~1.30
			070201MFR-KM																		●				0.02~0.08	0.05~1.50
			070202MFR-KM																		●				0.03~0.11	0.06~1.70
			11T3005MFR-KM																						0.02~0.08	0.05~1.50
			11T301MFR-KM																		●				0.03~0.11	0.06~1.70
			11T302MFR-KM																		●				0.04~0.15	0.08~2.00
			0702005MFL-KM																						0.01~0.06	0.04~1.30
			070201MFL-KM																						0.02~0.08	0.05~1.50
			070202MFL-KM																						0.03~0.11	0.06~1.70
			11T3005MFL-KM																						0.02~0.08	0.05~1.50
			11T301MFL-KM																						0.03~0.11	0.06~1.70
			11T302MFL-KM																						0.04~0.15	0.08~2.00
Finishing	KF	DCGT	0702003R-KF																						0.01~0.06	0.04~1.30
			070201R-KF																						0.02~0.08	0.05~1.50
			070202R-KF																						0.03~0.11	0.06~1.50
			11T3003R-KF																						0.02~0.08	0.05~1.50
			11T301R-KF																						0.03~0.11	0.06~1.70
			11T302R-KF																				●		0.04~0.15	0.08~2.00
			0702003L-KF																						0.01~0.06	0.04~1.30
			070201L-KF																						0.02~0.08	0.05~1.50
			070202L-KF																						0.03~0.11	0.06~1.50
			11T3003L-KF																						0.02~0.08	0.05~1.50
			11T301L-KF																						0.03~0.11	0.06~1.70
			11T302L-KF																						0.04~0.15	0.08~2.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	**SDQCR/L**	B196
SDJCR/L	B109, 173	**SDUCR/L**	B197
SDNCN	B110, 173	**SDZCR/L**	B198

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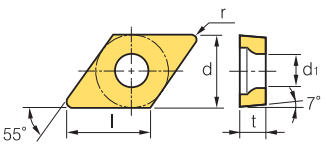


Dimensions (mm)			
Size	d	t	d1
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Rhombic **55° Positive**
Relief Angle: 7°

Workpiece			Machining types
Steel	P		● Continuous cutting
Stainless steel	M		⬌ General cutting
Cast iron	K		✱ Interrupted cutting
Non-ferrous metal	N		
Heat resistant alloy, Titanium alloy	S		
Hardened steel	H		

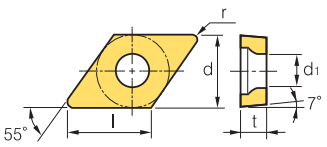
Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VP1	DCGT	070201-VP1															●		●	●	●		●		0.03~0.06	0.06~1.00
			070202-VP1															●		●	●	●		●		0.03~0.10	0.08~1.50
			070204-VP1															●		●	●	●		●		0.05~0.12	0.10~1.50
			11T301-VP1															●			●					0.03~0.13	0.06~1.00
			11T302-VP1															●		●	●	●		●		0.04~0.15	0.08~1.50
			11T304-VP1															●		●	●	●		●		0.06~0.20	0.10~1.50
Finishing (High precision)	VP1	DCGT	070201MFN-VP1																		●					0.03~0.06	0.06~1.00
			070202MFN-VP1																		●					0.03~0.10	0.08~1.50
			070204MFN-VP1																		●					0.05~0.12	0.10~1.50
			11T301MFN-VP1																		●					0.03~0.13	0.06~1.00
			11T302MFN-VP1																		●					0.04~0.15	0.08~1.50
			11T304MFN-VP1																		●					0.06~0.20	0.10~1.50
Medium to finishing	KM	DCGT	0702003R-KM																							0.01~0.06	0.04~1.30
			070201R-KM																							0.02~0.08	0.05~1.50
			070202R-KM																							0.03~0.11	0.06~1.50
			11T3003R-KM																							0.02~0.08	0.05~1.50
			11T301R-KM																							0.03~0.11	0.06~1.70
			11T302R-KM																							0.04~0.15	0.08~2.00
			0702003L-KM																							0.01~0.06	0.04~1.30
			070201L-KM																							0.02~0.08	0.05~1.50
			070202L-KM																							0.03~0.11	0.06~1.50
			11T3003L-KM																							0.02~0.08	0.05~1.50
			11T301L-KM																							0.03~0.11	0.06~1.70
			11T302L-KM																							0.04~0.15	0.08~2.00
Finishing	VF	DCMT	070202-VF			●					●															0.03~0.10	0.06~1.00
			070204-VF		●	●					●							●								0.05~0.20	0.30~1.20
			11T302-VF	●							●															0.04~0.15	0.08~1.50
			11T304-VF	●	●	●					●							●								0.05~0.20	0.30~1.50
			11T308-VF	●		●												●								0.10~0.25	0.30~1.50

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	**SDQCR/L**	B196
SDJCR/L	B109, 173	**SDUCR/L**	B197
SDNCN	B110, 173	**SDZCR/L**	B198

DC○○

Rhombic 55° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ⬌ ✱ ⬌ ⬌ ✱ ✱ ● ⬌ ✱ ⬌ ⬌ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ✱ ● ⬌ ● ⬌ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌ ● ⬌ ⬌ ● ⬌ ● ⬌ ✱ ✱ ● ⬌ ⬌
Heat resistant alloy, Titanium alloy	S	● ⬌ ● ⬌ ⬌ ⬌ ✱ ✱ ● ⬌ ⬌ ● ⬌ ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VL	DCMT	070202-VL																						0.02~0.10	0.06~0.80
			070204-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●		●	●	0.04~0.10	0.08~0.90
			070208-VL						●		●		●					●								0.06~0.12	0.10~1.00
			11T302-VL																							0.03~0.10	0.07~0.80
			11T304-VL	●		●	●	●	●		●		●		●	●	●	●	●		●				●	0.05~0.10	0.10~1.00
			11T308-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●		●	●	0.08~0.15	0.10~1.00
Finishing	VP1	DCMT	11T304-VP1																							0.06~0.20	0.10~1.50
			11T308-VP1																							0.08~0.23	0.10~1.50
Medium to finishing	HMP	DCMT	070202-HMP																							0.03~0.12	0.10~1.50
			070204-HMP																							0.06~0.17	0.20~2.30
			070208-HMP																							0.08~0.23	0.40~2.30
			11T302-HMP																							0.04~0.22	0.10~2.00
			11T304-HMP																							0.08~0.23	0.30~3.00
			11T308-HMP																							0.10~0.30	0.50~3.00
Medium	C25	DCMT	070202-C25	●	●	●	●	●	●		●		●					●	●		●					0.03~0.15	0.30~2.00
			070204-C25	●	●	●	●	●	●		●	●	●	●				●	●		●		●			0.05~0.20	0.50~2.50
			070208-C25	●		●	●	●	●		●	●		●				●	●		●					0.06~0.25	0.80~2.50
			11T302-C25	●	●	●	●	●	●		●		●					●	●		●					0.04~0.25	0.50~2.50
			11T304-C25	●	●	●	●	●	●		●	●	●	●				●	●		●				●	0.08~0.30	0.80~3.00
			11T308-C25	●		●	●	●	●	●	●	●		●				●	●		●		●			0.10~0.30	1.00~3.00
Medium	MP new	DCMT	070202-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.04~0.12	0.12~1.80
			070204-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.05~0.15	0.30~1.80
			070208-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.08~0.22	0.30~1.80
			11T302-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.04~0.15	0.30~2.00
			11T304-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.08~0.20	0.50~2.30
			11T308-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.10~0.30	0.50~2.30

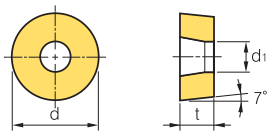
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	**SDQCR/L**	B196
SDJCR/L	B109, 173	**SDUCR/L**	B197
SDNCN	B110, 173	**SDZCR/L**	B198

RC○○

Round R° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
08	8.0	3.18	3.35
10	10.0	3.18	3.6
12	12.0	4.76	4.2
16	16.0	6.35	5.2
20	20.0	6.35	6.5
25	25.0	7.94	7.25
32	32.0	9.52	9.55

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
	Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
	Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌
	Non-ferrous metal	N																					●	⬌
	Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌		●	⬌
	Hardened steel	H																		⬌	✱		●	⬌

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	VM	RCMT	0803M0-VM																						0.05~0.30	0.80~2.50
			10T3M0-VM																						0.05~0.35	0.90~3.00
			1204M0-VM																						0.10~0.50	1.00~3.50
			1606M0-VM																						0.13~0.60	1.30~6.50
Medium		RCMX	1003M0									●	●	●											0.25~0.50	1.50~4.00
			1204M0							●		●	●	●											0.30~0.60	2.50~5.00
			1606M0									●	●	●											0.40~0.70	3.00~7.00
			2006M0									●		●											0.48~0.90	3.50~9.00
			2507M0									●		●											0.55~1.20	4.00~12.00
			3209M0									●		●											0.65~1.50	5.00~15.00

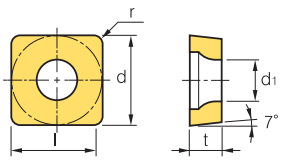
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
PRDCN	B156	**PRGCR/L**	B156

SC○○

Square 90° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.97	4.4

Workpiece			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
	Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱								
	Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌		
	Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌										●	⬌
	Non-ferrous metal	N																					●	⬌
	Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌		●	⬌
	Hardened steel	H																		⬌	✱		●	⬌

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

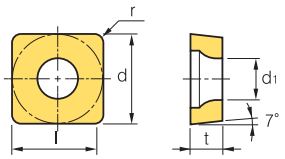
Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VF	SCMT	09T304-VF								●						●								0.05~0.20	0.30~1.50

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B174	**SSKCR/L**	B175, 198
SSDCN	B174	**SSSCR/L**	B175, 224

SC○○

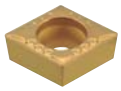


Dimensions (mm)			
Size	d	t	d1
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Square 90° Positive
Relief Angle: 7°

Workpiece																								
Steel	P	●	⇕	⌘	●	⇕	●	⇕	⇕	⌘	⌘	●	⇕		⌘									
Stainless steel	M									⇕	⇕		●	⇕	⌘	⇕	⌘		●	⇕	⇕			
Cast iron	K	●	⇕	⌘	●	⇕	⇕				⇕	⇕										●	⇕	
Non-ferrous metal	N																					●	⇕	
Heat resistant alloy, Titanium alloy	S										●			●	●	⇕	⌘	●	●	⇕		●	⇕	
Hardened steel	H																		⇕	⌘		●	⇕	

Machining types
- ● Continuous cutting
- ⇕ General cutting
- ⌘ Interrupted cutting

	Inserts	Designation		Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (mm/rev)	Cutting Condition ap (mm)
Finishing	VL 	SCMT	09T304-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.05~0.10	0.10~1.00
			09T308-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.08~0.15	0.10~1.00
Medium to finishing	HMP 	SCMT	09T304-HMP																							0.08~0.23	0.30~3.00
			09T308-HMP																							0.10~0.30	0.50~3.00
			120404-HMP																							0.09~0.27	0.30~3.60
			120408-HMP																							0.12~0.36	0.60~3.60
Medium	C25 	SCMT	060204-C25									●														0.08~0.25	0.40~2.50
			09T304-C25	●	●	●	●	●	●		●	●	●	●				●	●		●					0.08~0.25	0.60~3.00
			09T308-C25	●		●	●	●	●	●	●	●	●	●				●	●		●					0.10~0.30	1.00~3.00
			120404-C25	●		●	●	●	●		●		●	●				●	●		●		●			0.10~0.30	0.80~3.80
			120408-C25	●		●	●	●	●	●	●	●	●	●				●	●		●		●			0.12~0.38	1.20~3.80
Medium	MP  new	SCMT	09T304-MP						●		●			●	●	●	●			●	●					0.05~0.25	0.30~2.80
			09T308-MP						●		●		●	●	●	●	●			●	●					0.10~0.30	0.50~2.80
			120404-MP																							0.10~0.30	0.50~2.80
			120408-MP											●	●	●	●			●	●					0.15~0.35	0.80~3.50

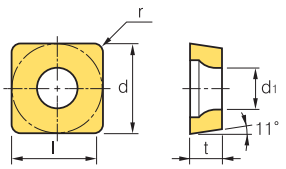
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B174	SSKCR/L	B175, 198
SSDCN	B174	SSSCR/L	B175, 224

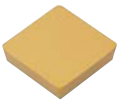
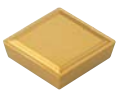
SP○○

Square **90° Positive**
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
07	7.94	2.38	-
09	9.525	3.18	3.4
12	12.7	4.76	-
15	15.875	4.76	-
19	19.05	4.76	-

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ⬌ ✱ ⬌ ⬌ ● ⬌ ✱ ⬌ ✱ ⬌ ● ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ⬌ ● ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	● ● ● ⬌ ✱ ● ⬌ ⬌ ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing		SPGA	060204																						0.50~0.25	0.50~2.00
			090308T	●	●																				0.10~0.25	0.70~3.00
			090308T-Z		●																				0.10~0.25	0.70~3.00
			(Z = Special Nega land)																							
Medium to finishing		SPGN	070202																						0.03~0.10	0.50~2.00
			070208																						0.10~0.25	0.70~3.00
			090302																						0.03~0.10	0.50~3.00
			090304																						0.08~0.20	0.70~3.50
			090308																						0.10~0.25	0.70~3.50
			120302																						0.03~0.20	0.50~3.00
			120304																						0.08~0.20	1.00~5.00
			120308									●													0.10~0.25	1.00~5.00
			120312																						0.15~0.30	1.00~5.00
			120316																						0.18~0.33	1.00~5.00
			120402																						0.03~0.20	0.50~3.00
			120404																						0.08~0.20	1.00~5.00
			120408																						0.10~0.25	1.00~5.00
			120412																						0.15~0.30	1.00~5.00
			120416																						0.18~0.33	1.00~5.00
			120430																						0.20~0.60	2.00~5.00
			120440																						0.25~0.70	3.00~5.00
			150404																						0.08~0.20	1.50~7.00
			150408																						0.10~0.25	1.50~7.00
			150412																						0.15~0.30	1.50~7.00
			150416																						0.18~0.33	1.50~7.00
			150420																						0.20~0.45	1.50~7.00
			190404																						0.08~0.20	1.50~9.00
			190408																						0.10~0.25	1.50~9.00
			190412																						0.15~0.45	1.50~9.00
			190416																						0.18~0.60	1.50~9.00
			190424																						0.25~0.70	2.50~9.00
Finishing	F 	SPGR	090304-F																						0.05~0.20	0.30~2.00
			120304-F																						0.10~0.25	0.50~2.00

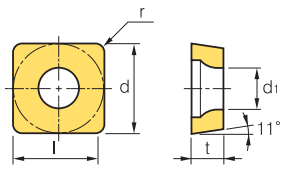
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
CSDPN	B163	**SSKPR/L**	B198
CSKPR/L	B164		

SP○○

Square **90° Positive**
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.18	3.4~4.4
12	12.7	3.18	-
15	15.875	4.76	-
19	19.05	4.76	-
25	25.4	6.35	-

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌	● Continuous cutting
Stainless steel	M	⬌ ● ⬌ ✱ ✱ ● ⬌ ✱ ⬌ ⬌ ✱ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ✱ ⬌ ● ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	● ● ⬌ ✱ ● ● ⬌ ⬌	
Hardened steel	H	⬌ ✱ ● ⬌	

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	M	SPGR	090308-M																						0.10~0.40	1.00~3.50
			120308-M																						0.20~0.40	1.50~4.00
Medium to finishing		SPGT	090304R																						0.08~0.23	0.30~3.00
			090308R																						0.10~0.30	0.50~3.00
			090304L		●																				0.08~0.23	0.30~3.00
			090308L																						0.10~0.30	0.50~3.00
Finishing	F	SPMR	090304-F																						0.05~0.20	0.30~2.00
			120304-F									●													0.10~0.25	0.50~2.00
Finishing	VF	SPMT	090304-VF																						0.05~0.20	0.30~1.50
			090308-VF																						0.10~0.25	0.30~1.50
Medium	M	SPMR	090308-M									●													0.10~0.40	1.00~3.50
			120308-M									●													0.10~0.40	1.50~4.00
			120312-M									●													0.20~0.40	1.50~4.00
Medium to finishing		SPUN	120304																						0.10~0.30	1.00~5.00
			120308																						0.15~0.40	1.00~5.00
			120308SN																						0.15~0.40	1.00~5.00
			150412																						0.20~0.50	1.00~5.00
			190412																						0.20~0.50	1.50~7.00
			190416																						0.25~0.60	2.00~7.00
			250620																						0.30~0.80	3.00~10.0

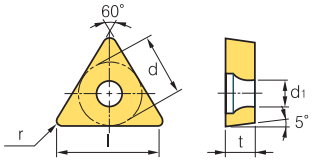
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
CSDPN	B163	**SSKPR/L**	B198
CSKPR/L	B164		

TB○○

Triangular **60° Positive**
Relief Angle: 5°



Dimensions (mm)			
Size	d	t	d1
06	3.97	1.59	2.16

Workpiece																						Machining types
Steel	P	●	⬌	✱	●	⬌	●	⬌	⬌	✱	✱	●	⬌		✱							● Continuous cutting
Stainless steel	M									⬌	⬌		●	⬌	✱	⬌	✱		●	⬌	⬌	⬌ General cutting
Cast iron	K	●	⬌	✱	●	⬌	⬌				⬌	⬌									●	✱ Interrupted cutting
Non-ferrous metal	N																				●	
Heat resistant alloy, Titanium alloy	S										●			●	●	⬌	✱	●	●	⬌	●	
Hardened steel	H																		●	✱	●	

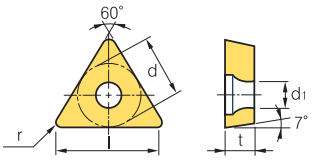
Inserts		Designation		Cermet			Coated		Coated															Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing		TBGT	**060102L**		●																		●	●		0.05~0.20	0.10~1.30
			060104L		●																					0.08~0.20	0.10~1.30
Finishing	VL 	TBMT	**060102-VL**																							0.03~0.06	0.05~0.60

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ●: Stock item

Available tool holders			
Designation	Page	Designation	Page
STUBR/L	B204		

TC ○○

Triangular **60° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
09	5.56	2.38	2.5
11	6.35	2.38	2.8
16	9.523	3.97	4.4

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌	● Continuous cutting
Stainless steel	M	⬌ ✱ ⬌ ⬌ ● ⬌ ✱ ⬌ ✱ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ✱ ● ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌	
Heat resistant alloy, Titanium alloy	S	● ● ● ⬌ ✱ ● ⬌ ⬌	
Hardened steel	H	⬌ ✱ ● ⬌	

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	KF	TCGT	0802003R-KF																						0.01~0.06	0.04~1.30
			080201R-KF																						0.02~0.08	0.05~1.50
			080202R-KF																						0.03~0.11	0.06~1.70
			0802003L-KF																						0.01~0.06	0.04~1.30
			080201L-KF																						0.02~0.08	0.05~1.50
			080202L-KF																						0.03~0.11	0.06~1.70
Finishing	VP1	TCGT	16T304-VP1																						0.06~0.20	0.10~1.50
			16T308-VP1																						0.08~0.23	0.10~1.50
Finishing	VF	TCMT	110202-VF																						0.03~0.13	0.06~0.70
			110204-VF		●													●							0.05~0.20	0.30~1.20
			110208-VF															●							0.10~0.25	0.30~1.20
			16T302-VF																						0.05~0.15	0.10~1.30
			16T304-VF								●		●					●							0.05~0.20	0.30~1.50
Finishing (Mild steel)	VL	TCMT	090208-VL																						0.08~0.20	0.10~1.20
			110204-VL																						0.05~0.15	0.10~1.30
			110208-VL																						0.08~0.20	0.10~1.30
			16T304-VL	●		●	●	●	●		●				●	●	●	●	●	●	●	●			0.05~0.20	0.30~1.50
			16T308-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●			0.05~0.20	0.30~1.50
Finishing	VP1	TCMT	16T304-VP1																						0.06~0.20	0.10~1.50
			16T308-VP1																						0.08~0.23	0.10~1.50
Medium to finishing	HMP	TCMT	090204-HMP																						0.06~0.17	0.20~2.30
			090208-HMP																						0.08~0.23	0.40~2.30
			110202-HMP																						0.03~0.15	0.10~1.50
			110204-HMP																						0.06~0.19	0.20~2.50
			110208-HMP																						0.09~0.26	0.40~2.50
			16T304-HMP																						0.08~0.23	0.30~3.00
			16T308-HMP																						0.10~0.30	0.50~3.00

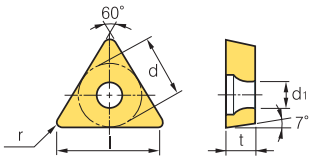
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STACR/L	B110, 175	**STTCR/L**	B176, 225
STFCR/L	B176, 224	**STWCR/L**	B225
STGCR/L	B176		

TC○○

Triangular 60° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
09	5.56	2.38	2.5
11	6.35	2.38	2.8
16	9.523	3.97	4.4

Workpiece			Machining types
Steel	P	● ⬣ ✱ ● ⬣ ● ⬣ ⬣ ✱ ✱ ● ⬣ ✱	● Continuous cutting
Stainless steel	M	⬣ ✱ ⬣ ⬣ ✱ ● ⬣ ✱ ⬣ ✱ ● ⬣ ⬣	⬣ General cutting
Cast iron	K	● ⬣ ✱ ● ⬣ ⬣ ✱ ⬣ ● ● ⬣	✱ Interrupted cutting
Non-ferrous metal	N	● ⬣
Heat resistant alloy, Titanium alloy	S	● ● ⬣ ✱ ● ● ⬣
Hardened steel	H	⬣ ✱ ● ⬣

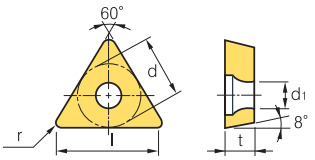
Inserts		Designation	Cermet			Coated		Coated													Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium	C25 	TCMT 090204-C25	●		●	●	●	●		●	●	●	●				●	●		●					0.06~0.18	0.40~2.50
		090208-C25	●		●	●	●	●		●		●	●				●	●		●					0.08~0.25	0.80~2.50
		110202-C25	●		●	●	●	●		●		●					●	●		●					0.04~0.12	0.40~2.00
		110204-C25	●	●	●	●	●	●		●	●	●	●				●	●		●					0.06~0.20	0.60~2.50
		110208-C25	●		●	●	●	●		●	●	●	●				●	●		●		●			0.08~0.25	0.80~2.50
		16T304-C25	●		●	●	●	●	●	●	●	●	●				●	●		●		●			0.08~0.28	0.80~3.00
		16T308-C25	●		●	●	●	●	●	●	●	●	●				●	●		●		●			0.10~0.30	1.00~3.00
Medium	MP 	TCMT 090204-MP												●	●	●									0.05~0.18	0.10~1.00
		090208-MP												●	●	●									0.08~0.20	0.10~1.20
		110202-MP						●		●		●		●	●	●			●	●					0.03~0.12	0.20~1.50
		110204-MP						●		●		●		●	●	●			●	●					0.05~0.15	0.20~15.0
		110208-MP						●		●		●		●	●	●			●	●					0.10~0.28	0.25~2.00
		16T304-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.08~0.20	0.30~2.50
		16T308-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.10~0.30	0.50~2.50
		16T312-MP						●		●		●		●	●	●			●	●	●				0.20~0.40	0.50~2.50

Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

TO○○

Triangular 60° Positive
Relief Angle: 8°



Dimensions (mm)			
Size	d	t	d1
06	3.97	1.59	2.15
09	5.56	2.38	2.8
14	8.2	3.0	3.8

Workpiece			Machining types
Steel	P	● ⬣ ✱ ● ⬣ ● ⬣ ⬣ ✱ ✱ ● ⬣ ✱	● Continuous cutting
Stainless steel	M	⬣ ✱ ⬣ ⬣ ✱ ● ⬣ ✱ ⬣ ✱ ● ⬣ ⬣	⬣ General cutting
Cast iron	K	● ⬣ ✱ ● ⬣ ⬣ ✱ ⬣ ● ● ⬣	✱ Interrupted cutting
Non-ferrous metal	N	● ⬣
Heat resistant alloy, Titanium alloy	S	● ● ⬣ ✱ ● ● ⬣
Hardened steel	H	⬣ ✱ ● ⬣

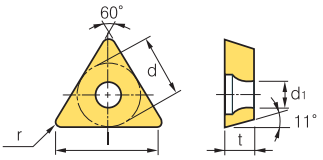
Inserts		Designation	Cermet			Coated		Coated													Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing		TOEH 060102L																							0.05~0.17	0.10~1.50
		090204L																							0.05~0.20	0.30~2.50
		140304L		●																					0.05~0.25	0.30~2.50

Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

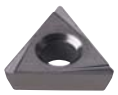
TP ○○

Triangular 60° Positive
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d1
08	4.76	2.38	2.3
09	5.56	2.38	-
11	6.35	2.38~3.18	3.4
16	9.525	3.18~4.76	4.4
22	12.7	4.76	-
27	15.875	4.76~6.35	-

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

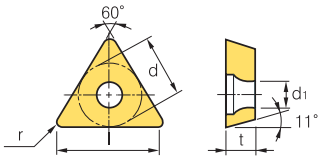
Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing		TPGH 080202L		●																				0.01~0.12	0.06~1.70
		080204L	●	●																				0.01~0.15	0.08~1.70
		110202L																						0.01~0.12	0.06~2.00
		110204L																						0.01~0.15	0.08~2.00
Medium to finishing		TPGN 090204																						0.07~0.20	0.70~2.00
		110302																						0.05~0.15	0.50~2.00
		110304									●												●	0.07~0.20	0.70~3.00
		110308									●												●	0.10~0.25	1.00~3.00
		160302																						0.05~0.18	1.00~5.00
		160304									●												●	0.07~0.20	1.00~5.00
		160308									●												●	0.10~0.25	1.00~5.00
		160310																						0.10~0.25	1.00~5.00
		160312																						0.15~0.30	1.00~5.00
		160316																						0.15~0.30	1.00~5.00
		160404																						0.07~0.20	1.00~5.00
		220404									●													0.07~0.20	1.50~7.00
		220408																						0.10~0.25	1.50~7.00
		220412									●													0.15~0.30	1.50~7.00
		220430																						0.30~0.45	1.50~7.00
		220440																						0.30~0.50	1.50~7.00
		270408																						0.15~0.25	3.00~8.00
		270608																						0.15~0.25	3.00~8.00
Finishing	F 	TPGR 110302-F																						0.05~0.15	0.10~1.50
		110304-F																						0.05~0.20	0.30~1.50
		160304-F																						0.08~0.25	0.50~2.00
Medium	M 	TPGR 110308-M																						0.13~0.30	1.00~3.00
		160308-M																						0.13~0.30	1.00~5.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25** ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B200	**STUPR/L**	B205
CTFPR/L	B164	**CTGPR/L**	B164

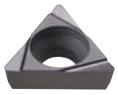
TP ○○

Triangular **60° Positive**
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d1
08	4.76	2.38	2.3
09	5.56	2.38	3.0
11	6.35	3.18	3.4
16	9.525	3.18~4.76	4.4
22	12.7	4.76	-

Workpiece			Machining types
Steel	P	● ⬣ ✱ ● ⬣ ● ⬣ ⬣ ✱ ✱ ● ⬣ ✱	● Continuous cutting
Stainless steel	M	⬣ ⬣ ⬣ ● ⬣ ✱ ✱ ⬣ ● ⬣ ✱ ⬣ ✱ ● ⬣ ⬣	⬣ General cutting
Cast iron	K	● ⬣ ✱ ● ⬣ ⬣ ⬣ ⬣ ⬣ ● ⬣ ⬣ ⬣ ● ⬣	✱ Interrupted cutting
Non-ferrous metal	N	● ⬣
Heat resistant alloy, Titanium alloy	S	● ● ⬣ ✱ ● ● ⬣ ⬣
Hardened steel	H	⬣ ✱ ● ⬣

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing		TPGT	080202R																					0.05~0.20	0.30~1.50
			110302R																					0.05~0.20	0.30~1.50
			110304R		●																			0.05~0.20	0.50~2.00
			110308R																					0.07~0.25	0.50~2.00
			160404R		●																			0.05~0.20	0.70~3.00
			160408R																					0.05~0.20	0.70~3.00
			080202L		●																	●	●	0.05~0.20	0.30~1.50
			110302L																					0.05~0.20	0.30~1.50
			110304L	●	●																			0.05~0.20	0.50~2.00
			110308L																					0.07~0.25	0.50~2.00
			160404L		●																			0.05~0.20	0.70~3.00
			160408L																					0.05~0.20	0.70~3.00
Medium to finishing		TPGX	090202L																					0.10~0.20	0.30~1.00
			090204L			●																		0.10~0.25	0.50~1.00
			090208L																					0.10~0.30	1.00~1.00
			110304L																					0.10~0.25	0.50~1.20
Finishing	F 	TPMR	090202-F																					0.05~0.15	0.10~1.00
			090204-F																					0.05~0.15	0.10~1.00
			110302-F																					0.05~0.15	0.10~1.50
			110304-F							●		●		●									●	0.05~0.20	0.30~1.50
			110308-F																					0.05~0.25	0.30~1.50
			160304-F							●		●	●								●		●	0.08~0.25	0.50~2.00
			160308-F																					0.08~0.25	0.50~3.00
Medium	M 	TPMR	110304-M																					0.10~0.25	0.70~3.00
			110308-M									●		●										0.13~0.30	1.00~3.00
			160304-M									●		●										0.10~0.25	1.00~5.00
			160308-M							●		●		●										0.13~0.30	1.00~5.00
			160312-M									●												0.15~0.35	1.00~5.00
			220408-M																					0.13~0.30	1.50~7.00

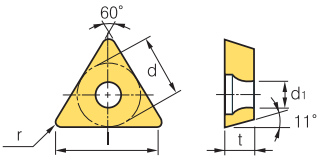
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B200	**STUPR/L**	B205
CTFPR/L	B164	**CTGPR/L**	B164

TP ○○

Triangular **60° Positive**
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d1
09	5.56	3.18	-
11	6.35	3.18	3.4
16	9.525	3.18~4.76	4.4
22	12.7	4.76	-
33	19.05	6.35	-

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts		Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	VF	TPMT	110304-VF		●						●		●					●							0.05~0.20	0.30~1.50
			110308-VF								●		●												0.10~0.25	0.30~1.50
			160404-VF																						0.05~0.20	0.30~2.00
			160408-VF																						0.10~0.25	0.30~2.00
Finishing	VL	TPMT	090204-VL																						0.04~0.10	0.10~0.90
			090208-VL																						0.06~0.12	0.10~1.00
			110304-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●			0.05~0.15	0.10~1.30
			110308-VL																						0.08~0.20	0.10~1.30
			160404-VL																						0.05~0.20	0.30~1.50
			160408-VL																						0.05~0.20	0.30~1.50
Medium to finishing	MP	TPMT	110304-MP	●		●	●	●											●	●						0.05~0.20	0.20~1.50
			110308-MP																						0.10~0.28	0.30~2.00
			160404-MP																						0.08~0.20	0.30~2.50
			160408-MP																						0.10~0.30	0.50~2.50
Medium to finishing		TPUN	090308																						0.10~0.30	0.50~2.00
			110208																						0.15~0.40	1.00~3.00
			110304																						0.10~0.30	1.00~3.00
			110308																						0.15~0.40	1.00~3.00
			160304																						0.10~0.30	1.00~5.00
			160308									●													0.15~0.40	1.00~5.00
			160308TN																						0.15~0.40	1.00~5.00
			160312																						0.20~0.50	1.50~5.00
			160312TN																						0.20~0.50	1.50~5.00
			220404																						0.10~0.30	1.50~7.00
			220408									●													0.15~0.40	1.50~7.00
			220412																						0.20~0.50	1.50~7.00
			220412TN																						0.20~0.50	1.50~7.00
			330620																						0.30~0.70	3.00~10.00

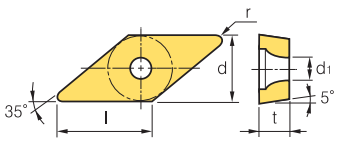
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B200	**STUPR/L**	B205
CTFPR/L	B164	**CTGPR/L**	B164

VB○○

Rhombic 35° Positive
Relief Angle: 5°



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.8
16	9.525	4.76	4.4

Workpiece			Machining types
Steel	P	● ⬢ ✱ ● ⬢	● Continuous cutting
Stainless steel	M	⬢ ✱ ⬢ ⬢ ✱	⬢ General cutting
Cast iron	K	● ⬢ ✱ ● ⬢	✱ Interrupted cutting
Non-ferrous metal	N	● ⬢
Heat resistant alloy, Titanium alloy	S	● ● ⬢ ✱ ● ● ⬢
Hardened steel	H	⬢ ✱ ● ⬢

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing	KF	VBGT	1103003R-KF																						0.01~0.06	0.04~1.30
			110301R-KF																						0.02~0.08	0.05~1.50
			110302R-KF																				●		0.03~0.13	0.06~1.70
			1103003L-KF																						0.01~0.06	0.04~1.30
			110301L-KF																						0.02~0.08	0.05~1.50
			110302L-KF																						0.03~0.13	0.06~1.70
Finishing	VP1	VBGT	160402-VP1																						0.04~0.20	0.16~1.50
			160404-VP1																						0.05~0.20	0.18~1.80
Medium to finishing		VBGT	160404																						0.07~0.20	0.50~1.50
			160408																						0.15~0.25	0.70~2.00
Medium to finishing	KM	VBGT	1103003R-KM																						0.01~0.06	0.04~1.30
			110301R-KM																						0.02~0.08	0.05~1.50
			110302R-KM																						0.03~0.13	0.06~1.70
			160404R-KM																						0.05~0.15	0.50~2.00
			1103003L-KM																						0.01~0.06	0.04~1.30
			110301L-KM																						0.02~0.08	0.05~1.50
			110302L-KM																						0.03~0.13	0.06~1.70
			160404L-KM																						0.05~0.15	0.50~2.00
Finishing	VB	VBMT	160404-VB	●		●					●														0.08~0.20	0.20~1.50
			160408-VB	●		●					●														0.10~0.23	0.50~1.50
Finishing	VF	VBMT	160404-VF	●	●	●					●		●					●			●				0.05~0.20	0.30~1.00
			160408-VF	●	●	●												●							0.10~0.25	0.30~1.00

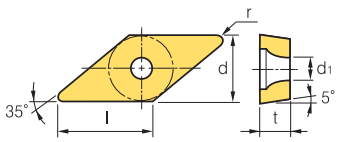
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	**SVVBN**	B178
SVHBR/L	B177	**SVQBR/L**	B202
SVJBR/L	B111, 177	**SVUBR/L**	B202

VB○○

Rhombic 35° Positive
Relief Angle: 5°



Dimensions (mm)			
Size	d	t	d1
11	6.35	2.38~3.18	2.8~3.4
16	9.525	4.76	4.4

Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

Machining types
- ● Continuous cutting
- ⬌ General cutting
- ✱ Interrupted cutting

Inserts		Designation		Cermet			Coated		Coated													Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing (Mild steel)	VL	VBMT	160404-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.05~0.20	0.30~1.50
			160408-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.10~0.20	0.30~1.50
			160412-VL												●	●	●		●	●	●					0.10~0.25	0.30~1.50
Finishing	VP1	VBMT	160402-VP1																							0.04~0.20	0.16~1.50
			160404-VP1																							0.05~0.20	0.18~1.80
			160408-VP1																							0.06~0.20	0.20~1.80
Medium to finishing		VBMT	160404		●					●		●											●			0.07~0.20	0.50~1.50
			160408							●		●											●			0.15~0.25	0.70~2.00
Medium to finishing	HMP	VBMT	110304-HMP																							0.03~0.20	0.15~2.70
			110308-HMP																							0.05~0.25	0.40~2.70
			160404-HMP																							0.07~0.20	0.20~2.70
			160408-HMP																							0.09~0.27	0.50~2.70
			160412-HMP																							0.11~0.32	0.50~2.70
Medium	MP new	VBMT	110304-MP																							0.05~0.15	0.20~1.50
			110308-MP																							0.10~0.28	0.30~2.00
			160404-MP	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●				0.08~0.20	0.30~2.00
			160408-MP	●		●	●	●	●		●		●	●	●	●	●	●	●	●	●	●				0.10~0.25	0.50~2.30
			160412-MP	●		●			●		●		●		●	●	●	●	●	●	●	●				0.10~0.35	0.50~2.30

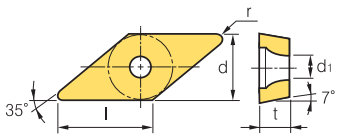
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	**SVVBN**	B178
SVHBR/L	B177	**SVQBR/L**	B202
SVJBR/L	B111, 177	**SVUBR/L**	B202

VC○○

Rhombic 35° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.8~3.4
16	9.525	4.76	4.4

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ⬌ ✱ ⬌ ● ⬌ ✱ ⬌ ⬌ ● ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ●	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌
Heat resistant alloy, Titanium alloy	S	● ● ⬌ ✱ ● ● ⬌ ⬌ ⬌ ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts		Designation	Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing (High precision)	KF	VCET 1103005MFR-KF																							0.01~0.06	0.04~1.30
		110301MFR-KF																		●					0.02~0.08	0.05~1.50
		110302MFR-KF																		●					0.03~0.11	0.06~1.70
		1103005MFL-KF																							0.01~0.06	0.04~1.30
		110301MFL-KF																							0.02~0.08	0.05~1.50
		110302MFL-KF																							0.03~0.11	0.06~1.70
Medium to finishing (High precision)	KM	VCET 1103005MFR-KM																							0.02~0.08	0.05~1.50
		110301MFR-KM																		●					0.03~0.11	0.06~1.70
		110302MFR-KM																		●					0.04~0.15	0.08~2.00
		1103005MFL-KM																							0.02~0.08	0.05~1.50
		110301MFL-KM																							0.03~0.11	0.06~1.70
		110302MFL-KM																							0.04~0.15	0.08~2.00
Finishing	KF	VCGT 1103003R-KF																							0.01~0.06	0.04~1.30
		110301R-KF																							0.02~0.08	0.05~1.50
		110302R-KF																				●			0.03~0.13	0.06~1.70
		1103003L-KF																							0.01~0.06	0.04~1.30
		110301L-KF																							0.02~0.08	0.05~1.50
		110302L-KF																							0.03~0.13	0.06~1.70
Finishing	KM	VCGT 1103003R-KM																							0.01~0.06	0.04~1.30
		110301R-KM																							0.02~0.08	0.05~1.50
		110302R-KM																				●			0.03~0.13	0.06~1.70
		1103003L-KM																							0.01~0.06	0.04~1.30
		110301L-KM																							0.02~0.08	0.05~1.50
		110302L-KM																							0.03 ~0.13	0.06~1.70
Finishing	VP1	VCGT 110301-VP1															●		●	●	●		●		0.02~0.15	0.05~0.50
		110302-VP1															●		●	●	●		●		0.02~0.18	0.10~1.00
		110304-VP1															●		●	●	●		●		0.03~0.18	0.15~1.20
		160404-VP1																							0.05~0.20	0.18~1.80
		160408-VP1																							0.06~0.20	0.20~1.80

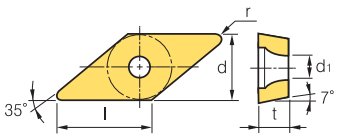
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B111, 178, 201	**SVQCR/L**	B202
SVVCN	B178	**SVUCR/L**	B202

VC○○

Rhombic 35° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
08	4.76	2.38	2.3
11	6.35	3.18	2.8~3.4
12	7.5	3.18	2.8
16	9.525	4.76	4.4

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	⬌ ⬌ ✱ ⬌ ⬌ ● ⬌ ✱ ⬌ ✱ ● ⬌ ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ⬌ ✱ ⬌ ● ⬌ ✱ ⬌ ⬌	✱ Interrupted cutting
Non-ferrous metal	N	● ⬌ ● ⬌ ⬌ ⬌ ✱ ⬌ ● ⬌ ✱ ⬌ ⬌	
Heat resistant alloy, Titanium alloy	S	● ⬌ ✱ ⬌ ⬌ ● ● ⬌ ✱ ● ⬌ ⬌ ⬌	
Hardened steel	H	⬌ ⬌ ✱ ⬌ ⬌ ⬌ ✱ ⬌ ⬌ ⬌ ⬌ ⬌ ⬌	

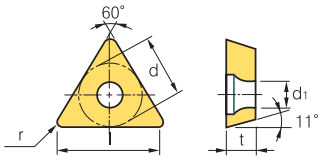
Inserts		Designation		Cermet			Coated		Coated												Uncoated		Cutting Condition	
				CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Finishing (High precision)	VP1	VCGT	110301MFN-VP1																		●					0.02~0.15	0.05~0.50
			110302MFN-VP1																		●					0.02~0.18	0.10~1.00
			110304MFN-VP1																		●					0.03~0.18	0.15~1.20
Finishing (High precision)	VP1	VCGX	120300MFR-VP1																							0.02~0.10	0.05~0.50
			120301MFR-VP1																							0.02~0.15	0.05~0.50
			120302MFR-VP1																							0.02~0.18	0.10~1.00
Finishing	VF	VCMT	080202-VF																							0.05~0.20	0.30~1.00
			080204-VF										●													0.10~0.25	0.30~1.00
			110304-VF								●															0.03~0.18	0.15~1.20
			160404-VF								●		●													0.04~0.20	0.15~1.50
Finishing (Mild steel)	VL	VCMT	080202-VL						●		●		●					●								0.03~0.08	0.10~0.80
			080204-VL						●		●		●					●								0.04~0.10	0.10~0.90
			160404-VL						●		●				●	●	●			●	●					0.05~0.20	0.30~1.50
			160408-VL						●		●				●	●	●			●	●					0.05~0.20	0.30~1.50
			160412-VL																							0.10~0.25	0.30~1.50
Finishing	VP1	VCMT	160404-VP1																							0.05~0.20	0.18~1.80
			160408-VP1																							0.06~0.20	0.20~1.80
Medium to finishing	HMP	VCMT	160404-HMP																							0.10~0.25	0.30~2.60
			160408-HMP																							0.13~0.33	0.60~2.60
Medium	MP new	VCMT	080202-MP																							0.03~0.15	0.10~1.00
			080204-MP																							0.05~0.18	0.10~1.00
			160404-MP						●		●			●	●	●	●			●	●					0.08~0.18	0.30~2.00
			160408-MP						●		●			●	●	●	●			●	●					0.10~0.23	0.50~2.30
			160412-MP											●	●	●	●			●	●					0.10~0.33	0.50~2.30

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B111, 178, 201	SVQCR/L	B202
SVVCN	B178	SVUCR/L	B202

VP ○○

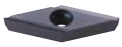


Dimensions (mm)			
Size	d	t	d1
08	6.35	2.38	2.3
11	6.35	3.18	2.8

Triangular 60° Positive
Relief Angle: 11°

Workpiece																								
Steel	P	●	⇄	✱	●	⇄	●	⇄	⇄	✱	✱	●	⇄		✱									
Stainless steel	M									⇄	⇄		●	⇄	✱	⇄	✱		●	⇄	⇄			
Cast iron	K	●	⇄	✱	●	⇄	⇄				⇄	⇄										●	⇄	
Non-ferrous metal	N																					●	⇄	
Heat resistant alloy, Titanium alloy	S										●			●	●	⇄	✱	●	●	⇄		●	⇄	
Hardened steel	H																		⇄	✱		●	⇄	

Machining types
● Continuous cutting
⇄ General cutting
✱ Interrupted cutting

Inserts		Designation		Cermet CN1500	Cermet CN2000	Cermet CN2500	Coated CC1500	Coated CC2500	Coated NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	Uncoated H01	Uncoated H05	Cutting Condition fn (mm/rev)	Cutting Condition ap (mm)
Finishing (High precision)	KF 	VPET	0802005MFR-KF																							0.01~0.12	0.05~0.50
			080201MFR-KF																		●					0.02~0.15	0.05~0.50
			080202MFR-KF																		●					0.02~0.18	0.10~1.00
			0802005MFL-KF																							0.01~0.12	0.05~0.50
			080201MFL-KF																							0.02~0.15	0.05~0.50
			080202MFL-KF																							0.02~0.18	0.10~1.00
			080201MFN-KF																							0.02~0.15	0.05~0.50
			080202MFN-KF																							0.02~0.18	0.10~1.00
Medium to finishing (High precision)	KM 	VPET	0802005MFR-KM																							0.01~0.12	0.05~0.50
			080201MFR-KM																		●					0.02~0.15	0.05~0.50
			080202MFR-KM																		●					0.02~0.18	0.10~1.00
			0802005MFL-KM																							0.01~0.12	0.05~0.50
			080201MFL-KM																							0.02~0.15	0.05~0.50
			080202MFL-KM																							0.02~0.18	0.10~1.00
Finishing	VP1 	VPGT	110301-VP1															●		●	●	●		●		0.02~0.15	0.05~0.50
			110302-VP1															●		●	●	●		●		0.02~0.18	0.10~1.00
			110304-VP1															●		●	●	●		●		0.03~0.18	0.15~1.20
Finishing (High precision)	VP1 	VPGT	110301MFN-VP1																		●					0.02~0.15	0.05~0.50
			110302MFN-VP1																		●					0.02~0.18	0.10~1.00
			110304MFN-VP1																		●					0.03~0.18	0.15~1.20

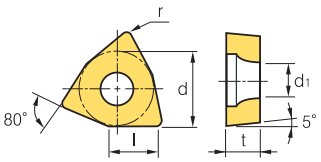
Cutting edge geometry A48~A55 Recommended chip breaker B04~B11 Code system B24~B25

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	SVVBN	B178
SVJBR/L	B111, 177		

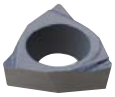
WB○○

Trigon 80° Positive
Relief Angle: 5°



Dimensions (mm)			
Size	d	t	d1
02	3.97	1.59	2.2
S3	4.76	2.38	2.4

Workpiece			Machining types
Steel	P	● ⬌ ✱ ● ⬌ ● ⬌ ⬌ ✱ ✱ ● ⬌ ✱	● Continuous cutting
Stainless steel	M	✱ ✱ ⬌ ⬌ ● ⬌ ✱ ⬌ ✱ ● ⬌	⬌ General cutting
Cast iron	K	● ⬌ ✱ ● ⬌ ⬌ ✱ ✱ ⬌ ⬌ ● ⬌	✱ Interrupted cutting
Non-ferrous metal	N	⬌ ✱ ● ⬌ ⬌
Heat resistant alloy, Titanium alloy	S	● ⬌ ✱ ● ⬌ ⬌ ✱ ● ⬌ ⬌
Hardened steel	H	⬌ ✱ ● ⬌

Inserts	Designation		Cermet			Coated		Coated														Uncoated		Cutting Condition	
			CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)
Medium to finishing		WBGT 020102R																						0.01~0.05	0.10~0.30
		S30204R																						0.01~0.10	0.10~0.50
		020102L		●																		●	●	0.01~0.08	0.10~0.40
		S30202L																						0.01~0.08	0.10~0.40
		S30204L																						0.01~0.10	0.10~0.50

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SWUBR/L	B206		

Technical Information for Aluminum

AK special chip breaker for aluminum

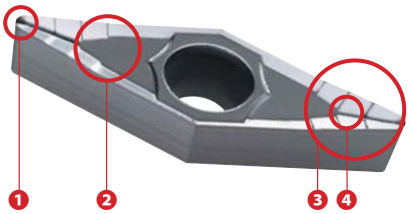
- Unique and 3-dimensional rake angle controls chip breaking and chip flow ensuring longer tool life and reducing cutting load
- High rake angle at cutting edge part reduces cutting load to increase tool life
- Buffed finish on top face controls chip flow reducing built-up edge



1. High rake angle & tabby pattern chip pocket - Low cutting load
2. Unique rake angle design - Effective chip breaking and good chip flow
3. Unique and 3-dimensional top face - Longer tool life & Excellent surface roughness
4. Tabby pattern & Sharp cutting edge - Distributing cutting load, long tool life
5. Buffed on top face - Excellent machining, Reducing built-up edge, Excellent chip flow

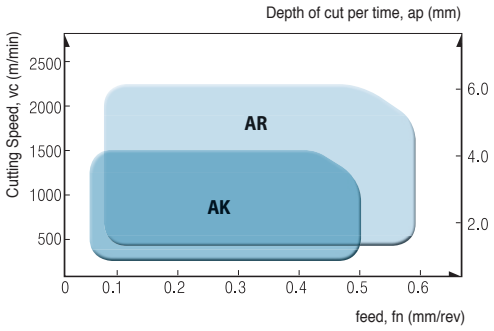
AR special chip breaker for aluminum

- AR chip breaker ensures reliability and good cutting performance at high feed, speed and interrupted machining

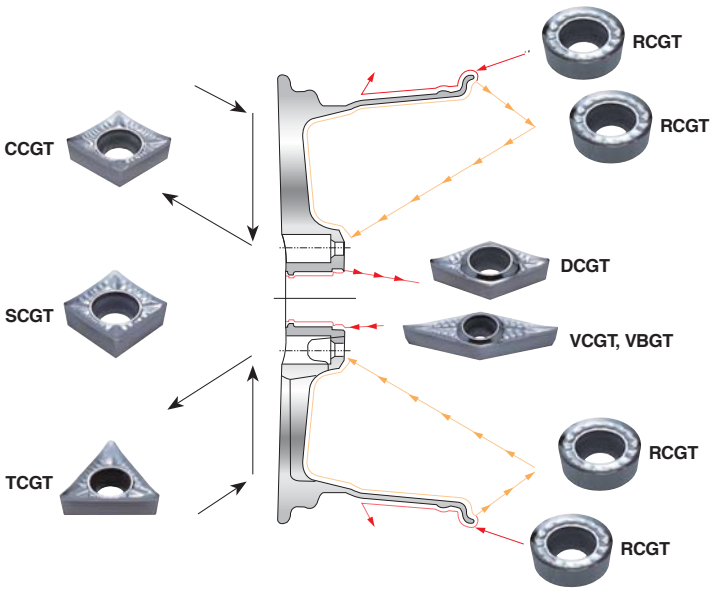


1. Flat corner cutting edge improved productivity at high feed machining and ensures good surface roughness and reliability owing to strong cutting edge
2. Specially buffed on top face controls chip flow reducing built-up edge
3. KORLOY's own technology applied for cutting edge and corner shape controlling chip flow ensures longer tool life
4. KORLOY special chip breaker design controls chip flow at high speed machining

AK and AR chip breaker specially developed for aluminum



	Recommendation range	Grades
AK	ap=0.1~5.0 ㎜ fn=0.03~0.5 ㎜/rev	H01 (Uncoated cemented carbides K10~K20) ND1000 (Diamond coating)
AR	ap=0.5~6.0 ㎜ fn=0.05~0.6 ㎜/rev	H01 (Uncoated cemented carbides K10~K20) ND1000 (Diamond coating) PD1000 (DLC coating)



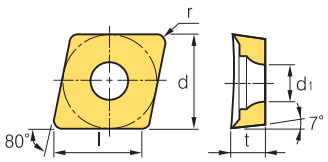
Features of H01 and cutting conditions

- Useful for aluminum and alloyed steel machining
- Buffed on top face reduced built-up edge
- 3-dimensional design reduced cutting load and shows good performance at high feed and speed machining

Workpiece		Hardness (HB)	kc (MPa)	vc (m/min)	fn (mm/rev)
Aluminum alloy (forged)	before heat treatment	50~70	500~600	1000~2500	0.1~0.6
	after heat treatment	90~110	700~900	300~1000	0.1~0.5
Aluminum alloy (cast)	before heat treatment	70~80	700~800	300~1000	0.1~0.6
	after heat treatment	80~100	800~950	200~600	0.1~0.4
Copper alloy	-	90~110	700	250~600	0.1~0.5
Non-ferrous metal, etc	-	100	1700	150~300	0.1~0.6

CC ○○

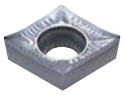
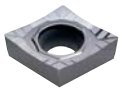
Rhombic 80° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◓	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
- ● Continuous cutting
- ◓ General cutting
- ✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (mm/rev)	ap (mm)
AK 	CCGT	060202-AK	●		●		0.01~0.12	0.05~3.00
		060204-AK	●		●		0.02~0.15	0.10~3.00
		060208-AK			●		0.02~0.20	0.10~4.00
		09T302-AK	●		●		0.02~0.20	0.05~3.00
		09T304-AK	●		●		0.02~0.30	0.10~5.00
		09T308-AK	●		●		0.03~0.50	0.10~5.00
		120402-AK			●		0.02~0.30	0.05~4.00
		120404-AK	●		●		0.03~0.50	0.10~5.00
		120408-AK			●		0.04~0.80	0.10~5.50
AR 	CCGT	060202-AR			●		0.02~0.30	0.30~4.00
		060204-AR					0.03~0.35	0.50~4.50
		060208-AR					0.04~0.50	0.50~4.50
		09T302-AR			●		0.03~0.45	0.30~4.00
		09T304-AR			●		0.04~0.50	0.50~4.50
		09T308-AR			●		0.05~0.60	0.50~6.00
		120402-AR					0.04~0.50	0.30~5.00
		120404-AR			●		0.05~0.60	0.50~6.00
		120408-AR			●		0.06~0.65	0.50~6.00
		120412-AR					0.08~0.70	0.50~6.50

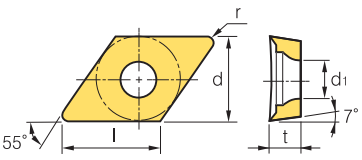
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B109, 172	**SCLCR/L**	B109, 172, 194

DC ○○

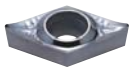
Rhombic 55° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◕	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◕ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (mm/rev)	ap (mm)
AK 	DCGT	070202-AK	●		●		0.01~0.20	0.05~3.00
		070204-AK	●		●		0.02~0.30	0.10~4.00
		070208-AK	●		●		0.03~0.40	0.10~4.00
		11T302-AK	●		●		0.02~0.30	0.05~4.00
		11T304-AK	●	●	●		0.03~0.50	0.10~5.00
		11T308-AK	●		●		0.03~0.50	0.10~5.00
		11T312-AK			●		0.04~0.60	0.15~5.00
AR 	DCGT	070202-AR			●		0.02~0.30	0.30~4.00
		070204-AR			●		0.03~0.40	0.50~5.00
		070208-AR			●		0.04~0.50	0.50~5.00
		11T302-AR					0.03~0.45	0.30~6.00
		11T304-AR			●		0.04~0.50	0.50~6.00
		11T308-AR			●		0.05~0.60	0.50~6.00
		11T312-AR			●		0.08~0.65	0.50~6.50

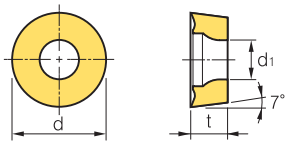
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B172	SDQCR/L	B196
SDJCR/L	B109, 173	SDUCR/L	B197
SDNCN	B110, 173	SDZCR/L	B198

RC ○○

Round **Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
06	6.0	2.38	2.8
08	8.0	3.18	3.35
10	10.0	3.18~3.97	4.4
12	12.0	4.76	4.4

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◆	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◆ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (mm/rev)	ap (mm)
AK 	RCGT	**0602M0-AK**			●		0.05~0.20	0.50~2.00
		0803M0-AK			●		0.05~0.25	0.50~2.50
		1003M0-AK			●		0.10~0.30	1.00~3.00
		10T3M0-AK					0.10~0.30	1.00~3.00
		1204M0-AK			●		0.10~0.35	1.00~3.50
AR 	RCGT	**0602M0-AR**					0.05~0.20	0.50~2.00
		0803M0-AR					0.05~0.25	0.50~2.50
		1003M0-AR			●		0.10~0.30	1.00~3.00
		10T3M0-AR					0.10~0.30	1.00~3.00
		1204M0-AR					0.10~0.35	1.00~3.50

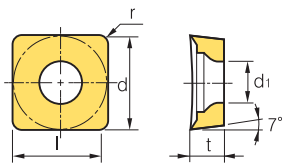
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SRDCN	B173	**SRGCR/L**	B174

SC ○○

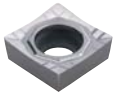
Square 90° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	✱	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
✱ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (mm/rev)	ap (mm)
AK 	SCGT	09T302-AK	●				0.02~0.30	0.10~4.00
		09T304-AK	●		●		0.04~0.40	0.10~5.00
		09T308-AK			●		0.03~0.40	0.10~5.00
		120404-AK			●		0.03~0.50	0.10~5.00
		120408-AK			●		0.04~0.60	0.15~5.50
		120416-AK					0.04~0.60	0.15~5.50
AR 	SCGT	09T302-AR					0.03~0.40	0.50~5.00
		09T304-AR			●		0.04~0.50	0.50~6.00
		09T308-AR					0.04~0.50	0.50~6.50
		120404-AR			●		0.05~0.60	0.50~6.50
		120408-AR					0.05~0.60	0.50~7.00
		120416-AR					0.05~0.60	0.50~7.00

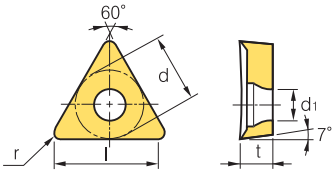
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B174	SSKCR/L	B175
SSDCN	B174	SSSCR/L	B175

TC ○○

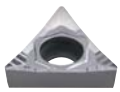
Triangular **60° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
09	5.56	2.38	2.5
11	6.35	2.38	2.8
16	9.525	3.97	4.4

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◉	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◉ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (mm/rev)	ap (mm)
AK 	TCGT	**090202-AK**			●		0.01~0.12	0.05~3.00
		090204-AK			●		0.02~0.15	0.10~4.00
		110202-AK	●		●		0.02~0.20	0.05~4.00
		110204-AK	●		●		0.03~0.30	0.10~4.00
		110208-AK			●		0.03~0.40	0.10~5.00
		16T302-AK			●		0.02~0.30	0.05~5.00
		16T304-AK			●		0.03~0.40	0.10~5.50
		16T308-AK			●		0.03~0.50	0.10~5.50
		16T312-AK			●		0.04~0.60	0.15~5.50
		16T316-AK			●		0.05~0.80	0.15~5.50
		16T325-AK					0.06~0.90	0.20~7.00
AR 	TCGT	**090202-AR**					0.02~0.18	0.30~3.00
		090204-AR			●		0.02~0.25	0.30~5.00
		110202-AR					0.02~0.30	0.30~4.00
		110204-AR			●		0.03~0.40	0.30~5.00
		110208-AR					0.04~0.45	0.50~6.00
		16T302-AR			●		0.03~0.45	0.30~5.00
		16T304-AR			●		0.04~0.50	0.50~6.00
		16T308-AR			●		0.05~0.60	0.50~6.00
		16T312-AR					0.06~0.65	0.50~6.00
		16T316-AR					0.08~0.70	0.50~6.50
		16T325-AR					0.10~0.10	0.80~7.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

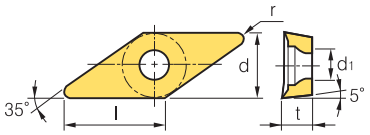
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STACR/L	B110	**STTCR/L**	B176, 225
STFCR/L	B176, 224	**STWCR/L**	B225
STGCR/L	B176		

VB ○○



Rhombic **35° Positive**
Relief Angle: 5°



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.8
16	9.525	4.76	4.4

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◕	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◕ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (mm/rev)	ap (mm)
AK 	VBGT	**110302-AK**			●		0.02~0.15	0.05~3.00
		110304-AK			●		0.02~0.15	0.10~4.00
		110308-AK					0.03~0.18	0.10~5.00
		160402-AK					0.03~0.30	0.05~4.00
		160404-AK			●		0.03~0.40	0.10~5.00
		160408-AK			●		0.03~0.50	0.10~5.00
		160412-AK					0.05~0.60	0.10~5.50
AR 	VBGT	**110302-AR**					0.02~0.35	0.30~3.00
		110304-AR					0.03~0.45	0.30~4.00
		110308-AR					0.03~0.50	0.50~6.00
		160402-AR					0.04~0.45	0.30~5.00
		160404-AR			●		0.04~0.50	0.50~6.00
		160408-AR			●		0.05~0.60	0.50~6.00
		160412-AR					0.05~0.70	0.50~6.50

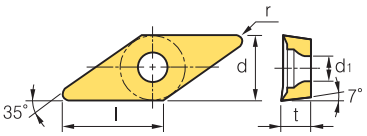
Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B177	**SVVBN**	B178
SVHBR/L	B177	**SVQBR/L**	B201
SVJBR/L	B111, 177	**SVUBR/L**	B202

VC ○○

Rhombic 35° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.8
13	7.94	3.18	3.4
16	9.525	4.76	4.4
22	12.7	5.56	5.6

Workpiece						
Steel	P					
Stainless steel	M					
Cast iron	K					
Non-ferrous metal	N	✱	●	◐	✱	
Heat resistant alloy, Titanium alloy	S					
Hardened steel	H					

Machining types
● Continuous cutting
◐ General cutting
✱ Interrupted cutting

Inserts	Designation		Coated		Uncoated		Cutting Condition	
			PC5040	PD1000	H01	H05	fn (mm/rev)	ap (mm)
AK 	VCGT	110301-AK					0.02~0.15	0.05~3.00
		110302-AK	●		●		0.02~0.20	0.05~3.00
		110304-AK	●		●		0.02~0.25	0.10~4.00
		110308-AK			●		0.03~0.30	0.10~5.00
		130302-AK	●		●		0.02~0.35	0.10~5.00
		130304-AK	●		●		0.03~0.35	0.10~5.00
		130308-AK					0.04~0.40	0.10~5.00
		160402-AK			●		0.02~0.30	0.05~5.00
		160404-AK		●	●		0.03~0.40	0.10~5.00
		160408-AK			●		0.03~0.50	0.10~5.00
		160412-AK			●		0.03~0.50	0.10~5.00
		220516-AK			●		0.03~0.60	0.10~7.00
		220525-AK					0.05~0.70	0.10~7.00
		220530-AK			●		0.08~1.00	0.10~7.00
AR 	VCGT	110301-AR					0.02~0.20	0.10~3.00
		110302-AR			●		0.02~0.25	0.30~3.00
		110304-AR			●		0.03~0.35	0.30~4.00
		110308-AR					0.04~0.45	0.50~6.00
		130302-AR					0.02~0.40	0.50~3.00
		130304-AR			●		0.03~0.45	0.50~4.00
		130308-AR					0.04~0.50	0.50~5.00
		160402-AR			●		0.03~0.40	0.30~5.00
		160404-AR			●		0.04~0.50	0.50~6.00
		160408-AR			●		0.05~0.60	0.50~6.00
		160412-AR					0.06~0.65	0.50~6.50
		220516-AR					0.10~0.65	0.80~6.50
		220525-AR					0.10~0.70	0.80~7.00
		220530-AR			●		0.12~0.75	1.00~7.00

Cutting edge geometry **A48~A55** Recommended chip breaker **B04~B11** Code system **B24~B25**

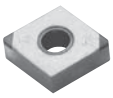
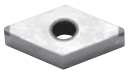
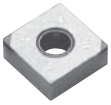
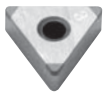
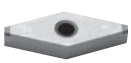
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B111, 178, 201	**SVQCR/L**	B202
SVVCN	B178	**SVUCR/L**	B202

cBN

Multi-Corner Type (Negative)

Dimensions (mm)			
Size	d	t	d1
12	12.7	4.76	5.16
15	12.7	4.76~6.358	3.4
16	9.525	4.76	3.81

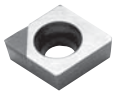
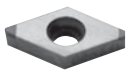
Inserts	Designation		Uncoated										Available tool holders			
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation		Page	
CN○○ 80° Nega 	2NU-CNGA	120404	●	●		●	●				●		DCBNR/L	DCLNR/L	B148	B148
		120404F	●				●						MCKNR/	MCLNR/L	B165	B165
		120404T	●			●	●						MCMNN	PCBNR/L	B165	B153
		120404W	●										PCLNR/L		B153	
		120404WF	●													
		120408	●	●		●	●				●					
		120408F	●				●									
		120408T	●			●	●									
		120408W	●	●		●	●				●					
		120408WF	●				●									
		120408WT				●	●									
		120412	●	●												
		120412F	●													
		120412T	●													
		120412W	●			●	●				●					
		120412WF	●				●									
		120412WT				●	●									
	T-2NU-CNGA	120408	●													
	2NU-CNMA	120404							●							
		120408							●							
	2NS-CNGA	120408			●			●								
DN○○ 55° Nega 	2NU-DNGA	150404	●	●		●	●		●		●		DDJNR/L	MDJNR/L	B149	B166
		150404F	●				●						MDNNN	MDQNR/L	B166	B167
		150404T	●			●	●						MDUNR/L	PDJNR/L	B192	B154
		150408	●	●		●	●		●		●		PDNNR/L	PDSNR/L	B155	B187
		150408F	●				●						PDUNR/L		B188	
		150408T	●			●	●									
		150412	●	●												
		150412F	●													
		150412T	●													
		150608										●				
	T-2NU-DNGA	150412	●													
	2NS-DNGA	150408			●			●								
SN○○ 90° Nega 	4NU-SNGA	120404	●			●	●				●		DSBNR/L	MSBNR/L	B149	B167
		120404F					●						MSDNN	MSKNR/L	B167	B168
		120404T				●	●						MSRNR/L	MSSNR/L	B168	B169
		120408	●			●	●				●		PSBNR/L	PSDNN	B157	B157
		120408F					●						PSKNR/L		B158	
		120408T				●	●									
		120412									●					
	2NS-SNGA	120408			●			●								
TN○○ 60° Nega 	3NU-TNGA	160404	●	●		●	●		●		●		MTENN	MTFNR/L	B169	B169
		160404F	●				●						MTGNR/	MTJNR/L	B170	B170
		160404T	●			●	●						PTFNR/L	PTGNR/L	B159	B159
		160408	●	●		●	●				●		PTTNR/L	WTENN	B160	B161
		160408F	●				●						WTJNR/L	WTXNR/L	B161	B161
		160408T	●			●	●									
		160412		●												
	2NS-TNGA	160408			●			●								
VN○○ 35° Nega 	2NU-VNGA	160404	●	●		●	●		●		●		MVJNR/L		B170	
		160404F	●				●						MVQNR/L		B171	
		160404T	●			●	●						MVUNR/L		B193	
		160408	●	●		●	●		●		●		MVVNN		B171	
		160408F	●				●									
		160408T	●			●	●									
	2NS-VNGA	160408			●			●								

● : Stock item

cBN

Multi-Corner Type (Positive)

Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
07	6.35	2.38	2.8
09	9.525	3.97	4.4
11	9.525	3.97	4.4

Inserts	Designation		Uncoated										Available tool holders	
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation	Page
CC○○ 80° Posi 	2NU-CCGW	060202	●										SCACR/L	B172
		060202F	●										SCLCR/L	B172
		060202T	●											
		060204	●			●	●							
		060204F	●				●							
		060204T	●			●	●							
		060208				●	●							
		060208F					●							
		060208T				●	●							
		09T304	●	●		●	●		●		●			
		09T304F	●				●							
		09T304T	●			●	●							
		09T308	●	●		●	●		●		●			
		09T308F	●				●							
		09T308T	●			●	●							
		09T308W	●											
		09T308WF	●											
DC○○ 55° Posi 	2NU-DCGW	070204				●	●						SDACR/L	B172
		070204F					●						SDJCR/L	B173
		070204T				●	●						SDNCN	B173
		070208				●	●						SDQCR/L	B196
		070208F					●						SDUCR/L	B197
		070208T				●	●						SDZCR/L	B198
		11T304	●	●		●	●		●		●			
		11T304F	●				●							
		11T304T	●			●	●							
		11T308	●	●		●	●		●		●			
		11T308F	●				●							
		11T308T	●			●	●							
	T-2NU-DCGW	11T304	●											
TC○○ 60° Posi 	3NU-TCGW	090204	●										STACR/L	B175
		090204F	●										STFCR/L	B176
		090204T	●										STGCR/L	B176
													STTCR/L	B176

● : Stock item

cBN

Multi-Corner Type (Positive)

Dimensions (mm)			
Size	d	t	d1
11	6.35	3.18	2.4
16	9.525	4.76	3.81

Inserts	Designation		Uncoated									Available tool holders	
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation	Page
TP◯◯ 60° Posi	3NU-TPGB	110304	●						●				CTFPR/L	B164
		110304F	●										CTGPR/L	B164
		110304T	●											
		110308	●						●					
		110308F	●											
		110308T	●											
	3NU-TPGN	110304				●	●						CTFPR/L	B164 B191
		110304F					●						CTGPR/L	B164
		110304T				●	●							
		110308				●	●							
		110308F					●							
		110308T				●	●							
		160304	●	●										
		160308	●	●										
	3NU-TPGW	110304	●	●		●	●				●			
		110304F	●				●							
		110304T	●			●	●							
		110308	●	●		●	●				●			
		110308F	●				●							
		110308T	●			●	●							
VB◯◯ 35° Posi	2NU-VBGW	160404	●	●		●	●		●		●		SVABR/L	B177
		160404F	●				●						SVHBR/L	B177
		160404T	●			●	●						SVJBR/L	B177
		160408	●	●		●	●		●		●		SVQBR/L	B201
		160408F	●				●						SVUBR/L	B202
		160408T	●			●	●							
VC◯◯ 35° Posi	2NU-VCGW	160404	●	●		●	●				●			
		160404F	●				●							
		160404T	●			●	●							
		160408	●	●		●	●				●			
		160408F	●				●							
		160408T	●			●	●							

● : Stock item

cBN

Regrinding Type (Negative/Positive)

Dimensions (mm)			
Size	d	t	d1
09	9.525	3.97	4.4
11	6.35~9.525	3.8~3.97	3.4~4.4
12	12.7	4.76	5.16

Dimensions (mm)			
Size	d	t	d1
15	12.7	4.76	5.16
16	9.525	4.76	3.81~4.4

Inserts	Designation		Uncoated									Available tool holders			
			DNC250	DNC350	DNC400	KB1000	KB2000	KB400	KB320	KB330	KB370	KB420	Designation		Page	
CN○○ 80° Nega	CNMA	120404							●				DCBNR/L	MCKNR/L	B148	B165
		120408							●			●	DCLNR/L	MCLNR/L	B148	B165
	T-CNMA	120408							●				PCBNR/L	MCMNN	B153	B165
													PCLNR/L		B153	
DN○○ 55° Nega	DNMA	150404							●				DDJNR/L	MDJNR/L	B149	B166
		150408							●	●			MDNNN	MDQNR/L	B166	B167
													MDUNR/L	PDJNR/L	B192	B154
													PDNNR/L	PDSNR/L	B155	B187
													PDUNR/L		B188	
SN○○ 90° Nega	SNMA	120404							●				DSBNR/L	MSBNR/L	B149	B167
		120408							●				MSDNN	MSKNR/L	B167	B168
													MSRNR/L	MSSNR/L	B168	B169
													PSBNR/L	PSDNN	B157	B157
													PSKNR/L		B158	
TN○○ 60° Nega	TNMA	160404							●				MTENNS	MTFNR/L	B169	B169
		160408							●				MTGNR/L	MTJNR/L	B170	B170
													PTFNR/L	PTGNR/L	B159	B159
													PTTNR/L	WTENN	B160	B161
													WTJNR/L	WTXNR/L	B161	B161
VN○○ 35° Nega	VNMA	160404							●				MVJNR/L		B170	
		160408							●				MVQNR/L		B171	
	T-VNMA	160404							●				MVUNR/L		B193	
													MVVNN		B171	
CC○○ CP○○ 80° Posi (CCMW)	CCMW	09T304							●				SCACR/L		B172	
													SCLCR/L		B172	
DC○○ 50° Posi	DCGW	11T308							●				SDACR/L		B172	
	T-DCGW	11T308							●				SDJCR/L		B173	
													SDNCN/L		B173	
TP○○ 60° Posi	TPGB	110304							●	●			CTFPR/L		B164	B191
		110308							●				CTGPR/L		B164	
VB○○ 35° Posi	VBMW	160404							●				SVABR/L		B177	
		160408							●				SVHBR/L		B177	
													SVJBR/L		B177	
													SVQBR/L		B201	
													SVUBR/L		B202	

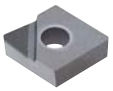
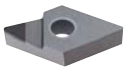
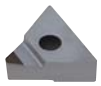
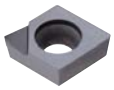
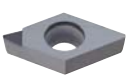
● : Stock item

PCD

Insert (Negative/Positive)

Dimensions (mm)			
Size	d	t	d1
06	6.35	2.38	2.8
07	6.35	2.38	2.8
08	7.94	2.38	3.4
09	9.525	3.18	4.4

Dimensions (mm)			
Size	d	t	d1
11	9.525	3.97	4.4
12	12.7	4.76	5.16
15	12.7	4.76	5.16
16	9.525	4.76	3.81

Inserts	Designation		PCD			Available tool holders			
			DP90	DP150	DP200	Designation		Page	
CN○○ 80° Nega  (CNMX)	CNMM	120404		●		DCBNR/L	DCLNR/L	B148	B148
		120408		●		MCKNR/L	MCLNR/L	B165	B165
		120412				MCMNN	PCBNR/L	B165	B153
	CNMX	120404				PCLNR/L		B153	
		120408							
		120412							
DN○○ 55° Nega  (DNMX)	DNMM	150404		●		DDJNR/L	MDJNR/L	B149	B166
		150408		●		MDNNN	MDQNR/L	B166	B167
		150412				MDUNR/L	PDJNR/L	B192	B154
	DNMX	150404				PDNNR/L	PDSNR/L	B155	B187
		150408				PDUNR/L		B188	
		150412							
TN○○ 60° Nega 	TNMX	160404				MTENNS	MTFNR/L	B169	B169
		160408				MTGNR/L	MTJNR/L	B170	B170
		160412				PTFNR/L	PTGNR/L	B159	B159
						PTTNR/L	WTENN	B160	B161
						WTJNR/L	WTXNR/L	B161	B161
VN○○ 35° Nega 	VNMX	160404				MVJNR/L		B170	
		160408				MVQNR/L		B171	
		160412				MVUNR/L		B193	
						MVVNN		B171	
CC○○ CP○○ 80° Posi 	CCMT	060202		●		SCACR/L		B172	
		060204		●		SCLCR/L		B172	
		060208							
		09T304		●					
		09T308		●					
		09T312							
	CPMT	080204							
		080208							
		080212							
		090304							
		090308							
		090312							
DC○○ 55° Posi 	DCMT	070202		●		SDACR/L		B172	
		070204		●		SDJCR/L		B173	
		070208				SDNCN		B173	
		11T302				SDQCR/L		B196	
		11T304		●		SDUCR/L		B197	
		11T308		●		SDZCR/L		B198	
SC○○ SP○○ 90° Posi  (SCMT)	SCMT	09T304				SSBCR/L		B174	
		09T308				SSDCN		B174	
		09T312				SSKCR/L		B175	
	SPGW	090302				SSSCR/L		B175	
		090304							
		090308							

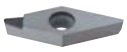
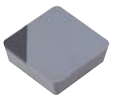
● : Stock item

PCD

Insert (Positive)

Dimensions (mm)			
Size	d	t	d1
06	3.97	1.59	2.8
08	4.76	2.38	2.4
09	5.56~9.525	2.38~3.18	2.55

Dimensions (mm)			
Size	d	t	d1
11	9.525	3.97	4.4
12	6.35	2.38~3.18	2.8~3.4
16	12.7	3.18	4.4

Inserts	Designation		PCD			Available tool holders	
			DP90	DP150	DP200	Designation	Page
TB ◯◯ TC ◯◯ TP ◯◯ 60° Posi  (TBGN)	TBGW	060102				STUBR/L	B204
		060104					
	TCMT	090201				STACR/L	B175
		090202				STFCR/L	B176
		090204				STFPR/L	B200
		110201				STGCR/L	B176
		110202				STTCR/L	B176
		110204					
	TPGB	080204					
		080208					
		090204		●			
		090208		●			
		110304					
		110308					
	TPGW	080202					
		080204					
		090204					
		090208					
		110302					
		110304		●			
		110308		●			
		160404					
		160408					
	TPGT	110302				STFPR/L	B200
		110304				STUPR/L	B205
VB ◯◯ VC ◯◯ 35° Posi 	VBMT	110302				SVABR/L	B177
		110304		●		SVHBR/L	B177
		110308		●		SVJBR/L	B177
		160402				SVQBR/L	B201
		160404		●		SVUBR/L	B202
		160408		●			
		160412		●			
	VCMT	110302				SVJCR	B178
		110304		●		SVVCN	B178
		110308		●			
		160404		●			
		160408		●			
		160412					
TP ◯◯ 60° Posi 	TPGN	090204				CTFPR/L	B164
		090208				CTGPR/L	B164
		110302					
		110304		●			
		110308		●			
		160302					
		160304					
		160308					
SP ◯◯ 90° Posi 	SPGN	090304		●		CSDPN	B163
		090308				CSKPR/L	B164
		120304					
		120308					

● : Stock item

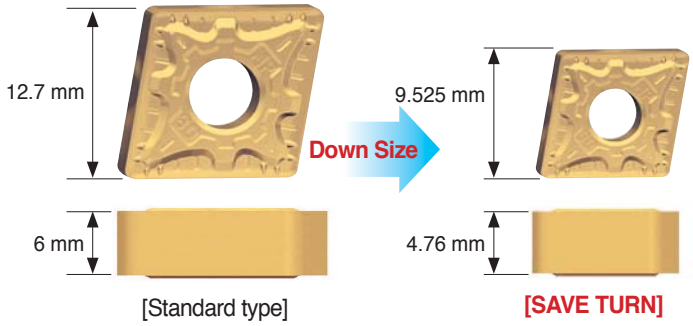
Economical small insert with powerful cutting performance

SAVE TURN

- Strongly recommended turning insert for machining smaller diameter than Ø100
- Small but powerful and economical insert which performs the same like standard-sized inserts under the depth of cut of 3.0 mm

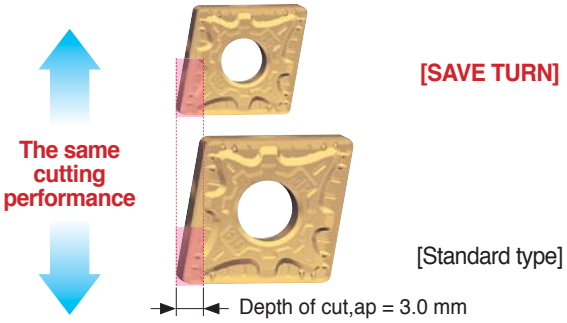
Features

Comparison of insert sizes



• Optimized size of the same performance like the standard type

Comparison of cutting performance

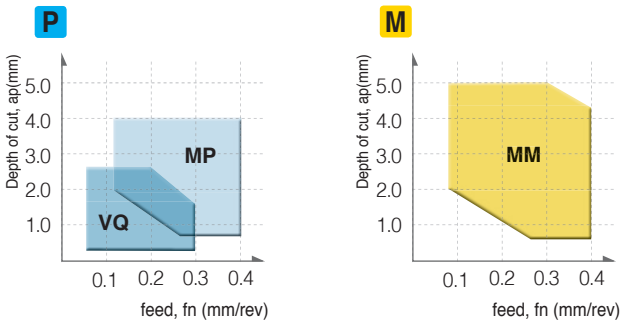


• Performs the same like standard type inserts under the depth of cut of 3.0 mm

Features of chip breaker

Insert shape	Cutting edge	Features
VQ		• For finishing steel • Efficient chip breaking and low cutting resistance • Various application available at low depth of cut • Recommended depth of cut: 0.5~2.5 mm
MP		• For medium cutting of steel • 4 dots for improved chip control in medium cutting to finishing • Stable chip evacuation at high depth of cut • Stable tool life due to lower cutting loads at high feed • Recommended depth of cut: 0.5~4.0 mm
MM		• For medium cutting of stainless steel • Limits plastic deformation caused by heat • Stable tool life thanks to the balanced cutting performance and toughness • Stable chip flow at high speeds and feeds • Recommended depth of cut: 0.5~5.0 mm

Application area of chip breaker



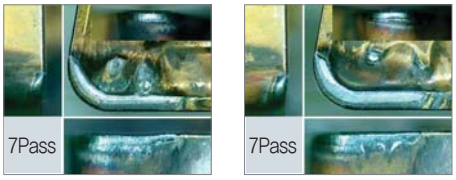
VQ : Depth of cut, ap = 0.5~2.5 mm / feed, fn = 0.05~0.30 mm/rev
MP : Depth of cut, ap = 0.5~4.0 mm / feed, fn = 0.15~0.40 mm/rev
MM : Depth of cut, ap = 0.5~5.0 mm / feed, fn = 0.10~0.40 mm/rev

Application example (NC3220)

Alloy steel (SCM440)

■ **Cutting conditions** vc (m/min) = 250, fn (mm/rev) = 0.25
ap (mm) = 2.0~3.0, continuous cutting, wet

■ **Cutting Result**



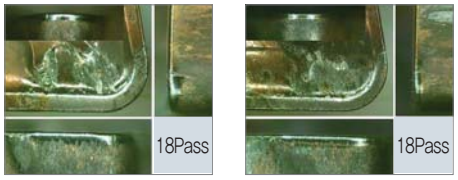
CNMG090408-HM
SAVE TURN

CNMG120408-HM
Standard type

Alloy steel (SCM440)

■ **Cutting conditions** vc (m/min) = 250, fn (mm/rev) = 0.25
ap (mm) = 2.0~3.0, interrupted cutting, wet

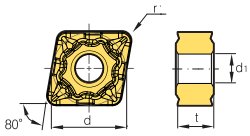
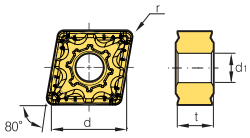
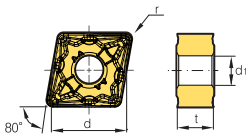
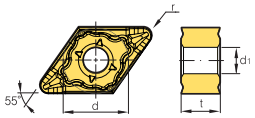
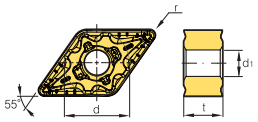
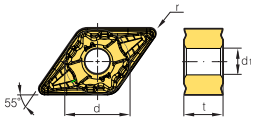
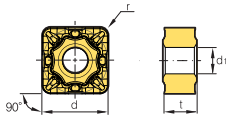
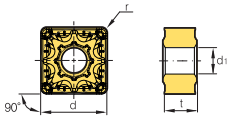
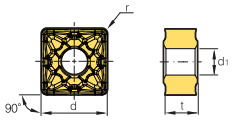
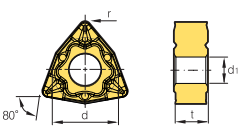
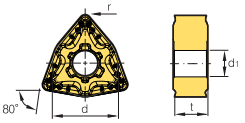
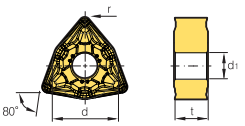
■ **Cutting Result**



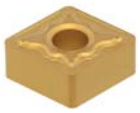
CNMG090408-HM
SAVE TURN

CNMG120408-HM
Standard type

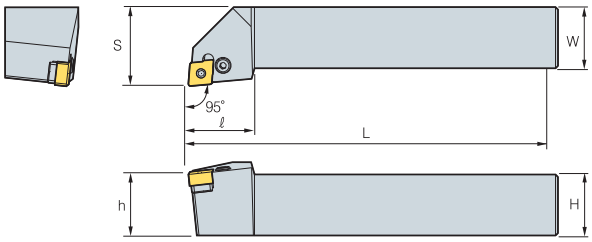
Insert

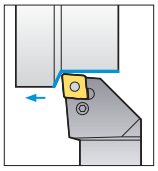
Type	Picture	Designation	Coated			Dimensions (mm)				cutting conditions		Configuration	Available tool holders page
			NC3215	NC3225	NC5330	d	t	r	d_1	ap (mm)	fn (mm/rev)		
C type	CNMG-VQ	CNMG 090408-VQ			●	9.525	4.76	0.8	3.81	0.50~2.50	0.08~0.30		B102 B105
		090412-VQ			●	9.525	4.76	1.2	3.81	0.50~2.50	0.10~0.30		
	CNMG-MP	CNMG 090404-MP				9.525	4.76	0.4	3.81	0.50~4.00	0.10~0.40		B102 B105
		090408-MP				9.525	4.76	0.8	3.81	0.50~4.00	0.15~0.40		
		090412-MP				9.525	4.76	1.2	3.81	0.50~4.00	0.15~0.45		
	CNMG-MM	CNMG 090404-MM				9.525	4.76	0.4	3.81	0.50~5.00	0.08~0.35		B102 B105
		090408-MM				9.525	4.76	0.8	3.81	0.50~5.00	0.10~0.40		
		090412-MM				9.525	4.76	1.2	3.81	0.50~5.00	0.12~0.45		
D type	DNMG-VQ	DNMG 110508-VQ			●	9.525	5.56	0.4	3.81	0.50~2.50	0.08~0.30		B102 B103 B105 B106
		110512-VQ			●	9.525	5.56	0.8	3.81	0.50~2.50	0.10~0.30		
	DNMG-MP	DNMG 110504-MP				9.525	5.56	0.4	3.81	0.50~4.00	0.10~0.40		B102 B103 B105 B106
		110508-MP				9.525	5.56	0.8	3.81	0.50~4.00	0.15~0.40		
		110512-MP				9.525	5.56	1.2	3.81	0.50~4.00	0.15~0.45		
	DNMG-MM	DNMG 110504-MM				9.525	5.56	0.4	3.81	0.50~5.00	0.08~0.35		B102 B103 B105 B106
		110508-MM				9.525	5.56	0.8	3.81	0.50~5.00	0.10~0.40		
		110512-MM				9.525	5.56	1.2	3.81	0.50~5.00	0.12~0.45		
S type	SNMG-VQ	SNMG 090408-VQ			●	9.525	4.76	0.4	3.81	0.50~2.50	0.08~0.30		B103 B104 B106
		090412-VQ			●	9.525	4.76	0.8	3.81	0.50~2.50	0.10~0.30		
	SNMG-MP	SNMG 090404-MP				9.525	4.76	0.4	3.81	0.50~4.00	0.10~0.40		B103 B104 B106
		090408-MP				9.525	4.76	0.8	3.81	0.50~4.00	0.15~0.40		
		090412-MP				9.525	4.76	1.2	3.81	0.50~4.00	0.15~0.45		
	SNMG-MM	SNMG 090404-MM				9.525	4.76	0.4	3.81	0.50~5.00	0.08~0.35		B103 B104 B106
		090408-MM				9.525	4.76	0.8	3.81	0.50~5.00	0.10~0.40		
		090412-MM				9.525	4.76	1.2	3.81	0.50~5.00	0.12~0.45		
W type	WNMG-VQ	WNMG 060404-VQ				9.525	4.76	0.4	3.81	0.30~2.00	0.06~0.30		B105 B106
		060408-VQ				9.525	4.76	0.8	3.81	0.50~2.00	0.08~0.30		
		060412-VQ				9.525	4.76	1.2	3.81	0.50~2.00	0.10~0.30		
	WNMG-MP	WNMG 060404-MP	●	●	●	9.525	4.76	0.4	3.81	0.50~3.50	0.10~0.40		B105 B106
		060408-MP	●	●	●	9.525	4.76	0.8	3.81	0.50~3.50	0.15~0.40		
		060412-MP				9.525	4.76	1.2	3.81	0.50~3.50	0.15~0.45		
	WNMG-MM	WNMG 060404-MM				9.525	4.76	0.4	3.81	0.50~4.00	0.08~0.35		B105 B106
		060408-MM				9.525	4.76	0.8	3.81	0.50~4.00	0.10~0.40		
		060412-MM				9.525	4.76	1.2	3.81	0.50~4.00	0.12~0.45		

PCLNR/L



CN□□





95°

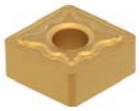
• R type insert

(mm)

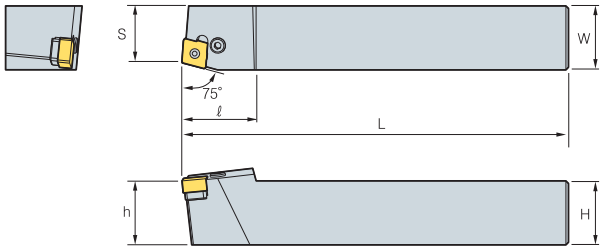
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PCLNR/L	1616-H09-4N	16	16	100	20	16	20	CN□□0904□□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSP3
	2020-K09-4N	20	20	125	25	20	25							
	2525-M09-4N	25	25	150	32	25	27							

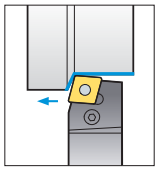
Applicable inserts **B22**

PCBNR/L



CN□□





75°

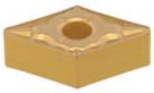
• R type insert

(mm)

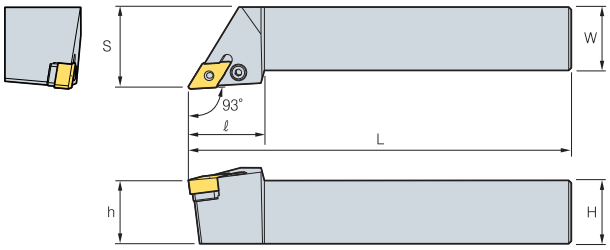
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PCBNR/L	2020-K09-4N	20	20	125	17	20	27	CN□□0904□□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSP3
	2525-M09-4N	25	25	150	22	25	29							

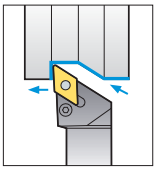
Applicable inserts **B101**

PDJNR/L



DN□□





93°

• R type insert

(mm)

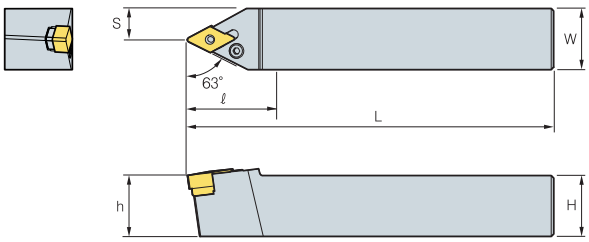
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PDJNR/L	2020-K11-5N	20	20	125	25	20	25	DN□□1105□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	2525-M11-5N	25	25	150	32	25	30							

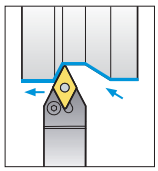
Applicable inserts **B101**

PDNNR/L



DN□□





63°

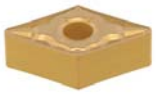
• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PDNNR/L	2020-K11-5N	20	20	125	25	20	30	DN□□1105□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	2525-M11-5N	25	25	150	32	25	30							

Applicable inserts **B101**

PDQNR/L



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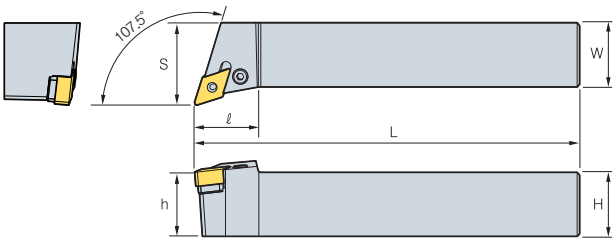
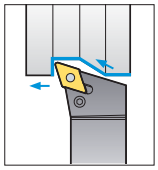




107.5°

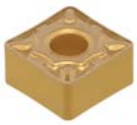
• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PDQNR/L	2020-K11-5N	20	20	125	25	20	30	DN□□1105□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	2525-M11-5N	25	25	150	32	25	30							

Applicable inserts **B101**

PSBNR/L



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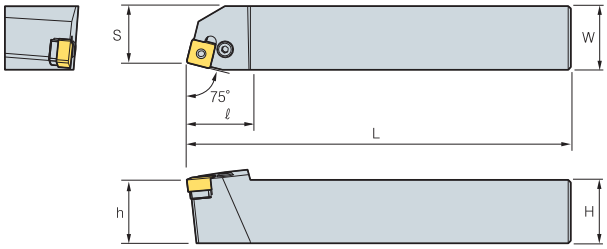
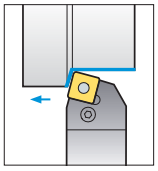




75°

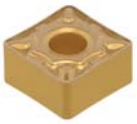
• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSBNR/L	2020-K09-4N	20	20	125	17	20	25	SN□□0904□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	2525-M09-4N	25	25	150	22	25	25							

Applicable inserts **B101**

PSDNN



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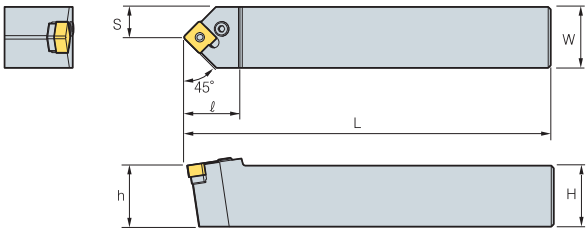
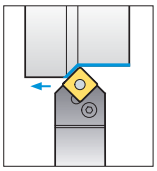




45°

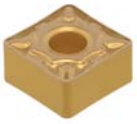
• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSDNN	2020-K09-4N	20	20	125	17	20	25	SN□□0904□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	2525-M09-4N	25	25	150	22	25	25							

Applicable inserts **B101**

PSKNR/L



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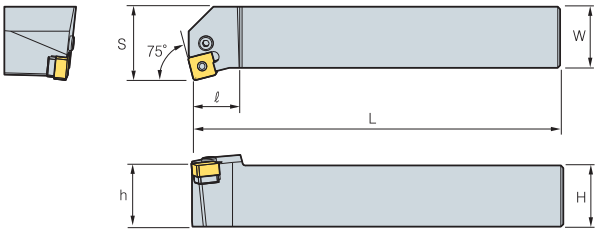
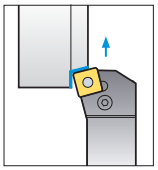




75°

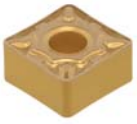
• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSKNR/L	2020-K09-4N	20	20	125	17	20	25	SN□□0904□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	2525-M09-4N	25	25	150	22	25	25							

Applicable inserts **B101**

PSSNR/L



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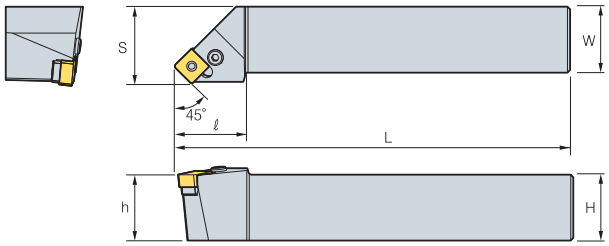
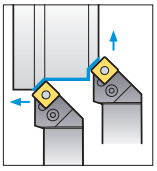




45°

• R type insert

(mm)

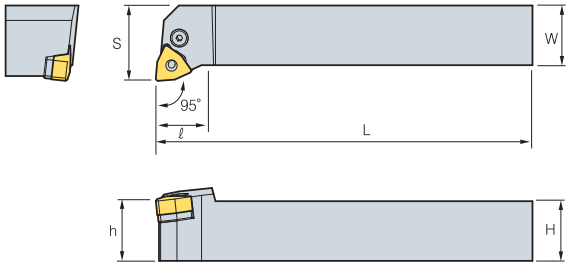
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PSSNR/L	2020-K09-4N	20	20	125	17	20	25	SN□□0904□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	2525-M09-4N	25	25	150	22	25	25							

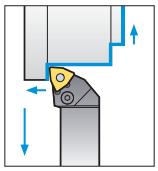
Applicable inserts **B101**

PWLNR/L



WN□□





95°

• R type insert

(mm)

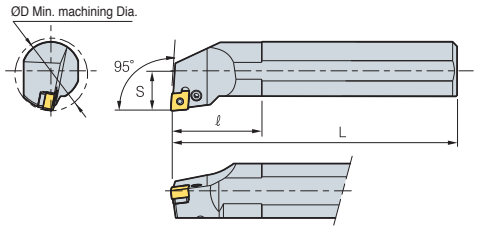
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
PWLNR/L	1616-H06	16	16	100	20	16	20	WN□□0604□□	LV3AN	VHX0617N	SS32N	SP3	HW25L	LSP3
	2020-K06	20	20	125	25	20	20							
	2525-M06	25	25	150	32	25	20							

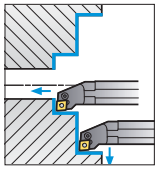
Applicable inserts **B101**

PCLNR/L



CN□□





95°

• R type insert

(mm)

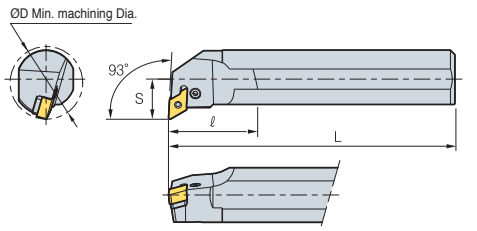
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S20Q-PCLNR/L-09-4N	25	20	18	180	13	50	CN□□0904□□	LV3B	VHX0512B	–	–	HW20L	–
S25R-PCLNR/L-09-4N	32	25	23	200	17	50		LV3B	VHX0512B	SC32N	SP3	HW20L	–
S32S-PCLNR/L-09-4N	40	32	30	250	22	50		LV3N	VHX0617N	SC32N	SP3	HW25L	–

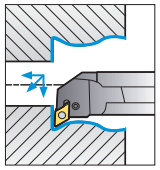
Applicable inserts **B101**

PDUNR/L



DN□□





93°

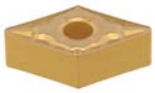
• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S32S-PDUNR/L-11-5N	40	32	30	250	22	30	DN□□1105□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	–
S40T-PDUNR/L-11-5N	50	40	38	300	27	50							

Applicable inserts **B101**

PDZNR/L



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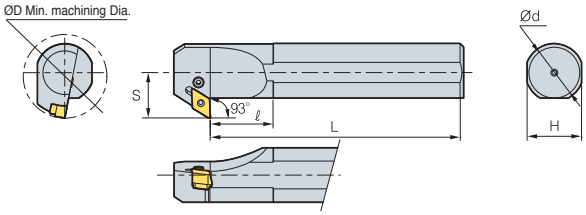
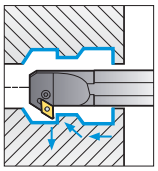




93°

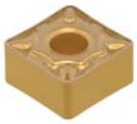
• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S32S-PDZNR/L-11-5N	40	32	30	250	22	30	DN□□1105□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	–
S40T-PDZNR/L-11-5N	50	40	38	300	27	50							

Applicable inserts **B101**

PSKNR/L



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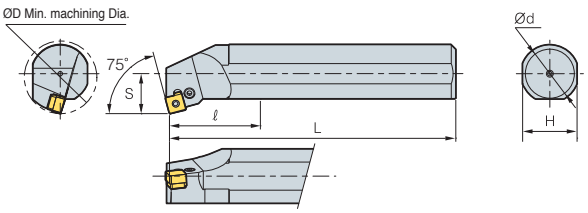
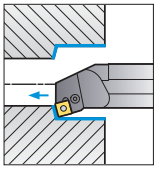




75°

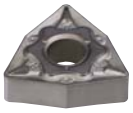
• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S25R-PSKNR/L-09-4N	32	25	23	200	17	32	SN□□0904□□	LV3B	VHX0512B	–	–	HW20L	–
S32S-PSKNR/L-09-4N	40	32	30	250	22	32		LV3N	VHX0617N	SS32N	–	HW25L	–

Applicable inserts **B101**

PWLNR/L



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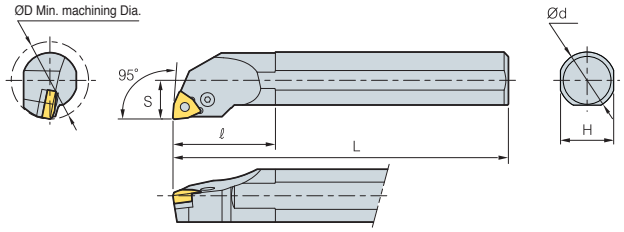
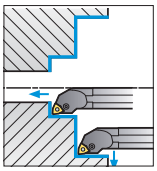




95°

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Wrench	Shim Pin Punch
S20S-PWLNR/L-06	25	20	18	250	13	40	WN□□0604□□	LV3B	VHX0512B	–	–	–	–
S25R-PWLNR/L-06	32	25	23	200	17	40							
S32S-PWLNR/L-06	44	32	30	250	22	45		LV3B	VHX0613B	SW317	SW317	HW25L	LSPS3

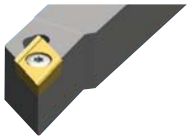
Applicable inserts **B101**

Excellent for precision machining

Auto Tools

- High precision machining of small parts and complex forms, etc.
- High quality products through stable machining
- Exclusive insert for automatic lathes

Type



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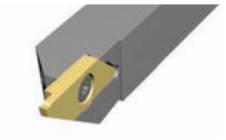

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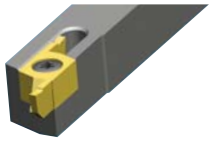
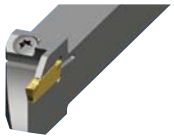


Multi utility

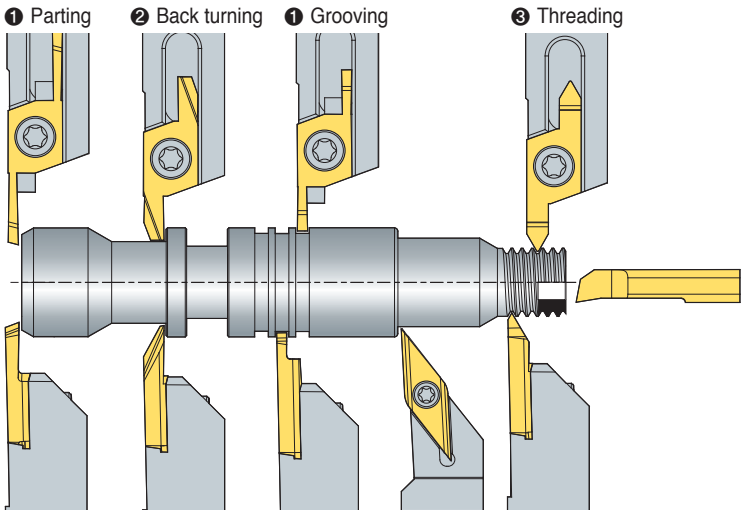


MGT

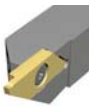
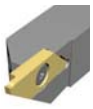


MSB tools

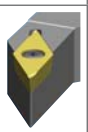
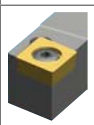
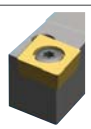
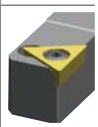
Application example



Index

Specification	❶ Parting and Grooving						❷ Back turning		
Holder	SXGNR/L	SXGNR/L	MGEHR/L	SBHR/L	SBHR/L	MGEHR/L	SXGNR/L	SXGNR/L	SBHR/L
Insert	SG	SC	MGMN	SBG	SBC	MGMN	SB	SGB	SBB
Holder size	10~20 mm	10~20 mm	10~16 mm	10~16 mm	10~16 mm	10~16 mm	10~20 mm	10~20 mm	10~16 mm
Insert shape									
Cutting width	1~3 mm	1~3 mm	1.5~2.5 mm	0.7~2.0 mm	0.7~2.0 mm	1.5~2.5 mm	2~4 mm	2~3 mm	3.18 mm
ØDmax	Ø18	Ø18	Ø32	Ø16	Ø16	Ø32	Tmax 8	Tmax 8.5	Tmax 8.0
Page	B119	B119	B123	B116	B116	B123	B119	B119	B116

Specification	❸ Threading	
Holder	SXGNR/L	SBHR/L
Insert	ST	SBT
Holder size	10~20 mm	10~16 mm
Insert shape		
Screw ranges	Pitch ranges 0.5~1.5 / 1.5~3.0	Pitch ranges 0.2~1.5 / 1.0~2.0
Insert	B119	B116

Specification	❹ External turning and Copy machining				❺ External turning and Facing		
Holder	SDJCR/L	SDNCN	SVJBR/L	SVJCR/L	SCACR/L	SCLCR/L	STACR/L
Insert	DC□T	DC□T	VB□T	VC□T	CC□T	CC□T	TC□T
Holder size	8~16 mm	8~16 mm	10~16 mm	10~16 mm	8~16 mm	8~16 mm	8~10 mm
Insert shape							
Feature	Offset "0"				Offset "0"		
Page	B109	B110	B111	B111	B109	B109	B110

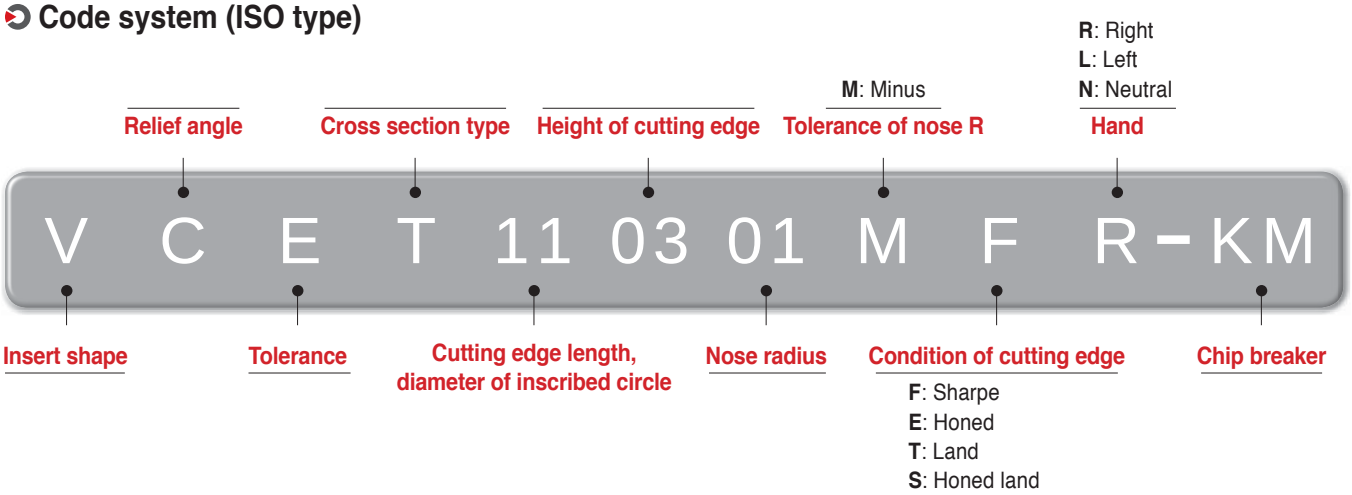
Specification	❻ Internal turning (Boring)				
Holder	SCLCR/L	STUBR/L	STUPR/L	SWUBR/L	MSB
Insert	CC□T	TB□T	TP□T	WB□T	-
Shank diameter	Ø4~Ø10	Ø8	Ø8	Ø5~Ø8	Ø4~Ø6
Insert shape					
ØDmin	Ø5	Ø8	Ø10	Ø5.5	Ø3.2
Page	B204	B204	B205	B206	B126~B130

Auto Tools (ISO type)

- ISO inserts for automatic lathes
- Precise R shape with the use of minus tolerance of nose R
- Tolerance class precise enough in no need for adjusting tools with the use of accurate cutting edge height
- Sharp blade for excellent chip control and surface roughness with low cutting force
- High precision tools for electrical/ electronics instruments and medical instruments



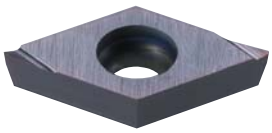
Code system (ISO type)



KF/KM chip breaker, ground type for grooving

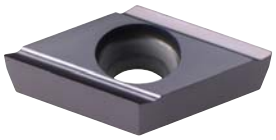
- Ground chip breaker with sharp cutting edge
- High precision insert of E-class tolerance with accurate nose radius

KF



- For finishing
- Low cutting loads with sharp cutting edges
- Longer tool life due to lower chip evacuation resistance at high speed
- Excellent surface roughness

KM

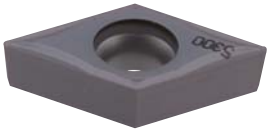


- For medium cutting to finishing
- Better chip flow due to wide chip pockets
- Longer tool life and better cutting action due to improved chip evacuation
- Excellent surface roughness

VP1 chip breaker

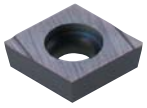
- Exclusive chip breaker for hard-to-cut materials such as titanium alloy, Inconel, stainless steel, etc.
- Minimized cutting heat by reducing contact area between chips and rake surface with the use of high positive blade

VP1

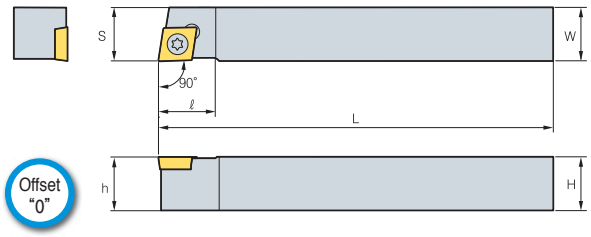


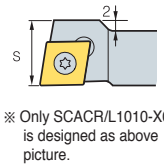
- **Sharp cutting edge**
  - Excellent chip control
  - Low cutting resistance
  - High precision machining
- **High positive angle of rake surface**
  - Chip breaking at low depth of cut
  - Stable chip control at high depth of cut
  - Wide cutting area available with the use of optimized chip breaker width according to depth of cuts

SCACR/L

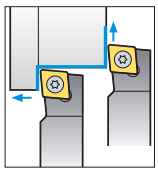


CC□T





※ Only SCACR/L1010-X09A is designed as above picture.



90°

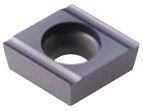
• R type insert

(mm)

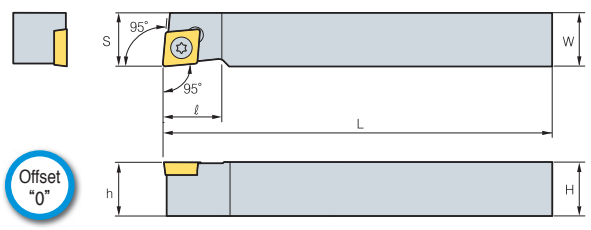
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SCACR/L	0808-X06A	8	8	120	8	8	10	CC□T 0602 □□	FTKA02565	TW 07P
	1010-X06A	10	10	120	10	10	10			
	1010-X09A	10	10	120	12	10	13	CC□T 09T3 □□	FTKA0410	TW 15P
	1212-X09A	12	12	120	12	12	16			
	1616-X09A	16	16	120	16	16	16			

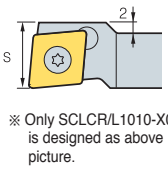
Applicable inserts **B62~B65, B87**

SCLCR/L

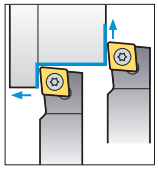


CC□T





※ Only SCLCR/L1010-X09A is designed as above picture.



95°

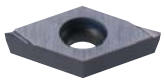
• R type insert

(mm)

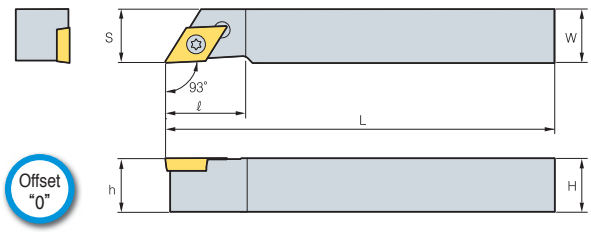
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SCLCR/L	0808-X06A	8	8	120	8	8	10	CC□T 0602 □□	FTKA02565	TW 07P
	1010-X06A	10	10	120	10	10	10			
	1010-X09A	10	10	120	12	10	13	CC□T 09T3 □□	FTKA0410	TW 15P
	1212-X09A	12	12	120	12	12	16			
	1616-X09A	16	16	120	16	16	16			

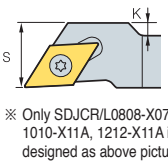
Applicable inserts **B62~B65, B87**

SDJCR/L

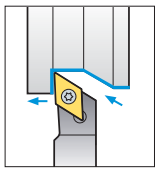


DC□T





※ Only SDJCR/L0808-X07A, 1010-X11A, 1212-X11A is designed as above picture.



93°

• R type insert

(mm)

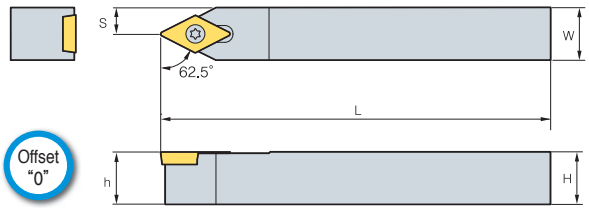
Designation		H	W	L	S	h	K	ℓ	Insert	Screw	Wrench
SDJCR/L	0808-X07A	8	8	120	10	8	2	18	DC□T 0702 □□	FTKA02565	TW 07P
	1010-X07A	10	10	120	10	10	-	15			
	1010-X11A	10	10	120	14	10	4	18	DC□T 11T3 □□	FTKA0410	TW 15P
	1212-X11A	12	12	120	14	12	2	18			
	1616-X11A	16	16	120	16	16	-	22			

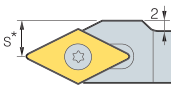
Applicable inserts **B67~B69, B88**

SDNCN

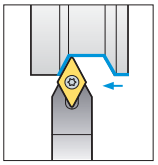


DC□T





※ Only SDNCN1010-X11A is designed as above picture.



62.5°

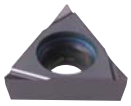
• R type insert

(mm)

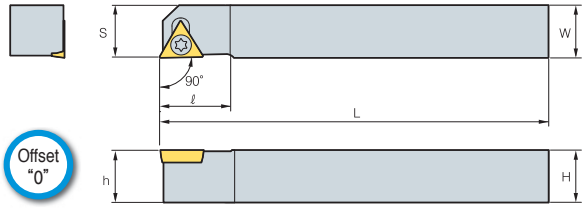
Designation		H	W	L	S	h	Insert	Screw	Wrench
SDNCN	0808-X07A	8	8	120	4	8	DC□T 0702 □□	FTKA02565	TW 07P
	1010-X07A	10	10	120	5	10			
	1010-X11A	10	10	120	7	10	DC□T 11T3 □□	FTKA0410	TW 15P
	1212-X11A	12	12	120	6	12			
	1616-X11A	16	16	120	8	16			

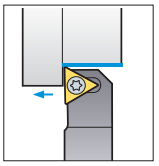
Applicable inserts **B67~B69, B88**

STACR/L



TC□T





90°

• R type insert

(mm)

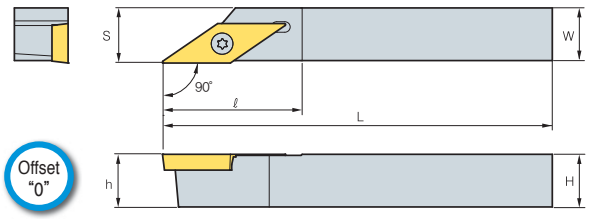
Designation		H	W	L	S	h	K	ℓ	Insert	Screw	Wrench
STACR/L	0808-X08A	8	8	120	8	8	1	12	TC□T 0802 □□	FTNA 0206	TW 06P
	1010-X08A	10	10	120	10	10	3	12			

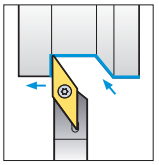
Applicable inserts **B75~B76**

SVACR/L



VC□□





90°

• R type insert

(mm)

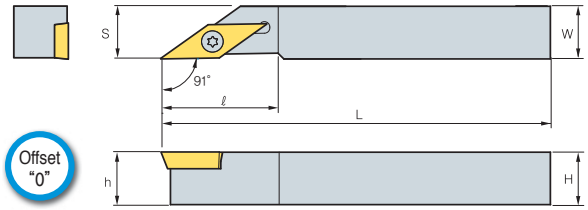
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVACR/L	0808-X12C	8	8	120	8.5	8	26	VC□□ 1203 □□	FTKA 02565	TW 07P
	1010-X12C	10	10	120	10.5	10	26			
	1212-X12C	12	12	120	12.5	12	26			
	1616-X12C	16	16	120	16.5	16	26			

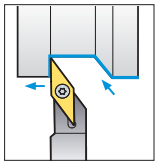
Applicable inserts **B82~B83, B93**

SVAPR/L



VP□T





91°

• R type insert

(mm)

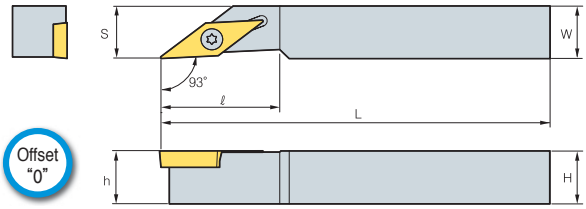
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVAPR/L	0808-X11A	8	8	120	8	8	22	VP□T 1103 □□	FTKA 02565	TW 07P
	1010-X11A	10	10	120	10	10	22			
	1212-X11A	12	12	120	12	12	22			
	1616-X11A	16	16	120	16	16	24			

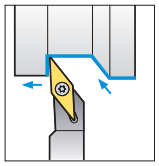
Applicable inserts **B84**

SVJBR/L



VB□T





93°

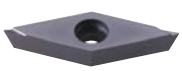
• R type insert

(mm)

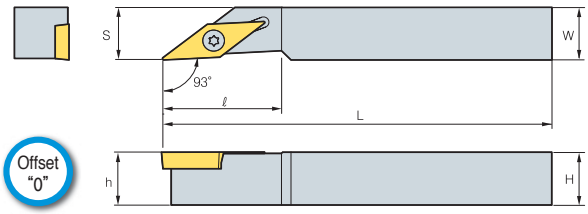
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJBR/L	1010-X11A	10	10	120	10	10	22	VB□T 1103 □□	FTKA 02565	TW 07P
	1212-X11A	12	12	120	12	12	22			
	1616-X11A	16	16	120	16	16	24			

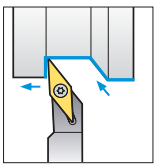
Applicable inserts **B80~B81, B92**

SVJCR/L



VC□T





93°

• R type insert

(mm)

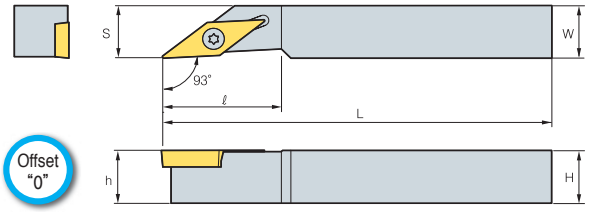
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJCR/L	1010-X11A	10	10	120	10	10	22	VC□T 1103 □□	FTKA 02565	TW 07P
	1212-X11A	12	12	120	12	12	22			
	1616-X11A	16	16	120	16	16	24			
SVJCR/L	0810-X12C	8	10	120	10	8	26	VC□□ 1203 □□	FTKA 02565	TW 07P
	1010-X12C	10	10	120	10	10	26			
	1212-X12C	12	12	120	12	12	26			
	1616-X12C	16	16	120	16	16	26			

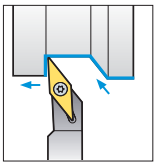
Applicable inserts **B82~B83, B93**

SVJPR/L



VP□T





93°

• R type insert

(mm)

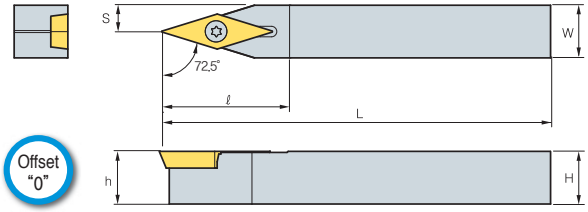
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVJPR/L	0810-X11A	8	10	120	8	10	22	VP□T 1103 □□	FTKA 02565	TW 07P
	1010-X11A	10	10	120	10	10	22			
	1212-X11A	12	12	120	12	12	22			
	1616-X11A	16	16	120	16	16	24			

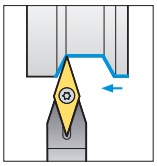
Applicable inserts **B84**

SVVPN



VP□T





72.5°

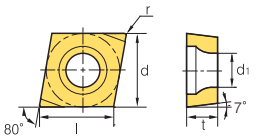
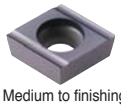
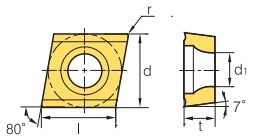
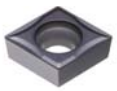
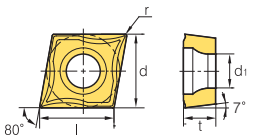
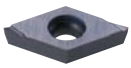
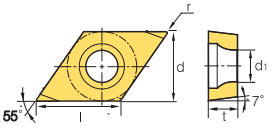
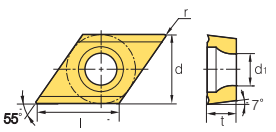
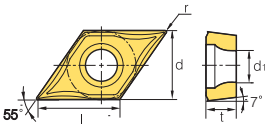
• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SVVPN	0808-X11A	8	8	120	4	8	24	VP□T 1103 □□	FTKA 02565	TW 07P
	1010-X11A	10	10	120	5	10	24			
	1212-X11A	12	12	120	6	12	24			
	1616-X11A	16	16	120	8	16	28			

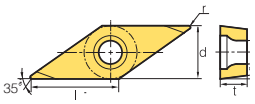
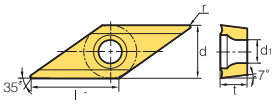
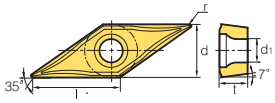
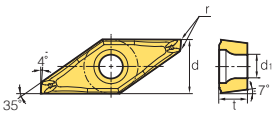
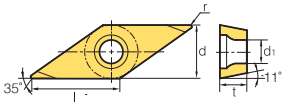
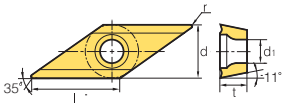
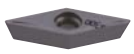
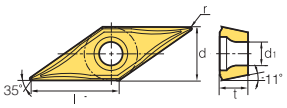
Applicable inserts **B84**

Insert

Picture	Designation	Coated				Uncoated	Dimensions (mm)					Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d_1	
CCET-KF  Finishing (High precision)	0602005MFR-KF						6.6	6.35	2.38	0.05	2.8	
	060201MFR-KF			●			6.4	6.35	2.38	0.1	2.8	
	060202MFR-KF			●			6.2	6.35	2.38	0.2	2.8	
	09T3005MFR-KF						9.8	9.525	3.97	0.05	4.4	
	09T301MFR-KF			●			9.6	9.525	3.97	0.1	4.4	
	09T302MFR-KF			●			9.2	9.525	3.97	0.2	4.4	
	0602005MFL-KF						6.6	6.35	2.38	0.05	2.8	
	060201MFL-KF						6.4	6.35	2.38	0.1	2.8	
	060202MFL-KF						6.2	6.35	2.38	0.2	2.8	
	09T3005MFL-KF						9.8	9.525	3.97	0.05	4.4	
	09T301MFL-KF						9.6	9.525	3.97	0.1	4.4	
	09T302MFL-KF						9.2	9.525	3.97	0.2	4.4	
CCET-KM  Medium to finishing (High precision)	0602005MFR-KM						6.6	6.35	2.38	0.05	2.8	
	060201MFR-KM			●			6.4	6.35	2.38	0.1	2.8	
	060202MFR-KM			●			6.2	6.35	2.38	0.2	2.8	
	09T3005MFR-KM						9.8	9.525	3.97	0.05	4.4	
	09T301MFR-KM			●			9.6	9.525	3.97	0.1	4.4	
	09T302MFR-KM			●			9.2	9.525	3.97	0.2	4.4	
	0602005MFL-KM						6.6	6.35	2.38	0.05	2.8	
	060201MFL-KM						6.4	6.35	2.38	0.1	2.8	
	060202MFL-KM						6.2	6.35	2.38	0.2	2.8	
	09T3005MFL-KM						9.8	9.525	3.97	0.05	4.4	
	09T301MFL-KM						9.6	9.525	3.97	0.1	4.4	
	09T302MFL-KM						9.2	9.525	3.97	0.2	4.4	
CCGT-VP1  Finishing (High precision)	060201MFN-VP1			●			6.6	6.35	2.38	0.1	2.8	
	060202MFN-VP1			●			6.4	6.35	2.38	0.2	2.8	
	060204MFN-VP1			●			6.2	6.35	2.38	0.4	2.8	
	09T301MFN-VP1			●			9.8	9.525	3.97	0.1	4.4	
	09T302MFN-VP1			●			9.6	9.525	3.97	0.2	4.4	
	09T304MFN-VP1			●			9.2	9.525	3.97	0.4	4.4	
DCET-KF  Finishing (High precision)	0702005MFR-KF						7.8	6.35	2.38	0.05	2.8	
	070201MFR-KF			●			7.8	6.35	2.38	0.1	2.8	
	070202MFR-KF			●			7.8	6.35	2.38	0.2	2.8	
	11T3005MFR-KF						11.6	9.525	3.97	0.05	4.4	
	11T301MFR-KF			●			11.6	9.525	3.97	0.1	4.4	
	11T302MFR-KF			●			11.6	9.525	3.97	0.2	4.4	
	0702005MFL-KF						7.8	6.35	2.38	0.05	2.8	
	070201MFL-KF			●			7.8	6.35	2.38	0.1	2.8	
	070202MFL-KF						7.8	6.35	2.38	0.2	2.8	
	11T3005MFL-KF						11.6	9.525	3.97	0.05	4.4	
	11T301MFL-KF						11.6	9.525	3.97	0.1	4.4	
	11T302MFL-KF						11.6	9.525	3.97	0.2	4.4	
DCET-KM  Medium to finishing (High precision)	0702005MFR-KM						7.8	6.35	2.38	0.05	2.8	
	070201MFR-KM			●			7.8	6.35	2.38	0.1	2.8	
	070202MFR-KM			●			7.8	6.35	2.38	0.2	2.8	
	11T3005MFR-KM						11.6	9.525	3.97	0.05	4.4	
	11T301MFR-KM			●			11.6	9.525	3.97	0.1	4.4	
	11T302MFR-KM			●			11.6	9.525	3.97	0.2	4.4	
	0702005MFL-KM						7.8	6.35	2.38	0.05	2.8	
	070201MFL-KM						7.8	6.35	2.38	0.1	2.8	
	070202MFL-KM						7.8	6.35	2.38	0.2	2.8	
	11T3005MFL-KM						11.6	9.525	3.97	0.05	4.4	
	11T301MFL-KM						11.6	9.525	3.97	0.1	4.4	
	11T302MFL-KM						11.6	9.525	3.97	0.2	4.4	
DCGT-VP1  Finishing (High precision)	070201MFN-VP1			●			7.8	6.35	0.1	2.38	2.8	
	070202MFN-VP1			●			7.8	6.35	0.2	2.38	2.8	
	070204MFN-VP1			●			7.8	6.35	0.4	2.38	2.8	
	11T301MFN-VP1			●			11.6	9.525	0.1	3.97	4.4	
	11T302MFN-VP1			●			11.6	9.525	0.2	3.97	4.4	
	11T304MFN-VP1			●			11.6	9.525	0.4	3.97	4.4	

● : Stock item

Insert

Picture	Designation	Coated				Uncoated	Dimensions (mm)					Configuration
		PC5300	PC8105	PC8110	PC8115	H01	l	d	t	r	d1	
VCET-KF  Finishing (High precision)	1103005MFR-KF						11.0	6.35	3.18	0.05	2.8	
	110301MFR-KF			●			11.0	6.35	3.18	0.1	2.8	
	110302MFR-KF			●			11.0	6.35	3.18	0.2	2.8	
	1103005MFL-KF						11.0	6.35	3.18	0.05	2.8	
	110301MFL-KF						11.0	6.35	3.18	0.1	2.8	
	110302MFL-KF						11.0	6.35	3.18	0.2	2.8	
VCET-KM  Medium to finishing (High precision)	1103005MFR-KM						11.0	6.35	3.18	0.05	2.8	
	110301MFR-KM			●			11.0	6.35	3.18	0.1	2.8	
	110302MFR-KM			●			11.0	6.35	3.18	0.2	2.8	
	1103005MFL-KM						11.0	6.35	3.18	0.05	2.8	
	110301MFL-KM						11.0	6.35	3.18	0.1	2.8	
	110302MFL-KM						11.0	6.35	3.18	0.2	2.8	
VCGT-VP1  Finishing (High precision)	110301MFN-VP1			●			11.0	6.35	3.18	0.1	2.8	
	110302MFN-VP1			●			11.0	6.35	3.18	0.2	2.8	
	110304MFN-VP1			●			11.0	6.35	3.18	0.4	2.8	
VCGX-VP1 (Chamfer type)  Finishing (High precision)	120300MFR-VP1						11.0	7.50	3.18	0.0	2.8	
	120301MFR-VP1						11.0	7.50	3.18	0.1	2.8	
	120302MFR-VP1						11.0	7.50	3.18	0.2	2.8	
	120304MFR-VP1						11.0	7.50	3.18	0.4	2.8	
	120308MFR-VP1						11.0	7.50	3.18	0.8	2.8	
VPET-KF  Finishing (High precision)	0802005MFR-KF						8.0	6.35	2.38	0.1	2.3	
	080201MFR-KF			●			8.0	6.35	2.38	0.1	2.3	
	080202MFR-KF			●			8.0	6.35	2.38	0.2	2.3	
	080201MFL-KF						8.0	6.35	2.38	0.1	2.3	
	080201MFL-KF						8.0	6.35	2.38	0.1	2.3	
	080202MFL-KF						8.0	6.35	2.38	0.2	2.3	
VPET-KM  Medium to finishing (High precision)	0802005MFR-KM						8.0	6.35	2.38	0.1	2.3	
	080201MFR-KM			●			8.0	6.35	2.38	0.1	2.3	
	080202MFR-KM			●			8.0	6.35	2.38	0.2	2.3	
	0802005MFL-KM						8.0	6.35	2.38	0.1	2.3	
	080201MFL-KM						8.0	6.35	2.38	0.1	2.3	
	080202MFL-KM						8.0	6.35	2.38	0.2	2.3	
VPGT-VP1  Finishing (High precision)	110301MFN-VP1			●			11.0	6.35	3.18	0.1	2.8	
	110302MFN-VP1			●			11.0	6.35	3.18	0.2	2.8	
	110304MFN-VP1			●			11.0	6.35	3.18	0.4	2.8	

● : Stock item

Auto tools (Blade type) new

- Blade insert for automatic lathes
- For external machining of precise small parts
- 4 types - SSB(for back turning), SGB(for grooving), SBT(for threading), SBC(for parting off)
- Convenient use of one holder to all blade inserts
- Exclusive holder for close cutting action to the sub spindle

Code system of auto tools insert (Blade type)

Turning (Back turning)

SB	B	R	25	10
Small blade	Back turning	Hand	Length of insert	Nose radius
		R: Right **L**: Left		

Grooving

SB	G	R	25	20
Small blade	Grooving	Hand	Length of insert	Width of cutting edge
		R: Right **L**: Left		

Threading

SB	T	R	25	60	–	N	–	010
Small blade	Threading	Hand	Length of insert	Angle of thread		Hand of thread		Nose radius
		R: Right **L**: Left				**R**: Right **L**: Left **N**: Neutral		

Parting

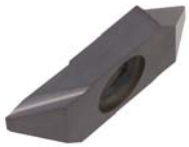
SB	C	R	25	20	16	–	N
Small blade	Cut off / Parting	Hand	Length of insert	Width of cutting edge	Max. machining diameter		Hand of thread
		R: Right **L**: Left					**R**: Right **L**: Left **N**: None **T**: C/B none

Code system of auto tools holder (Blade type)

SB	H	R	10	10	K25	X
Small blade	Holder	Hand	Height of shank	Width of shank	Length of insert	Sub spindle
		R: Right **L**: Left				

Types of blade insert

Possible to apply various types of blade inserts to one holder



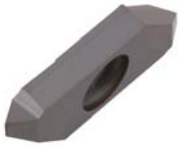
SBB: For back turning

- Approach angle: 59°
- Max. cutting depth: 4 mm
- Nose R: 0.05, 0.1, 0.2 mm



SBG: For grooving

- Width: 0.5~2.5 mm
- Nose R: 0.05 mm



SBT: For threading

- V profile: 60°
- Pitch: 0.2~1.0 mm
- Nose R: 0.05 mm



SBC: For cut off/Parting

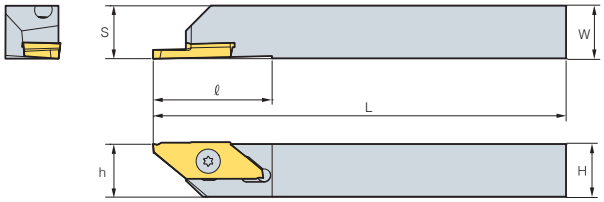
- Cutting width: 0.7~2.0
- D Max.: 16 mm
- Nose R: 0.05 mm

SBHR/L



SBBR SBGR
SBTR SBCR

Offset "0"



(mm)

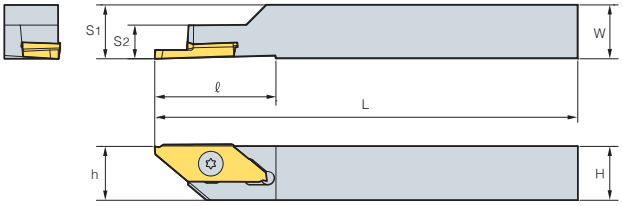
Designation		H	W	L	S	h	ℓ	Insert	Screw	Wrench
SBHR/L	1010-K25	10	10	125	10	10	27	SB□R/L25	FTKA0409S	T9
	1212-K25	12	12	125	12	12	27			
	1616-K25	16	16	125	16	16	27			

SBHR/L-X (sub spindle)



SBBR SBGR
SBTR SBCR

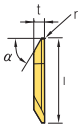
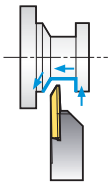
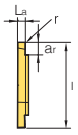
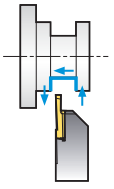
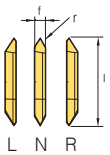
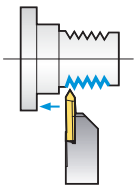
Offset "0"



(mm)

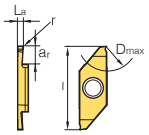
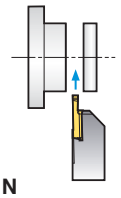
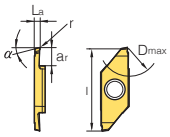
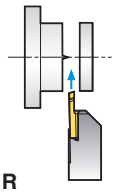
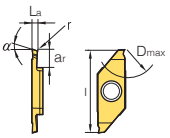
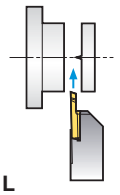
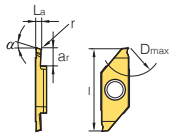
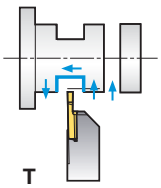
Designation		H	W	L	S1	S2	h	ℓ	Insert	Screw	Wrench
SBHR/L	1010-K25-X	10	10	125	10	7.5	10	27	SB□R/L25	FTKA0407S	T9
	1212-K25-X	12	12	125	12	7.5	12	27			

Insert

Application	Picture	Designation		Coated PC8110 R	Coated PC8110 L	l	α	t	r	La	ar	f	D-MAX	Pitch range Min.	Pitch range Max.	Configuration	Feed direction
Back turning	 SBBR/L	SBBR/L	25005	●		25	59	3.18	0.05	-	-	-	-	-	-		
			25010	●		25	59	3.18	0.10	-	-	-	-	-	-		
			25020	●		25	59	3.18	0.20	-	-	-	-	-	-		
Grooving	 SBGR/L	SBGR/L	2505	●		25	-	-	0.05	0.5	1.35	-	-	-	-		
			2510	●		25	-	-	0.05	1.0	2.75	-	-	-	-		
			2515	●		25	-	-	0.05	1.5	3.75	-	-	-	-		
			2520	●		25	-	-	0.05	2.0	3.75	-	-	-	-		
			2525	●		25	-	-	0.05	2.5	3.75	-	-	-	-		
Threading	 SBTR/L	SBTR/L	2560-N-005	●		25	-	-	0.05	-	-	1.59	-	0.2	2.0	 L N R	
			2560-N-010	●		25	-	-	0.10	-	-	1.59	-	1.0	2.0		
			2560-R-005	●		25	-	-	0.05	-	-	0.6	-	0.2	1.5		
			2560-R-010	●		25	-	-	0.10	-	-	0.6	-	1.0	1.5		
			2560-L-005	●		25	-	-	0.05	-	-	0.6	-	0.2	1.5		
			2560-L-010	●		25	-	-	0.10	-	-	0.6	-	1.0	1.5		

● : Stock item

KGT Insert

Application	Picture	Designation		Coated PC8110 R	Coated PC8110 L	Dimensions (mm) l	α	t	r	La	ar	f	D-MAX	Pitch range Min.	Pitch range Max.	Configuration	Feed direction
Parting off	 SBCR/L	SBCR/L	250708-N	●		25	0	-	0.05	0.70	4.3	-	8	-	-		 N
			251012-N	●		25	0	-	0.05	1.00	6.3	-	12	-	-		
			251512-N	●		25	0	-	0.05	1.50	6.3	-	12	-	-		
			252016-N	●		25	0	-	0.05	2.00	8.3	-	16	-	-		
			250708-R	●		25	15	-	0.05	0.70	4.3	-	8	-	-		 R
			251012-R	●		25	15	-	0.05	1.00	6.3	-	12	-	-		
			251512-R	●		25	15	-	0.05	1.50	6.3	-	12	-	-		
			252016-R	●		25	15	-	0.05	2.00	8.3	-	16	-	-		
			250708-L	●		25	15	-	0.05	0.70	4.3	-	8	-	-		 L
			251012-L	●		25	15	-	0.05	1.00	6.3	-	12	-	-		
			251512-L	●		25	15	-	0.05	1.50	6.3	-	12	-	-		
			252016-L	●		25	15	-	0.05	2.00	8.3	-	16	-	-		
			251012-T	●		25	0	-	0.05	1.00	6.3	-	12	-	-		 T
			251512-T	●		25	0	-	0.05	1.50	6.3	-	12	-	-		
			252016-T	●		25	0	-	0.05	2.00	8.3	-	16	-	-		

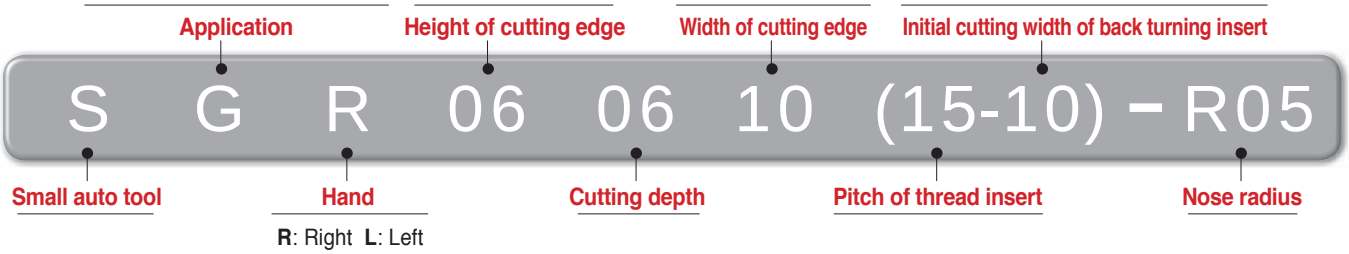
●: Stock item

Auto tools (For multi utility)

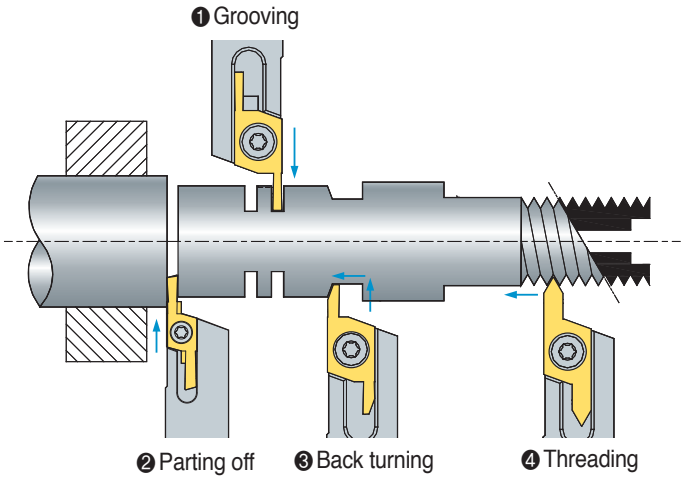
- Multifunctional insert for automatic lathes
- For external machining of precise small parts
- 5 types - SB(for back turning), SG(for grooving), ST(for threading), SC(for parting off), SGB(for grooving and back turning)
- Convenient use of one holder to all inserts
- Offset "0" to all ISO type holders

Insert code system (Multi utility type)

B: Back turning **G**: Grooving
C: Parting off **T**: Threading
GB : Grooving and back turning

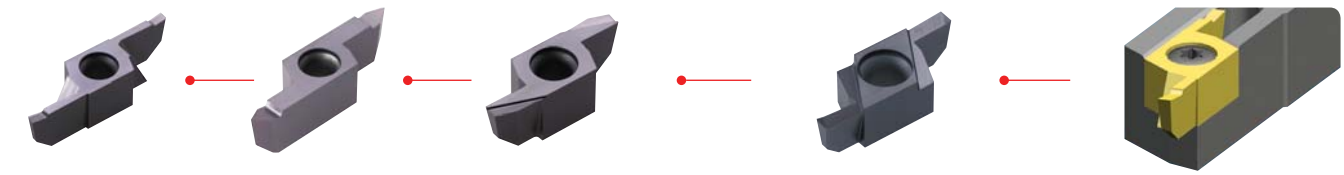


Application example



Types of multifunctional insert

Possible to apply various types of blade inserts to one holder (Ex: All designations of 06 size inserts can be applied to one 06 size holder.)

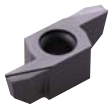


SG: Grooving | ST: Threading | SB: Back turning | SGB: Grooving and back turning | SC: Parting off

Recommended cutting conditions

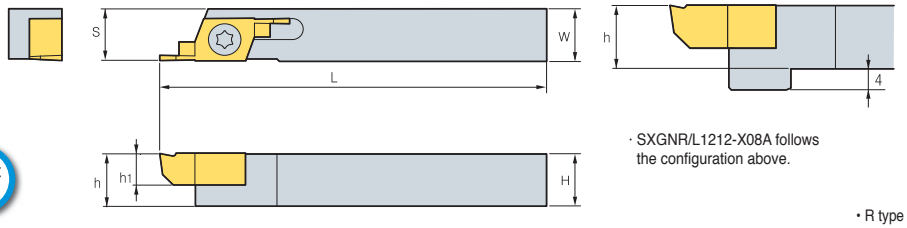
Workpiece	Turning		Grooving		Parting off		Back turning	
	Cutting speed, vc (m/min)	Feed, fn (mm/rev)	Cutting speed, vc (m/min)	Feed, fn (mm/rev)	Cutting speed, vc (m/min)	Feed, fn (mm/rev)	Cutting speed, vc (m/min)	Feed, fn (mm/rev)
Stainless steel	50~120	0.02~0.20	30~120	0.02~0.05	30~120	0.02~0.05	30~120	0.02~0.20
Carbon steel	50~150	0.01~0.25	50~150	0.02~0.08	50~150	0.01~0.08	50~150	0.01~0.25
Free cutting steel	30~150	0.02~0.25	30~150	0.02~0.08	30~150	0.01~0.08	30~150	0.01~0.25
Non-ferrous metal	70~200	0.03~0.25	70~200	0.03~0.10	70~200	0.03~0.10	70~200	0.03~0.30

SXGNR/L



SBR, SGBR
SCR, STR, SGR

Offset "0"



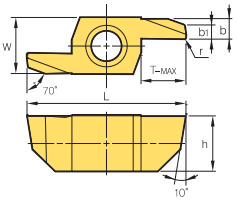
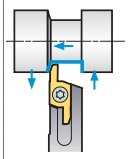
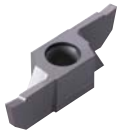
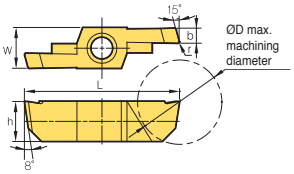
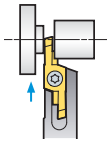
· SXGNR/L1212-X08A follows the configuration above.

• R type insert

(mm)

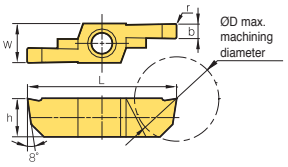
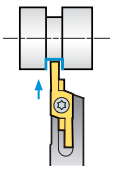
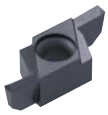
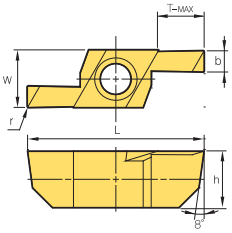
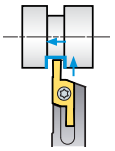
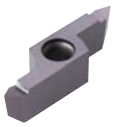
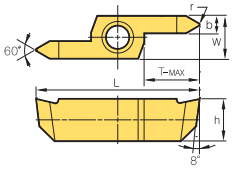
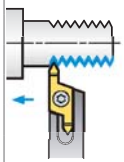
Designation		H	W	L	S	h	h1	Insert	Screw	Wrench
SXGNR/L	1010-X06A	10	10	125	10	10	6	S□R/L 06	FTNA 0408	TW 15P
	1212-X06A	12	12	125	12	12	6			
	1616-X06A	16	16	125	16	16	6			
	2020-X06A	20	20	125	20	20	6			
	1212-X08A	12	12	130	12	12	8	S□R/L 08	FTNA 0411	TW 15P
	1616-X08A	16	16	130	16	16	8			
	2020-X08A	20	20	130	20	20	8			

Insert

Application	Picture	Designation		Coated PC9030 R	Coated PC9030 L	Dimensions (mm) b1	b	W	L	r	h	T-MAX	ØD	Configuration	Feed direction
Back turning	SBR/L 	SBR/L	060520-10-R00			1	2	8	22	0	6	5.5	-		
			060520-10-R05			1	2	8	22	0.05	6	5.5	-		
			060520-10-R10			1	2	8	22	0.1	6	5.5	-		
			060630-20-R00			2	3	8	24	0	6	6.5	-		
			060630-20-R05			2	3	8	24	0.05	6	6.5	-		
			060630-20-R10			2	3	8	24	0.1	6	6.5	-		
			080630-20-R00			2	3	8	23	0	8	6.5	-		
			080630-20-R05			2	3	8	23	0.05	8	6.5	-		
			080630-20-R10			2	3	8	23	0.1	8	6.5	-		
			080840-20-R00			2	4	8	27	0	8	8.5	-		
			080840-20-R05			2	4	8	27	0.05	8	8.5	-		
			080840-20-R10			2	4	8	27	0.1	8	8.5	-		
Parting off	SCR/L 	SCR/L	060610-R00			-	1	8	24	0	6	-	11		
			060610-R05	●		-	1	8	24	0.05	6	-	11		
			060610-R10	●		-	1	8	24	0.1	6	-	11		
			060615-R00			-	1.5	8	24	0	6	-	11		
			060615-R05	●		-	1.5	8	24	0.05	6	-	11		
			060615-R10	●		-	1.5	8	24	0.1	6	-	11		
			060620-R00			-	2	8	24	0	6	-	11		
			060620-R05	●		-	2	8	24	0.05	6	-	11		
			060620-R10	●		-	2	8	24	0.1	6	-	11		
			081015-R00			-	1.5	8	31	0	8	-	18		
			081015-R05			-	1.5	8	31	0.05	8	-	18		
			081015-R10			-	1.5	8	31	0.1	8	-	18		
			081020-R00			-	2	8	31	0	8	-	18		
			081020-R05			-	2	8	31	0.05	8	-	18		
			081020-R10	●		-	2	8	31	0.1	8	-	18		
			081025-R00			-	2.5	8	31	0	8	-	18		
			081025-R05	●		-	2.5	8	31	0.05	8	-	18		
			081025-R10	●		-	2.5	8	31	0.1	8	-	18		
			081030-R00			-	3	8	31	0	8	-	18		
			081030-R05	●		-	3	8	31	0.05	8	-	18		
			081030-R10			-	3	8	31	0.1	8	-	18		

●: Stock item

Insert

Application	Picture	Designation		Coated PC9030 R	Coated PC9030 L	b	W	L	r	h	T-MAX	ØD	Pitch	Configuration	Feed direction
Grooving	SGR/L 	SGR/L	060610-R00			1	8	24	0	6	-	11	-		
			060610-R05	●		1	8	24	0.05	6	-	11	-		
			060610-R10	●		1	8	24	0.1	6	-	11	-		
			060615-R00			1.5	8	24	0	6	-	11	-		
			060615-R05	●		1.5	8	24	0.05	6	-	11	-		
			060615-R10	●		1.5	8	24	0.1	6	-	11	-		
			060620-R00			2	8	24	0	6	-	11	-		
			060620-R05	●		2	8	24	0.05	6	-	11	-		
			060620-R10	●		2	8	24	0.1	6	-	11	-		
			081015-R00			1.5	8	31	0	8	-	18	-		
			081015-R05			1.5	8	31	0.05	8	-	18	-		
			081015-R10			1.5	8	31	0.1	8	-	18	-		
			081020-R00			2	8	31	0	8	-	18	-		
			081020-R05	●		2	8	31	0.05	8	-	18	-		
			081020-R10			2	8	31	0.1	8	-	18	-		
			081025-R00			2.5	8	31	0	8	-	18	-		
			081025-R05			2.5	8	31	0.05	8	-	18	-		
			081025-R10			2.5	8	31	0.1	8	-	18	-		
			081030-R00			3	8	31	0	8	-	18	-		
			081030-R05			3	8	31	0.05	8	-	18	-		
			081030-R10			3	8	31	0.1	8	-	18	-		
Grooving and back turning	SGBR/L 	SGBR/L	0604520-R00			2	8	22	0	6	4.5	-	-		
			0604520-R05			2	8	22	0.05	6	4.5	-	-		
			0604520-R10			2	8	22	0.1	6	4.5	-	-		
			0604525-R00			2.5	8	22	0	6	4.5	-	-		
			0604525-R05			2.5	8	22	0.05	6	4.5	-	-		
			0604525-R10			2.5	8	22	0.1	6	4.5	-	-		
			0605530-R00			3	8	24	0	6	5.5	-	-		
			0605530-R05			3	8	24	0.05	6	5.5	-	-		
			0605530-R10			3	8	24	0.1	6	5.5	-	-		
			0805525-R00			2.5	8	24	0	8	5.5	-	-		
			0805525-R05			2.5	8	24	0.05	8	5.5	-	-		
			0805525-R10			2.5	8	24	0.1	8	5.5	-	-		
			0806530-R00			3	8	26	0	8	6.5	-	-		
			0806530-R05			3	8	26	0.05	8	6.5	-	-		
			0806530-R10			3	8	26	0.1	8	6.5	-	-		
Threading	STR/L 	STR/L	06073215			3.2	8	25	0.06	6	7	-	0.5-1.5		
			06073230			3.2	8	25	0.19	6	7	-	1.5-3.0		
			08103215			3.2	8	31	0.06	8	10.5	-	0.5-1.5		
			08103230			3.2	8	31	0.19	8	10.5	-	1.5-3.0		

● : Stock item

Auto tools (KGT/MGT type)

- Grooving insert for automatic lathes
- Exclusive holder for automatic lathes
- Economic double sided insert
- Strong clamping system secures stable machining and precision.
- A wide selection of chip breakers according to various cutting conditions such as low/high feed, continuous/interrupted machining, etc.

Insert code system (KGT/MGT type)

KG M N 300 - 04 - T

System code	Tolerance	Hand	Width of cutting edge	Corner nose radius of insert	Chip breaker
KG SYSTEM (KORLOY Grooving) MG SYSTEM (Multi Grooving)	**M**: Pressed class **G**: Ground class	**N**: Neutral **R**: Right **L**: Light **I**: Internal	2.0~8.0 mm	0.2 mm 0.3 mm 0.4 mm	L/R/T/ LP/RP

Holder code system (KGT/MGT type)

KG E H R/L 1212 - 3 D25A

System code	Application	Holder type	Hand	Shank size	Cutting width	Max. cutting diameter
KG SYSTEM (KORLOY Grooving) MG SYSTEM (Multi Grooving)	**E**: External machining **I**: Internal machining	**H**: Horizontal type **V**: Vertical type **U**: Undercut type	**R**: Right **L**: Light	Height 12 mm, width 12 mm (For internal machining: Min. machining diameter)	2.0~3.0 mm	Ø15~Ø32 mm

Chip breaker line-up

KGT Type

KGMN-L



- Sharp cutting edge
- For low feed machining
- For small diameter parts

KGMN-R



- Reinforced cutting edge
- For high feed machining
- For interrupted cutting

KGMN-T



- Sharp cutting edge
- Stronger chip control
- For turning and grooving

KGMR/L-LP



- Sharp cutting edge
- For low feed machining
- Small diameter component
- Right / Left handed
- Low carbon steel

KGMR/L-RP



- Strong cutting edge
- For high feed machining
- For iInterrupted cutting
- Right / Left handed

KRMN-C



- Improved chip control
- Copying
- Relief

MGT Type

MGM(G)N-M



- Easier chip control by narrowing chip width with the use of chip breaker on rake surface center
- Smooth chip flow by small dots in external machining
- Available for both external machining and grooving

MGMN-G



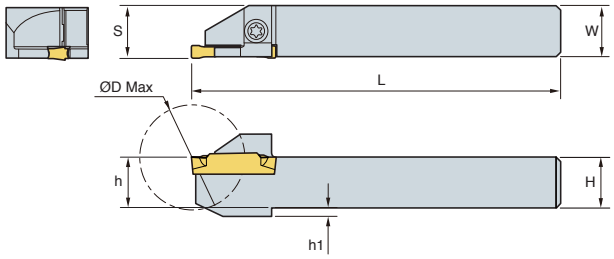
- Specially designed chip breaker allows narrower chips to promote better chip flow with the use of center dots
- Exclusive chip breaker for grooving

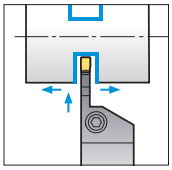
KGEHR/L-D00A

Grooving, turning, parting off



KGGN KGMN KGMR/L





• R type insert

(mm)

Designation		H = (h)	W	L	S	h1	ØD Max	Insert	Screw	Wrench
KGEHR/L	1010-2-D20A	10	10	125	10.2	2	20	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	ETNA0412	TW15L
	1414-2-D25A	14	14	125	14.2	-	25			
	1616-2-D32A	16	16	125	16.2	-	32			
	1212-2-D25A	12	12	125	12.4	2	25	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN200-□-□		
	1616-3-D32A	16	16	125	16.4	-	32			

KGT Insert

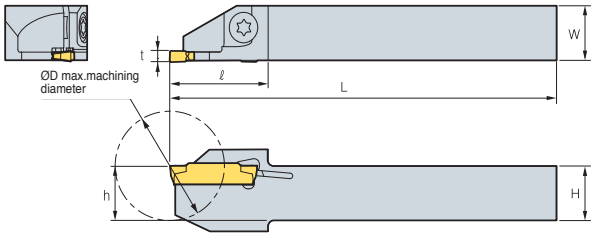
Application	Picture	Designation		Coated						Dimensions (mm)					Configuration
				NC3120	NC3225	NC5330	NC6315	PC5300	PC9030	b	r	l	d	α °	
Grooving	KGMN-L	KGMN	200-02-L		●	●		●	●	2.0	0.2	20	1.7	-	
			300-02-L		●	●		●	●	3.0	0.2	20	2.3	-	
Grooving · Parting off	KGMN-R	KGMN	200-02-R		●	●		●	●	2.0	0.2	20	1.7	-	
			300-02-R		●	●		●	●	3.0	0.2	20	2.3	-	
Grooving · turning	KGMN-T	KGMN	200-02-T		●	●	●	●	●	2.0	0.2	20	1.7	-	
			300-02-T		●	●	●	●	●	3.0	0.2	20	2.3	-	
			300-04-T		●	●	●	●	●	3.0	0.4	20	2.3	-	
Parting off (Right handed)	KGMR-LP	KGMR	200-6D-LP			●		●		2.0	0.2	20	-	6	
			200-15D-LP			●		●		2.0	0.2	20	-	15	
			300-6D-LP			●		●		3.0	0.2	20	-	6	
			300-15D-LP			●		●		3.0	0.2	20	-	15	
Parting off (Right handed)	KGMR-RP	KGMR	200-6D-RP			●		●		2.0	0.2	20	-	6	
			200-15D-RP			●		●		2.0	0.2	20	-	15	
			300-6D-RP			●		●		3.0	0.2	20	-	6	
			300-15D-RP			●		●		3.0	0.2	20	-	15	
Parting off (Left handed)	KGML-LP	KGML	200-6D-LP							2.0	0.2	20	1.7	6	
			200-15D-LP							2.0	0.2	20	1.7	15	
			300-6D-LP							3.0	0.2	20	2.3	6	
			300-15D-LP							3.0	0.2	20	2.3	15	
Parting off (Left handed)	KGML-RP	KGML	200-6D-RP							2.0	0.2	20	1.7	6	
			200-15D-RP							2.0	0.2	20	1.7	15	
			300-6D-RP							3.0	0.2	20	2.3	6	
			300-15D-RP							3.0	0.2	20	2.3	15	
Grooving · Turning	KRMN-C	KRMN	200-C		●	●	●	●		2.0	1.0	20	1.7	-	
			300-C		●	●	●	●		3.0	1.5	20	2.2	-	

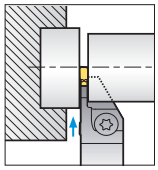
● : Stock item

MGEHR/L



MGMN



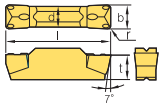
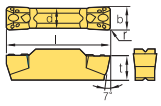


• R type insert

(mm)

Designation		ØD	H = (h)	W	L	ℓ	t	Insert	Screw	Wrench
MGEHR/L	1010-X15A	20	10	10	125	18	1.5	MGMN150-G	ETNA 0412	TW 15L
	1212-X15A	25	12	12	125	19.5	1.5			
	1010-X20A	20	10	10	125	18	2	MGMN200-M MGMN200-G	ETNA 0412	TW 15L
	1212-X20A	25	12	12	125	19.5	2			
	1616-X20A	32	16	16	125	25	2			
	1010-X25A	20	10	10	125	20	2.5	MGMN250-M MGMN250-G	ETNA 0412	TW 15L
	1212-X25A	25	12	12	125	20	2.5			
	1616-X25A	32	16	16	125	25	2.5			

MGT Insert

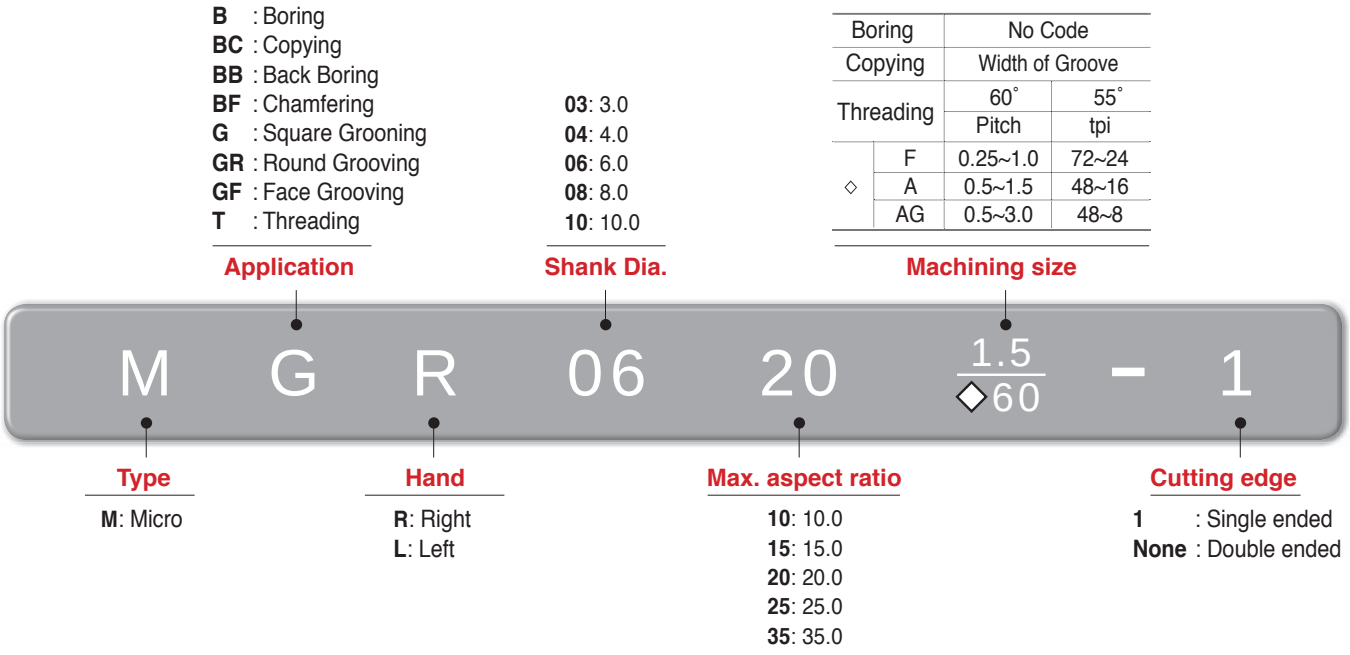
Application	Picture	Designation		Coated							Uncoated			Dimensions (mm)					Configuration
				NC3120	NC3225	NC5330	NC6315	NC3030	PC5300	PC9030	H01	G10	ST30A	b	r	l	d	t	
Grooving	MGMN-G	MGMN	150-G					●	●	●	●			1.5	0.15	16.0	1.2	3.5	
			200-G	●				●		●	●			2.0	0.2	16.0	1.6	3.5	
			250-G					●	●	●				2.5	0.2	18.5	2.0	3.85	
Grooving	MGMN-M	MGMN	200-M	●		●		●	●	●	●			2.0	0.2	16.0	1.6	3.5	
			250-M	●				●	●	●				2.5	0.2	18.5	2.0	3.85	

● : Stock item

Auto tool (MSB tool)

- High hardness grade guarantees longer tool life
- Various kinds of machining (Fitting, Valve, Medical parts, Automobile component, and Semiconductor equipment) are available
- Various types of MSB tools (Boring, Grooving, Threading)

Code system



MSB tool code system

Types		Application		Designation
01	Boring	Boring		MBR/L○○☆☆
02		Copying		MBCR/L○○☆☆
03		Back Boring		MBBR/L○○☆☆
04		Chamfering		MBFR/L○○☆☆
05	Grooving	Square Grooning		MGR/L○○☆☆-□□
06		Round Grooving		MGRR/L○○☆☆-□□
07		Face Grooving		MGFR/L○○00-□□
08	Threading	Partial	60°	MTR/L○○☆☆-◇60
			55°	MTR/L○○☆☆-◇55

Details

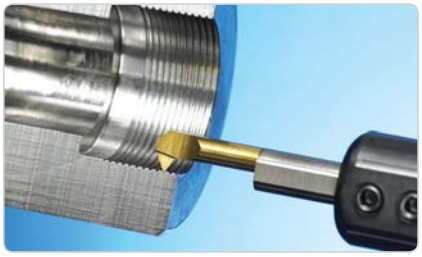
Marks	○○	Shank Dia.			
	☆☆	Max. depth of boring			
	□□	Width of groove			
	◇	Pitch / tpi	F	0.25~1.0	72~24
			A	0.5~1.5	48~16
			AG	0.5~3.0	48~8

Grades

Grades	Coating	Application and features
Z12M	Carbide	Ultra fine grain substrate ensures superior wear resistance and toughness Application: Cast iron, Aluminum alloy and Non-ferrous metals machining
PC30M	TiN coating	TiN coated ultra fine grain substrate ensures long tool life Application: Stainless steel, heat resisting alloy and hard-to-cut material machining

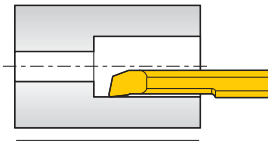
Machining types



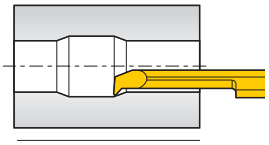


Types

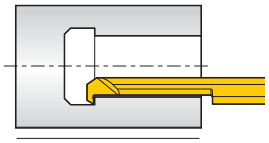
Boring



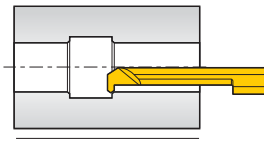
Boring
Min. dia. of machining: Ø3.2



Copying
Min. dia. of machining: Ø4.2

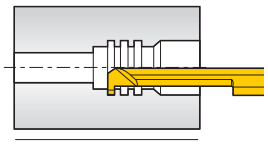


Back Boring
Min. dia. of machining: Ø3.2

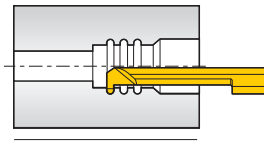


Chamfering
Min. dia. of machining: Ø4.2

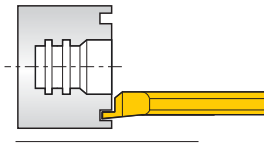
Grooving



Square Grooving
Min. dia. of machining: Ø3.2

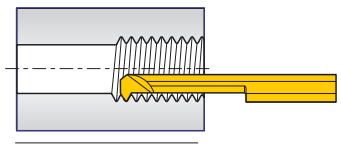


Round Grooving
Min. dia. of machining: Ø3.2



Face Grooving
Min. dia. of machining: Ø6.0

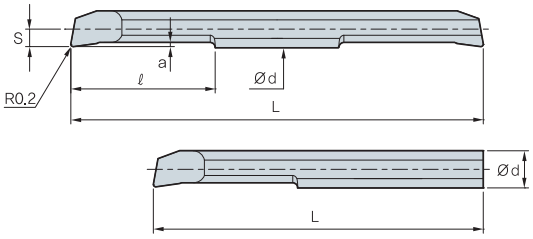
Threading

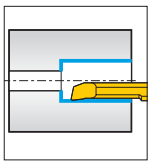


Threading
Min. dia. of machining: Ø3.3

Boring





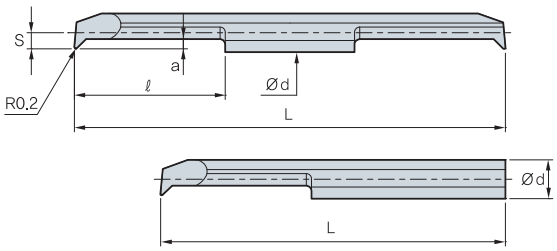


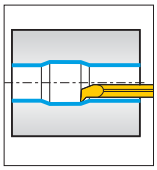
Twin Edge				Single Edge				Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge	
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M				L		a	S
											Double ended	Single ended		
MBR	0310	●		MBR	0310-1			3.0	3.2	10	40	35	0.5	1.4
	0315	●			0315-1					15	50	45		
	0410	●			0410-1			4.0	4.2	10	40	35	0.6	1.9
	0415	●			0415-1					15	50	45		
	0420	●			0420-1					20	60	50		
	0610				0610-1			6.0	6.2	10	45	40	0.75	2.9
	0615	●			0615-1					15	55	45		
	0620	●			0620-1					20	65	50		
	0810				0810-1			8.0	8.2	10	50	45	0.8	3.9
	0820	●			0820-1					20	70	60		
	0830				0830-1					30	80	70		
	1015				1015-1			10.0	10.2	15	60	60	1.0	4.9
	1025	●			1025-1					25	80	70		
	1035				1035-1					35	100	80		

● : Stock item

Copying





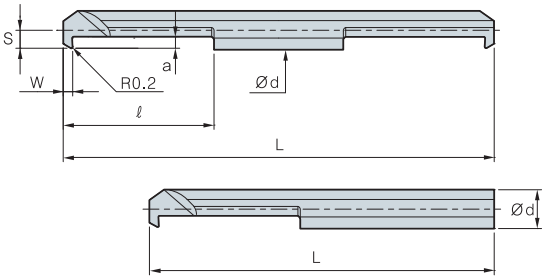


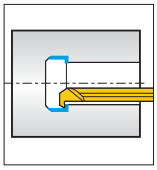
Twin Edge				Single Edge				Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge	
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M				L		a	S
											Double ended	Single ended		
MBCR	0410			MBCR	0410-1			4.0	4.2	10	40	35	1.0	1.9
	0415	●			0415-1					15	50	45		
	0420	●			0420-1					20	60	50		
	0610				0610-1			6.0	6.2	10	45	40	1.3	2.9
	0615	●			0615-1					15	55	45		
	0620	●			0620-1					20	60	50		

● : Stock item

Back Boring





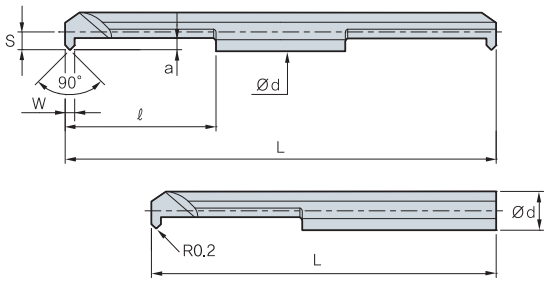


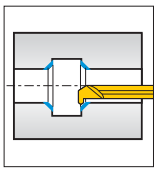
Twin Edge			Single Edge			Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation	Coated PC30M	Uncoated Z12M	Designation	Coated PC30M	Uncoated Z12M				L Double ended	L Single ended	W	a	S
MBBR 0310			MBBR 0310-1			3.0	3.2	10	40	35	1.5	0.8	1.4
0315			0315-1					15	50	45			
0410			0410-1			4.0	4.2	10	40	35	2.0	1.3	1.9
0415			0415-1					15	50	45			
0420			0420-1					20	60	50			
0610			0610-1			6.0	6.2	10	45	40	2.0	1.9	2.9
0615			0615-1					15	55	45			
0620			0620-1					20	65	50			

● : Stock item

Chamfering





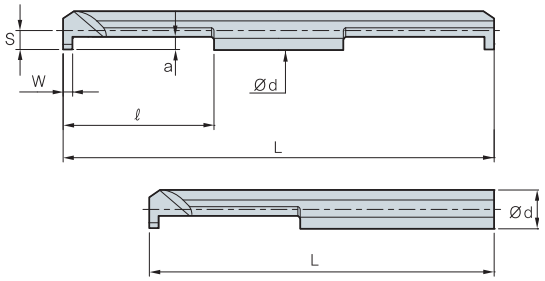


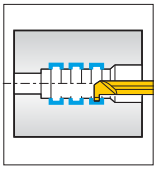
Twin Edge			Single Edge			Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation	Coated PC30M	Uncoated Z12M	Designation	Coated PC30M	Uncoated Z12M				L Double ended	L Single ended	W	a	S
MBFR 0410			MBFR 0410-1			4.0	4.2	10	40	35	0.8	1.0	1.9
0415			0415-1					15	50	45			
0420			0420-1					20	60	50			
0610			0610-1			6.0	6.2	10	45	40	1.4	1.2	2.9
0615			0615-1					15	55	45			
0620			0620-1					20	65	50			

● : Stock item

Square Grooving





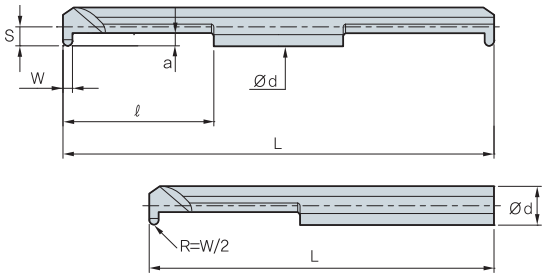


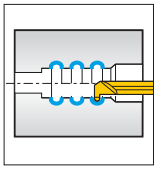
Twin Edge				Single Edge				Ød	Min.dia. of machining	ℓ	Overall length		Detailed cutting edge		
Designation		Coated	Uncoated	Designation		Coated	Uncoated				L		W	a	S
		PC30M	Z12M			PC30M	Z12M				Double ended	Single ended			
MGR	0310-1.0			MGR	0310-1.0-1			3.0	3.2	10	40	35	1.0	0.8	1.4
	0315-1.0				0315-1.0-1					15	50	45			
	0310-1.5				0310-1.5-1					10	40	35	1.5		
	0315-1.5				0315-1.5-1					15	50	45			
	0410-1.0				0410-1.0-1			4.0	4.2	10	40	35	1.0	1.4	1.9
	0420-1.0				0420-1.0-1					20	60	50			
	0410-1.5				0410-1.5-1					10	40	35	1.5		
	0420-1.5				0420-1.5-1					20	60	50			
	0410-2.0				0410-2.0-1					10	40	35	2.0		
	0420-2.0				0420-2.0-1					20	60	50			
	0610-1.0	●			0610-1.0-1			6.0	6.2	10	45	40	1.0	1.8	2.9
	0620-1.0	●			0620-1.0-1					20	65	50			
	0610-1.5				0610-1.5-1					10	45	40	1.5		
	0620-1.5				0620-1.5-1					20	65	50			
	0610-2.0				0610-2.0-1					10	45	40	2.0		
	0620-2.0				0620-2.0-1					20	65	50			
	0610-2.5				0610-2.5-1					10	45	40	2.5	2.0	
	0620-2.5				0620-2.5-1					20	65	50			
	0820-1.5				0820-1.5-1			8.0	8.2	20	70	60	1.5	2.5	3.9
	0820-2.0				0820-2.0-1								2.0		
	0820-2.5				0820-2.5-1								2.5	3.5	
	0820-3.0				0820-3.0-1								3.0		
	1025-1.5				1025-1.5-1			10.0	10.2	25	80	70	1.5	2.5	4.9
	1025-2.0				1025-2.0-1								2.0		
	1025-2.5				1025-2.5-1								2.5	3.5	
	1025-3.0				1025-3.0-1								3.0		

●: Stock item

Round Grooving



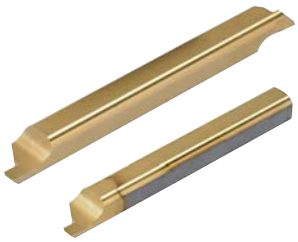


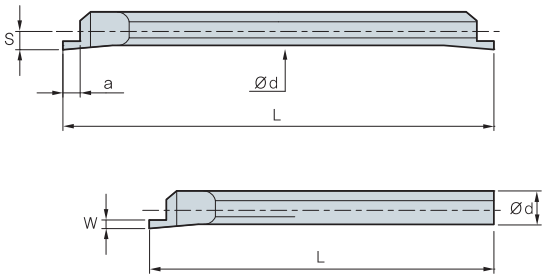


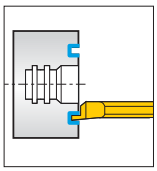
Twin Edge			Single Edge			Ød	Min.dia. of machining	ℓ	Overall length L		Detailed cutting edge		
Designation	Coated PC30M	Uncoated Z12M	Designation	Coated PC30M	Uncoated Z12M				Double ended	Single ended	W	a	S
MGRR 0310-0.8			MGRR 0310-0.8-1			3.0	3.2	10	40	35	0.8	0.8	1.4
0315-0.8			0315-0.8-1					15	50	45			
0410-1.0			0410-1.0-1			4.0	4.2	10	40	35	1.0	1.0	1.9
0420-1.0			0420-1.0-1					20	60	50			
0610-1.0			0610-1.0-1			6.0	6.2	10	45	40	1.0	2.0	2.9
0620-1.0			0620-1.0-1					20	65	50			
0610-1.5			0610-1.5-1					10	45	40	1.5		
0620-1.5			0620-1.5-1					20	65	50			
0610-2.0			0610-2.0-1					10	45	40	2.0		
0620-2.0			0620-2.0-1					20	65	50			
0820-1.0			0820-1.0-1			8.0	8.2	20	70	60	1.0	2.3	3.9
0820-1.5			0820-1.5-1								1.5		
0820-2.0			0820-2.0-1								2.0		
1025-1.0			1025-1.0-1			10.0	10.2	25	80	70	1.0	2.8	4.9
1025-1.5			1025-1.5-1								1.5		
1025-2.0			1025-2.0-1								2.0		

● : Stock item

Face Grooving





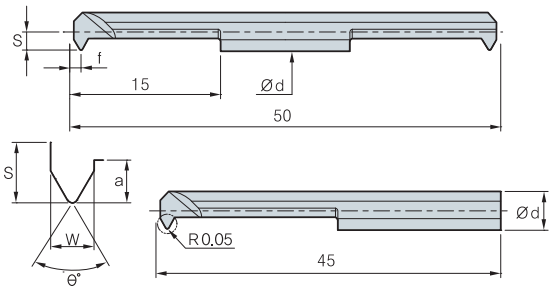


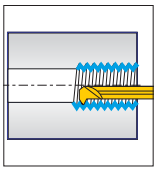
Twin Edge			Single Edge			Ød	Min.dia. of machining	Overall length L		Detailed cutting edge		
Designation	Coated PC30M	Uncoated Z12M	Designation	Coated PC30M	Uncoated Z12M			Double ended	Single ended	W	a	S
MGFR 0400-1.0			MGFR 0400-1.0-1			4.0	6.0	50	45	1.0	1.5	1.8
0400-1.5			0400-1.5-1							1.5	2.0	
0600-1.0			0600-1.0-1			6.0	8.5	50	45	1.0	1.5	2.9
0600-1.5			0600-1.5-1							1.5	2.0	
0600-2.0	●		0600-2.0-1							2.0	2.5	
0800-1.0			0800-1.0-1			8.0	10.4	70	60	1.0	1.5	3.9
0800-1.5			0800-1.5-1							1.5	2.0	
0800-2.0			0800-2.0-1							2.0	2.5	
1000-2.0			1000-2.0-1			10.0	12.4	80	70	2.0	2.5	4.9
1000-2.5			1000-2.5-1							2.5	3.0	
1000-3.0			1000-3.0-1							3.0	3.5	
1000-3.5			1000-3.5-1							3.5	4.0	
1000-4.0			1000-4.0-1							4.0	4.5	
1000-4.5			1000-4.5-1							4.5	5.0	

● : Stock item

Threading







Twin Edge				Single Edge				Ød	Min.dia. of machining	Threading			Detailed cutting edge		
Designation		Coated PC30M	Uncoated Z12M	Designation		Coated PC30M	Uncoated Z12M			W	Pitch / tpi	θ°	S	a	f
MTR	0315-F60			MTR	0315-F60-1			3.0	3.3	1.2	0.5~1.0	60°	1.45	1.2	0.6
	0415-F60				0415-F60-1			4.0	4.3				1.95		
	0615-A60				0615-A60-1			6.0	6.2	2.0	0.5~1.5		2.90	2.2	1.0
	0315-F55				0315-F55-1			3.0	3.3	1.2	48~24	55°	1.45	1.2	0.6
	0415-F55				0415-F55-1			4.0	4.3				1.95		
	0615-A55				0615-A55-1			6.0	6.2	2.0	28~16		2.9	2.2	1.0

● : Stock item

SLEEVE

SL (SLEEVE)

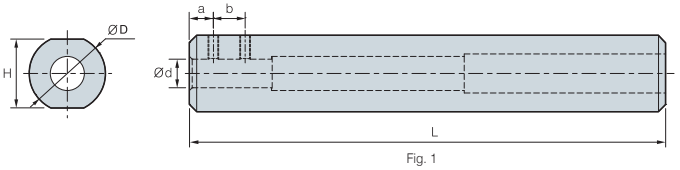


Fig. 1

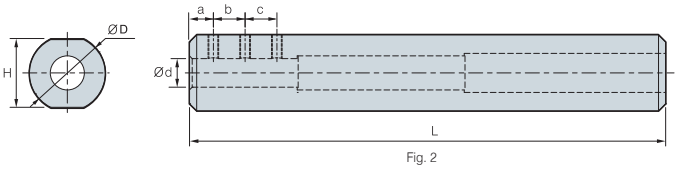


Fig. 2

(mm)

Designation	Ød	a	b	c	ØD	H	L	Screw	Wrench	Fig.
SL1603	3	5	-	-	16	14	100	M3	HW15L	1
SL1604	4	5	6	-	16	14	100	M4	HW20L	
SL1605	5	5	8	-	16	14	100	M4	HW20L	
SL1606	6	5	6	6	16	14	100	M4	HW20L	2
SL1607	7	5	6	8	16	14	100	M4	HW20L	
SL2008	8	5	10	10	20	18	100	M4	HW20L	2
SL2010	10	5	10	10	20	18	100	M5	HW20L	

※ Fine tolerance and surface roughness

Multi Turn

Holder code system

MT 20 R - 2.25D

- MT: Brand Name
- 20: Tool Dia.
- R: Hand
- 2.25D: Aspect ratio

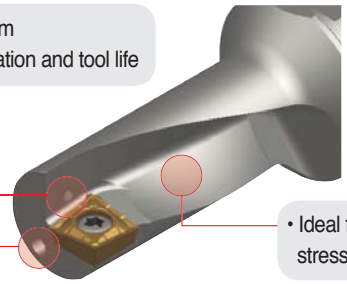
Insert code system

Q C M T 08 03 04 - CM

- Q: Insert shape
- C: Relief angle
- M: Tolerance
- T: Cross Section Type
- 08: Cutting Edge Length
- 03: Height of Cutting Edge
- 04: Nose Radius
- CM: Chip Breaker

Tool design by FEM analysis

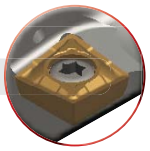
- Double coolant system
- Excellent chip evacuation and tool life

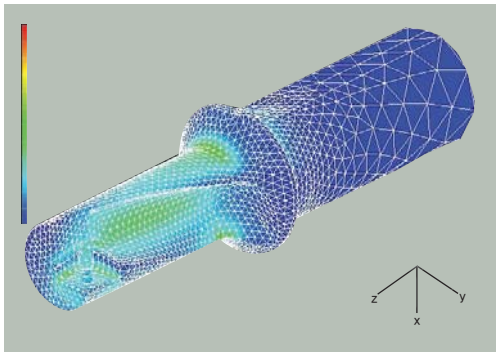


- Ideal flute design minimizing stress concentrations

※ Clamping tip

Correct: High cutting edge position
Wrong: Low cutting edge position





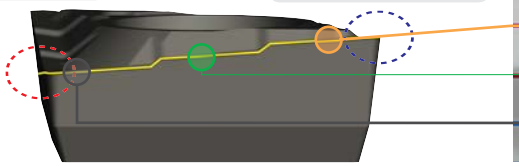
- Minimized stress during cutting, prevented damage from vibration and longer tool life

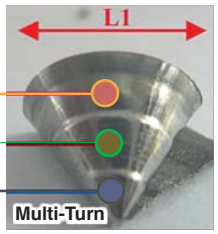
Optimized design

Creative stepping cutting edge

Drilling edge (Drilling)

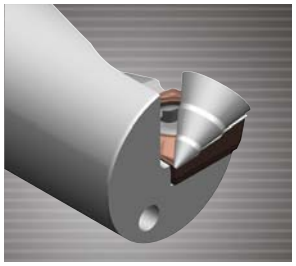
Turning edge (Internal, external and face turning)







- Special chip formed by edge geometry better chip
- evacuation due to small radius width of chip curl





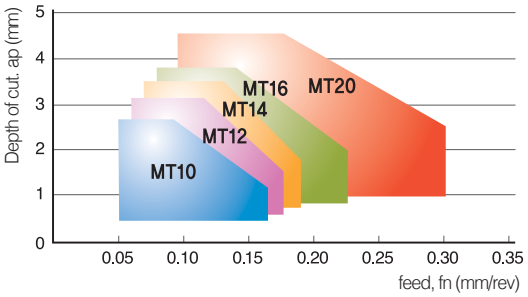
Comparison	Multi turn	Competitor A	Competitor B
Feed fn (mm/rev) = 0.08			
Feed fn (mm/rev) = 0.10			
Chip width (rate)	80%	100%	120%

User's guide

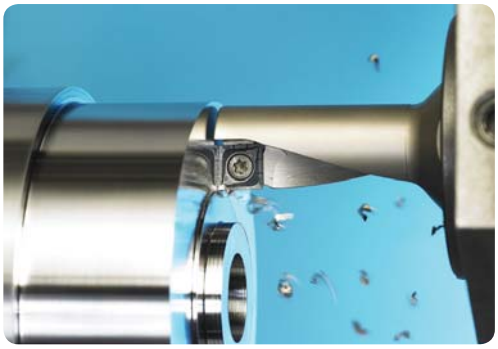
External / Internal turning



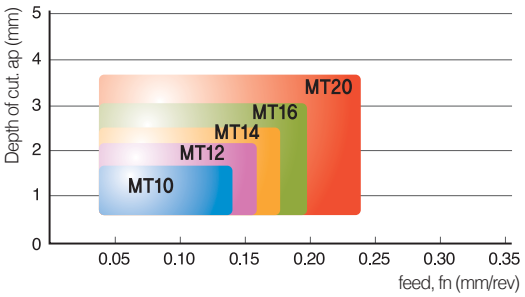
Application range



Facing



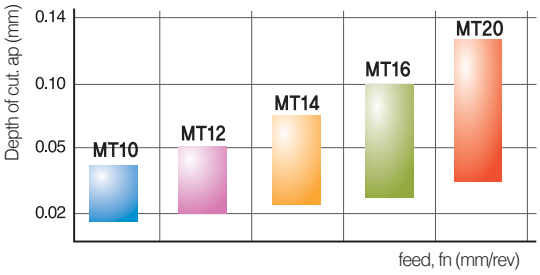
Appication ranges of facing



Drilling

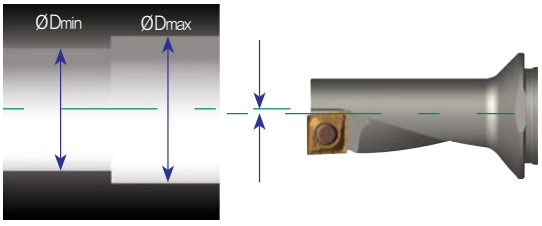


Drilling feed range by designation



Offset (Diameter compensation)

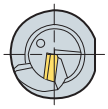
Disignation	Machined diameter (mm)	ØDmin (mm)	ØDmax (mm)
MT10R/L-2.25D	10	9.85	10.35
MT12R/L-2.25D	12	11.85	12.35
MT14R/L-2.25D	14	13.85	14.35
MT16R/L-2.25D	16	15.85	16.35
MT20R/L-2.25D	20	19.85	20.35
MT25R/L-2.25D	25	24.85	25.35
MT32R/L-2.25D	32	31.85	32.35

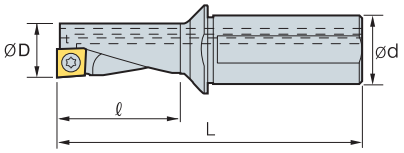


Drill diameter is adjustable by the offset compensation

MT (Multi-Turn)





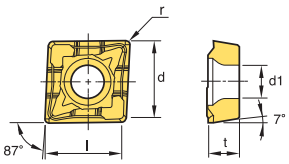
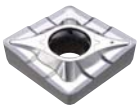
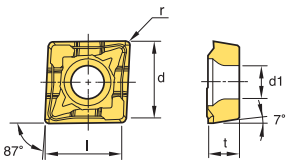


(mm)

Designation		ØD	Ød	ℓ	L	Insert	Screw	Wrench
MT	10R/L-2.25D	10	12	22.5	69.5	QC□T050204	FTNA0204S	TW06P
	12R/L-2.25D	12	16	27.0	78.0	QC□T060204	FTNA02205S	TW06P
	14R/L-2.25D	14	16	31.5	83.5	QC□T070304	FTKA02555	TW07P
	16R/L-2.25D	16	20	36.0	94.0	QC□T080304	FTNA0306	TW09P
	20R/L-2.25D	20	25	45.0	111.0	QC□T10T304	FTNA03508	TW15P
	25R/L-2.25D	25	32	56.5	130.0	QC□T130408	FTNC04509	TW20S
	32R/L-2.25D	32	40	72.0	160.0	QC□T170508	FTNC04511	TW20S

Applicable inserts **B133**

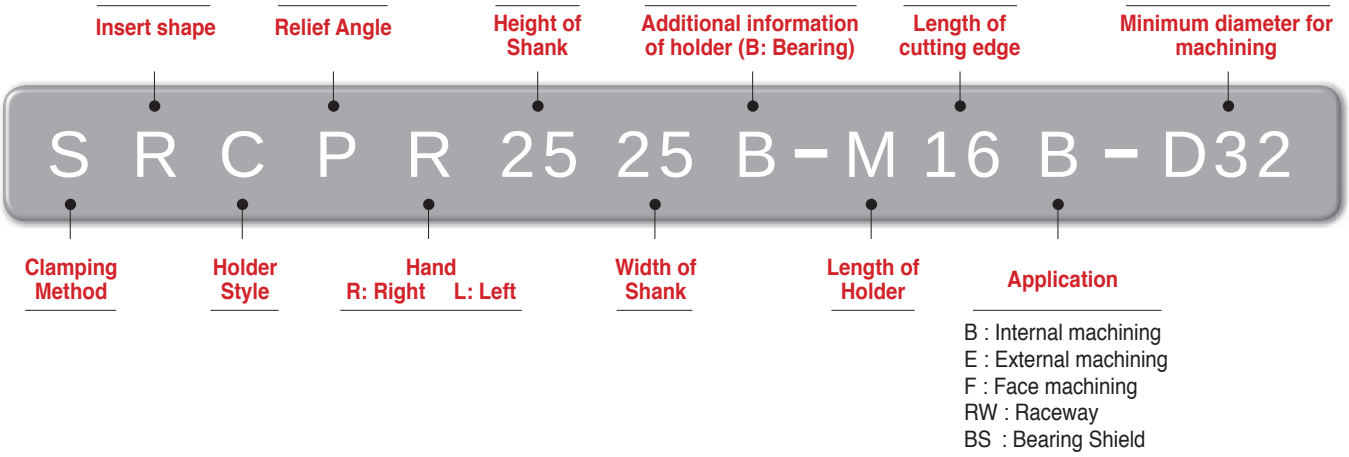
Insert

Picture	Designation		Coated				Uncoated		Dimensions (mm)					Configuration
			NC3120	NC3225	NC6315	PC5300	H01	H05	l	d	t	r	Ød1	
	QCMT	050204-CM		●	●	●			5.0	5.4	2.10	0.4	2.3	
		060204-CM		●	●	●			6.0	6.4	2.38	0.4	2.5	
		070304-CM		●	●	●			7.0	7.4	3.18	0.4	2.8	
		080304-CM		●	●	●			8.0	8.4	3.18	0.4	3.4	
		10T304-CM		●	●	●			10.0	10.4	3.97	0.4	4.0	
		130408-CM		●	●	●			12.7	13.5	4.76	0.8	5.5	
		170508-CM		●	●	●			16.7	17.5	5.56	0.8	5.5	
	QCGT	050204-CA					●		5.0	5.4	2.10	0.4	2.3	
		060204-CA					●		6.0	6.4	2.38	0.4	2.5	
		070304-CA					●		7.0	7.4	3.18	0.4	2.8	
		080304-CA					●		8.0	8.4	3.18	0.4	3.4	
		10T304-CA					●		10.0	10.4	3.97	0.4	4.0	
		130408-CA					●		12.7	13.5	4.76	0.8	5.5	
		170508-CA					●		16.7	17.5	5.56	0.8	5.5	

● : Stock item

Bearing Solution

Holder code system

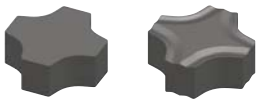


Insert code system for race way and bearing shield machining

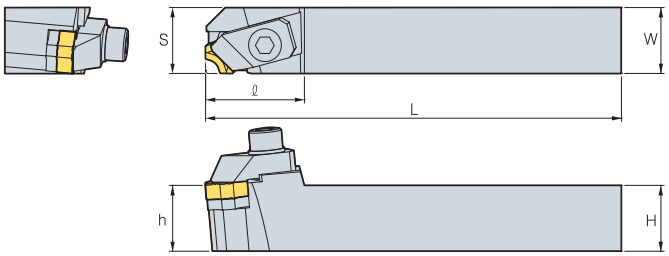


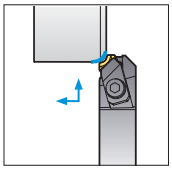


CMSN...F Type



MC12□□ MC12□□-BR
MC15□□

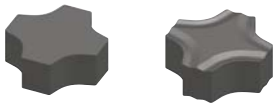




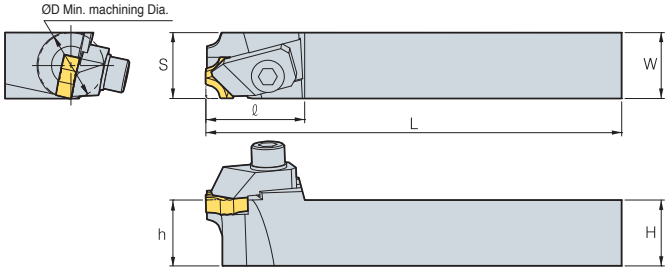
• R type insert
(mm)

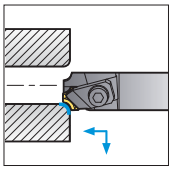
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CMSNR/L	2020B-L12F	20	20	140	21	20	33	MC12□□ MC12□□-BR	CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	2023B-L12F	20	23	140	24	20	33						
	2525B-L15F	25	25	140	26	25	35	MC15□□	CH6R/L1B	BHA0620	SX52CB	SS0408	HW50L

CMSN...B Type



MC12□□ MC12□□-BR

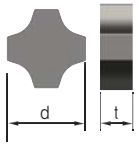
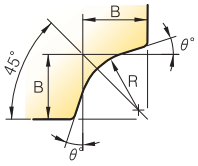
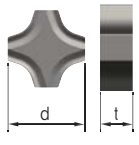




• R type insert
(mm)

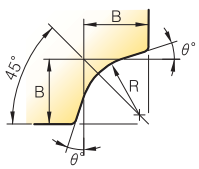
Designation		ØD	H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CMSNR/L	2020B-L12B-D28	28	20	20	140	21	20	33		CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	2525B-L12B-D28	28	25	25	140	26	25	33	MC12□□	CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L
	1620B-L12B-D20	20	16	20	140	18	16	32	MC12□□-BR	CH6R/L1B	BHA0620	-	-	HW50L
	2023B-L12B-D28	28	20	23	140	24	20	33		CH6R/L1B	BHA0620	SX42CB	SS0308	HW50L

Insert

Application	Picture	Designation	Cermet	Dimensions (mm)					Configuration
			CN2000	R	θ°	B	d	t	
R-Chamfering		MC0906		0.6	12	1.8	9.525	3.18	
		MC0910		1.0	12	2.4	9.525	3.18	
		MC1206		0.6	18	1.8	12.7	4.76	
		MC1210		1.0	18	2.4	12.7	4.76	
		MC1212		1.2	18	2.2	12.7	4.76	
		MC1215		1.5	18	3.0	12.7	4.76	
		MC1220		2.0	18	3.8	12.7	4.76	
		MC1225		2.5	18	2.8	12.7	4.76	
		MC1525		2.5	18	4.0	15.875	5.56	
		MC1530		3.0	18	4.7	15.875	5.56	
		MC1540		4.0	20	4.7	15.875	5.56	
		MC1206-BR		0.6	18	1.8	12.7	4.76	
		MC1210-BR		1.0	18	2.4	12.7	4.76	
		MC1212-BR		1.2	18	2.2	12.7	4.76	
		MC1215-BR		1.5	18	3.0	12.7	4.76	
		MC1220-BR		2.0	18	3.2	12.7	4.76	
		MC1230-BR		3.0	18	3.7	12.7	4.76	
		MC1235-BR		3.5	18	3.9	12.7	4.76	

● : Stock item

Special order-form



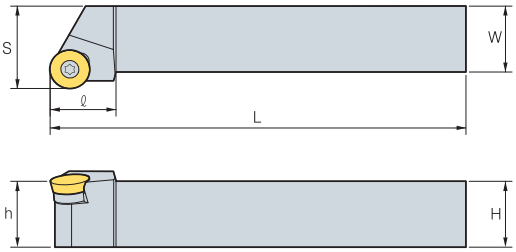
Designation	CN1000	CN2000	R	θ°	B	d	t	Configuration
MC...								

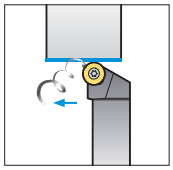
SRGP...E Type



RPGT1203M0
RPGT1604M0
RPGT2004M0







• R type insert

(mm)

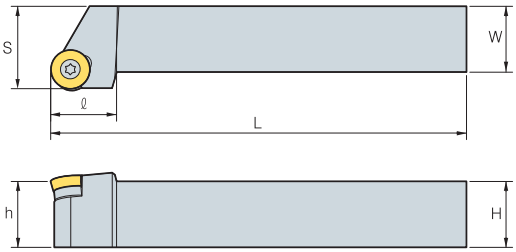
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SRGPR/L	2020B-L12E	20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
	2020B-L16E	20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
	2525B-L20E	25	25	140	32	25	30	RPGT2004M0	FTNA0513	SR20T3S	SHXN0712F	TW20P

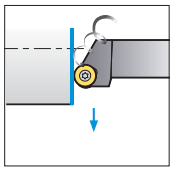
SRGP...F Type



RPGT1203M0
RPGT1604M0
RPGT2004M0







• R type insert

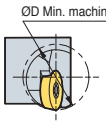
(mm)

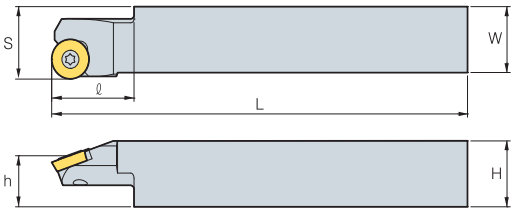
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SRGPR/L	2020B-L12F	20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
	2020B-L16F	20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
	2525B-L20F	25	25	140	32	25	30	RPGT2004M0	FTNA0513	SR20T3S	SHXN0712F	TW20P

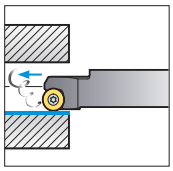
SRCP...B Type



RPGT0802M0
RPGT1203M0
RPGT1604M0







• R type insert

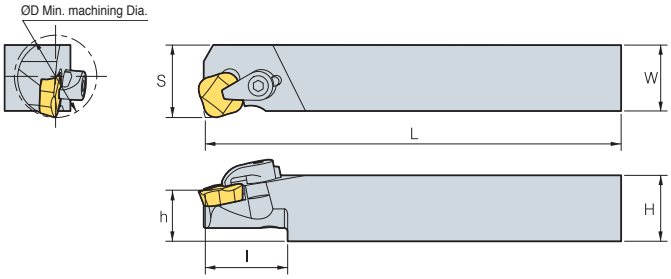
(mm)

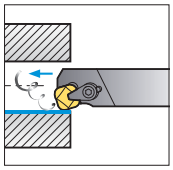
Designation		ØD	H	W	L	S	h	ℓ	Insert	Screw	Wrench
SRCPR/L	2020B-L08B-D12	12	20	20	140	21.5	15.5	25	RPGT0802M0	FTKA0305	TW09P
	1919B-L12B-D15	15	19	19	140	21	16	25	RPGT1203M0	FTNA0408	TW15P
	2020B-L12B-D20	20	20	20	140	22	15.5	25	RPGT1203M0	FTNA0408	TW15P
	2525B-L16B-D32	32	25	25	140	27	20	30	RPGT1604M0	FTKA0510	TW20P

CSKP...B Type



SPGR120440L



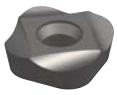


• R type insert

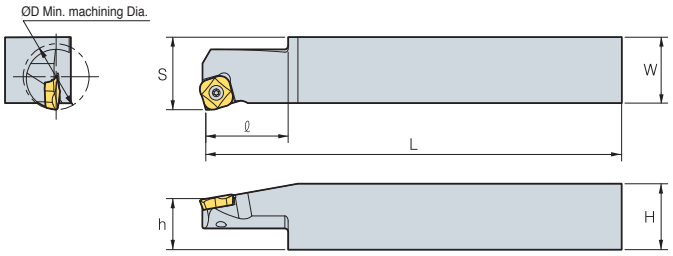
(mm)

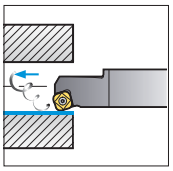
Designation		ØD	H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Wrench
CSKPR/L	2022B-L12B-D30	30	20	22	140	27	20	37	SPGR120440R/L	CH5R1	CHX0510	HW30L

SSKP...B Type



SPGH090330L



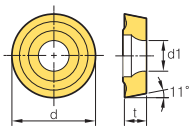
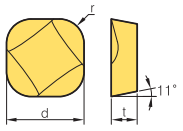
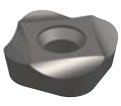
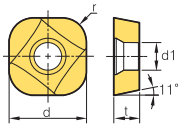


• R type insert

(mm)

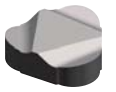
Designation		ØD	H	W	L	S	h	ℓ	Insert	Screw	Wrench
SSKPR/L	2020B-L09B-D12	12	20	20	140	21.7	19	20	SPGH090330R/L	FTNA0307	TW09P
	2020B-L09B-D13	13	20	20	140	21.7	19	20			
	2020B-L09B-D20	20	20	20	140	21.7	19	20			

Insert

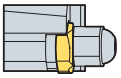
Application	Picture	Designation	Cermet	Dimensions (mm)				Configuration
			CN2000	r	d	d_1	t	
Internal turning		RPGT0802M0		-	8	3.4	2.38	
		RPGT1203M0		-	12	4.4	3.18	
		RPGT1604M0		-	16	5.5	4.76	
		RPGT2004M0		-	20	5.5	4.76	
		SPGR120440L		4.0	12..7	-	4.76	
		SPGH090330L		3.0	9.525	3.4	3.18	

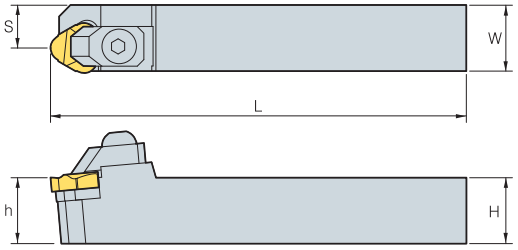
●: Stock item

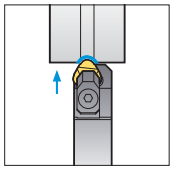
CKFN...RW Type



KORIC





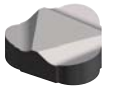


• R type insert

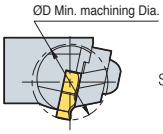
(mm)

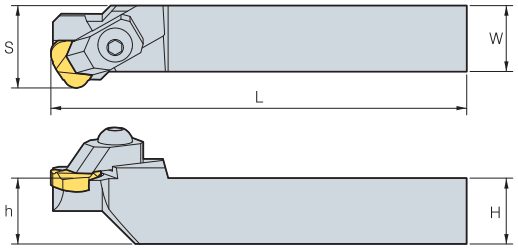
Designation		H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CKFNR/L	2020B-L22RW	20	20	140	12.5	20	KORIC2204R/L	CH6N1B	BHA0620	ST42CB	SS0408	HW50L
	2022B-L27RW	20	22	140	13	20	KORIC2704R/L	CH8R/L1B	BHA0820	ST52CB	SS0408	HW60L
	2025B-L33RW	20	25	140	16	20	KORIC3306R/L	CH8R/L1B	BHA0820	ST62CB	SS0408	HW60L
	2533B-L44RW	25	33	140	21	25	KORIC4408R/L	CH8R/L1B	BHA0820	ST82CB	SS0408	HW60L

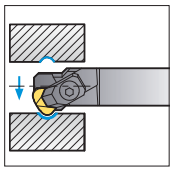
CKGN...RW Type



KORIC







• R type insert

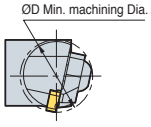
(mm)

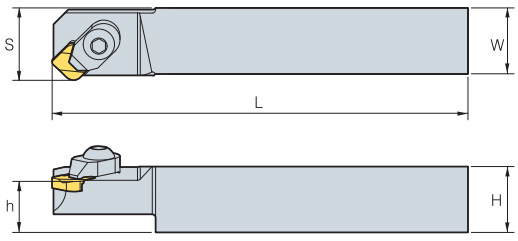
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CKGNR	2022B-L22RW-D23	23	20	22	140	30	20	KORIC2204R/L	CH6R/L3B	BHA0620	ST42CB	SS0408	HW50L
	2022B-L27RW-D29	29	20	22	140	34	20	KORIC2704R/L	CH6R/L7B	BHA0620	ST52CB	SS0408	HW50L
	2025B-L33RW-D38	38	20	25	140	33	20	KORIC3306R/L	CH6R/L5B	BHA0620	ST62CB	SS0408	HW50L
	2528B-L38RW-D50	50	25	28	140	46	25	KORIC3806R/L	CH8R/L2B	BHA0820	ST72CB	SS0408	HW60L
	2528B-L44RW-D52	52	25	28	140	50	25	KORIC4408R/L	CH8R/L2B	BHA0820	ST82CB	SS0408	HW60L

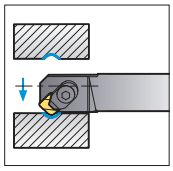
CSGN...RW Type



SNGN





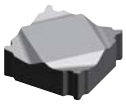


• R type insert

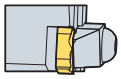
(mm)

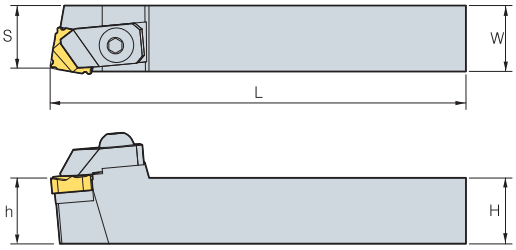
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Wrench
CSGNR/L	2020B-L09RW-D17	17	20	20	140	22	20	SNGN0903WR/L	CH5R1	CHX0510	HW30L
	2020B-L09RW-D22	22	20	20	140	22	20	SNGN0903WR/L	CH5R1	CHX0510	HW30L

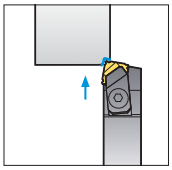
CSBN...BS Type



SNGN





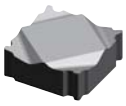


• R type insert

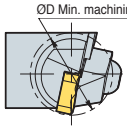
(mm)

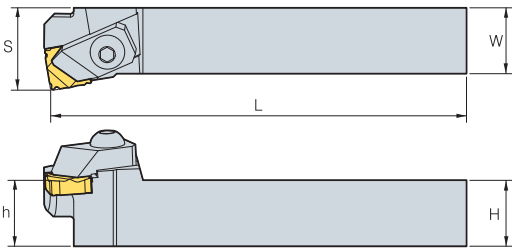
Designation		H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CSBNR/L	2023B-L12BS	20	23	140	21	20	SNGN1204SR/L	CH6N1B	BHA0620	SS42CB	SS0308	HW50L
	2525B-L15BS	25	25	140	23	25	SNGN1504SR/L	CH6N1B	BHA0620	SS52CB	SS0408	HW50L

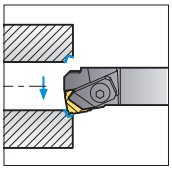
CSKN...BS Type



SNGN





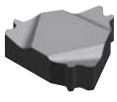


• R type insert

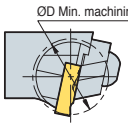
(mm)

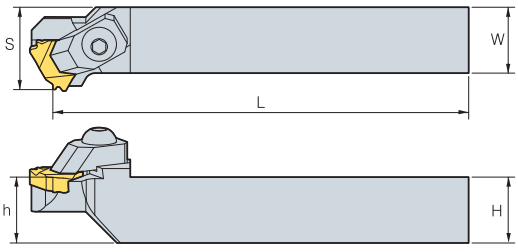
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CSKNR/L	1622B-L09BS-D14	14	16	22	140	16	16	SNGN0903SR/L	CH6R/L2B	BHA0620	-	-	HW50L
	2022B-L12BS-D26	26	20	22	140	27	20	SNGN1204SR/L	CH6R/L1B	BHA0620	SS42CB	SS0308	HW50L
	2525B-L15BS-D35	35	25	25	140	31	25	SNGN1504SR/L	CH6R/L3B	BHA0620	SS52CB	SS0408	HW50L

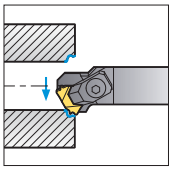
CTGN...BS Type



TNGN





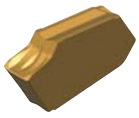


• R type insert

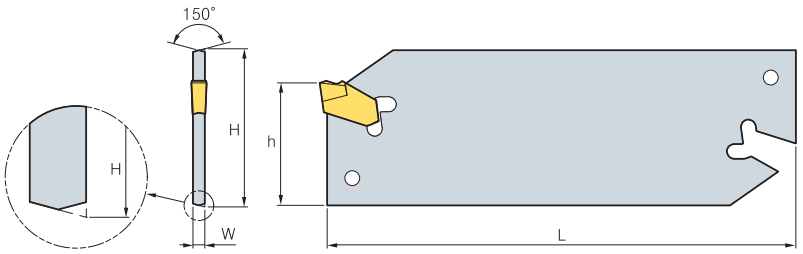
(mm)

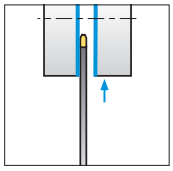
Designation		ØD	H	W	L	S	h	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Wrench
CTGNR/L	2021B-K22BS-D25	25	20	21	140	30	20	TNGN2204SR/L	CH6R/L7B	BHA0620	ST42CB	SS0408	HW50L

SPB-S Type



SP

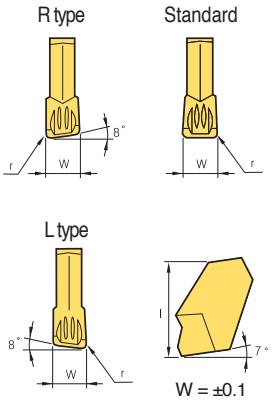




(mm)

Designation		H	W	L	h	Insert	Wrench
SPB	1626-S	26	1.3	110	21	SP160	SW15S
	1826-S	26	1.5	110	21	SP180	
	226-S	26	1.6	110	21	SP200, SP200R/L	
	326-S	26	2.4	110	21	SP300, SP300R/L	
	426-S	26	3.2	110	21	SP400, SP400R/L	
	526-S	26	4.0	110	21	SP500, SP500R/L	
	626-S	26	5.2	110	21	SP600, SP600R/L	
	1632-S	32	1.3	150	25	SP160	
	1832-S	32	1.5	150	25	SP180	
	232-S	32	1.6	150	25	SP200, SP200R/L	
	332-S	32	2.4	150	25	SP300, SP300R/L	
	432-S	32	3.2	150	25	SP400, SP400R/L	
	532-S	32	4.0	150	25	SP500, SP500R/L	
	632-S	32	5.2	150	25	SP600, SP600R/L	

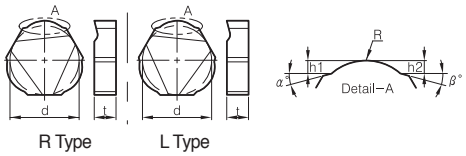
Insert

Application	Picture	Designation		Coated									Un-coated	Dimensions (mm)			Configuration
				NCM325	NC3120	NC3225	NC3030	NC5330	PC3500	PC8105	PC8110	PC5300	PC9030	STA30	W	l	r	
Parting tools		SP	160												1.6	7.8	0.16	
			180												1.8	9.3	0.16	
			200	●			●	●			●	●	●		2.2	9.3	0.2	
			200R				●						●		2.2	9.3	0.2	
			200L										●		2.2	9.3	0.2	
			300	●	●		●	●			●	●	●	●	3.1	11.3	0.2	
			300R	●			●				●				3.1	11.3	0.2	
			300L				●								3.1	11.3	0.2	
			400	●	●		●	●			●	●	●		4.1	11.3	0.25	
			400R				●				●				4.1	11.3	0.25	
			400L				●								4.1	11.3	0.25	
			500	●			●	●			●	●			5.1	11.4	0.3	
			500R												5.1	11.4	0.3	
			500L												5.1	11.4	0.3	
			600				●	●				●			6.4	11.4	0.35	
			600R												6.4	11.4	0.35	
			600L												6.4	11.4	0.35	

● : Stock item

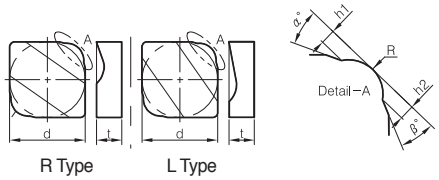
Machining Race-way

KORIC... R/L Type



		d	t	R	h1	h2	α°	β°
KORIC	2204R/L	12.7	4.76					
	2704R/L	15.875	4.76					
	3306R/L	19.05	6.0					
	3806R/L	22.225	6.0					
	4408R/L	25.4	8.0					

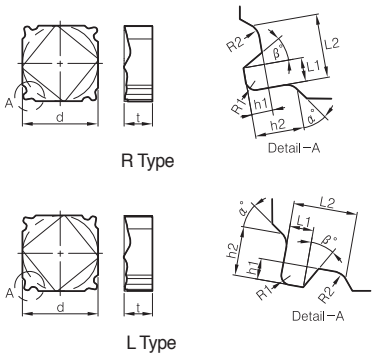
SNGN... WR/L Type



		d	t	R	h1	h2	α°	β°
SNGN	0903WR/L	9.525	3.18					
	1504WR/L	15.875	4.76					
	1905WR/L	19.05	5.56					

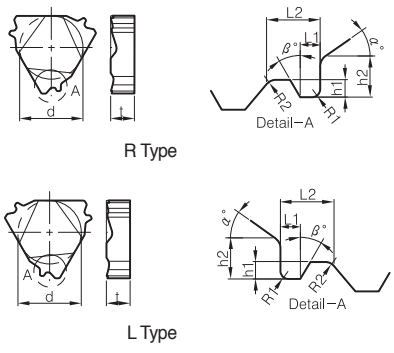
Machining for Bearing shield

KORIC... R/L Type



		d	t	L1	L2	h1	h2	R1	R2	α°	β°
SNGN	0903SR/L	9.525	3.18								
	1204SR/L	12.7	4.76								
	1504SR/L	15.875	4.76								

TNGN...SR/L Type



		d	t	L1	L2	h1	h2	R1	R2	α°	β°
TNGN	02204SR/L	12.7	4.76								

P S K N R 25 25 - M 12

1	2	3	4	5	6	7	8	9
Clamping Method of Insert	Insert Shape	Holder Style	Clearance Angle of Insert	Hand	Height of Shank	Width of Shank	Length of Holder	Length of Insert Cutting Edge

1 Clamping Method of Insert

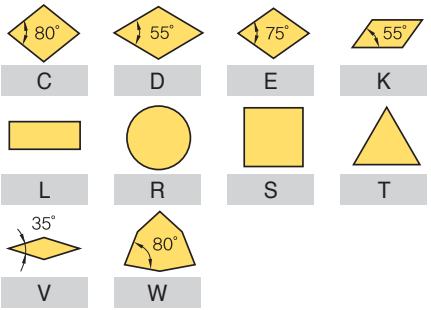
P S K N R 25 25 - M 12



Top clamping without hole	Top and hole clamping (Multi clamp, pin and clamp)	Top and hole clamping (Multi clamp, pin and clamp)	Hole clamping(Pin lock)	Screw on	Top and hole clamping (Wedge clamp, pin and clamp)
C	D	M	P	S	W

2 Insert Shape

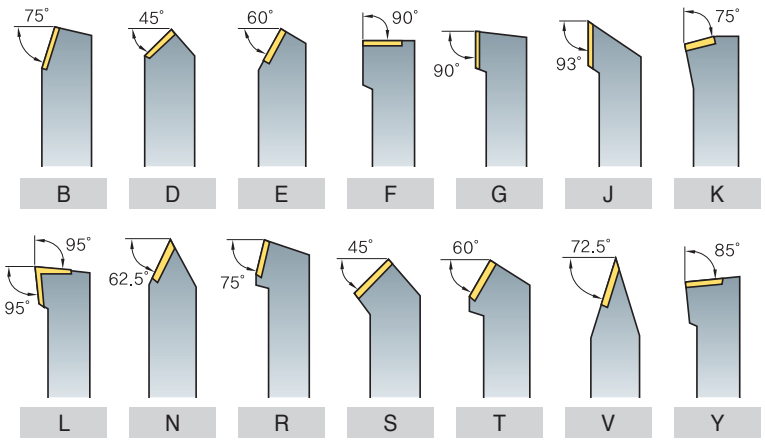
P S K N R 25 25 - M 12



C	D	E	K	L	R	S	T	V	W

3 Holder Style

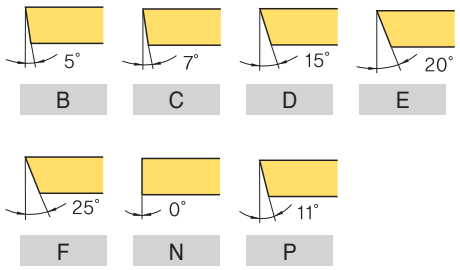
P S K N R 25 25 - M 12



B	D	E	F	G	J	K	L	N	R	S	T	V	Y

4 Clearance Angle of Insert

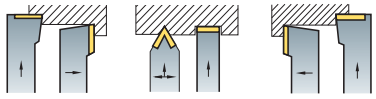
P S K N R 25 25 - M 12



B	C	D	E	F	N	P

5 Hand

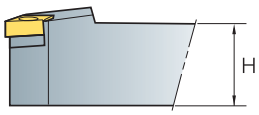
P S K N R 25 25 - M 12



L	N	R

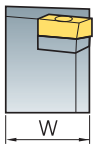
6 Height of Shank

P S K N R 25 25 - M 12



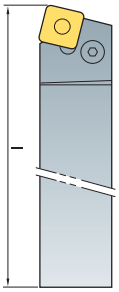
7 Width of Shank

P S K N R 25 25 - M 12



8 Length of Holder

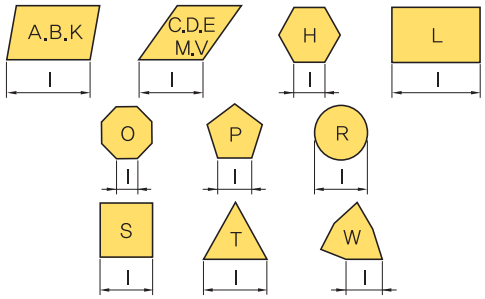
P S K N R 25 25 - M 12



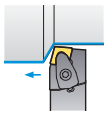
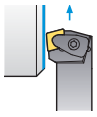
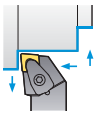
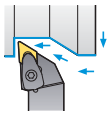
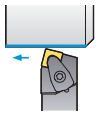
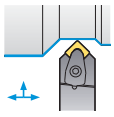
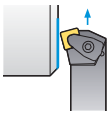
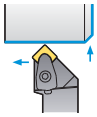
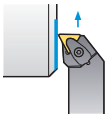
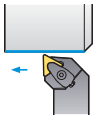
A - 32	H - 100	Q - 180	X-Special Item
B - 40	J - 110	R - 200	
C - 50	K - 125	S - 250	
D - 60	L - 140	T - 300	
E - 70	M - 150	U - 350	
F - 80	N - 160	V - 400	
G - 90	P - 170	W - 450	

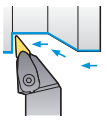
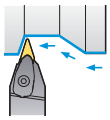
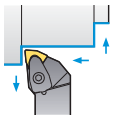
9 Length of Insert Cutting Edge

P S K N R 25 25 - M 12

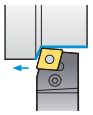
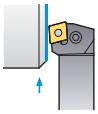
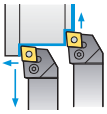
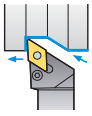
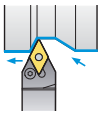
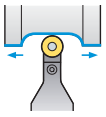
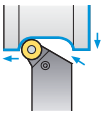
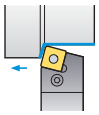
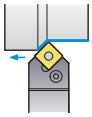
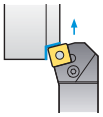


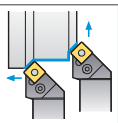
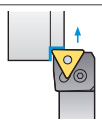
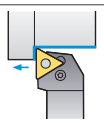
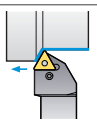
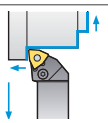
Double Clamp System

Cutting Shape										
Designation	DCBNR/L	DCKNR/L	DCLNR/L	DDJNR/L	DSBNR/L	DSDNN	DSKNR/L	DSSNR/L	DTFNR/L	DTGNR/L
Approach angle	75°	75°	95°	93°	75°	45°	75°	45°	90°	90°
Page	B148	B148	B148	B149	B149	B150	B150	B150	B151	B151
Turning	●		●	●	●	●		●		●
Copying				●						
Facing		●	●				●	●	●	
Chamfering						●				
Back turning			●	●						

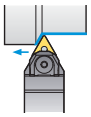
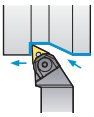
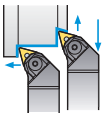
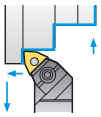
Cutting Shape			
Designation	DVJNR/L	DVVNN	DWLNR/L
Approach angle	93°	72.5°	95°
Page	B151	B152	B152
Turning	●	●	●
Copying	●	●	
Facing			●
Chamfering			
Back turning	●		●

Lever Lock System

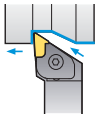
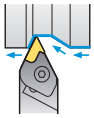
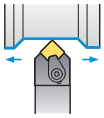
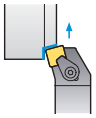
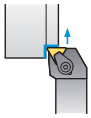
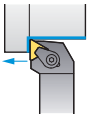
Cutting Shape										
Designation	PCBNR/L	PCKNR/L	PCLNR/L	PDJNR/L	PDNNR/L	PRDCN	PRGCR/L	PSBNR/L	PSDNN	PSKNR/L
Approach angle	75°	75°	95°	93°	62.5°	-	-	75°	45°	75°
Page	B153	B153	B154	B154	B155	B156	B156	B157	B157	B158
Turning	●	●	●	●	●	●	●	●	●	
Copying				●	●	●	●			
Facing			●							●
Chamfering										
Back turning			●	●						

Cutting Shape					
Designation	PSSNR/L	PTFNR/L	PTGNR/L	PTTNR/L	PWLNR/L
Approach angle	45°	90°	90°	60°	95°
Page	B158	B159	B159	B160	B160
Turning	●		●	●	●
Copying					
Facing	●	●			●
Chamfering				●	
Back turning					●

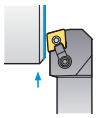
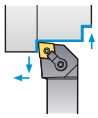
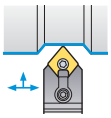
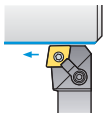
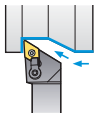
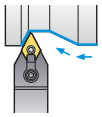
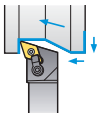
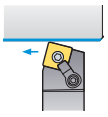
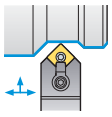
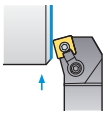
Wedge Clamp System

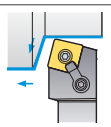
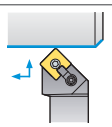
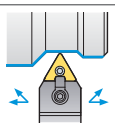
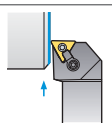
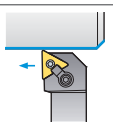
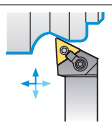
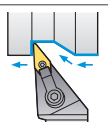
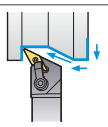
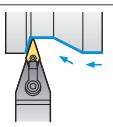
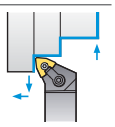
Cutting Shape										
Designation	WTENN	WTJNR/L	WTXNR/L	WWLNR/L						
Approach angle	60°	93°	105°	95°						
Page	B161	B161	B161	B162						
Turning	●	●	●	●						
Copying	●	●	●							
Facing				●						
Chamfering										
Back turning		●	●	●						

Clamp on System

Cutting Shape										
Designation	CKJNR/L	CKNNR/L	CSDPN	CSKPR/L	CTFPR/L	CTGPR/L				
Approach angle	93°	62.5°	45°	75°	90°	90°				
Page	B163	B163	B163	B164	B164	B164				
Turning	●	●	●			●				
Copying	●	●								
Facing				●	●					
Chamfering										
Back turning	●									

Multi Lock System

Cutting Shape										
Designation	MCKNR/L	MCLNR/L	MCMNN	MCRNR/L	MDJNR/L	MDNNN	MDQNR/L	MSBNR/L	MSDNN	MSKNR/L
Approach angle	75°	95°	50°	75°	93°	62.5°	107.5°	75°	45°	75°
Page	B165	B165	B165	B166	B166	B166	B167	B167	B167	B168
Turning		●	●	●	●	●	●	●	●	
Copying					●	●	●			
Facing	●	●								●
Chamfering										
Back turning		●			●		●			

Cutting Shape										
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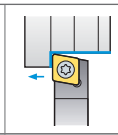
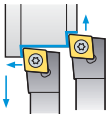
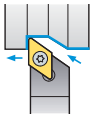
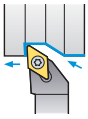
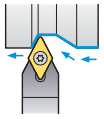
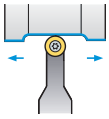
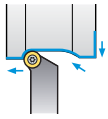
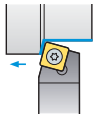
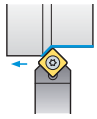
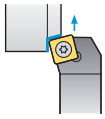
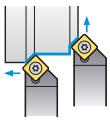
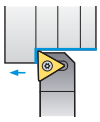
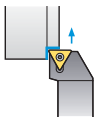
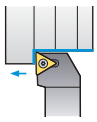
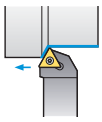
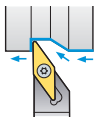
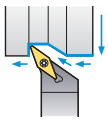
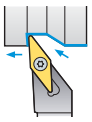
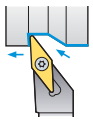
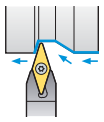
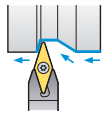
Page	B168	B169	B169	B169	B170	B170	B170	B171	B171	B171
Turning	●	●	●		●	●	●	●	●	●
Copying			●			●	●	●	●	
Facing		●		●		●				●
Chamfering										
Back turning						●	●	●		●

Screw on System

Cutting Shape										
Designation	SCACR/L	SCLCR/L	SDACR/L	SDJCR/L	SDNCN	SRDCN	SRGCR/L	SSBCR/L	SSDCN	SSKCR/L
Approach angle	90°	95°	90°	93°	62.5°	-	-	75°	45°	75°
Page	B172	B172	B172	B173	B173	B173	B174	B174	B174	B175
Turning	●	●	●	●	●	●	●	●	●	
Copying			●	●	●	●	●			
Facing		●								●
Chamfering										
Back turning		●		●						

Cutting Shape										
Designation	SSSCR/L	STACR/L	STFCR/L	STGCR/L	STTCR/L	SVABR/L	SVHBR/L	SVJBR/L	SVJCR/L	SVVBN
Approach angle	45°	90°	90°	90°	60°	90°	107.5°	93°	93°	72.5°
Page	B175	B175	B176	B176	B176	B177	B177	B177	B178	B178
Turning	●	●		●	●	●	●	●	●	●
Copying						●	●	●	●	●
Facing	●		●							
Chamfering										
Back turning						●	●	●	●	

Cutting Shape										
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Approach angle	72.5°									
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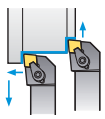
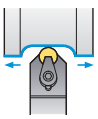
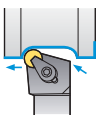
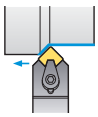
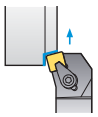
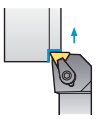
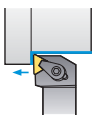
Turning	●									
Copying	●									
Facing										
Chamfering										
Back turning										

Ceramic Holder

Cutting Shape										
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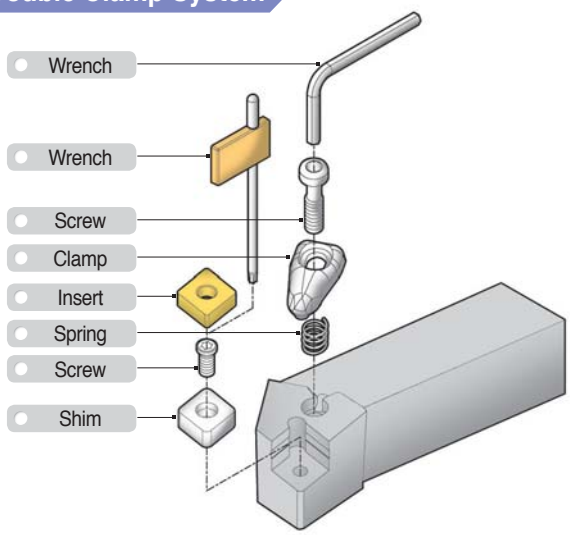
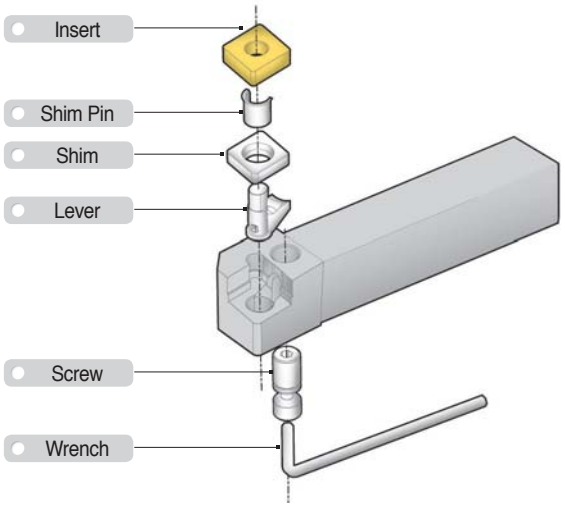
Approach angle	95°	-	-	45°	75°	90°	90°			
Page	B179	B179	B179	B179	B180	B180	B180			
Turning	●	●	●	●			●			
Copying			●							
Facing	●				●	●				
Chamfering										
Back turning	●									

Instruction of External Holder

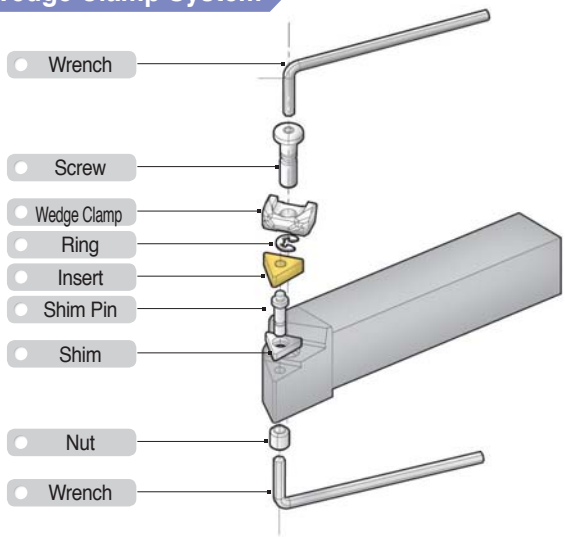
Double Clamp System



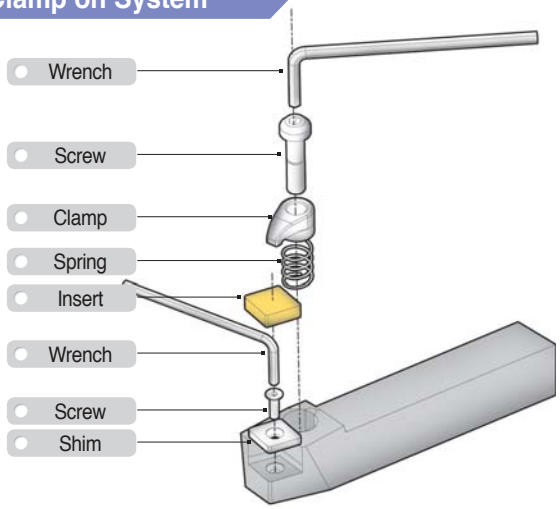
Lever Lock System



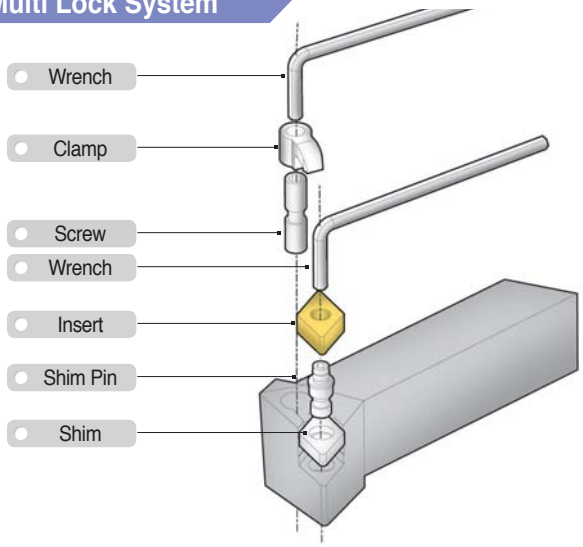
Wedge Clamp System



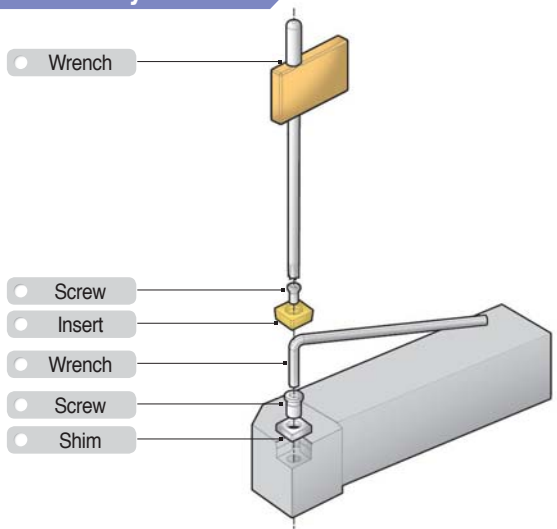
Clamp on System



Multi Lock System



Screw on System

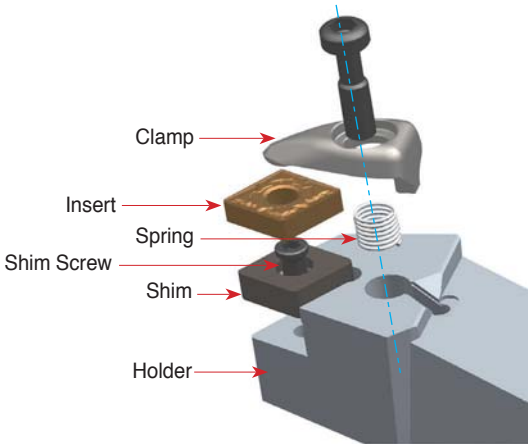


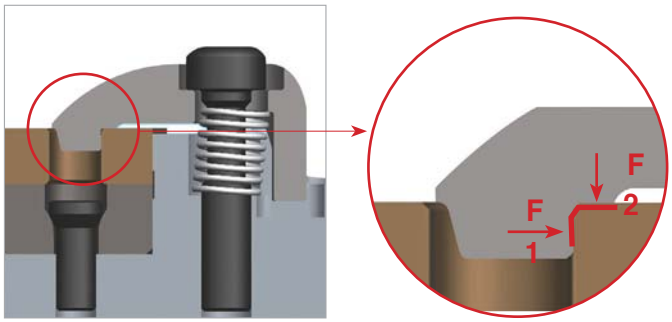
Double Clamp System

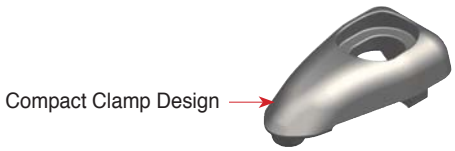
Stable clamping with double clamp system

Features

- Simple and powerful clamping system operated by only a single clamp screw
- The powerful double-clamping system (upper and internal) is suitable for machining in very tough cutting conditions
- The holder offers precision due to the special design in the rear of the clamp
- Compact and optimized design for avoiding chip interference with a powerful clamp





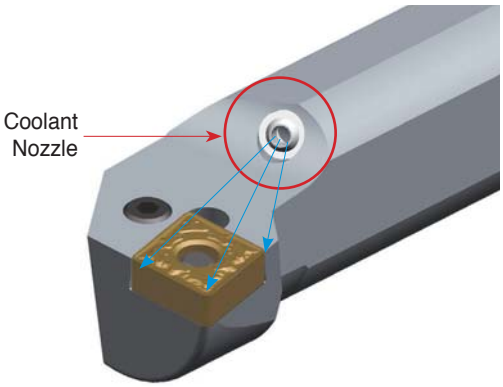


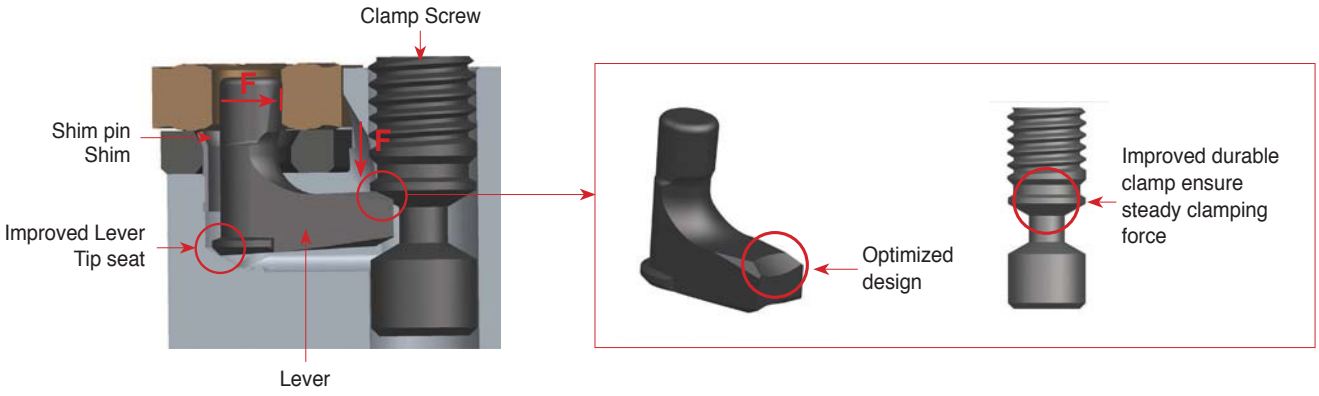
Lever Lock System

Stable clamping with double clamp system

Features

- The holder offers precision due to the special design due to the improved Lever tip seat
- The durability of parts has been improved
- Superior tool life due to powerful clamping system and optimized design of part
- Part designation on holder body makes it easy to check the right part description for each product
- Adjustable coolant nozzle gives the option to change the direction of the coolant to optimize chip control and improve tool life

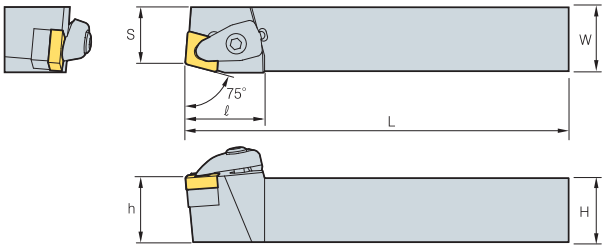


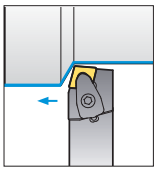


DCBNR/L



CN□□





75°

• R type insert

(mm)

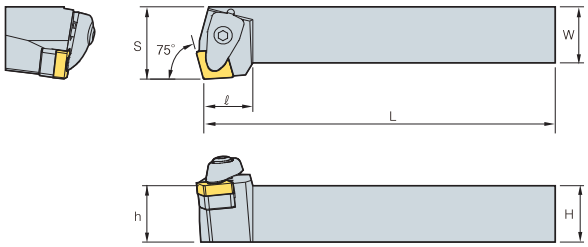
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DCBNR/L	2020-K12	20	20	125	17	20	31	CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	2525-M12	25	25	150	22	25	31							
	3225-P12	32	25	170	22	32	31							
	2525-M16	25	25	150	22	25	36	CN□□1606□□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	3232-P16	32	32	170	27	32	36							
	3232-P19	32	32	170	27	32	40	CN□□1906□□	CVH6	CHX0622	SC63V	FTNA0511	SPR0811	HW40L
	4040-S19	40	40	250	35	40	40							

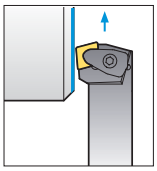
Applicable inserts **B26~B32**

DCKNR/L



CN□□





75°

• R type insert

(mm)

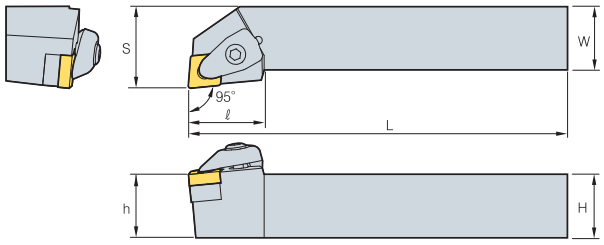
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DCKNR/L	2020-K12	20	20	125	25	20	21	CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	2525-M12	25	25	150	32	25	21							
	3225-P12	32	25	170	32	32	21							
	3232-P16	32	32	170	40	32	26	CN□□1606□□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	4040-S16	40	40	250	50	40	26							

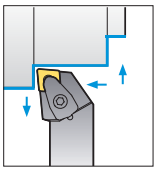
Applicable inserts **B26~B32**

DCLNR/L



CN□□





95°

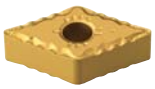
• R type insert

(mm)

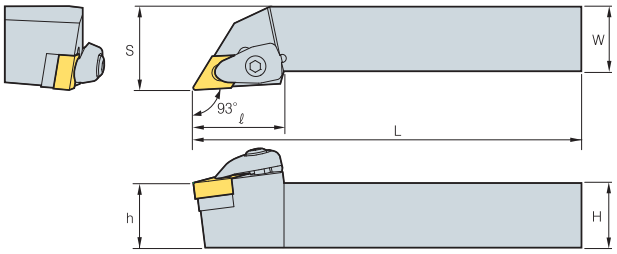
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DCLNR/L	2020-K09	20	20	125	25	20	24.5	CN□□0903□□	CVH3	CHX0415	SC32V	FTKA0307	SPR0510	HW25P
	2525-M09	25	25	150	32	25	24.5							
	2020-K12	20	20	125	25	20	30	CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30P
	2525-M12	25	25	150	32	25	30							
	3225-P12	32	25	170	32	32	30							
	3232-P12	32	32	170	40	32	30							
	2525-M16	25	25	150	32	25	36	CN□□1606□□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	HW40L
	3225-P16	32	25	170	32	32	36							
	3232-P16	32	32	170	40	32	36							
	2525-M19	25	25	150	32	25	40	CN□□1906□□	CVH6	CHX0622	SC63V	FTNA0511	SPR0811	HW40L
	3225-P19	32	25	170	32	32	40							
	3232-P19	32	32	170	40	32	40							
	4040-S19	40	40	250	50	40	40							

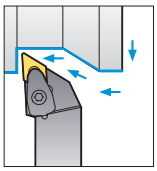
Applicable inserts **B26~B32**

DDJNR/L



DN□□





93°

• R type insert

(mm)

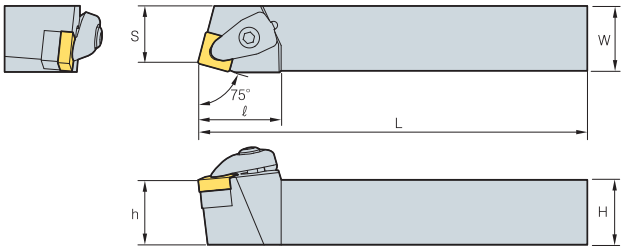
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DDJNR/L	2020-K11	20	20	125	25	20	30	DN□□1104□□	CVH3	CHX0415	15SD32V	FTKA0307	SPR0510	HW25P
	2525-M11	25	25	150	32	25	30							
	3225-P11	32	25	170	32	32	30							
	3232-P11	32	32	170	40	32	30							
	2020-K15	20	20	125	25	20	35	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	HW30P
	2525-M15	25	25	150	32	25	35							
	3225-P15	32	25	170	32	32	35							
	3232-P15	32	32	170	40	32	35							
	2020-K15-3	20	20	125	25	20	35	DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	HW30P
	2525-M15-3	25	25	150	32	25	35							
	3232-P15-3	32	32	170	40	32	35							

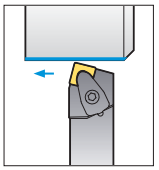
Applicable inserts **B33~B39**

DSBNR/L



SN□□





75°

• R type insert

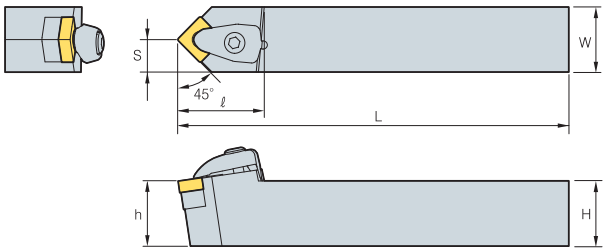
(mm)

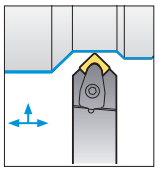
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSBNR/L	2020-K09	20	20	125	17	20	25	SN□□0903□□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	2525-M09	25	25	150	22	25	25							
	2020-K12	20	20	125	17	20	32	SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	2525-M12	25	25	150	22	25	32							
	3225-P12	32	25	170	22	32	32							
	3232-P12	32	32	170	27	32	32							
	2525-M15	25	25	150	22	25	38	SN□□1506□□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	3225-P15	32	25	170	22	32	38							
	3232-P15	32	32	170	27	32	38							
	3232-P19	32	32	170	27	32	43	SN□□1906□□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	4040-S19	40	40	250	35	40	43							

Applicable inserts **B41~B48**

DSDNN







45°

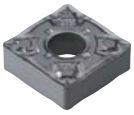
• R type insert

(mm)

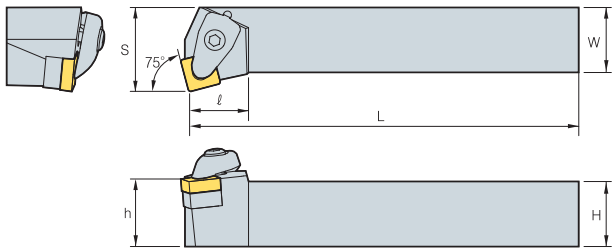
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSDNN	2020-K09	20	20	125	10	20	26.5	SN□□0903□□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	2020-K12	20	20	125	10	20	33	SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	2525-M12	25	25	150	12.5	25	33							
	3225-P12	32	25	170	12.5	32	33							
	3232-P12	32	32	170	16	32	33							
	2525-M15	25	25	150	12.5	25	39.4	SN□□1506□□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW25P
	3232-P15	32	32	170	16	32	38							
	3232-P19	32	32	170	16	32	43	SN□□1906□□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	4040-S19	40	40	250	20	40	45							

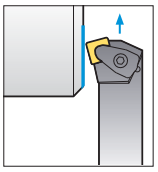
Applicable inserts **B41~B48**

DSKNR/L



SN□□





75°

• R type insert

(mm)

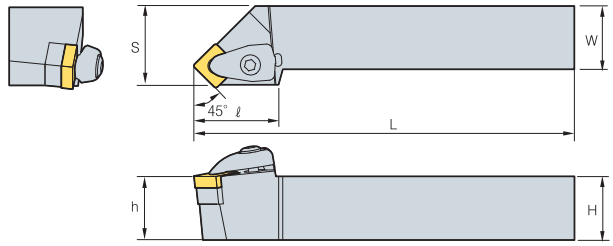
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSKNR/L	2020-K09	20	20	125	25	20	20	SN□□0903□□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	2020-K12	20	20	125	25	20	23	SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	2525-M12	25	25	150	32	25	23							
	3232-P12	32	32	170	40	32	23							
	3232-P15	32	32	170	40	32	28	SN□□1506□□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	3232-P19	32	32	170	40	32	35	SN□□1906□□	CVH6	CHX0622	SC64V	FTNA0511	SPR0811	HW40L
	4040-S19	40	40	250	50	40	43							

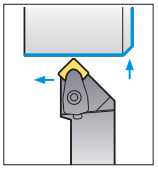
Applicable inserts **B41~B48**

DSSNR/L



SN□□





45°

• R type insert

(mm)

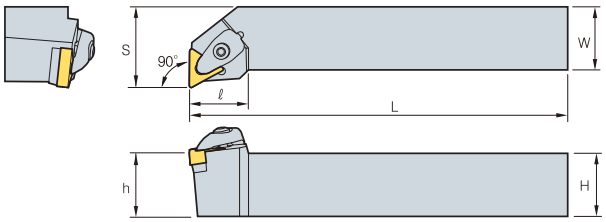
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DSSNR/L	2020-K09	20	20	125	25	20	28.5	SN□□0903□□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	HW25P
	2020-K12	20	20	125	25	20	35	SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30P
	2525-M12	25	25	150	32	25	35							
	3225-P12	32	25	170	32	32	35							
	3232-P12	32	32	170	40	32	35							
	2525-M15	25	25	150	32	25	38.5	SN□□1506□□	CVH5	CHX0622	SS54V	FTNA0511	SPR0811	HW40L
	3232-P15	32	32	170	40	32	38.5							
	3232-P19	32	32	170	40	32	46	SN□□1906□□	CVH6	CHX0622	SS64V	FTNA0511	SPR0811	HW40L
	4040-S19	40	40	250	50	40	46							

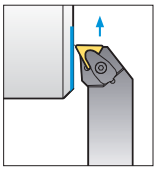
Applicable inserts **B41~B48**

DTFNR/L



TN□□





90°

• R type insert

(mm)

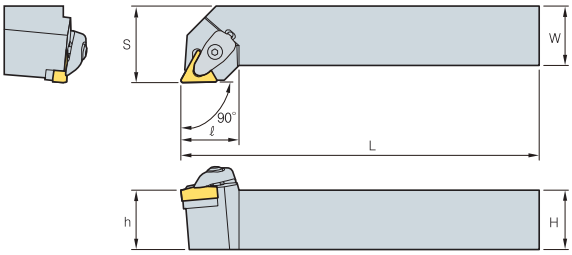
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DTFNR/L	2020-K16	20	20	125	25	20	24.5	TN□□1604□□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	HW25P
	2525-M16	25	25	150	32	25	24.5							
	3232-P16	32	32	170	40	32	23.5							
	2525-M22	25	25	150	32	25	33	TN□□2204□□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	HW30P
	3225-P22	32	25	170	32	32	33							
	3232-P22	32	32	170	40	32	33							

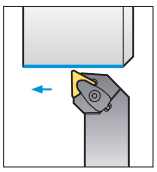
Applicable inserts **B49~B55**

DTGNR/L



TN□□





90°

• R type insert

(mm)

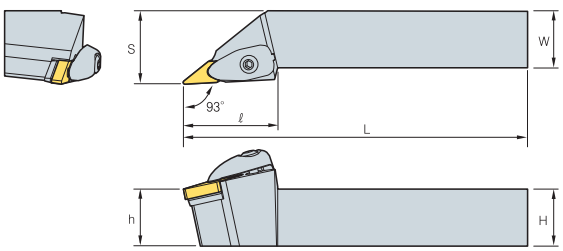
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DTGNR/L	2020-K16	20	20	125	25	20	24.5	TN□□1604□□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	HW25P
	2525-M16	25	25	150	32	25	24.5							
	3232-P16	32	32	170	40	32	24.5							
	2525-M22	25	25	150	32	25	32.6	TN□□2204□□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	HW30P
	3225-P22	32	25	170	32	32	32.6							
	3232-P22	32	32	170	40	32	32.6							

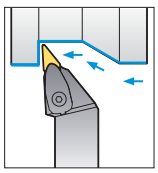
Applicable inserts **B49~B55**

DVJNR/L



VN□□





93°

• R type insert

(mm)

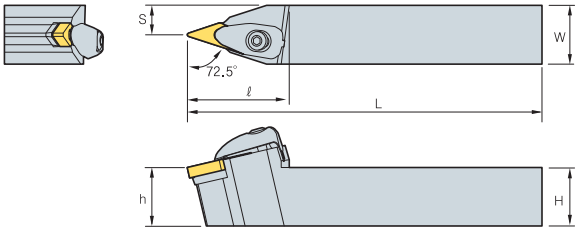
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DVJNR/L	2020-K16	20	20	125	25	20	41.5	VN□□1604□□	CVH3V	CHX0518	SV32V	FTNA03508	SPR0714	HW30P
	2525-M16	25	25	150	32	25	41.5							
	3232-P16	32	32	170	40	32	41.5							

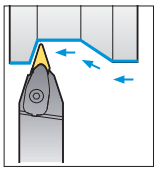
Applicable inserts **B56~B57**

DVVNN



VN□□





72.5°

• R type insert
(mm)

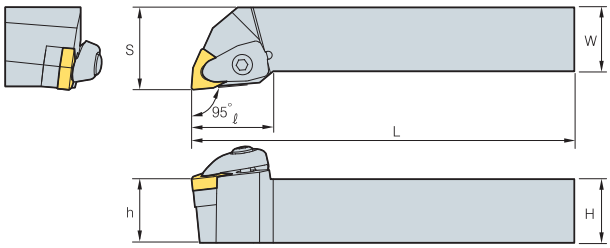
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DVVNN	2020-K16	20	20	125	10	20	40	VN□□1604□□	CVH3V	CHX0518	SV32V	FTNA03508	SPR0714	HW30P
	2525-M16	25	25	150	12.5	25	40							
	3232-P16	32	32	170	16	32	40							

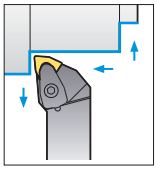
Applicable inserts **B56~B57**

DWLNR/L



WN□□





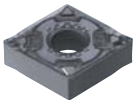
95°

• R type insert
(mm)

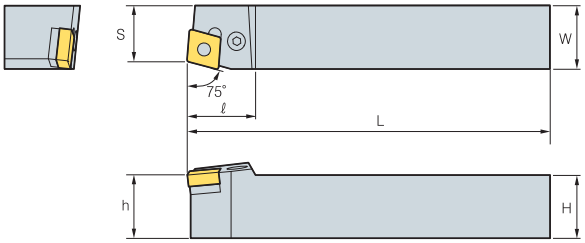
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DWLNR/L	2020-K06	20	20	125	25	20	26	WN□□ 0604□□	CVH3	CHX0415	SW32V	FTKA0307	SPR0510	HW25P
	2525-M06	25	25	150	32	25	26							
	2020-K08	20	20	125	25	20	32	WN□□ 0804□□	CVH4	CHX0518	SW44V	FTKA0410	SPR0714	HW30P
	2525-M08	25	25	150	32	25	32							

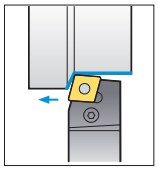
Applicable inserts **B58~B61**

PCBNR/L



CN□□





75°

• R type insert

(mm)

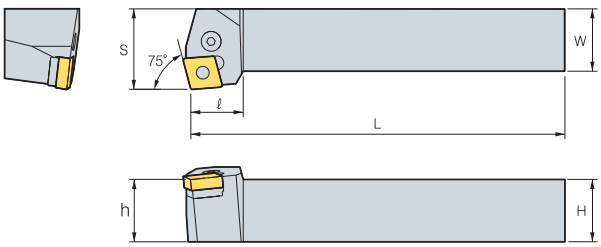
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PCBNR/L	2020-K12	20	20	125	17	20	27	CN□□ 1204□□	LV4	VHX0821	SC42	SP4	HW30L	LSPS4
	2525-M12	25	25	150	22	25	27							
	3225-P12	32	25	170	22	32	27							
	2525-M16	25	25	150	22	25	33	CN□□ 1606□□	LV5	VHX0825	SC53	SP5	HW30L	LSPS6
	3232-P16	32	32	170	27	32	33							
	3232-P19	32	32	170	27	32	36	CN□□ 1906□□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	4040-S19	40	40	250	35	40	36							
	4040-S25	40	40	250	35	40	47	CN□□ 2509□□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	4040-S25-5	40	40	250	35	40	47	CN□□ 2507□□						
	5050-T25	50	50	300	43	50	47	CN□□ 2509□□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
PCBNR/L	2020-K12N	20	20	125	17	20	27	CN□□ 1204□□	LV4N	VHX0820N	SC42N	SP4N	HW30L	LSPS4
	2525-M12N	25	25	150	22	25	27							
	3225-P12N	32	25	170	22	32	27							
	2525-M16N	25	25	150	22	25	33	CN□□ 1606□L□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS8
	3232-P16N	32	32	170	27	32	33							
	3232-P19N	32	32	170	27	32	36	CN□□ 1906□□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS8
	4040-S19N	40	40	250	35	40	38	CNMG190612						

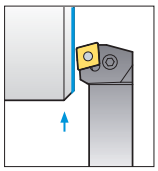
Applicable inserts B26~B32

PCKNR/L



CN□□





95°

• R type insert

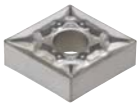
(mm)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PCKNR/L	2020-K12	20	20	125	25	20	27	CN□□ 1204□□	LV4	VHX0821	SC42	SP4	HW30L	LSPS4
	2525-M12	25	25	150	32	25	27							
	3225-P12	32	25	170	40	32	30							
	3232-P16	32	32	170	40	32	26	CN□□ 1606□□	LV5	VHX0825	SC53	SP5	HW30L	HW30L
	4040-S16	40	40	250	50	40	25							
PCKNR/L	2020-K12N	20	20	125	25	20	27	CN□□ 1204□□	LV4N	VHX0820N	SC42N	SP4N	HW30L	LSPS4
	2525-M12N	25	25	150	32	25	27							
	3225-P12N	32	25	170	40	32	30							
	3232-P16N	32	32	170	40	32	26	CN□□ 1606□□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	4040-S16N	40	40	250	50	40	25							

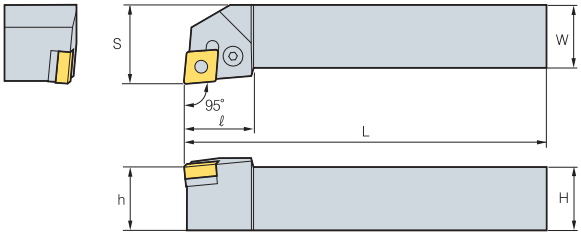
Applicable inserts B26~B32

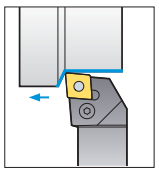
- Improved holders and parts ensure performance and durability
- "N" stand for New type (Holders and parts)

PCLNR/L



CN□□





95°

• R type insert

(mm)

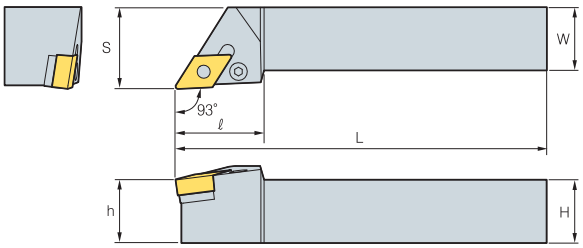
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PCLNR/L	1616-H09	16	16	100	20	16	20	CN□□ 0903□□	LV3	VHX0617	SC32	SP3	HW25L	LSPS3
	2020-K09	20	20	125	25	20	22							
	2525-M09	25	25	150	32	25	22							
	1616-H12	16	16	100	20	16	28	CN□□ 1204□□	LV4	VHX082	SC42	SP4	HW30L	LSPS4
	2020-K12	20	20	125	25	20	28							
	2525-M12	25	25	150	32	25	28							
	3225-P12	32	25	170	32	32	28							
	3232-P12	32	32	170	40	32	28							
	2525-M16	25	25	150	32	25	33	CN□□ 1606□□	LV5	VHX0825	SC53	SP5	HW30L	LSPS5
	3232-P16	32	32	170	40	32	33							
	2525-M19	25	25	150	32	25	36	CN□□ 1906□□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	3225-P19	32	25	170	32	32	36							
	3232-P19	32	32	170	40	32	36							
	4040-P19	40	40	170	50	40	36							
	4040-S19	40	40	250	50	40	36							
	4040-S25	40	40	250	50	40	47	CN□□ 2509□□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	5050-T25	50	50	300	60	50	47							
	4040-S25-5	40	40	250	50	40	47	CN□□ 2507□□	LV8N	VHX1236N	SC84N	SP8N	HW50L	LSPS8
	5050-S25-5	50	50	300	60	50	47							
PCLNR/L	1616-H09N	16	16	100	20	16	20	CN□□ 0903□□	LV3N	VHX0617N	SC32N	SP3	HW25L	LSPS3
	2020-K09N	20	20	125	25	20	22							
	2525-M09N	25	25	150	32	25	22							
	1616-H12N	16	16	100	20	16	28	CN□□ 1204□□	LV4N	VHX0817N — VHX0820N	SC42N	SP4N	HW30L	LSPS4
	2020-K12N	20	20	125	25	20	28							
	2525-M12N	25	25	150	32	25	28							
	3225-P12N	32	25	170	32	32	28							
	3232-P12N	32	32	170	40	32	28							
	2525-M16N	25	25	150	32	25	33	CN□□ 1606□□	LV5N	VHX0820AN	SC53N	SP5N	HW30L	LSPS5
	3232-P16N	32	32	170	40	32	33							
	2525-M19N	25	25	150	32	25	38	CN□□ 1906□□	LV6N	VHX1027N	SC63N	SP6N	HW40L	LSPS6
	4040-S19N	40	40	250	50	40	36							

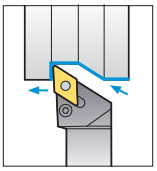
Applicable inserts **B26~B32**

PDJNR/L



DN□□





93°

• R type insert

(mm)

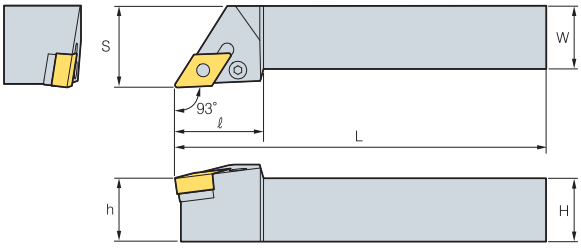
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PDJNR/L	1616-H11	16	16	100	20	16	25	DN□□ 1104□□	LV3	VHX0617	SD317	SP3	HW25L	LSPS3
	2020-K11	20	20	125	25	20	25							
	2525-M11	25	25	150	32	25	30							
	2020-K15	20	20	125	25	20	35	DN□□ 1506□□	LV4B	VHX0821	SD42	SP4	HW30L	LSPS4
	2525-M15	25	25	150	32	25	35							
	3225-P15	32	25	170	32	32	35							
	3232-P15	32	32	170	40	32	35							
	2020-K15-3	20	20	125	25	20	35	DN□□ 1504□□	LV4	VHX0821	SD42	SP4	HW30L	LSPS4
	2525-M15-3	25	25	150	32	25	35							
	3232-P15-3	32	32	170	40	32	35							

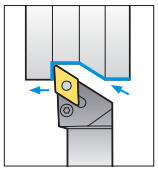
Applicable inserts **B33~B39**

PDJNR/L



DN□□





93°

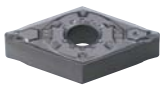
• R type insert

(mm)

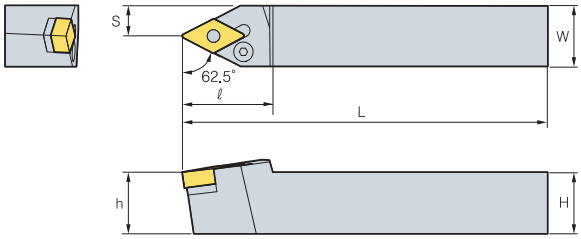
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PDJNR/L	1616-H11N	16	16	100	20	16	25	DN□□ 1104□□	LV3AN	VHX0617N	SD32N	SP3	HW25L	LSPS3
	2020-K11N	20	20	125	25	20	25							
	2525-M11N	25	25	150	32	25	30							
	2020-K15N	20	20	125	25	20	35	DN□□ 1506□□	LV4BN	VHX0821N	SD42N	SP4N	HW30L	LSPS4
	2525-M15N	25	25	150	32	25	35							
	3225-P15N	32	25	170	32	32	35							
	3232-P15N	32	32	170	40	32	35							
	2020-K15-3N	20	20	125	25	20	35	DN□□ 1504□□	LV4BN	VHX0821N	SD43N	SP4N	HW30L	LSPS4
	2525-M15-3N	25	25	150	32	25	35							
	3232-P15-3N	32	32	170	40	32	35							

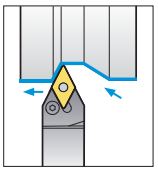
Applicable inserts **B33~B39**

PDNNR/L



DN□□





62.5°

• R type insert

(mm)

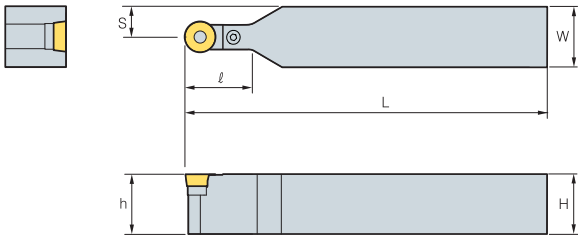
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PDNNR/L	2020-K15	20	20	125	8	20	37	DN□□ 1506□□	LV4B	VHX0821	SD42	SP4	HW30L	LSPS4
	2525-M15	25	25	150	12.5	25	37							
	3232-P15	32	32	150	16	32	37							
	4025-M15	40	25	170	12.5	32	37							
	2525-M15-3	25	25	150	12.5	25	37	DN□□ 1504□□	LV4	VHX0821	SD42	SP4	HW30L	LSPS4
	4025-M15-3	40	25	150	12.5	25	37							
PDNNR/L	2020-K15N	20	20	125	8	20	37	DN□□ 1506□□	LV4BN	VHX0821N	SD42N	SP4N	HW30L	LSPS4
	2525-M15N	25	25	150	12.5	25	37							
	3232-P15N	32	32	170	16	32	37							
	2525-M15-3N	25	25	150	12.5	25	37	DN□□ 1504□□	LV4BN	VHX0821N	SD43N	SP4N	HW30L	LSPS4
	3232-P15-3N	32	32	170	16	32	37							

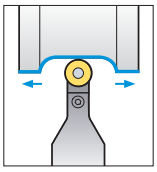
Applicable inserts **B33~B39**

PRDCN



RCMX





(mm)

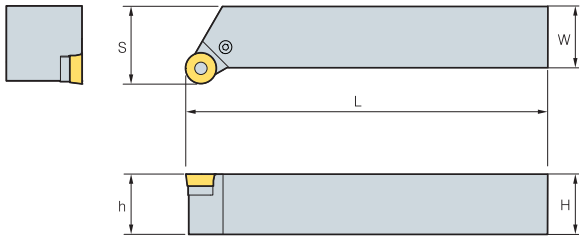
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PRDCN	2020-M10	20	20	150	15	20	24	RCMX 1003M0	LR10	VHX0514	SR10	SP3	HW20L	LSPS3
	2525-M10	25	25	150	17.5	25	24							
	2525-M12	25	25	150	18.5	25	24	RCMX 1204M0	LR12	VHX0617	SR12	SP3	HW25L	LSPS3
	2020-K12	20	20	125	16	20	24							
	3225-Q12	32	25	180	18.5	32	24							
	2525-Q16	25	25	180	20.5	25	30	RCMX 1606M0	LR16	VHX0621	SR16	SP4	HW25L	LSPS4
	3225-Q16	32	25	180	20.5	32	30							
	3232-Q16	32	32	180	24	32	35							
	3232-Q20	32	32	180	26	32	40	RCMX 2006M0	LR20	VHX0823	SR20	SP20	HW30L	LSPS5
	4040-S25	40	40	250	32.5	40	42	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LSPS6
	4040-T25	40	40	300	32.5	40	42							
	5050-U32	50	50	350	41	50	52	RCMX 3209M0	LR32	VHX1236	SR32	SP8N	HW50L	LSPS8

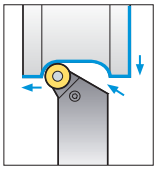
Applicable inserts **B70**

PRGCR/L



RCMX





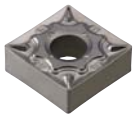
• R type insert

(mm)

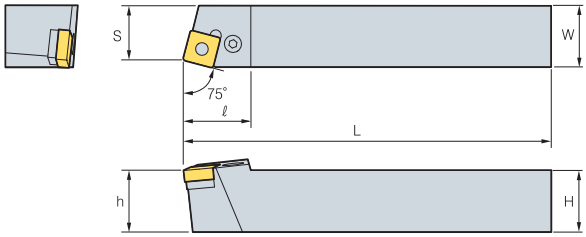
Designation		H	W	L	S	h	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PRGCR/L	2020-K10	20	20	125	25	20	RCMX 1003M0	LR10	VHX0514	SR10	SP3	HW20L	LSPS3
	2525-M10	25	25	150	32	25							
	2020-K12	20	20	125	25	20	RCMX 1204M0	LR12	VHX0617	SR12	SP3	HW25L	LSPS3
	2525-M12	25	25	150	32	25							
	3225-P12	32	25	170	32	32							
	2525-M16	25	25	150	32	25	RCMX 1606M0	LR16	VHX0621	SR16	SP4	HW25L	LSPS4
	3225-P16	32	25	170	32	32							
	3232-P20	32	32	170	40	32	RCMX 2006M0	LR20	VHX0823	SR20	SP5-1	HW30L	LSPS5
	4040-S25	40	40	250	50	40	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LSPS6

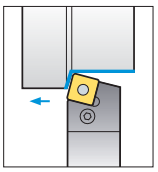
Applicable inserts **B70**

PSBNR/L



SN□□





75°

• R type insert

(mm)

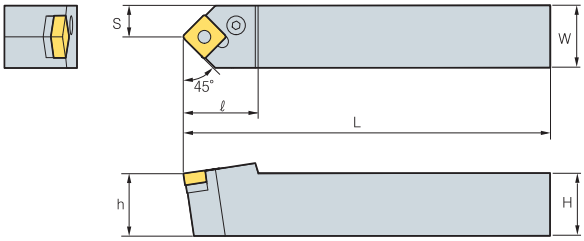
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSBNR/L	1616-H09	16	16	100	13	16	21	SN□□0903□□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	2020-K09	20	20	125	17	20	23							
	2020-K12	20	20	125	17	20	28	SN□□1204□□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	2525-M12	25	25	150	22	25	28							
	3225-P12	32	25	170	22	32	28							
	3232-P12	32	32	170	27	32	28							
	2525-M15	25	25	150	22	25	35	SN□□1506□□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	3232-P15	32	32	170	27	32	35							
	3232-P19	32	32	170	27	32	40	SN□□1906□□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	4040-S19	40	40	250	35	40	40							
	4040-S25	40	40	250	35	40	50	SN□□2507□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	4040-S25-6	40	40	250	35	40	50	SN□□2509□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	5050-T25	50	50	300	43	50	50	SN□□2507□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	5050-T25-6	50	50	300	43	50	46	CNMG250924	LV8N	VHX1026N	SS84N	SP8N	HW50L	LSPS8
PSBNR/L	1616-H09N	16	16	100	13	16	21	SN□□0903□□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	2020-K09N	20	20	125	17	20	23							
	2020-K12N	20	20	125	17	20	28	SN□□1204□□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	2525-M12N	25	25	150	22	25	28							
	3225-P12N	32	25	150	22	25	28							
	3232-P12N	32	32	170	27	32	28							
	2525-M15N	25	25	150	22	25	35	SN□□1506□□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	3232-P15N	32	32	170	27	32	35							

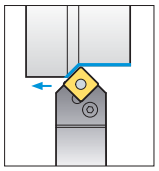
Applicable inserts **B41~B48**

PSDNN



SN□□





45°

(mm)

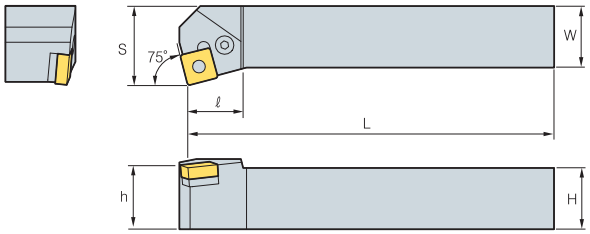
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSDNN	1616-H09	16	16	100	8	16	23	SN□□0903□□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	2020-K12	20	20	125	10	20	30	SN□□1204□□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	2525-M12	25	25	150	12.5	25	30							
	3225-P12	32	25	170	12.5	32	30							
	3232-P12	32	32	170	16	32	40							
	2525-M15	25	25	150	12.5	25	40	SN□□1506□□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	3232-P15	32	32	170	16	32	40							
	3225-P19	32	25	170	12.5	32	40	SN□□1906□□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	3232-P19	32	32	170	16	32	40							
	4040-S19	40	40	250	20	40	40							
	4040-S25	40	40	250	20	40	50	SN□□2507□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	5050-T25	50	50	300	25	50	50							
	4040-S25-6	40	40	250	20	40	50	SN□□2509□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	5050-T25-6	50	50	300	25	50	50							
PSDNN	1616-H09N	16	16	100	8	16	23	SN□□0903□□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	2020-K12N	20	20	125	10	20	30	SN□□1204□□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	2525-M12N	25	25	150	12.5	20	30							
	3225-P12N	32	25	170	12.5	32	30							
	3232-P12N	32	32	170	16	32	40							
	2525-M15N	25	25	150	12.5	25	40	SN□□1506□□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	3232-P15N	32	32	170	16	32	40							

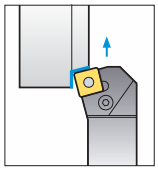
Applicable inserts **B41~B48**

PSKNR/L



SN□□





75°

• R type insert

(mm)

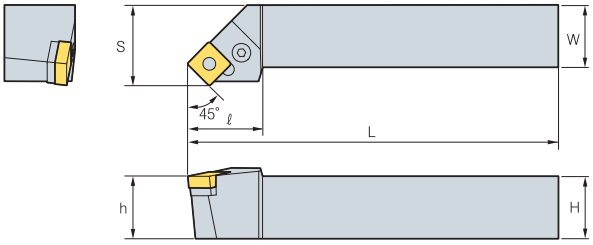
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSKNR/L	1616-H09	16	16	100	20	16	17	SN□□ 0903□□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	2020-K09	20	20	125	25	20	20							
	2020-K12	20	20	125	25	20	23	SN□□1204□□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	2525-M12	25	25	150	32	25	23							
	3232-P12	32	32	170	40	32	23							
	2525-M15	25	25	150	32	25	28	SN□□1506□□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	3232-P15	32	32	170	40	32	28							
	3232-P19	32	32	170	40	32	41.5	SN□□1906□□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	4040-S19	40	40	250	50	40	41.5							
	4040-S25	40	40	250	50	40	46	SN□□2507□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	4040-S25-6	40	40	250	50	40	46	SN□□2509□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	5050-T25-6	50	50	300	60	50	37.5	SN□□2509□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
PSKNR/L	1616-H09N	16	16	100	20	16	17	SN□□ 0903□□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	2020-K09N	20	20	125	25	20	20							
	2020-K12N	20	20	125	25	20	26	SN□□ 1204□□	LV4N	VHX0820N	SS42N	SP4N	HW30L	LSPS4
	2525-M12N	25	25	150	32	25	26							
	3232-P12N	32	32	170	40	32	26							
	2525-M15N	25	25	150	32	25	32	SN□□ 1506□□	LV5N	VHX0820AN	SS53N	SP5N	HW30L	LSPS5
	3232-P15N	32	32	170	40	32	32							

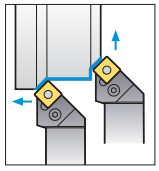
Applicable inserts **B41~B48**

PSSNR/L



SN□□





45°

• R type insert

(mm)

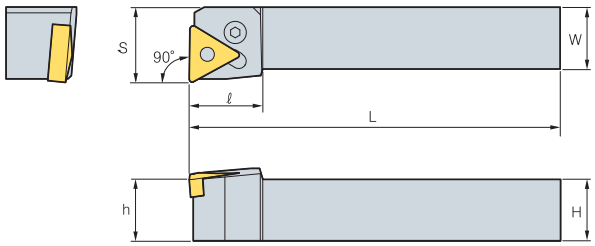
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PSSNR/L	1616-H09	16	16	100	20	16	25	SN□□0903□□	LV3	VHX0617	SS32	SP3	HW25L	LSPS3
	2020-K12	20	20	125	25	20	30	SN□□1204□□	LV4	VHX0821	SS42	SP4	HW30L	LSPS4
	2525-M12	25	25	150	32	25	36							
	3225-P12	32	25	170	32	32	36							
	3232-P12	32	32	170	40	32	40							
	2525-M15	25	25	150	32	25	36	SN□□1506□□	LV5	VHX0825	SS53	SP5	HW30L	LSPS5
	3232-P15	32	32	170	40	32	45							
	3232-P19	32	32	170	40	32	41.5	SN□□1906□□	LV6N	VHX1027N	SS63N	SP6N	HW40L	LSPS6
	4040-R19	40	40	200	50	40	41.5							
	4040-S19	40	40	250	50	40	41.5							
	4040-S25	40	40	250	50	40	48	SN□□2507□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
	4040-S25-6	40	40	250	50	40	48	SN□□2509□□	LV8N	VHX1236N	SS84N	SP8N	HW50L	LSPS8
PSSNR/L	1616-H09N	16	16	100	20	16	25	SN□□0903□□	LV3N	VHX0617N	SS32N	SP3	HW25L	LSPS3
	2020-K12N	20	20	125	25	20	30	SN□□1204□□	LV4N	VHX0821N	SS42N	SP4N	HW30L	LSPS4
	2525-M12N	25	25	150	32	25	36							
	3225-P12N	32	25	170	32	32	45							
	3232-P12N	32	32	170	40	32	40							
	2525-M15N	25	25	150	32	25	36	SN□□1506□□	LV5N	VHX08209N	SS53N	SP5N	HW30L	LSPS5
	3232-P15N	32	32	170	40	32	45							

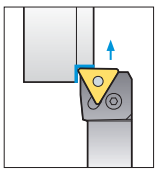
Applicable inserts **B41~B48**

PTFNR/L



TN□□





90°

• R type insert
(mm)

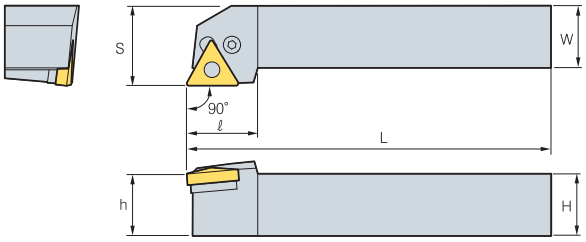
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PTFNR/L	1616-H16	16	16	100	20	16	20	TN□□1604□□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	2020-K16	20	20	125	25	20	20							
	2525-M16	25	25	150	32	25	20							
	2525-M22	25	25	150	32	25	25	TN□□2204□□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
	3232-P22	32	32	170	40	32	25							
	3232-P27	32	32	170	40	32	34	TN□□2706□□	LV5	VHX0825	ST53	SP5	HW30L	LSPS5
	4040-S27	40	40	250	50	40	34							
PTFNR/L	1616-H16N	16	16	100	20	16	20	TN□□1604□□	LV3N	VHX0617N	ST317N	SP3	HW25L	LSPS3
	2020-K16N	20	20	125	25	20	20							
	2525-M16N	25	25	150	32	25	20							
	2525-M22N	25	25	150	32	25	25	TN□□2204□□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4
	3232-P22N	32	32	170	40	32	25							
	3232-P27N	32	32	170	40	32	34	TN□□2706□□	LV5AN	VHX0823N	ST53N	SP5N	HW30L	LSPS5
	4040-S27N	40	40	250	50	40	34							

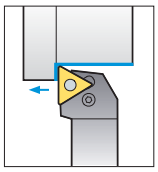
Applicable inserts **B49~B55**

PTGNR/L



TN□□





90°

• R type insert
(mm)

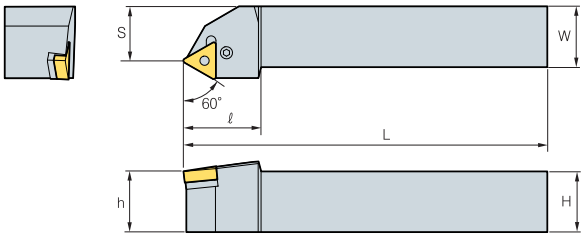
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PTGNR/L	1212-F11	12	12	80	16	12	16	TN□□1103□□	LV2	VHX0509B	-	-	HW20L	-
	1616-H11	16	16	100	20	16	18							
	2020-K11	20	20	125	25	20	19							
	2525-M11	25	25	150	32	25	20							
	1616-H16	16	16	100	20	16	20	TN□□1604□□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	2020-K16	20	20	125	25	20	20							
	2525-M16	25	25	150	32	25	20							
	3232-P16	32	32	170	40	32	20							
	2525-M22	25	25	150	32	25	28	TN□□2204□□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
	3232-P22	32	32	170	40	32	28							
	3232-P27	32	32	170	40	32	33	TN□□2706□□	LV5	VHX0825	ST53	SP5	HW30L	LSPS5
	4040-S27	40	40	250	50	40	33							
PTGNR/L	1616-H16N	16	16	100	20	16	20	TN□□1604□□	LV3N	VHX0617N	ST317N	SP3N	HW25L	LSPS3
	2020-K16N	20	20	125	25	20	20							
	2525-M16N	25	25	150	32	25	20							
	3232-P16N	32	32	170	40	32	20							
	2525-M22N	25	25	150	32	25	28	TN□□2204□□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4
	3232-P22N	32	32	170	40	32	28							
	3232-P27N	32	32	170	40	32	33	TN□□2706□□	LV5AN	VHX0823N	ST53N	SP5N	HW30L	LSPS5
	4040-S27N	40	40	250	50	40	33							

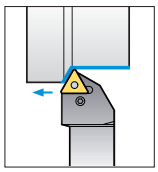
Applicable inserts **B49~B55**

PTTNR/L



TN□□





60°

• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch
PTTNR/L	1616-H16	16	16	100	13	16	25	TN□□1604□□	LV3	VHX0617	ST317	SP3	HW25L	LSPS3
	2020-K16	20	20	125	17	20	25							
	2525-M16	25	25	150	22	25	32							
	2525-M22	25	25	150	22	25	32	TN□□2204□□	LV4	VHX0821	ST42	SP4	HW30L	LSPS4
PTTNR/L	1616-H16N	16	16	100	13	16	25	TN□□1604□□	LV3N	VHX0617N	ST317N	SP3	HW25L	LSPS3
	2020-K16N	20	20	125	17	20	25							
	2525-M16N	25	25	150	22	25	32							
	2525-M22N	25	25	150	22	25	32	TN□□2204□□	LV4N	VHX0820N	ST42N	SP4N	HW30L	LSPS4

Applicable inserts **B49~B55**

PWLNR/L



WN□□

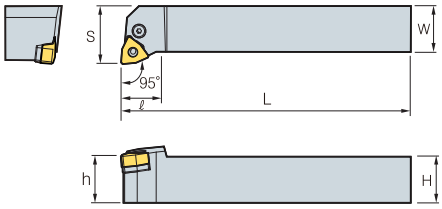


Fig.1

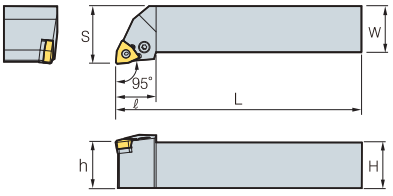
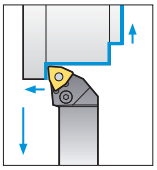


Fig.2



95°

• R type insert

(mm)

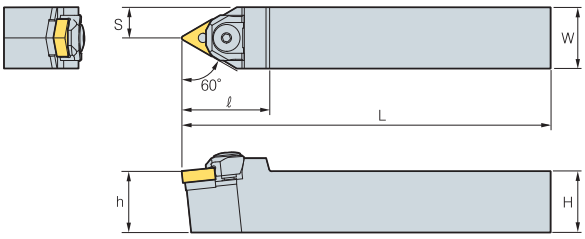
Designation		H	W	L	S	h	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench	Shim Pin Punch	Fig.
PWLNR/L	1616-H06	16	16	100	20	16	20	WN□□0604□□	LV3	VHX0617	SW317	SP3	HW25L	LSPS3	1
	2020-K06	20	20	125	25	20	20								
	2525-M06	25	25	150	32	25	20								
	2020-K08	20	20	125	25	20	26	WN□□0804□□	LV4	VHX0821	SW42	SP4	HW30L	LSPS4	2
	2525-M08	25	25	150	32	25	26								
PWLNR/L	1616-H06N	16	16	100	20	16	20	WN□□0604□□	LV3N	VHX0617N	SW317N	SP3	HW25L	LSPS3	1
	2020-K06N	20	20	125	25	20	20								
	2525-M06N	25	25	150	32	25	20								
	2020-K08N	20	20	125	25	20	26	WN□□0804□□	LV4N	VHX0820N	SW42N	SP4N	HW30L	LSPS4	2
	2525-N08N	25	25	150	32	25	26								

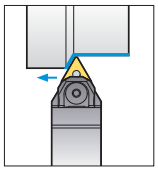
Applicable inserts **B58~B61**

WTENN



TN□□





60°

• R type insert

(mm)

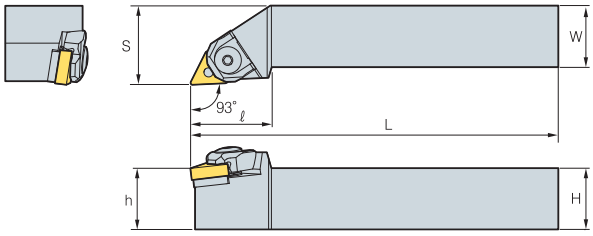
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WTENN	2020-K16	20	20	125	10	20	36	TN□□1604□□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW30L
	2525-M16	25	25	150	12.5	25	36								
	2525-M22	25	25	150	12.5	25	42	TN□□2204□□	CMH6R1	MHX0626	ER04	ST43M	SP4M	N0508	HW30L
	3232-P22	32	32	170	16	32	42								

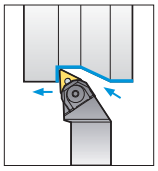
Applicable inserts **B49~B55**

WTJNR/L



TN□□





93°

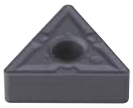
• R type insert

(mm)

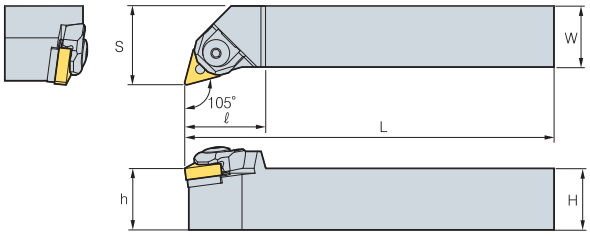
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WTJNR/L	2020-K16	20	20	125	25	20	33	TN□□1604□□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW30L
	2525-M16	25	25	150	32	25	33								
	3232-P16	32	32	170	40	32	33								
	2525-M22	25	25	150	32	25	35	TN□□2204□□	CMH6R1	MHX0626	ER04	ST43M	SP4M	N0508	HW30L
	3232-P22	32	32	170	40	32	35								

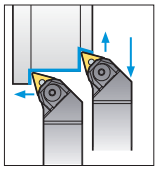
Applicable inserts **B49~B55**

WTXNR/L



TN□□





105°

• R type insert

(mm)

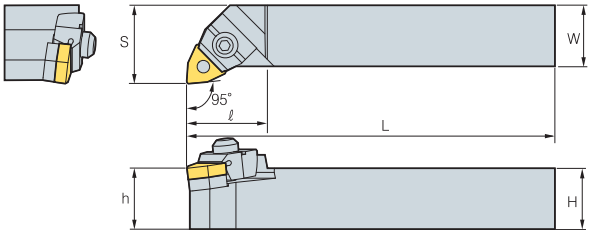
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WTXNR/L	2020-K16	20	20	125	25	20	30	TN□□1604□□	CMH6R6	MHX0626	ER04	ST32M	SP3M-1 / SP3M	N0407	HW25L / HW30L
	2525-M16	25	25	150	32	25	33								
	3232-P16	32	32	170	40	32	33								

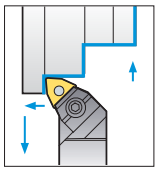
Applicable inserts **B49~B55**

WWLNR/L



WN□□





95°

• R type insert

(mm)

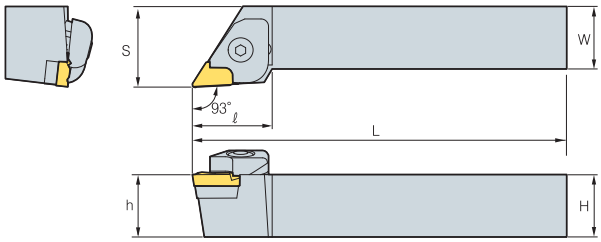
Designation		H	W	L	S	h	ℓ	Insert	Wedge Clamp	Screw	Stopper Ring	Shim	Shim Pin	Nut	Wrench
WWLNR/L	2020-K08	20	20	125	25	20	32	WN□□0804□□	CMH6R/L3	MHX0630	CR05	SW43M	SP2M	N0508	HW30L
	2525-M08	25	25	150	32	25	33		CMH6R2				SP4M		HW40L
	3232-P08	32	32	170	40	32	33		CMH6R2						

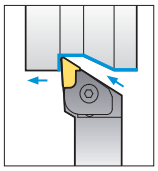
Applicable inserts **B58~B61**

CKJNR/L



KN□□





93°

• R type insert

(mm)

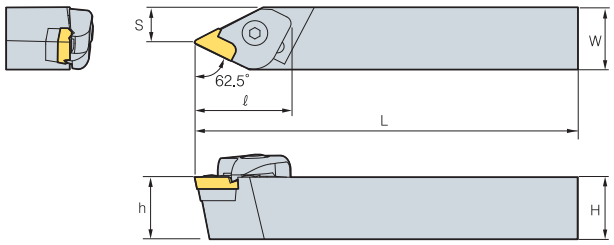
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin + Spring	Shim Screw	Wrench
CKJNR	2020-K16	20	20	125	25	20	32	KN□□1604□□R	CTH6R1	CHX0625	SR3	SK33C	PN0515 SR4	SHX0310	HW20L HW40L
	2525-M16	25	25	150	32	25	32								
	3225-M16	32	25	150	32	32	32								
	3225-P16	32	25	170	32	32	32								
	3232-P16	32	32	170	40	32	32								
	4040-R16	40	40	200	50	40	32								
CKJNL	2020-K16	20	20	125	25	20	32	KN□□1604□□L	CTH6L1	CHX0625	SR3	SK33CL	PN0515 SR4	SHX0310	HW20L HW40L
	2525-M16	25	25	150	32	25	32								
	3232-P16	32	32	170	40	32	32								
	4040-R16	40	40	200	50	40	32								

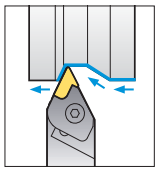
Applicable inserts **B40**

CKNNR/L



KN□□





62.5°

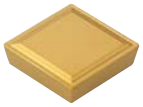
• R type insert

(mm)

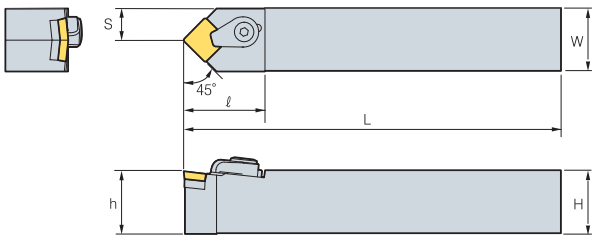
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin + Spring	Shim Screw	Wrench
CKNNR	2525-M16	25	25	150	14.3	25	37	KN□□1604□□R	CTH6R1	CHX0625	SR3	SK33C	PN0515 SR4	SHX0310	HW20L HW40L
	3232-P16	32	32	170	16.8	32	37								
CKNNL	2525-M16	25	25	150	14.3	25	37	KN□□1604□□L	CTH6L1	CHX0625	SR3	SK33CL	PN0515 SR4	SHX0310	HW20L HW40L
	3232-P16	32	32	170	16.8	32	37								

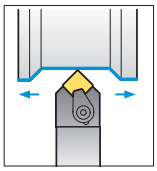
Applicable inserts **B40**

CSDPN



SP□R





45°

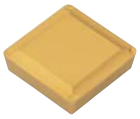
• R type insert

(mm)

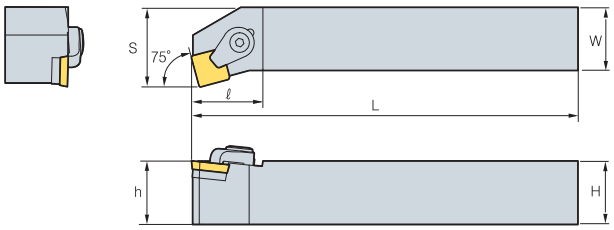
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CSDPN	1616-H09	16	16	100	8	16	30	SP□R0903□□	CH53R1	CH0515C	SS32C	SP3C	CR03C	HW25L
	2525-M12	25	25	150	12.5	25	35	SP□R1203□□	CH6R5	CHX0622C	SS42C	SP3C	CR04C	HW30L

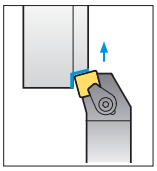
Applicable inserts **B72~B73**

CSKPR/L



SP□R





75°

• R type insert
(mm)

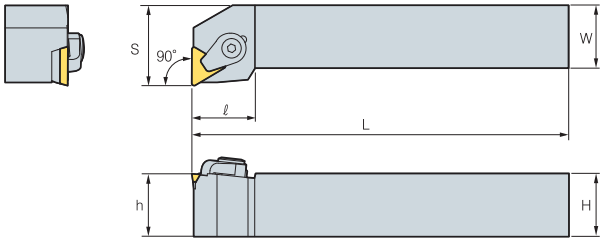
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CSKPR/L	2525-M12	25	25	150	32	20	32	SP□R1203□□	CH6R5	CHX0414C	SS42C	SP3C	CR04C	HW30L

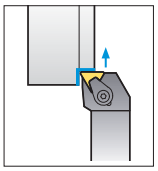
Applicable inserts **B72~B73**

CTFPR/L



TP□R





90°

• R type insert
(mm)

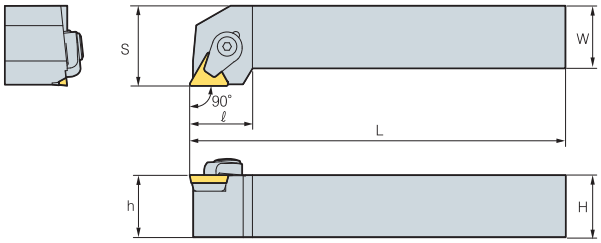
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CTFPR/L	2020-K16	25	25	125	25	20	32	TP□R1603□□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
	2525-M16	25	25	150	32	25	32							

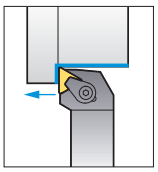
Applicable inserts **B77~B79**

CTGPR/L



TP□R





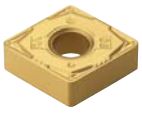
90°

• R type insert
(mm)

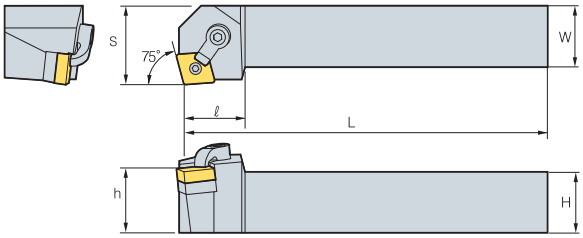
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-Ring	Wrench
CTGPR/L	1212-F11	12	12	80	16	12	20	TP□R1103□□	CH53R1	CHX0515C	-	-	CR03C	HW25L
	1616-H11	16	16	100	20	16	20							
	2020-K11	20	20	125	25	20	20							
	2020-K16	20	20	125	25	20	25	TP□R1603□□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
	2525-M16	25	25	150	32	25	25							
	2525-M22	25	25	150	32	25	32	TP□R2204□□	CH83R1	CHX0823C	ST43C	SP4C	CR05C	HW40L
	3232-P22	32	32	170	40	32	32							

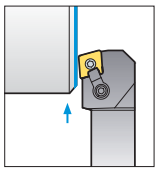
Applicable inserts **B77~B79**

MCKNR/L



CN□□





75°

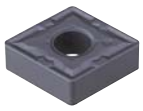
• R type insert

(mm)

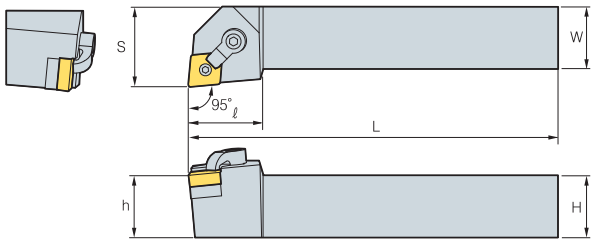
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCKNR/L	2020-K12	20	20	125	25	20	32	CN□□1204□□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	2525-M12	25	25	150	32	25	32						
	3232-P12	32	32	170	40	32	32						

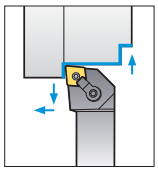
Applicable inserts B26~B32

MCLNR/L



CN□□





95°

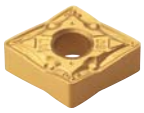
• R type insert

(mm)

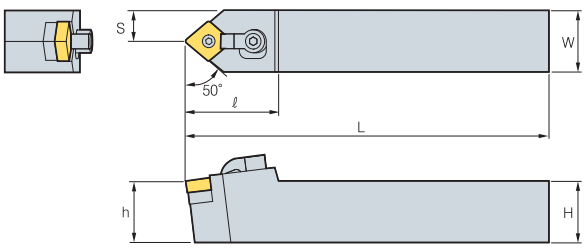
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCLNR/L	1616-H09	16	16	100	20	16	25	CN□□0903□□	CDH7N	DHA10-32-19	SC32D	SP3DS	HW23.8L HW19.8L
	2020-K09	20	20	125	25	20	25						
	2525-M09	25	25	150	32	25	25						
	2020-K12	20	20	125	25	20	32	CN□□1204□□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	2525-M12	25	25	150	32	25	32						
	3225-P12	32	25	170	32	32	32						
	3232-P12	32	32	170	40	32	32						
	2525-M16	25	25	150	32	25	33	CN□□1606□□	CDH8N	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	3232-P16	32	32	170	40	32	33						
	4040-S16	40	40	250	50	40	33						
	2525-M19	25	25	150	32	25	38	CN□□1906□□	CDH8N	DHA5/16-32	SC63D	SP6D	HW39.7L HW35.7L
	3232-P19	32	32	170	40	32	38						
	4040-S19	40	40	250	50	40	38						
	4040-S25	40	40	250	50	40	38	CN□□2507□□	CDH8N3	DHA3/8-35	SC84D	SP8D	HW39.7L HW47.6L

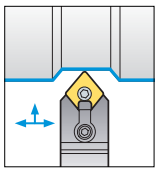
Applicable inserts B26~B32

MCMNN



CN□□





50°

• R type insert

(mm)

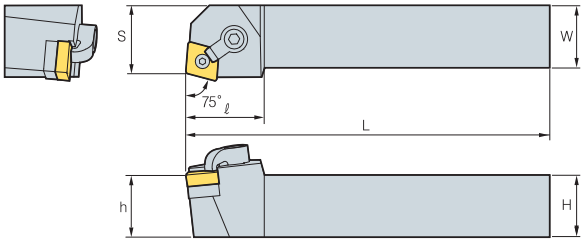
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCMNN	2020-K12	20	20	125	10	20	32	CN□□1204□□	CDH6N	DHA1/4-25	SC43D	SP4D	HW31.8L HW23.8L
	2525-M12	25	25	150	12.5	25	32						
	3232-P12	32	32	170	16	32	32						
	2525-M16	25	25	150	12.5	25	40	CN□□1606□□	CDH8N	DHA5/16-32	SC53S	SP5D	HW39.7L HW31.8L
	3232-P16	32	32	170	16	32	40						
	3232-P19	32	32	170	16	32	40	CN□□1906□□	CDH8N	DHA5/16-32	SD63D	SP6D	HW39.7L HW35.7L
	4040-S19	40	40	250	20	40	32						

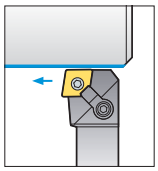
Applicable inserts B26~B32

MCRNR/L



CN□□





75°

• R type insert

(mm)

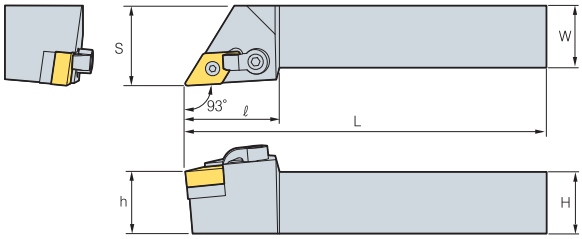
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCRNR/L	2020-K12	20	20	125	22	20	32	CN□□1204□□	CDH8N1	DHA5/16-32	SC43D	SP4D	HW39.7L HW23.8L
	2525-M12	25	25	150	27	25	32						
	2525-M16	25	25	150	27	25	33	CN□□1606□□	CDH8N1	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	3232-P16	32	32	170	35	32	33						
	3232-P19	32	32	170	35	32	38	CN□□1906□□	CDH8N1	DHA5/16-32	SC63D	SP6D	HW39.7L HW35.7L
	4040-S19	40	40	250	43	40	38						

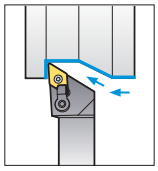
Applicable inserts **B26~B32**

MDJNR/L



DN□□





93°

• R type insert

(mm)

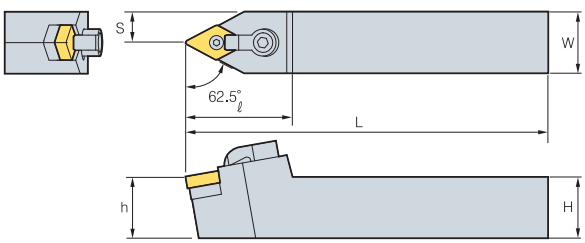
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MDJNR/L	2020-K11	20	20	125	25	20	32	DN□□1204□□	CDH6N	DHA1/4-19	SD32D	SP3D	HW31.8L HW19.8L
	2525-M11	25	25	150	32	25	32						
	2020-K15-3	20	20	125	25	20	36	DN□□1504□□	CDH6N	DHA1/4-25	SD43D	SP4D	HW31.8L HW23.8L
	2525-M15-3	25	25	150	32	25	36						
	3232-P15-3	32	32	170	40	32	36						
	2020-K15	20	20	125	25	20	36	DN□□1506□□	CDH6N	DHA1/4-25	SD43D	SP4DL	HW31.8L HW23.8L
	2525-M15	25	25	150	32	25	36						
	3232-P15	32	32	170	40	32	36						

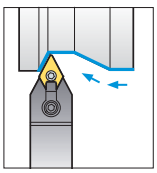
Applicable inserts **B33~B39**

MDNNN



DN□□





62.5°

(mm)

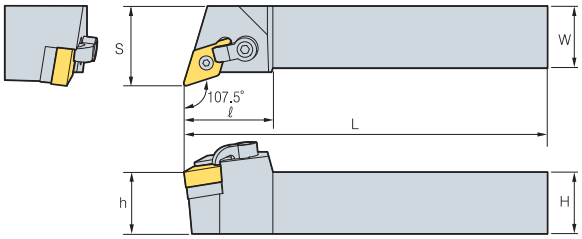
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MDNNN	2525-M15-3	25	25	150	12.5	25	41	DN□□1504□□	CDH8N	DHA5/16-32	SD43D	SP4D	HW39.7L HW23.8L
	2525-M15	25	25	150	12.5	25	41	DN□□1506□□	CDH8N	DHA5/16-32	SD43D	SP4DL	HW39.7L HW23.8L

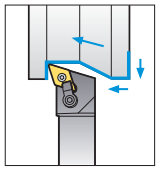
Applicable inserts **B33~B39**

MDQNR/L



DN□□





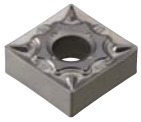
107.5°

• R type insert
(mm)

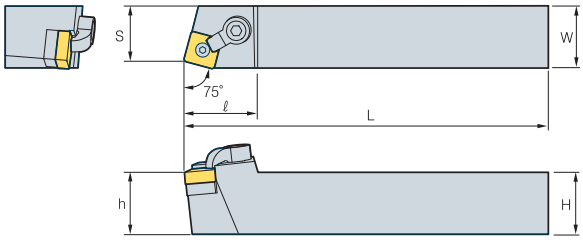
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MDQNR/L	2525-M15-3	25	25	150	32	25	36	DN□□1504□□	CDH6N	DHA1/4-25	SD43D	SP4D	HW31.8L HW23.8L
	3232-P15-3	32	32	170	40	32	36						
	2525-M15	25	25	150	32	25	36	DN□□1506□□	CDH6N	DHA1/4-25	SD43D	SP4DL	HW31.8L HW23.8L
	3232-M15	32	32	170	40	32	36						

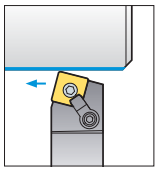
Applicable inserts **B33~B39**

MSBNR/L



SN□□





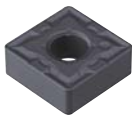
75°

• R type insert
(mm)

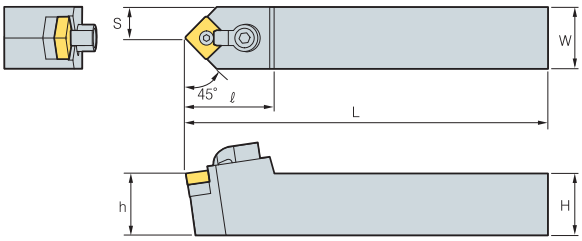
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSBNR/L	2020-K12	20	20	125	17	20	32	SN□□1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	2525-M12	25	25	150	22	25	32						
	2525-M15	25	25	150	22	25	35	SN□□1506□□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	3232-P15	32	32	170	22	32	35						
	3232-P19	32	32	170	27	32	40	SN□□1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	4040-S19	40	40	250	35	40	40						

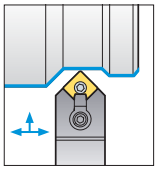
Applicable inserts **B41~B48**

MSDNN



SN□□





45°

(mm)

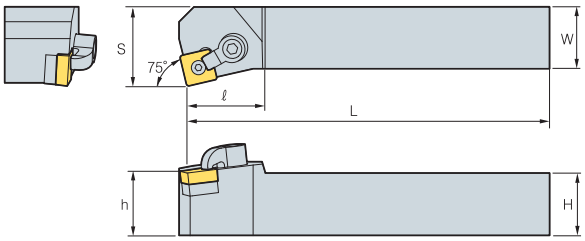
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSDNN	1616-H09	16	16	100	8	16	28	SN□□0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	2020-K09	20	20	125	10	20	28						
	2020-K12	20	20	125	10	20	32	SN□□1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	2525-M12	25	25	150	12.5	25	32						
	3225-P12	32	25	170	12.5	32	32						
	2525-M15	25	25	150	12.5	25	35	SN□□1506□□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	3225-P15	32	25	170	12.5	32	35						
	3232-P15	32	32	170	16	32	35						
	4040-S15	40	40	250	20	40	35						
	3232-P19	32	32	170	16	32	42	SN□□1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	4040-S19	40	40	250	20	40	42						

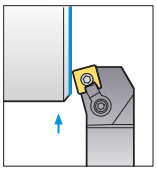
Applicable inserts **B41~B48**

MSKNR/L



SN□□





75°

• R type insert

(mm)

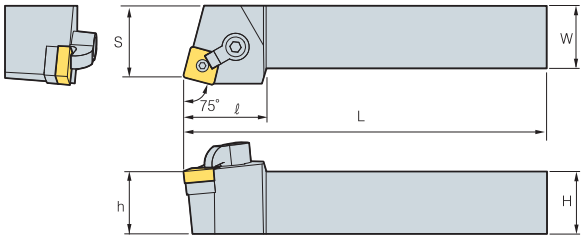
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSKNR/L	1616-H09	16	16	100	20	16	28	SN□□0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	2020-K09	20	20	125	22	20	28						
	2020-K12	20	20	125	25	20	32	SN□□1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	2525-M12	25	25	150	32	25	32						
	3225-P12	32	25	170	32	32	32						
	2525-M15	25	25	150	32	25	35	SN□□1506□□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	3232-P15	32	32	170	40	32	35						
	3232-P19	32	32	170	40	32	40	SN□□1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	4040-S19	40	40	250	50	40	40						
	4040-S25	40	40	250	50	40	40	SN□□2507□□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L HW39.7L

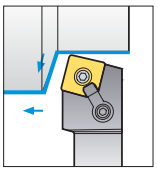
Applicable inserts **B41~B48**

MSRNR/L



SN□□





75°

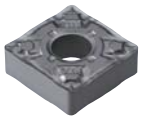
• R type insert

(mm)

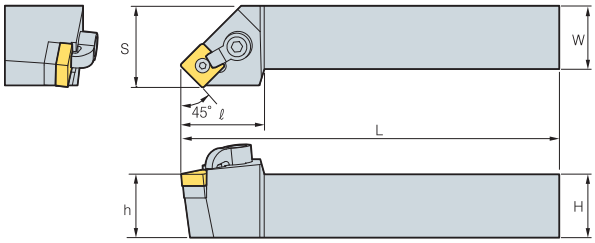
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSRNR/L	1616-H09	16	16	100	17	16	28	SN□□0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	2020-K09	20	20	125	22	20	28						
	2020-K12	20	20	125	22	20	32	SN□□1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	2525-M12	25	25	150	27	25	32						
	2525-M15	25	25	150	27	25	35	SN□□1506□□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	3232-P15	32	32	170	35	32	35						
	3225-P19	32	25	170	27	32	40						
	3232-P19	32	32	170	35	32	40	SN□□1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	4040-S19	40	40	250	43	40	40						
	4040-S25	40	40	250	43	40	40	SN□□2507□□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L HW39.7L

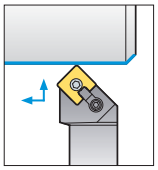
Applicable inserts **B41~B48**

MSSNR/L



SN□□





45°

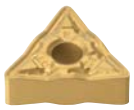
• R type insert

(mm)

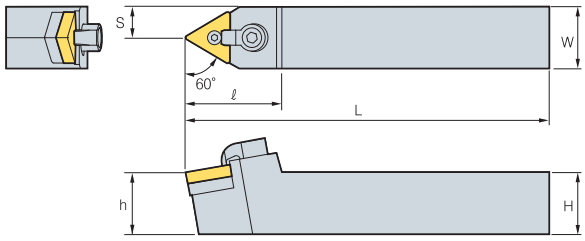
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSSNR/L	1616-H09	16	16	100	20	16	28	SN□□0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L HW23.8L
	2020-K09	20	20	125	25	20	28						
	2020-K12	20	20	125	25	20	32	SN□□1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L HW23.8L
	2525-M12	25	25	150	32	25	32						
	2525-M15	25	25	150	32	25	35	SN□□1506□□	CDH8N1	DHA5/16-32	SS53D	SP5D	HW39.7L HW31.8L
	3232-P15	32	32	170	40	32	35						
	3232-P19	32	32	170	40	32	40	SN□□1906□□	CDH8N1	DHA5/16-32	SS63D	SP6D	HW39.7L HW35.7L
	4040-S19	40	40	250	50	40	40						

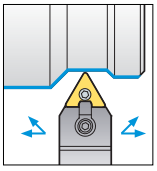
Applicable inserts **B41~B48**

MTENN



TN□□





60°

(mm)

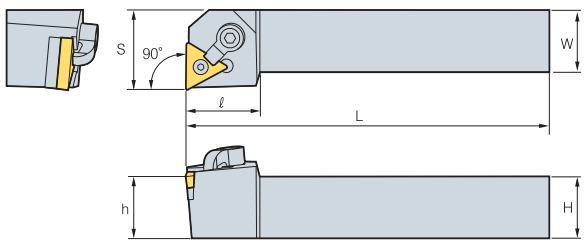
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTENN	2020-K16	20	20	125	10	20	32	TN□□1604□□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	2525-M16	25	25	150	12.5	25	32						
	2525-M22	25	25	150	12.5	25	35	TN□□2204□□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	3232-P27	32	32	170	16	32	35	TN□□2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	4040-S33	40	40	250	20	40	40	TN□□3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

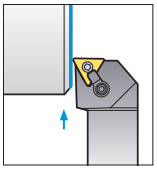
Applicable inserts **B49~B55**

MTFNR/L



TN□□





90°

• R type insert

(mm)

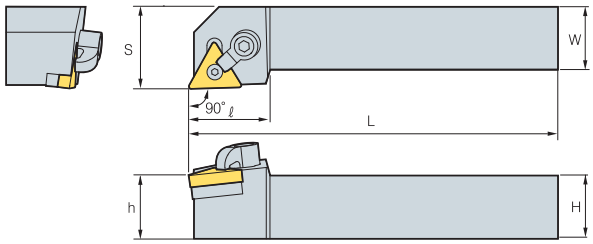
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTFNR/L	1616-H16	16	16	100	20	16	32	TN□□1604□□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	2020-K16	20	20	125	25	20	32						
	2525-M16	25	25	150	32	25	32						
	2525-M22	25	25	150	32	25	32	TN□□2204□□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	3232-P22	32	32	170	40	32	32						
	4040-S22	40	40	250	50	40	32						
	3232-P27	32	32	170	40	32	35	TN□□2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	4040-S27	40	40	250	50	40	35						
	4040-S33	40	40	250	50	40	40	TN□□3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

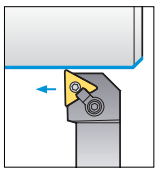
Applicable inserts **B49~B55**

MTGNR/L



TN□□





90°

• R type insert

(mm)

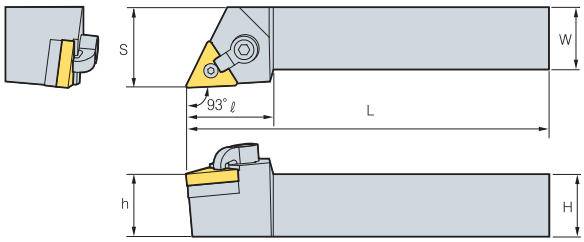
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTGNR/L	1616-H16	16	16	100	20	16	32	TN□□1604□□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	2020-K16	20	20	125	25	20	32						
	2525-M16	25	25	150	32	25	32						
	2525-M22	25	25	150	32	25	32	TN□□2204□□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	3232-P22	32	32	170	40	32	32						
	3232-P27	32	32	170	40	32	35	TN□□2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	4040-S27	40	40	250	50	40	35						
	4040-S33	40	40	250	50	40	40	TN□□3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

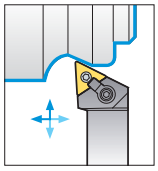
Applicable inserts **B49~B55**

MTJNR/L



TN□□





93°

• R type insert

(mm)

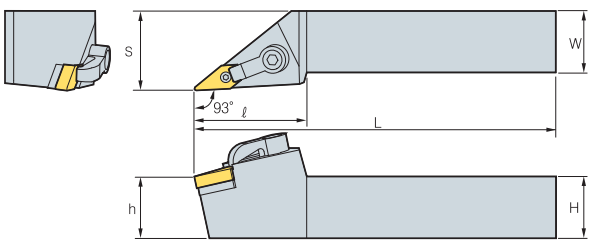
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTJNR/L	2020-K16	20	20	125	25	20	32	TN□□1604□□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	2525-M16	25	25	150	32	25	32						
	2525-M22	25	25	150	32	25	32	TN□□2204□□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	3232-P22	32	32	170	40	32	32						
	3232-P27	32	32	170	40	32	35	TN□□2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	4040-S27	40	40	250	50	40	35						
	4040-S33	40	40	250	50	40	40	TN□□3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

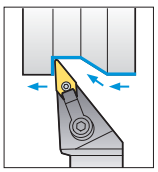
Applicable inserts **B49~B55**

MVJNR/L



VN□□





93°

• R type insert

(mm)

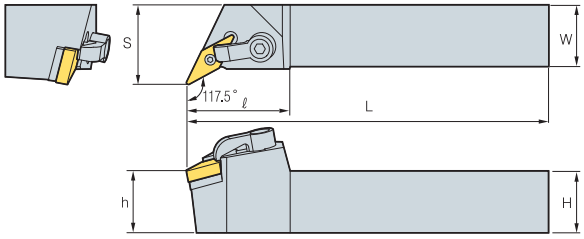
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MVJNR/L	2020-K16	20	20	125	25	20	37	VN□□1604□□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	2525-M16	25	25	150	32	25	37						
	3232-P16	32	32	170	40	32	37						
	2525-M22	25	25	150	32	25	50	VN□□2204□□	CDH8N2	DHA5/16-32	SV43D	SP4D	HW39.7L HW23.8L
	3232-P22	32	32	170	40	32	50						
	4040-S22	40	40	250	50	40	50						

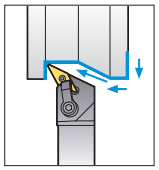
Applicable inserts **B56~B57**

MVQNR/L



VN□□





117.5°

• R type insert

(mm)

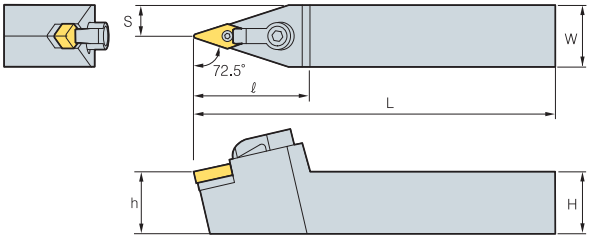
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MVQNR/L	2020-K16	20	20	125	25	20	42	VN□□1604□□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	2525-M16	25	25	150	32	25	42						
	3232-P16	32	32	170	40	32	37						

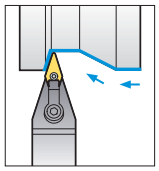
Applicable inserts **B56~B57**

MVVNN



VN□□





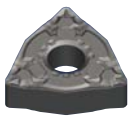
72.5°

(mm)

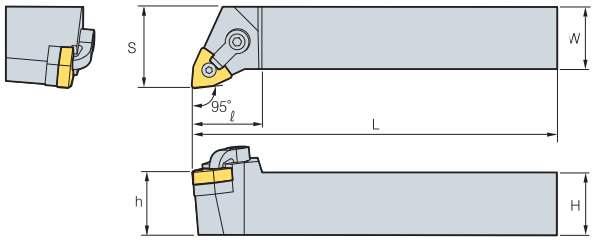
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MVVNN	2020-K16	20	20	125	25	20	42	VN□□1604□□	CDH8N2	DHA5/16-32	SV32D	SP3D	HW39.7L HW19.8L
	2525-M16	25	25	150	32	25	42						

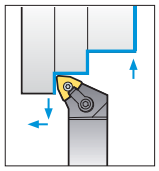
Applicable inserts **B56~B57**

MWLNR/L



WN□□





95°

• R type insert

(mm)

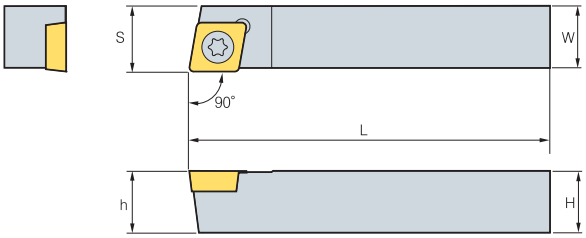
Designation		H	W	L	S	h	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MWLNR/L	2020-K06	20	20	125	25	20	32	WN□□0604□□	CDH7N	DHA10-32-19	SW32D	SP3D	HW19.8L HW23.8L
	2525-M06	25	25	150	32	25	32						
	3232-P06	32	32	170	40	32	32						
	2020-K08	20	20	125	25	20	32	WN□□0804□□	CDH6N	DHA1/4-21	SW43D	SP4D	HW31.8L HW23.8L
	2525-M08	25	25	150	32	25	32						
	3232-P08	32	32	170	40	32	32						

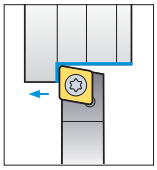
Applicable inserts **B58~B61**

SCACR/L



CC□□





90°

• R type insert

(mm)

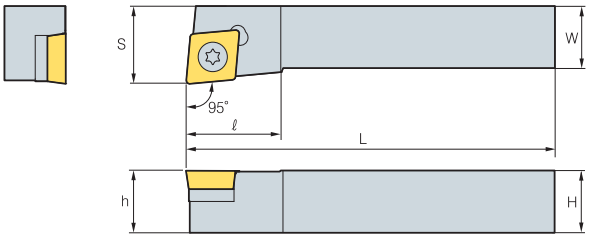
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SCACR/L	1010-E06	10	10	70	10.5	10	CC□□0602□□	FTKA02565	-	-	TW07P
	1212-F09	12	12	80	12.5	12	CC□□09T3□□	FTKA03508	-	-	TW15P

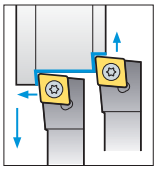
Applicable inserts **B62~B65, B87**

SCLCR/L



CC□□





95°

• R type insert

(mm)

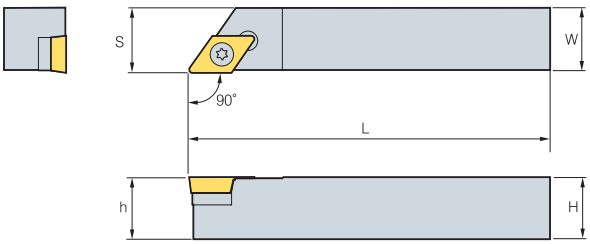
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SCLCR/L	0808-D06	08	08	60	10	08	10	CC□□0602□□	FTKA02565	-	-	TW07P
	1010-E06	10	10	70	16	10	10					
	1212-F09	12	12	80	20	12	16	CC□□09T3□□	CDH7N	-	-	TW15P
	1616-H09	16	16	100	20	16	16					
	2020-K09	20	20	125	25	20	16					
	2020-K12	20	20	125	25	20	25	CC□□1204□□	FTGA0411F	SC42S	SHXN0610F	TW15P
	2525-M09	25	25	150	32	25	26	CC□□09T3□□	FTGA03508	-	-	TW156P
	2525-M12	25	25	150	32	25	26	CC□□1204□□	FTGA0411F	SC42S	SHXN0610F	HW40L

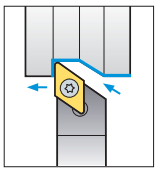
Applicable inserts **B62~B65, B87**

SDACR/L



DC□□





90°

• R type insert

(mm)

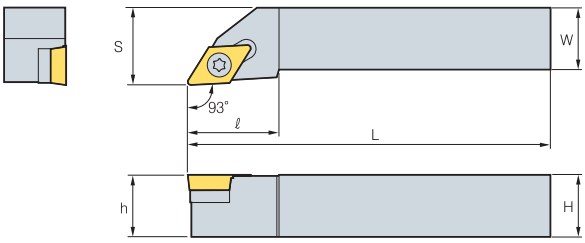
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SDACR/L	1010-E07	10	10	70	10.5	10	DC□□0702□□	FTKA02565	-	-	TW07P
	1212-F11	12	12	80	12.5	12	DC□□11T3□□	FTKA03508	-	-	TW15P
	1616-H11	16	16	100	16.5	16		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L

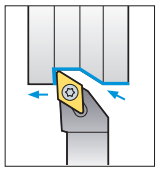
Applicable inserts **B67~B69, B88**

SDJCR/L



DC□□





93°

• R type insert

(mm)

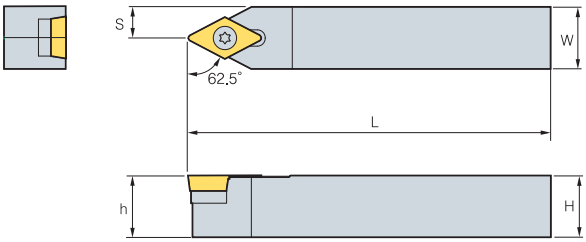
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SDJCR/L	1010-E07	10	10	70	12	10	15	DC□□0702□□	FTKA02565	-	-	TW07P
	1212-F07	12	12	80	16	12	15					
	1616-H07	16	16	100	20	16	18					
	2020-K07	20	20	125	25	20	15					
	1212-F11	12	12	80	16	12	15	DC□□11T3□□	FTGA03512	-	-	TW15P, HW35L
	1616-H11	16	16	100	20	16	24					
	2020-K11	20	20	125	25	20	24					
	2525-M11	25	25	150	32	25	29					

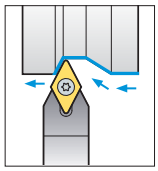
Applicable inserts **B67~B69, B88**

SDNCN



DC□□





62.5°

(mm)

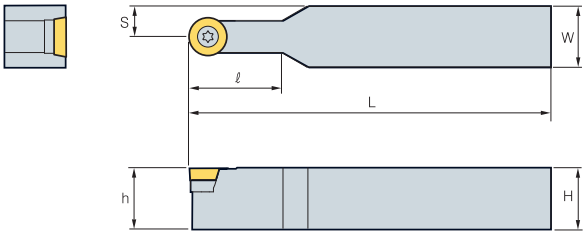
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SDNCN	1010-E07	10	10	70	5	10	DC□□0702□□	FTKA02565	-	-	TW07P
	1212-F07	12	12	80	6	12					
	1212-H11	12	12	100	6	12	DC□□11T3□□	FTGA03508	-	-	TW15P
	1616-H11	16	16	100	8	16	DC□□11T3□□	FTGA03512	SD32S	SHXN0509F	TW15P, HW35L
	2020-K11	20	20	125	10	20					
	2020-M11	25	25	150	12.5	25	DCMT□□11T3□□	FTGA03512	SD32S	SHXN0509F	TW25P, HW35L

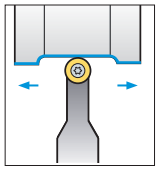
Applicable inserts **B67~B69, B88**

SRDCN



RCGT





(mm)

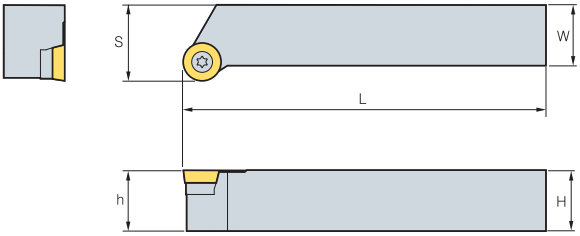
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SRDCN	1010-E06	10	10	70	5	10	10	RCGT0602M0	FTKA02565	-	-	TW07P
	1212-F06	12	12	80	6	12	12					
	1616-H06	16	16	100	8	16	12					
	2525-M06	25	25	150	12.5	25	20					
	1616-H08	16	16	100	8	16	16	RCGT0803M0	FTNA0307	-	-	TW09P
	2020-K08	20	20	125	10	20	20					
	2525-M08	25	25	150	12.5	25	20					
	1616-H10	16	16	100	8	16	25	RCGT1003M0	FTKA03511A	SR10S	SHXN0509F	TW15P HW35L
	2020-K10	20	20	125	10	20	25					
	2525-M10	25	25	150	12.5	25	25					
	2020-K12	20	20	125	10	20	28	RCGT1204M0	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	2525-M12	25	25	150	12.5	25	28					

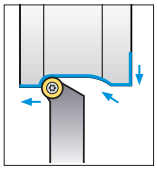
Applicable inserts **B89**

SRGCR/L



RCGT





• R type insert

(mm)

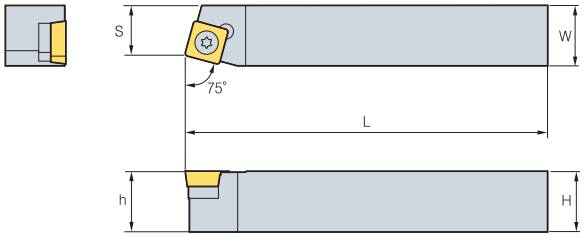
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SRGCR/L	1010-E06	10	10	70	12	10	RCGT0602M0	FTKA02565	-	-	TW07P
	1212-F06	12	12	80	16	12					
	1616-H06	16	16	100	20	16					
	1616-H08	16	16	100	20	16	RCGT0803M0	FTNA0307	-	-	TW09P
	2020-K08	20	20	125	25	20					
	2525-M08	25	25	150	32	25					
	1616-H10	16	16	100	20	16	RCGT1003M0	FTKA03511A	SR10S	SHXN0509F	TW15P HW35L
	2020-K10	20	20	125	25	20					
	2525-M10	25	25	150	32	25					
	2020-K12	20	20	125	25	20	RCGT1204M0	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	2525-M12	25	25	150	32	25					

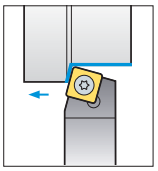
Applicable inserts **B89**

SSBCR/L



SC□□





75°

• R type insert

(mm)

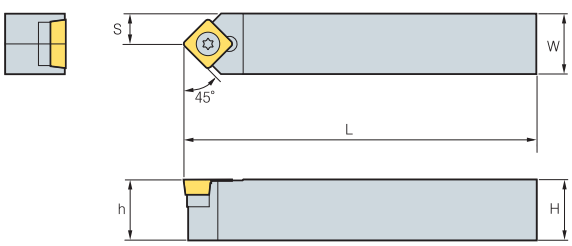
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SSBCR/L	1212-F09	12	12	80	11	12	SC□□09T3□□	FTGA03508	-	-	TW15P
	1616-H09	16	16	100	13	16		FTGA03512	SS32S	SHXN0509F	TW15P, HW35L
	2020-K12	20	20	125	17	20	SC□□1204□□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L

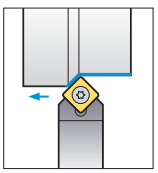
Applicable inserts **B70~B71, B90**

SSDCN



SC□□





45°

(mm)

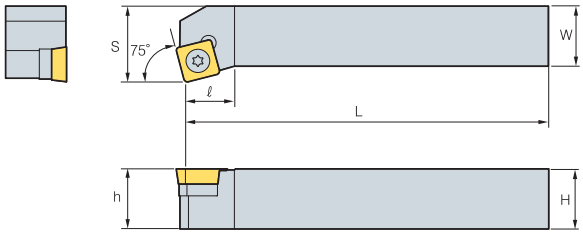
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SSDCN	1212-F09	12	12	80	6	12	SC□□09T3□□	FTGA03508	-	-	TW15P
	1616-H09	16	16	100	8	16		FTGA03512	SS32S	SHXN0509F	TW15P, HW35L

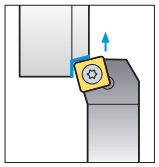
Applicable inserts **B70~B71, B90**

SSKCR/L



SC□□





75°

• R type insert
(mm)

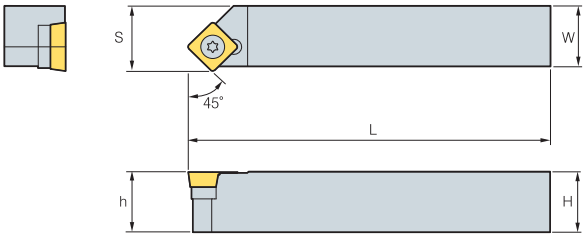
Designation	H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SSKCR/L 1616-H09	16	16	100	20	16	13	SC□□09T3□□	FTGA03512	SS32S	SHXN0509F	TW15P, HW35L

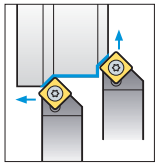
Applicable inserts **B70~B71, B90**

SSSCR/L



SC□□





45°

• R type insert
(mm)

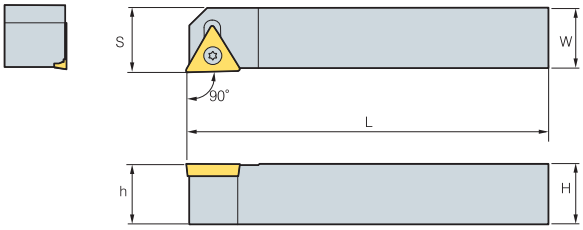
Designation	H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SSSCR/L 1616-H09	16	16	100	17	16	SC□□09T3□□	FTGA03512	SS32S	SHXN0509F	TW15P, HW35L
2020-K12	20	20	125	21	20	SC□□1204□□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L
2525-M12	25	25	150	26	25	SC□□1204□□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L

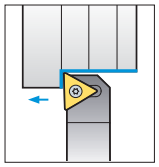
Applicable inserts **B70~B71, B90**

STACR/L



TC□□





90°

• R type insert
(mm)

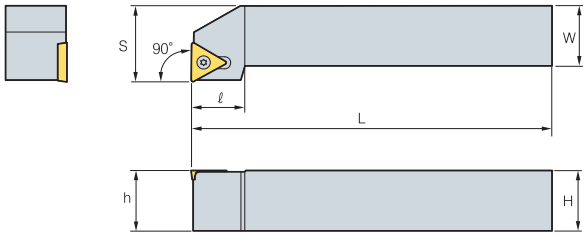
Designation	H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
STACR/L 1010-E09	10	10	70	10.5	10	TC□□0902□□	FTKA02206	-	-	TW06P
1212-F11	12	12	80	12.5	12	TC□□1102□□	FTKA02565	-	-	TW07P

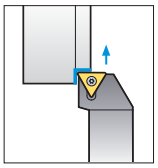
Applicable inserts **B75~B76, B91**

STFCR/L



TC□□





90°

• R type insert
(mm)

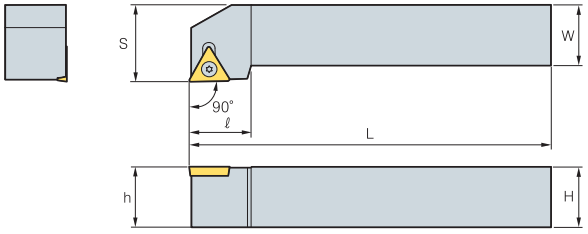
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
STFCR/L	1010-E09	10	10	70	12	10	10	TC□□0902□□	FTKA02206	-	-	TW06P
	1212-F11	12	12	80	16	12	14	TC□□1102□□	FTKA02565	-	-	TW07P
	1616-H11	16	16	100	20	16	14					
	1616-H16	16	16	100	20	16	19	TC□□16T3□□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	25	20	19					
	2525-M16	25	25	150	32	25	25.2	TC□□16T3□□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L

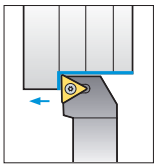
Applicable inserts **B75~B76, B91**

STGCR/L



TC□□





90°

• R type insert
(mm)

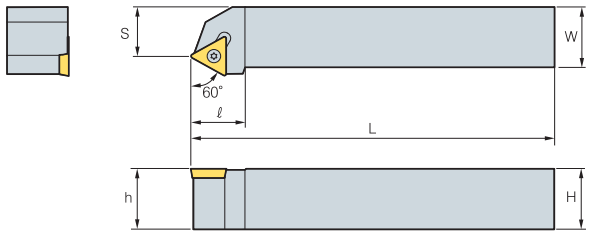
Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
STGCR/L	0808-D09	08	08	60	10	08	11	TC□□0902□□	FTKA02206	-	-	TW06P
	1010-E09	10	10	70	12	10	11					
	1212-F11	12	12	80	16	12	14	TC□□1102□□	FTKA02565	-	-	TW07P
	1616-H11	16	16	100	20	16	16					
	1616-H16	16	16	100	20	16	21	TC□□16T3□□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	25	20	21					
	2525-M16	25	25	150	32	25	21					

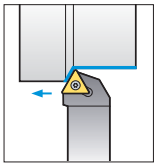
Applicable inserts **B75~B76, B91**

STTCR/L



TC□□





60°

• R type insert
(mm)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
STTCR/L	1616-H11	16	16	100	13	16	14	TC□□1102□□	FTKA02565	-	-	TW07P
	1616-H16	16	16	100	13	16	19	TC□□16T3□□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	17	20	19					

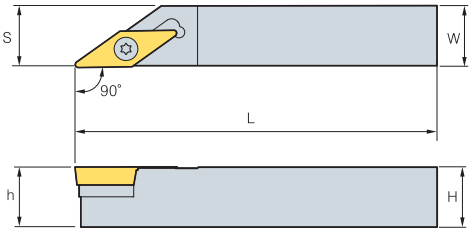
Applicable inserts **B75~B76, B91**

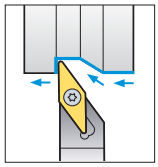
SVABR/L



VB□□







90°

• R type insert

(mm)

Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVABR/L	1616-H16	16	16	100	16.5	16	VB□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	20.5	20					

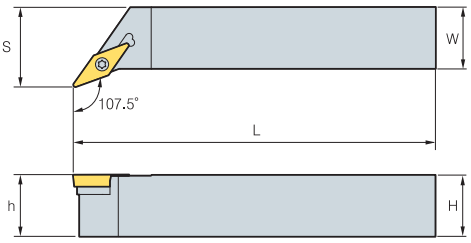
Applicable inserts **B80~B81, B92**

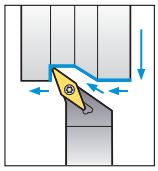
SVHBR/L



VB□□







107.5°

• R type insert

(mm)

Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVHBR/L	2525-M16	25	25	150	32	25	VB□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	3225-P16	32	25	170	32	32					

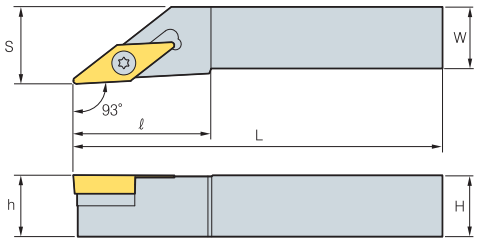
Applicable inserts **B80~B81, B92**

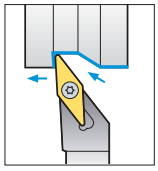
SVJBR/L



VB□□







93°

• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SVJBR/L	1212-F11	12	12	80	16	12	27	VB□□1102□□	FTKA02565	-	-	TW07P
	1616-H11	16	16	100	20	16	27					
	2020-K11	20	20	125	25	20	27					
	1616-H16	16	16	100	20	16	36	VB□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	25	20	41					
	2525-M16	25	25	150	32	25	41	VB□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	3225-P16	32	25	170	32	32	55					
	3232-P16	32	32	170	40	33	55					

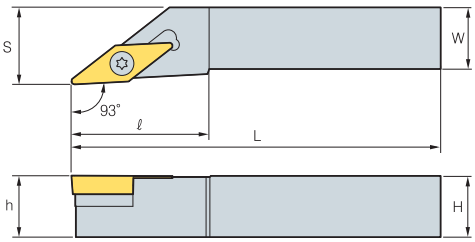
Applicable inserts **B80~B81, B92**

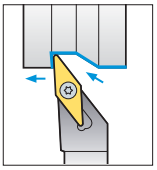
SVJCR/L



VC□□







93°

• R type insert

(mm)

Designation		H	W	L	S	h	ℓ	Insert	Screw	Shim	Shim Screw	Wrench
SVJCR/L	1212-F11	12	12	80	16	12	25	VC□□1103□□	FTKA02565	-	-	TW07P
	1616-H11	16	16	100	20	16	25					
	2020-K11	20	20	125	25	20	25					
	1212-F13	12	12	80	16	12	32	VC□□1303□□	FTKA0307	-	-	TW09P
	1616-H13	16	16	100	20	16	32					
	2020-K13	20	20	125	25	20	32					
	1616-H16	16	16	100	20	16	40	VC□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	25	20	40					
	2525-M16	25	25	150	32	25	40					

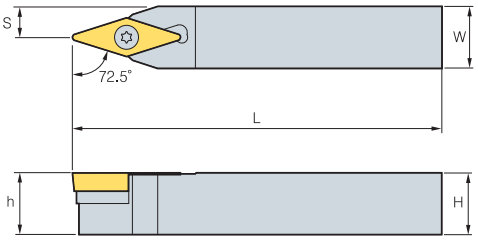
Applicable inserts **B82~B83, B93**

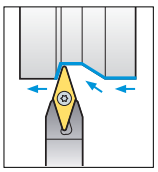
SVVBN



VB□□







72.5°

(mm)

Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVVBN	1212-F11	12	12	80	6	12	VB□□1102□□	FTKA02565	-	-	TW07P
	1616-H11	16	16	100	8	16					
	2020-K11	20	20	125	10	20					
	1616-H16	16	16	100	8	16	VB□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	10	20					
	2525-M16	25	25	150	12.5	25					
	3225-P16	32	25	170	12.5	32					

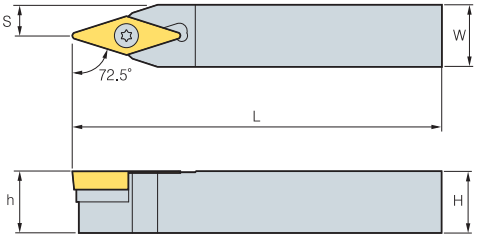
Applicable inserts **B80~B81, B92**

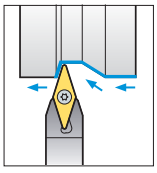
SVVCN



VC□□







72.5°

(mm)

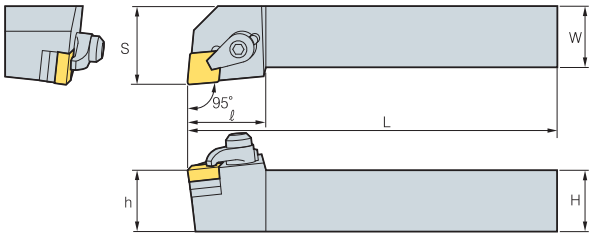
Designation		H	W	L	S	h	Insert	Screw	Shim	Shim Screw	Wrench
SVVCN	1212-F11	12	12	80	6	12	VC□□1103□□	FTKA02565	-	-	TW07P
	1616-H11	16	16	100	8	16					
	2020-K11	20	20	125	10	20					
	1212-F13	12	12	80	6	12	VC□□1303□□	FTNA0307	-	-	TW09P
	1616-H13	16	16	100	8	16					
	2020-K13	20	20	125	10	20					
	1616-H16	16	16	100	8	16	VC□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	2020-K16	20	20	125	10	20					
	2525-M16	25	25	150	12.5	25					

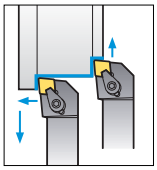
Applicable inserts **B82~B83, B93**

CCLNR/L



CN□N





95°

• R type insert

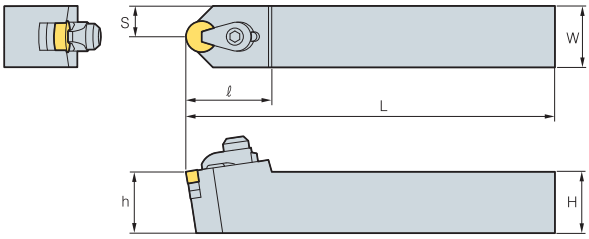
(mm)

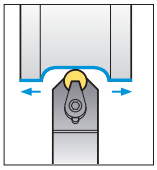
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CCLNR/L 2525-M12C	25	25	150	32	25	32	CN□N1204□□ 1207□□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

CRDNN



RN□N





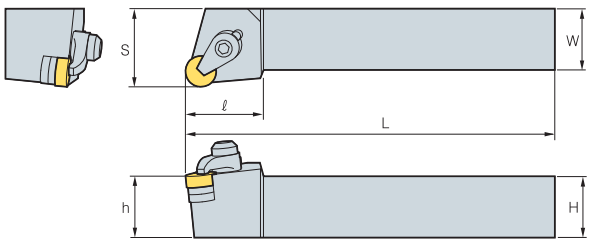
(mm)

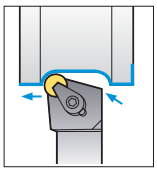
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CRDNN 2525-M12C	25	25	150	12.5	25	35	RN□N1204□□ 1207□□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

CRGNR/L



RN□N



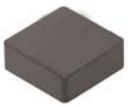


• R type insert

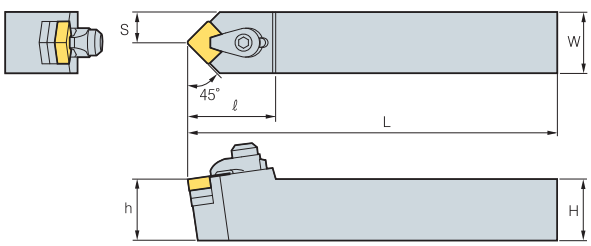
(mm)

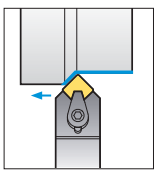
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CRGNR/L 2525-M12C	25	25	150	32	25	32	RN□N1204□□ 1207□□	CH6R3	MHX0630 SHX0310	SC42CC	SR3	HW40L HW20L

CSDNN



SN□N





45°

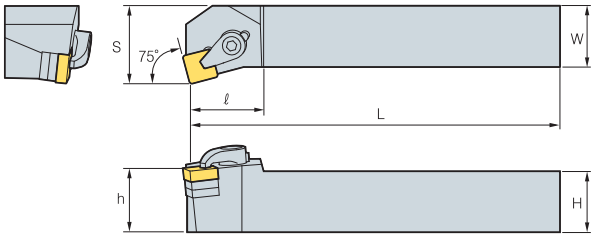
(mm)

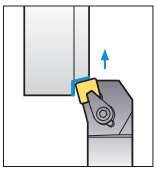
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CSDNN 2525-M12C	25	25	125	12.5	25	35	SN□N1204□□ 1207□□	CH6R3	MHX0630 SHX0310	SS42CC	SR3	HW40L HW20L

CSKNR/L



SN□N





75°

• R type insert

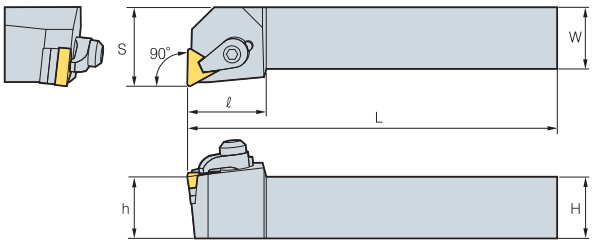
(mm)

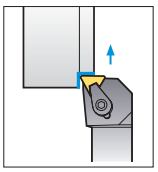
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CSKNR/L 2525-M12C	25	25	150	32	25	28	SN□N1204□□ 1207□□	CH6R3	MHX0630 SHX0310	SS42CC	SR3	HW40L HW20L

CTFNR/L



TN□N





90°

• R type insert

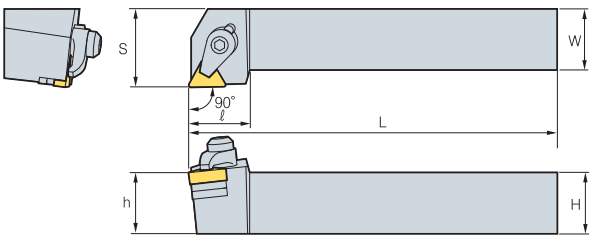
(mm)

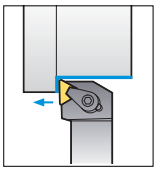
Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CTFNR/L 2525-M16C	25	25	150	32	25	32	TN□N1604□□ 1607□□	CH6R3	MHX0630 SHX0310	ST32CC	SR3	HW40L HW20L

CTGNR/L



TN□N





90°

• R type insert

(mm)

Designation	H	W	L	S	h	ℓ	Insert	Clamp	Screw	Shim	Spring	Wrench
CTGNR/L 2525-M16C	25	25	150	32	25	32	TN□N1604□□ 1607□□	CH6R3	MHX0630 SHX0310	ST32CC	SR3	HW40L HW20L

Note) Generally, two shims are clamped to a Ceramic Holder.
However, only one shim is used in clamping 1207□□ and 1607□□ sized inserts.

S 12 M - S T F P R - 11

1	2	3	4	5	6	7	8	9
Type of Bar	Bar Diameter	Bar Length	Method of Mounting Insert	Insert Shape	Lead Angle of Boring Bar	Relief Angle of Insert	Hand of Bar	Length of Cutting Edge

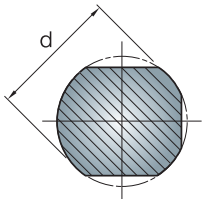
1 Type of Bar

S 12 M - S T F P R - 11

"A" Steel with coolant hole
"E" Carbide bar with fixed steel head and coolant hole
"C" Carbide shank
"S" Steel shank
"X" Special type

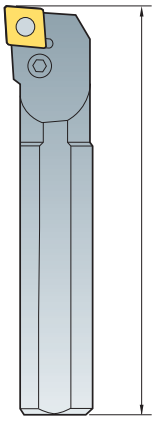
2 Bar Diameter

S 12 M - S T F P R - 11



3 Bar Length

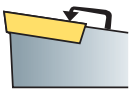
S 12 M - S T F P R - 11



length(L)	(mm)
H	100
J	110
K	125
M	150
N	160
Q	180
R	200
S	250
T	300
U	350
V	400
W	450
Y	500

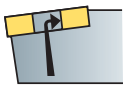
4 Method of Mounting Insert

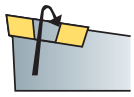
S 12 M - S T F P R - 11


Top clamping
C


Top and hole clamping
D

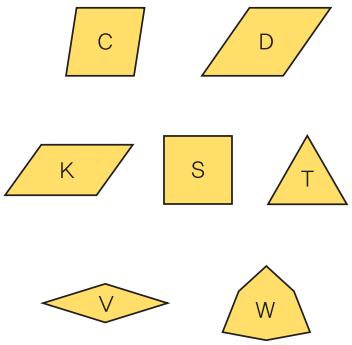

Top and hole clamping
M


Hole clamping
P


Screw on
S

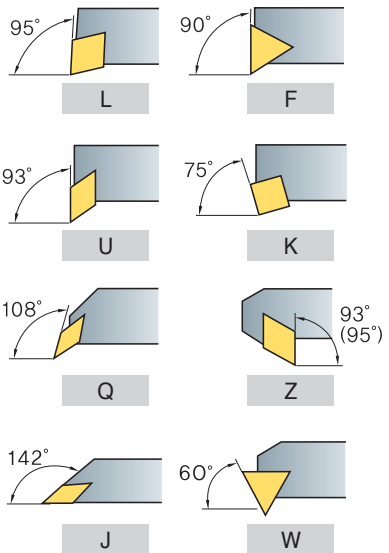
5 Insert Shape

S 12 M - S T F P R - 11



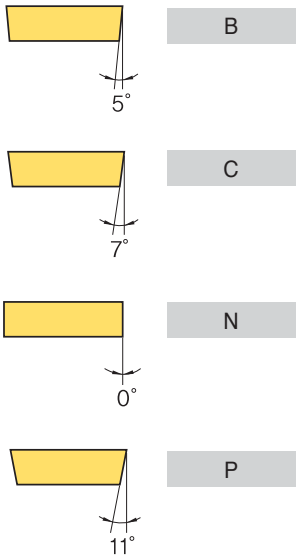
6 Lead Angle of Boring Bar

S 12 M - S T F P R - 11



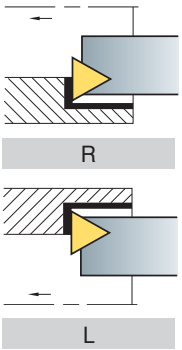
7 Relief Angle of Insert

S 12 M - S T F P R - 11



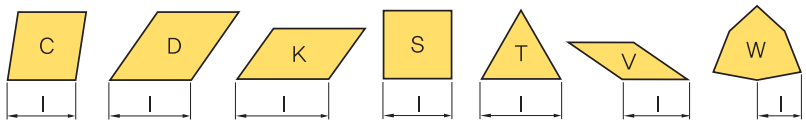
8 Hand of Bar

S 12 M - S T F P R - 11



9 Length of Cutting Edge

S 12 M - S T F P R - 11



Double Clamp System

Cutting Shape								
Designation	DCLNR/L	DDUNR/L	DSKNR/L	DTFNR/L	DWLNR/L			
Approach angle	95°	93°	75°	90°	95°			
Page	B185	B185	B185	B186	B186			
Copying		●						
Facing	●				●			
Back turning		●						
Turning	●	●	●	●	●			

Lever Lock System

Cutting Shape								
Designation	PCLNR/L	PDSNR/L	PDUNR/L	PSKNR/L	PTFNR/L	PWLNR/L		
Approach angle	95°	62.5°	93°	75°	90°	95°		
Page	B187	B187	B188	B189	B189	B190		
Copying		●	●					
Facing	●					●		
Back turning		●	●			●		
Turning	●	●	●	●	●	●		

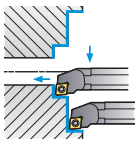
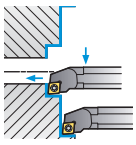
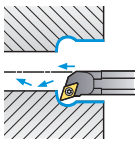
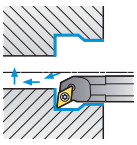
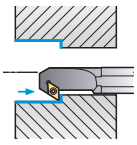
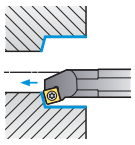
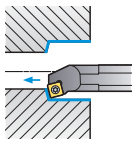
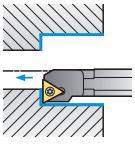
Clamp on System

Cutting Shape								
Designation	CKUNR/L	CSKPR/L	CTFPR/L					
Approach angle	93°	75°	90°					
Page	B191	B191	B191					
Copying								
Facing								
Back turning	●							
Turning	●	●	●					

Multi Lock System

Cutting Shape								
Designation	MCLNR/L	MDUNR/L	MSKNR/L	MTFNR/L	MVUNR/L	MWLNR/L		
Approach angle	95°	93°	75°	90°	93°	95°		
Page	B192	B192	B192	B193	B193	B193		
Copying		●			●			
Facing	●					●		
Back turning		●			●			
Turning	●	●	●	●	●	●		

Screw on System

Cutting Shape								
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Approach angle	95°	95°	107.5°	93°	93°	75°	75°	90°
Page	B194	B195	B196	B197	B198	B198	B198	B199
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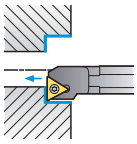
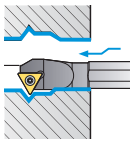
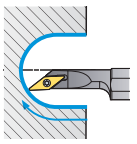
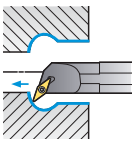
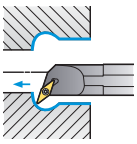
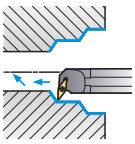
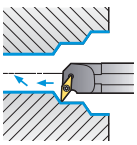
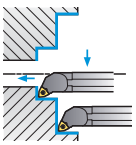
Facing	●	●						
Back turning			●	●	●			
Turning	●	●	●	●	●	●	●	●

Cutting Shape								
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Approach angle	90°	60°	142°	108°	108°	93°	93°	95°
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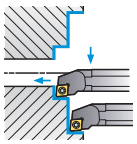
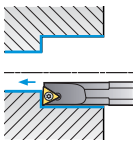
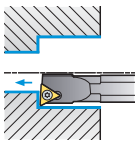
Copying			●	●	●	●	●	●
Facing								
Back turning				●	●	●	●	●
Turning	●	●	●	●	●	●	●	●

Compact Mini

Cutting Shape								
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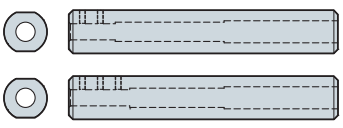
Page	B204	B204	B205	B206				
Copying								
Facing	●	●						
Back turning			●					
Turning	●	●	●	●				

Carbide Shank Boring Bar

Designation	SCLCR/L	SCLPR/L	SDQCR/L	SDUCR/L	STFCR/L
Approach angle	95°	95°	107.5°	93°	90°
Page	B194	B195	B196	B197	B199

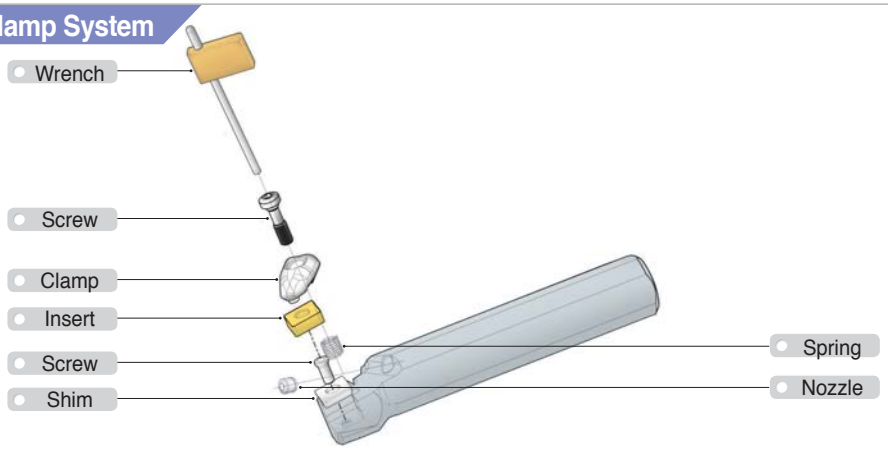
Designation	STFPR/L	STUBR/L	STUPR/L	SWUBR/L	-
Approach angle	90°	93°	93°	93°	-
Page	B200	B204	B205	B206	-

Sleeve

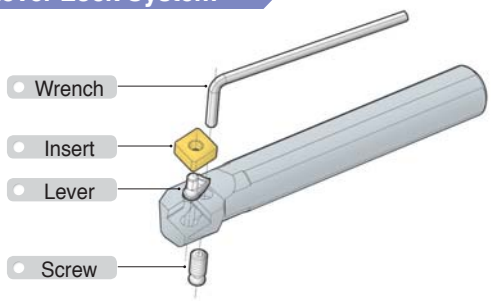
Shape	
Designation	**SL**
Page	B130

Instructions of Boring Bar assembly

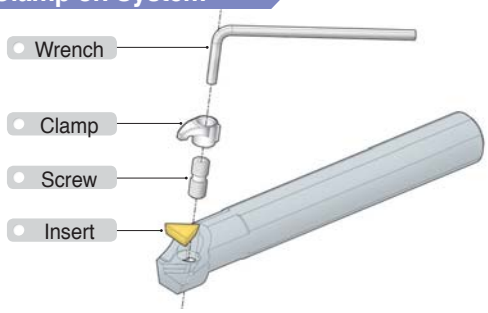
Double Clamp System



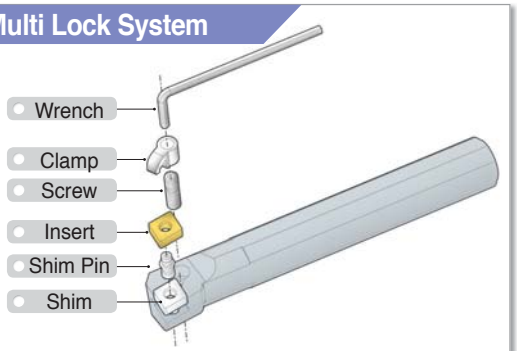
Lever Lock System



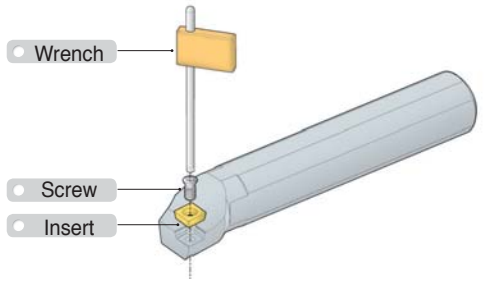
Clamp on System



Multi Lock System



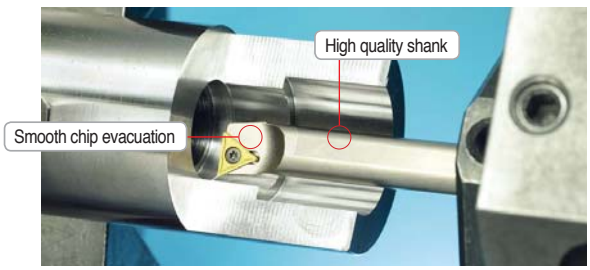
Screw on System



Carbide Shank Boring Bar

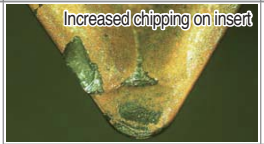
- Excellent cutting performance even in internal machining with chattering
- Available for various workpieces such as steel, stainless steel, cast iron, etc.
- Improved tool life and surface roughness

Features



Higher strength and durability than steel shank, special surface treatment applied

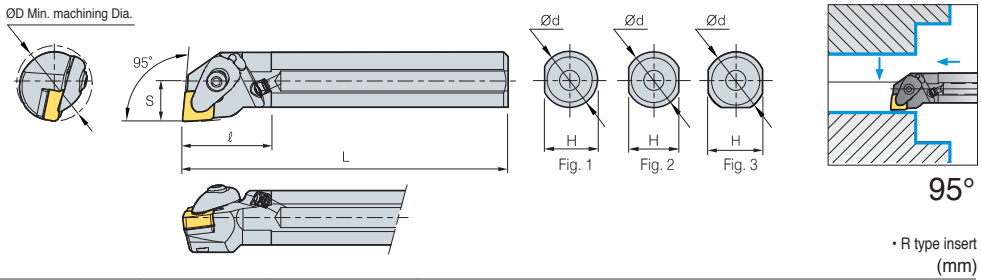
Comparison of chipping

Specifications	Steel boring bar			Carbide boring bar		
SCM440 vc:200 m/min ap:0.4 mm fn:0.15 mm/rev Cutting depth:5D	 			 		
	Rmax	Rz	Ra	Rmax	Rz	Ra
	4.67	3.68	0.62	3.07	2.76	0.53

DCLNR/L



CN□□



• R type insert

(mm)

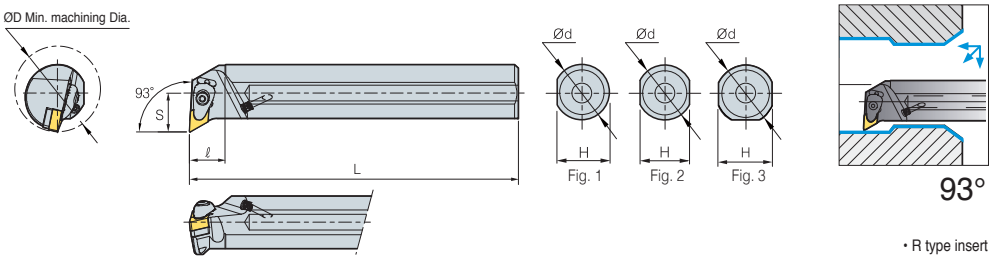
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A25R-DCLNR/L-09	32	25	24	200	17	40	CN□□0903□□	CVH3	CHX0415	SC32V	FTKA0307	SPR0510	CN0605	HW25P	1
A25R-DCLNR/L-12	32	25	24	200	17	40	CN□□1204□□	CVH4	CHX0518	SC42V	FTKA0410	SPR0714	CN0605	HW30P	1
A32S-DCLNR/L-12	40	32	30	250	22	50									3
A40T-DCLNR/L-12	50	40	38	300	27	60									
A50U-DCLNR/L-16	63	50	48	350	35	70	CN□□1604□□	CVH5	CHX0622	SC54V	FTNA0511	SPR0811	CN0605	HW40L	3

Applicable inserts **B26~B32**

DDUNR/L



DN□□



• R type insert

(mm)

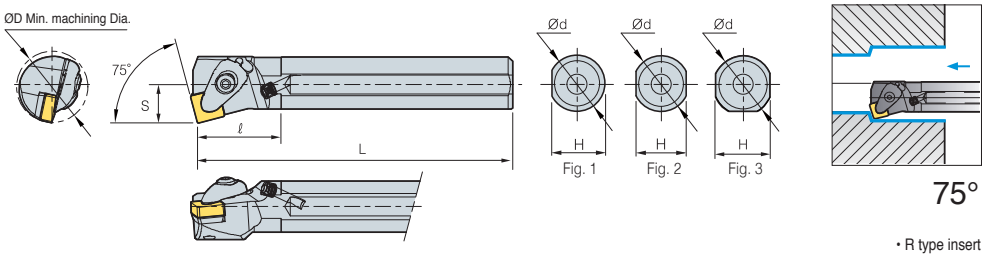
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A40T-DDUNR/L-15	50	40	38	300	27	60	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	HW30P	3
A50U-DDUNR/L-15	63	50	47	350	35	70									
A40T-DDUNR/L-15 -3	50	40	38	300	27	60	DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	HW30P	3
A50U-DDUNR/L-15 -3	63	50	47	350	35	70									

Applicable inserts **B33~B39**

DSKNR/L



SN□□



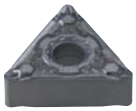
• R type insert

(mm)

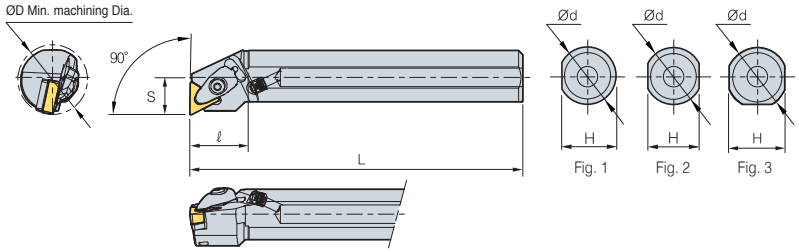
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A25R-DSKNR/L-09	32	25	24	200	17	40	SN□□0903□□	CVH3	CHX0415	SS32V	FTKA0307	SPR0510	CN0605	HW25P	1
A25R-DSKNR/L-12	32	25	24	200	17	40	SN□□1204□□	CVH4	CHX0518	SS42V	FTKA0410	SPR0714	CN0605	HW30P	1
A32S-DSKNR/L-12	40	32	30	250	22	50									3
A40T-DSKNR/L-12	50	40	38	300	27	60									

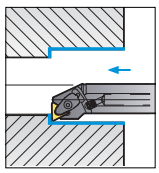
Applicable inserts **B41~B48**

DTFNR/L



TN□□





90°

• R type insert
(mm)

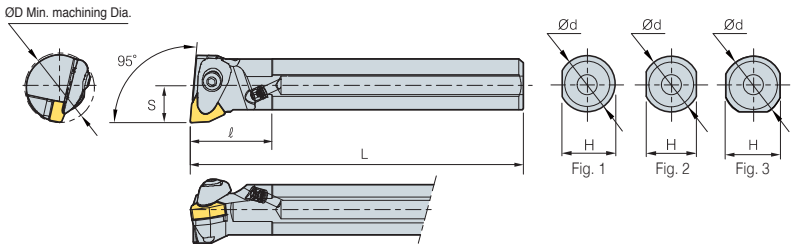
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A25R-DTFNR/L-16	32	25	24	200	17	40	TN□□1604□□	CVH3	CHX0415	ST32V	FTKA0307	SPR0510	CN0605	HW25P	1
A32S-DTFNR/L-16	40	32	30	250	22	50									3
A40T-DTFNR/L-22	50	40	38	300	27	60	TN□□2204□□	CVH4	CHX0518	ST44V	FTKA0410	SPR0714	CN0605	HW30P	3
A50U-DTFNR/L-22	63	50	47	350	35	70									

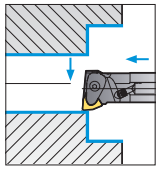
Applicable inserts **B49~B55**

DWLNR/L



WN□□





95°

• R type insert
(mm)

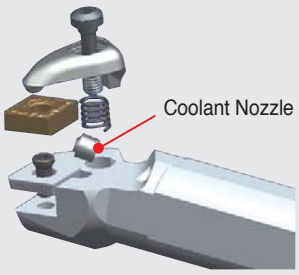
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Nozzle	Wrench	Fig.
A25R-DWLNR/L-06	32	25	24	200	17	40	WN□□0604□□	CVH3	CHX0415	SW32V	FTKA0307	SPR0510	CN0605	HW25P	1
A32S-DWLNR/L-06	40	32	30	250	22	50									3
A40T-DWLNR/L-06	50	40	38	300	27	60									
A25R-DWLNR/L-08	32	25	24	200	17	40	WN□□0804□□	CVH4	CHX0518	SW42V	FTKA0410	SPR0714	CN0605	HW30P	1
A32S-DWLNR/L-08	40	32	30	250	22	50									3
A40T-DWLNR/L-08	50	40	38	300	27	60									
A50U-DWLNR/L-08	63	50	47	350	35	70									

Applicable inserts **B58~B61**

Features of Double Clamp (Boring bar)

Longer tool life and excellent surface finish can be achieved with the adjustable Coolant Nozzle



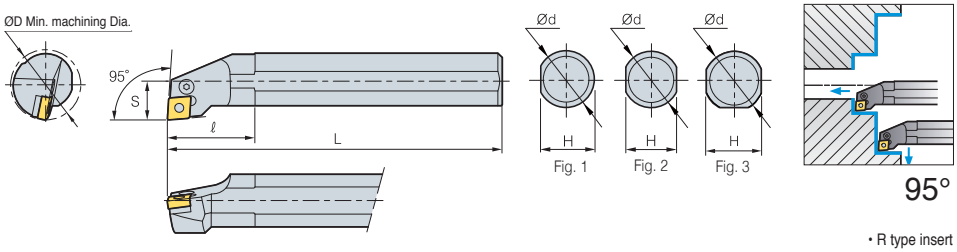




PCLNR/L



CN□□



• R type insert
(mm)

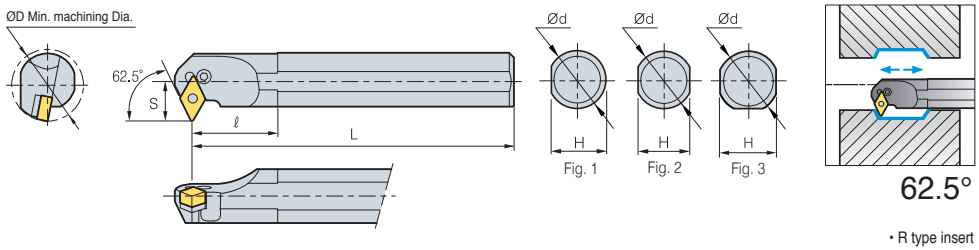
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S16R-PCLNR/L-09	20	16	14	200	11	25	CN□□0903□□	LV3C	VHX0509B	-	-	-	HW20L	2
S20S-PCLNR/L-09	25	20	18	250	13	32								
S25R-PCLNR/L-09	32	25	23	200	17	40								3
S25R-PCLNR/L-12	32	25	23	200	17	40	CN□□1204□□	LV4A	VHX0613A	-	-	-	HW25L	3
S32S-PCLNR/L-12	40	32	30	250	22	50		LV4	VHX0821	SC42B	SP4	LSPS4	HW30L	
S40T-PCLNR/L-12	50	40	38	300	27	60								
S50U-PCLNR/L-12	63	50	47	350	35	70								
S50U-PCLNR/L-19	63	50	47	350	35	70	CN□□1906□□	LV6	VHX1027	SC63	SP6	LSPS6	HW40L	3
A25R-PCLNR/L-12	32	25	24	200	17	40	CN□□1204□□	LV4A	VHX0613A	-	-	-	HW25L	1
A32S-PCLNR/L-12	40	32	30	250	22	50		LV4	VHX0821	SC42B	SP4	LSPS4	HW30L	3
A40T-PCLNR/L-12	50	40	38	300	27	60								
S16R-PCLNR/L-09N	20	16	14	200	11	25	CN□□0903□□	LV3CN	VHX0509BN	-	-	-	HW20L	2
S20S-PCLNR/L-09N	25	20	18	250	13	32								
S25R-PCLNR/L-09N	32	25	23	200	17	40								3
S25R-PCLNR/L-12N	32	25	23	200	17	40	CN□□1204□□	LV4AN	VHX0613N	-	-	-	HW25L	3
S25T-PCLNR/L-12N	32	25	23	300	17	40								
S32S-PCLNR/L-12N	40	32	30	250	22	50		LV4N	VHX0820N	SC42N	SP4N	LSPS4	HW30L	
S32U-PCLNR/L-12N	40	32	30	350	22	50								
S40T-PCLNR/L-12N	50	40	38	300	27	60								
S50U-PCLNR/L-12N	63	50	47	350	35	70								
S50U-PCLNR/L-19N	63	50	47	350	35	70	CN□□1906□□	LV6N	VHX1027N	SC63N	SP6N	LSPS6	HW40L	3
A16R-PCLNR/L-09N	20	16	14	200	11	25	CN□□0903□□	LV3CN	VHX0509BN	-	-	-	HW20L	1
A20S-PCLNR/L-09N	25	20	18	250	13	32								
A25R-PCLNR/L-09N	32	25	23	200	17	40								
A25R-PCLNR/L-12N	32	25	23	200	17	40	CN□□1204□□	LV4AN	VHX0613N	-	-	-	HW25L	1
A32R-PCLNR/L-12N	40	32	30	250	22	50		LV4N	VHX0820N	SC42N	SP4N	LSPS4	HW30L	3
A40T-PCLNR/L-12N	50	40	38	300	27	60								
A50U-PCLNR/L-12N	63	50	47	350	35	70								
A50U-PCLNR/L-19N	63	50	47	350	35	70	CN□□1906□□	LV6N	VHX1027N	SC63N	SP6N	LSPS6	HW40L	3

Applicable inserts **B33~B39**

PDSNR/L



DN□□



• R type insert
(mm)

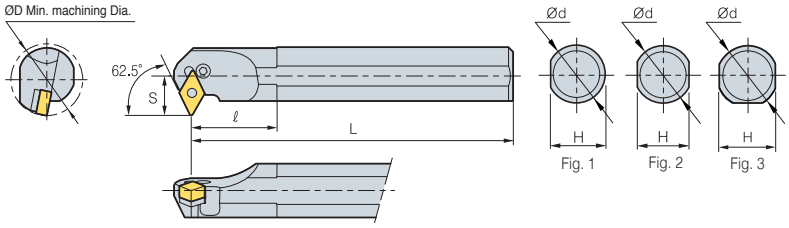
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S32S-PDSNR/L-15	40	32	30	250	22	50	DN□□1506□□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	3
S40T-PDSNR/L-15	50	40	38	300	27	60								
S32S-PDSNR/L-15-3	40	32	30	250	22	50	DN□□1504□□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	
S40T-PDSNR/L-15-3	50	40	38	300	27	60								
A32S-PDSNR/L-15	40	32	30	250	22	50	DN□□1506□□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	
A32S-PDSNR/L-15-3	40	32	30	250	22	50	DN□□1504□□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	

Applicable inserts **B33~B39**

PDSNR/L



DN□□



• R type insert

(mm)

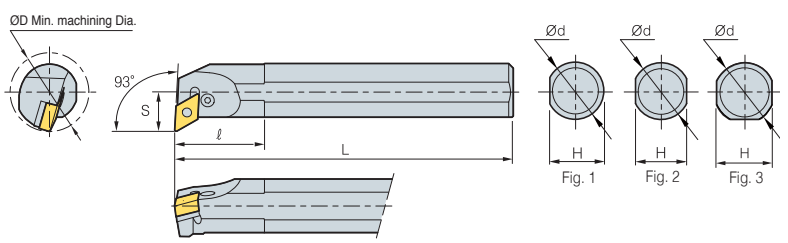
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S32S-PDSNR/L-15N	40	32	30	250	22	50	DN□□1506□□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	3
S40T-PDSNR/L-15N	50	40	38	300	27	60								
S32S-PDSNR/L-15-3N	40	32	30	250	22	50	DN□□1504□□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	
S40T-PDSNR/L-15-3N	50	40	38	300	27	60								
A32S-PDSNR/L-15N	40	32	30	250	22	50	DN□□1506□□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	
A40T-PDSNR/L-15N	50	40	38	300	27	60								
A32S-PDSNR/L-15-3N	40	32	30	250	22	50	DN□□1504□□	LV4BN	VHX0821	SD42N	SP4N	LSPS4	HW30L	
A40T-PDSNR/L-15-3N	50	40	38	300	27	60								

Applicable inserts **B33~B39**

PDUNR/L



DN□□



• R type insert

(mm)

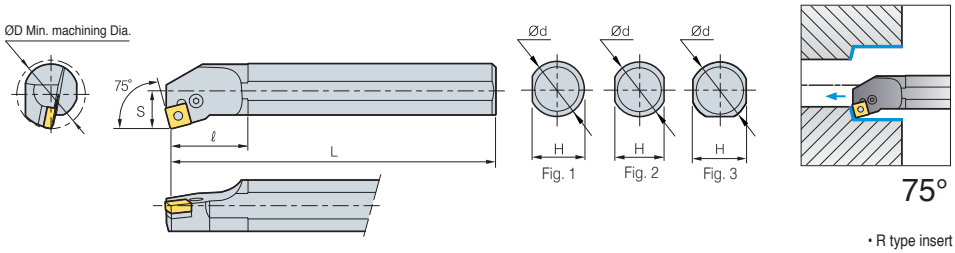
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S20S-PDUNR/L-11	25	20	18	250	13	32	DNMG110408	LV3D	VHX0512B	-	-	-	HW20L	2
S25R-PDUNR/L-11	32	23.5	23	250	17	40		LV3DN	VHX0512B	-	-	-	HW20L	3
S32S-PDUNR/L-11	40	32	30	250	22	50	DN□□1104□□	LV3	VHX0617	SD317	SP3	LSPS3	HW25L	3
S32S-PDUNR/L-15	40	32	30	250	22	50	DN□□1506□□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	3
S40T-PDUNR/L-15	50	40	38	300	27	60								
S50U-PDUNR/L-15	63	50	47	350	35	70								
S32S-PDUNR/L-15-3	40	32	30	250	22	50	DN□□1504□□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	3
S40T-PDUNR/L-15-3	50	40	38	300	27	60								
A32S-PDUNR/L-15	40	32	30	250	22	50	DN□□1506□□	LV4B	VHX0821	SD42	SP4	LSPS4	HW30L	3
A32S-PDUNR/L-15-3	40	32	30	250	22	50	DN□□1504□□	LV4	VHX0821	SD42	SP4	LSPS4	HW30L	3
S20S-PDUNR/L-11N	25	20	18	250	13	32	DN□□1104□□	LV3DN	VHX0512BN	-	-	-	HW20L	2
S25R-PDUNR/L-11N	32	25	23	200	17	40								3
S32S-PDUNR/L-11N	40	32	30	250	22	50		LV3AN	VHX0617N	SD32N	SP3	LSPS3	HW30L	
S32S-PDUNR/L-15N	40	32	30	250	22	50	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	HW30L	3
S32U-PDUNR/L-15N	40	32	30	350	22	50								
S40T-PDUNR/L-15N	50	40	38	300	27	60								
S50U-PDUNR/L-15N	63	50	47	350	35	70								
S32S-PDUNR/L-15-3N	40	32	30	250	22	50	DN□□1504□□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	HW30L	3
S40T-PDUNR/L-15-3N	50	40	38	300	27	60								
A20S-PDUNR/L-11N	25	20	19	250	13	32	DN□□1104□□	LV3DN	VHX0512BN	-	-	-	HW20L	1
A25R-PDUNR/L-11N	32	25	24	200	17	40								3
A32S-PDUNR/L-11N	40	32	30	250	22	50		LV3AN	VHX0617N	SD32N	SP3	LSPS3	HW30L	
A32S-PDUNR/L-15N	40	32	30	250	22	50	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	HW30L	3
A40T-PDUNR/L-15N	50	40	38	300	27	60								
A50U-PDUNR/L-15N	63	50	47	350	35	70								
A32S-PDUNR/L-15-3N	40	32	30	250	22	50	DN□□1504□□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	HW30L	3
A40T-PDUNR/L-15-3N	50	40	38	300	27	60								

Applicable inserts **B33~B39**

PSKNR/L



SN□□



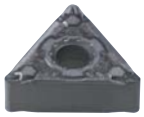
• R type insert

(mm)

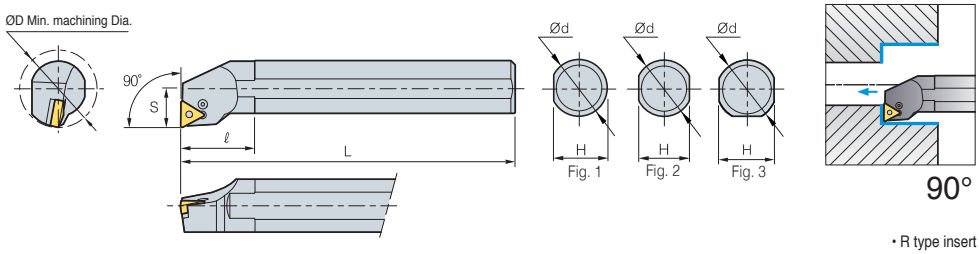
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S25R-PSKNR/L-12	32	25	23	200	17	40	SN□□1204□□	LV4A	VHX0613A	-	-	-	HW30L	3
S32S-PSKNR/L-12	40	32	30	250	22	50		LV4	VHX0821	SS42B	SP4	LSPS4	HW30L	
S40T-PSKNR/L-12	50	40	38	300	27	60								
A25R-PSKNR/L-12	32	25	24	200	17	40	SN□□1204□□	LV4A	VHX0613A	-	SP4	-	HW25L	1
A32S-PSKNR/L-12	40	32	30	250	22	50		LV4	VHX0821	SS42B	SP4	LSPS4	HW30L	3
S25R-PSKNR/L-12N	32	25	23	200	17	40	SN□□1204□□	LV4AN	VHX0613N	-	-	-	HW25L	3
S32S-PSKNR/L-12N	40	32	30	250	22	50		LV4N	VHX0821N	SS42N	SP4N	LSPS4	HW30L	
S40T-PSKNR/L-12N	50	40	38	300	27	60								
A25R-PSKNR/L-12N	32	25	24	200	17	40	SN□□1204□□	LV4AN	VHX0613N	-	-	-	HW25L	1
A32S-PSKNR/L-12N	40	32	30	250	22	50		LV4N	VHX0821N	SS42N	SP4N	LSPS4	HW30L	3
A40T-PSKNR/L-12N	50	40	38	300	27	60								

Applicable inserts **B41~B48**

PTFNR/L



TN□□



• R type insert

(mm)

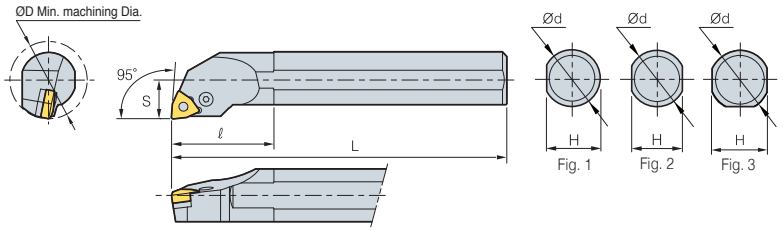
Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S16R-PTFNR/L-11	20	16	23	200	11	25	TN□□1103□□	LV2	VHX0509B	-	-	-	HW25L	1
S20S-PTFNR/L-11	25	20	30	250	13	32								
S25R-PTFNR/L-11	32	25	38	200	17	40								3
S25R-PTFNR/L-16	32	25	23	200	17	40	TN□□1604□□	LV3B	VHX0512B	-	-	-	HW20L	3
S32S-PTFNR/L-16	40	32	30	250	22	50		LV3	VHX0617	ST317B	SP3	LSPS3	HW25L	
S40T-PTFNR/L-16	50	40	38	300	27	60								
A25R-PTFNR/L-16	32	25	24	200	17	40								1
A32S-PTFNR/L-16	40	32	30	250	22	50								3
S25T-PTFNR/L-16N	32	24	23	200	17	40	TNMG160408	LV3B	VHX0512B	-	-	-	HW20L	3
S32S-PTFNR/L-16N	40	31	30	250	22	50		LV3N	VHX0617N	ST317B	SP3	LSPS3	HW25L	3
S40T-PTFNR/L-16N	50	39	38	300	27	50								

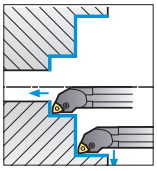
Applicable inserts **B49~B55**

PWLNR/L



WN□□





95°

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Lever	Screw	Shim	Shim pin	Shim pin Punch	Wrench	Fig.
S16R-PWLNR/L-06	20	16	14	200	11	25	WNMG060408	LV3B	VHX0512B	-	-	-	HW20L	2
S20S-PWLNR/L-06	25	20	18	250	13	32	WN□□0604□□	LV3B	VHX0512B	-	-	-	HW20L	2
S25R-PWLNR/L-06	32	25	23	200	17	40								3
S32S-PWLNR/L-06	40	32	30	250	22	50		LV3	VHX0617	SW317	SP3	LSPS3	HW25L	
S25R-PWLNR/L-08	32	25	23	200	17	40	WN□□0804□□	LV4A	VHX0613A	-	-	-	HW25L	3
S32S-PWLNR/L-08	40	32	30	250	22	50		LV4	VHX0821	SW42	SP4	LSPS3	HW30L	
S32S-PWLNR/L-06N*	40	32	30	250	22	50	WN□□0604□□	LV3N	VHX0617N	SW317N	SP3	LSPS3	HW25L	3
S25R-PWLNR/L-08N*	32	25	23	200	17	40	WN□□0804□□	LV4AN	VHX0613N	-	-	-	HW25L	
S32S-PWLNR/L-08N*	40	32	30	250	22	50		LV4N	VHX0820N	SW42N	SP4N	LSPS4	HW30L	

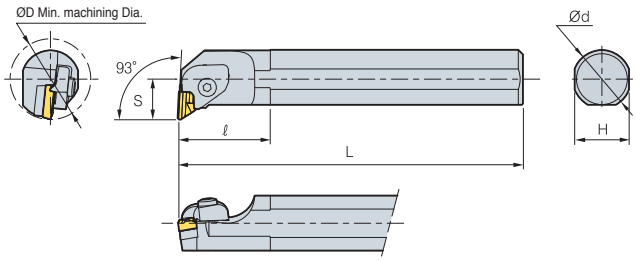
Applicable inserts **B58~B61**

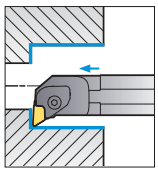
- **Improved holders and parts ensure performance and durability**
- **"N" stand for New type (parts)**

CKUNR/L



KN□□





93°

• R type insert

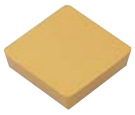
(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin+Spring	Shim Screw	Wrench
S32S-CKUNR-16	40	32	30	250	22	70	KN□□1604□□L	CTH6LI	CHX0625	SR3	SK33CL	PN0515 / SR4	SHX0310	HW40L HW20L
S40T-CKUNR-16	50	40	37	300	27	60								
S50U-CKUNR-16	63	50	43	350	35	55								
S32S-CKUNL-16	40	32	30	250	22	70	KN□□1604□□R	CTH6RI	CHX0625	SR3	SK33C	PN0515 / SR4	SHX0310	HW40L HW20L
S40T-CKUNL-16	50	40	37	300	27	60								
S50U-CKUNL-16	63	50	43	350	35	55								

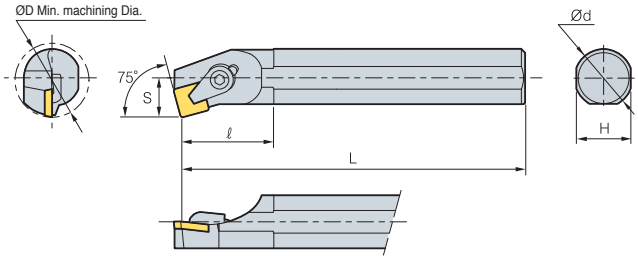
Applicable inserts **B40**

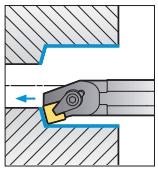
• Use left handed insert for right handed holder

CSKPR/L



SP□□





75°

• R type insert

(mm)

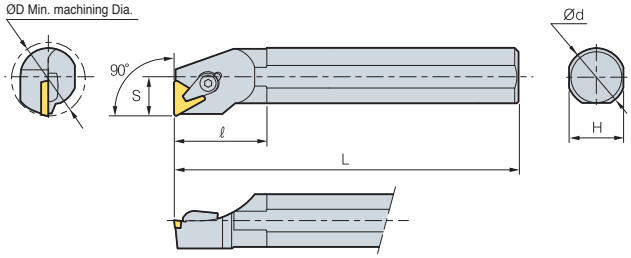
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	C-ring	Wrench
S16R-CSKPR/L-09	20	16	15	200	11	30	SP□□0903□□	CH4R1C	CHX0414C	CR02C	HW25L
S20S-CSKPR/L-09	25	20	18	250	13	36		CH5R5C	CHX0519C	CR03C	HW30L
S20S-CSKPR/L-12	25	20	18	250	13	28	SP□□1203□□	CH6R5	CH0616	CR04C	HW30L
S25R-CSKPR/L-12	32	25	23	300	17	40					

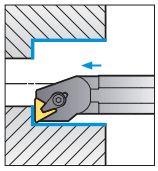
Applicable inserts **B72~B73**

CTFPR/L



TP□□





90°

• R type insert

(mm)

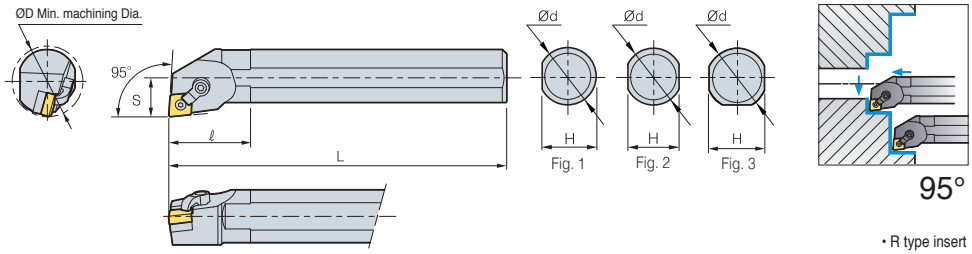
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	C-ring	Shim	Shim pin	Wrench
S12M-CTFPR/L-11	16	12	11	150	9	26	TP□□1103□□L	CH4R1C	CHX0414C	CR02C	-	-	HW25L
S16R-CTFPR/L-11	20	16	15	200	11	40							
S20S-CTFPR/L-11	25	20	18	250	13	40							
S16R-CTFPR/L-16	20	16	15	200	11	40	TP□□1603□□L	CH5R5C	CHX0519C	CR03C	-	-	HW30L
S20S-CTFPR/L-16	25	20	18	250	13	40							
S25R-CTFPR/L-16	32	25	23	200	17	40		CH6R5	CHX0622C	CR04C	ST32C	SP3C	
S32S-CTFPR/L-16	40	32	30	250	22	45							
S40T-CTFPR/L-16	50	40	37	300	27	60							
S40T-CTFPR/L-22	50	40	37	300	27	60	TP□□2204□□L	CH83R1	CH0823C	CR05C	ST43C	SP4C	HW40L

Applicable inserts **B77~B79**

MCLNR/L



CN□□



95°

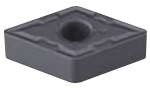
• R type insert

(mm)

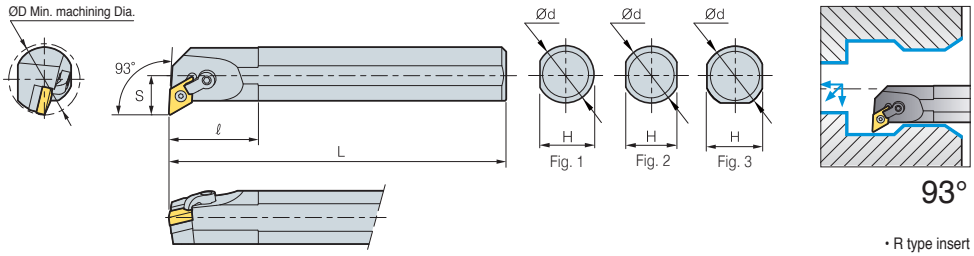
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S20S-MCLNR/L-09	25	20	18	200	13	32	CN□□0903□□	CDH7N	DHA10/32-19	-	SP3D3	HW19.8L	2
S25R-MCLNR/L-09	32	25	23	250	17	40						HW23.8L	3
S25R-MCLNR/L-12	32	25	23	200	17	40	CN□□1204□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L	3
S32S-MCLNR/L-12	40	32	30	250	22	50				SC43D	SP4D	HW23.8L	
S40T-MCLNR/L-12	50	40	38	300	27	60							
A25R-MCLNR/L-12	32	25	24	200	17	40	CN□□1204□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L	1
A32S-MCLNR/L-12	40	32	31	250	22	50				SC43D	SP4D	HW23.8L	3

Applicable inserts **B26~B32**

MDUNR/L



DN□□



93°

• R type insert

(mm)

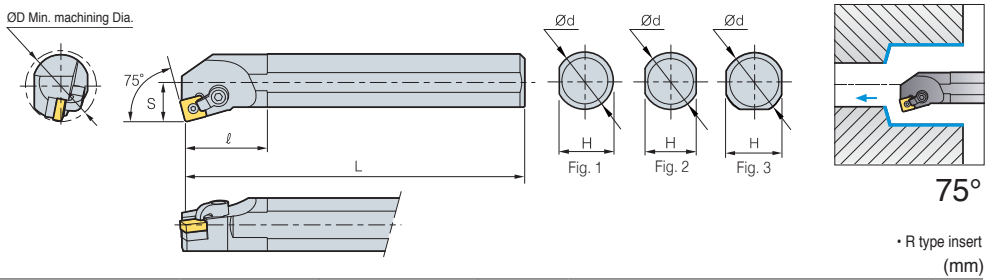
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S32S-MDUNR/L-15-3	40	32	30	250	22	50	DN□□1504□□	CDH6N	DHA1/4-21	SD43D	SP4D	HW31.8L	3
S40T-MDUNR/L-15-3	50	40	38	300	27	60						HW23.8L	
A32S-MDUNR/L-15-3	40	32	30	250	22	50							

Applicable inserts **B33~B39**

MSKNR/L



SN□□



75°

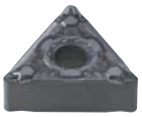
• R type insert

(mm)

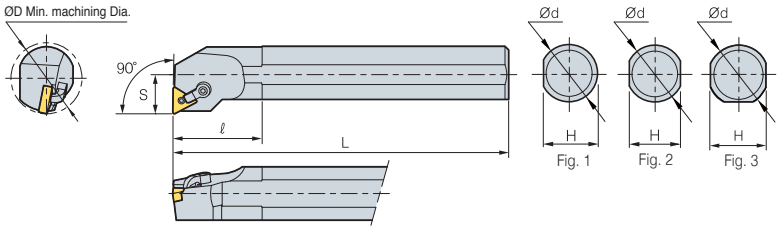
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S25R-MSKNR/L-12	32	25	23	200	17	40	SN□□1204□□	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L	3
S32S-MSKNR/L-12	40	32	30	250	22	50				SS43D	SP4D	HW23.8L	
S40T-MSKNR/L-12	50	40	38	300	27	60							
A25R-MSKNR/L-12	32	25	23	200	17	40	SN□□1204□□	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L	1
A32S-MSKNR/L-12	40	32	30	250	22	50				SS43D	SP4D	HW23.8L	3
A40T-MSKNR/L-12	50	40	38	300	27	60							

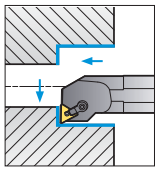
Applicable inserts **B41~B48**

MTFNR/L



TN□□





90°

• R type insert

(mm)

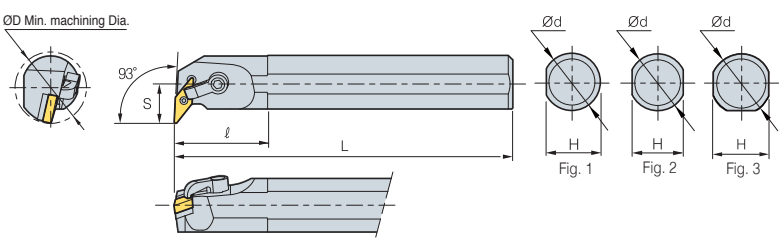
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S25R-MTFNR/L-16	32	25	23	200	17	40	TN□□1604□□	CDH7N1	DHA10-32-19	-	SP3D3	HW23.8L	3
S32S-MTFNR/L-16	40	32	30	250	22	50		CDH7N1	DHA10-32-19	ST32D	SP3D	HW19.8L	
S40T-MTFNR/L-16	50	40	38	300	27	60							
A25R-MTFNR/L-16	32	25	24	200	17	40	TN□□1604□□	CDH7N1	DHA10-32-19	-	SP3D3	HW23.8L	1
A32S-MTFNR/L-16	40	32	30	250	22	50		CDH7N1	DHA10-32-19	ST32D	SP3D	HW19.8L	3

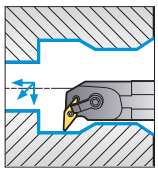
Applicable inserts **B49~B55**

MVUNR/L



VN□□





93°

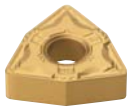
• R type insert

(mm)

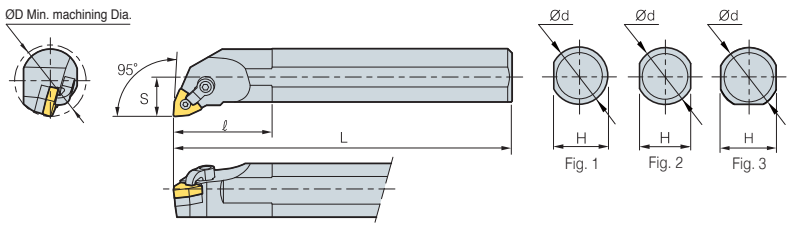
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S32S-MVUNR/L-16	40	32	30	250	22	50	VN□□1604□□	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L HW19.8L	3
S40T-MVUNR/L-16	50	40	38	300	27	60							
A32S-MVUNR/L-16	40	32	30	250	22	50	VN□□1604□□	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L HW19.8L	3
A40T-MVUNR/L-16	50	40	38	300	27	60							

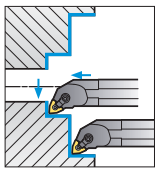
Applicable inserts **B56~B57**

MWLNR/L



WN□□





95°

• R type insert

(mm)

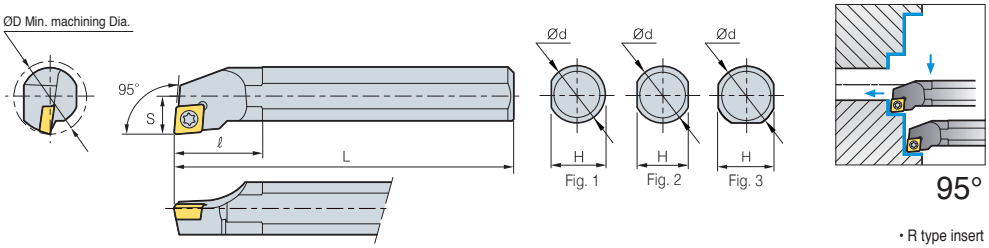
Designation	ØD	Ød	H	L	S	ℓ	Insert	Clamp	Clamp Screw	Shim	Shim pin	Wrench	Fig.
S25R-MWLNR/L-06	32	25	23	200	17	40	WN□□0604□□	CDH7N	DHA10/32-19	-	SP3D3	HW23.8L HW19.8L	3
S32S-MWLNR/L-06	40	32	30	250	22	50				SW32D	SP3D		
S40T-MWLNR/L-06	50	40	38	300	27	60							
S25R-MWLNR/L-08	32	25	23	200	17	40	WN□□0804□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L	3
S32S-MWLNR/L-08	40	32	30	250	22	50				SW43D	SP4D		
S40T-MWLNR/L-08	50	40	38	300	27	60							
A25R-MWLNR/L-06	32	25	24	200	17	40	WN□□0604□□	CDH7N	DHA10/32-19	-	SP3D3	HW31.8L HW19.8L	1
A32S-MWLNR/L-06	40	32	31	250	22	50				SW32D	SP3D		3
A25R-MWLNR/L-08	32	25	24	200	17	40	WN□□0804□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L	1
A32S-MWLNR/L-08	40	32	31	250	22	50				SW43D	SP4D		3

Applicable inserts **B58~B61**

SCLCR/L



CC□□



• R type insert

Steel shank type

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S08K-SCLCR/L-06	11	8	7.2	125	6	12	CC□□0602□□	FTKA02555			TWO7	2
S10K-SCLCR/L-06	13	10	9	125	7	16		FTKA02565	-	-	TWO7P	
S10M-SCLCR/L-06	13	10	9	150	7	16						
S12M-SCLCR/L-06	16	12	11	150	9	20						
S16R-SCLCR/L-06	20	16	14	200	11	25						
S12M-SCLCR/L-09	16	12	11	150	9	20	CC□□09T3□□	FTGA03508	-	-	TW15P	2
S16R-SCLCR/L-09	20	16	14	200	11	25						
S20S-SCLCR/L-09	25	20	18	250	13	32						
S25R-SCLCR/L-09	32	25	23	200	17	40		FTGA03510			TW15P	3
S25R-SCLCR/L-12	32	25	23	200	17	40	CC□□1204□□	FTGA0411F	-	-	TW15P	3
S32S-SCLCR/L-12	40	32	30	250	22	50		FTGA0411F	SC42S	SHXN0610F	HW40L TW15P	
S40T-SCLCR/L-12	50	40	38	300	27	60						
A08F-SCLCR/L-06	11	8	7.6	80	6	12	CC□□0602□□	FTKA02555	-	-	TW07P	1
A10H-SCLCR/L-06	13	10	9.5	100	7	16		FTKA02565	-	-	TW07P	
A12K-SCLCR/L-06	16	12	11.5	125	9	20						
A12K-SCLCR/L-09	16	12	11.5	125	9	20	CC□□09T3□□	FTGA03508	-	-	TW15P	1
A16M-SCLCR/L-09	20	16	15	150	11	25						
A20Q-SCLCR/L-09	25	20	19	180	13	32						
A25R-SCLCR/L-09	32	25	24	200	17	40		FTGA03510	-	-	TW15P	
A25R-SCLCR/L-12	32	25	24	200	17	40	CC□□1204□□	FTGA0411F	-	-	TW15P	1
A32S-SCLCR/L-12	40	32	31	250	22	50		FTGA0411F	SC42S	SHXN0610F	HW40L,TW15P	3

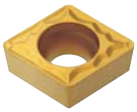
Carbide shank type

(mm)

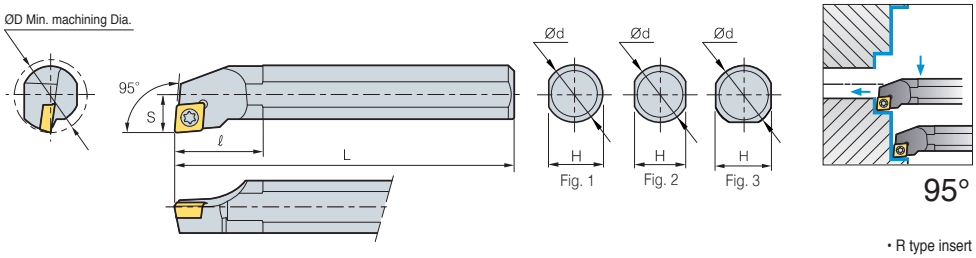
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C04G-SCLCR/L-03	5	4	3.8	90	2.5	CC□T0301□□	FTNA01633	TW06P	1
C05H-SCLCR/L-03	6	5	4.4	100	3				
C06H-SCLCR/L-04	7	6	5.4	100	3.5	CC□T0401□□	FTNA0238	TW06P	
C07K-SCLCR/L-04	8	7	6.4	125	4				
C08K-SCLCR/L-06	10	8	7	125	5	CC□T0602□□	FTKA02555	TW07P	2
C10K-SCLCR/L-06	12	10	9	125	6		FTKA02565	TW07P	
C10M-SCLCR/L-06	12	10	9	150	6				
C12M-SCLCR/L-06	14	12	11	150	7				
C12Q-SCLCR/L-06	14	12	11	180	7				
C12M-SCLCR/L-09	15	12	11	150	8	CC□T09T3□□	FTGA03508	TW15P	
C12Q-SCLCR/L-09	15	12	11	180	8				
C16R-SCLCR/L-09	20	16	15	200	10				
C16S-SCLCR/L-09	20	16	15	250	10				
C20R-SCLCR/L-09	25	20	18	200	13				
C20S-SCLCR/L-09	25	20	18	250	13				
C25T-SCLCR/L-12	32	25	23	300	17	CC□T1204□□	FTGA0411F	TW15P	
E06H-SCLCR/L-04	7	6	5.4	100	3.5	CC□T0401□□	FTNA0238	TW06P	1
E07K-SCLCR/L-04	8	7	6.4	125	4				
E08K-SCLCR/L-06	10	8	7	125	5	CC□T0602□□	FTKA02555	TW07P	2
E10K-SCLCR/L-06	12	10	9	125	6		FTKA02565	TW07P	
E10M-SCLCR/L-06	12	10	9	150	6				
E12M-SCLCR/L-06	14	12	11	150	7				
E12Q-SCLCR/L-06	14	12	11	180	7				
E12M-SCLCR/L-09	15	12	11	150	8	CC□T09T3□□	FTGA03508	TW15P	
E12Q-SCLCR/L-09	15	12	11	180	8				
E16R-SCLCR/L-09	20	16	15	200	11				
E16S-SCLCR/L-09	20	16	15	250	10				
E20R-SCLCR/L-09	25	20	18	200	13				
E20S-SCLCR/L-09	25	20	19	250	13				
E25T-SCLCR/L-12	32	25	23	300	17	CC□T1204□□	FTGA0411F	TW15P	

Applicable inserts **B62~B64**

SCLPR/L



CP□□



Steel shank type

• R type insert
(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S10M-SCLPR/L-08	11	8	7.2	150	7	16	CP□□0802□□	FTNA0305	TW09P	2
S12M-SCLPR/L-08	13	10	9	150	9	20		FTNA0307	TW09P	
S16N-SCLPR/L-09	16	12	11	160	11	25	CP□□0903□□	FTNA0408	TW15P	2
S16R-SCLPR/L-09	20	16	14	200	11	25				
S20N-SCLPR/L-09	25	20	18	160	13	32				
S20S-SCLPR/L-09	32	25	23	250	17	40				3
A10H-SCLPR/L-08	11	8	7.6	100	7	16	CP□□0802□□	FTNA0305	TW09P	1
A12K-SCLPR/L-08	13	10	9.5	125	9	20		FTNA0307	TW09P	
A16M-SCLPR/L-09	32	25	24	150	11	25	CP□□0903□□	FTNA0408	TW15P	1
A20Q-SCLPR/L-09	40	32	31	180	13	32				3

Carbide shank type

(mm)

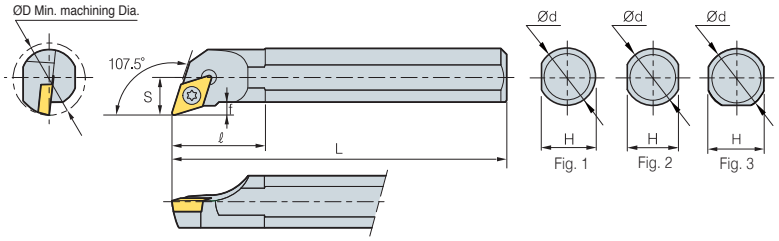
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C10K-SCLPR/L-08	12	10	9	125	6	CP□T0802□□	FTNA0305	TW09P	2
C10M-SCLPR/L-08	12	10	9	150	6				
C12M-SCLPR/L-08	15	12	11	150	7.5		FTNA0306	TW09P	
C12Q-SCLPR/L-08	15	12	11	180	7.5				
C12M-SCLPR/L-09	15	12	11	150	8	CP□T0903□□	FTNA0408	TW15P	
C12Q-SCLPR/L-09	15	12	11	180	8				
C16R-SCLPR/L-09	20	16	15	200	10				
C16S-SCLPR/L-09	20	16	15	250	10				
C20R-SCLPR/L-09	25	20	18	200	13				
C20S-SCLPR/L-09	25	20	18	250	13				
E10K-SCLPR/L-08	12	10	9	125	6	CP□T0802□□	FTNA0305	TW09P	2
E10M-SCLPR/L-08	12	10	9	150	6				
E12M-SCLPR/L-08	15	12	11	150	7.5				
E12Q-SCLPR/L-08	15	12	11	180	7.5				
E12M-SCLPR/L-09	15	12	11	150	8		FTNA0407	TW09P	
E12Q-SCLPR/L-09	15	12	11	180	8				
E16R-SCLPR/L-09	20	16	15	200	10	CP□T0903□□	FTNA0408	TW15P	
E16S-SCLPR/L-09	20	16	15	250	10				
E20R-SCLPR/L-09	25	20	18	200	13				
E20S-SCLPR/L-09	25	20	18	250	13				

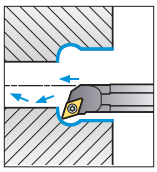
Applicable inserts **B66**

SDQCR/L



DC□□





107.5°

Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S10M-SDQCR/L-07	13	10	9	150	7	16	DC□□0702□□	FTKA02555	TW07P	2
S12M-SDQCR/L-07	16	12	11	150	9	20		FTKA02565	TW07P	
S16R-SDQCR/L-07	20	16	14	200	11	25				
S16R-SDQCR/L-11	20	16	14	200	11	25	DC□□11T3□□	FTGA03508	TW15P	2
S20S-SDQCR/L-11	25	20	18	250	13	32				
S25R-SDQCR/L-11	32	25	23	200	17	40		FTGA03510	TW15P	3
A10H-SDQCR/L-07	13	10	9.5	100	7	16	DC□□0702□□	FTKA02555	TW07P	1
A12K-SDQCR/L-07	16	12	11.5	125	9	20		FTKA02565	TW07P	1
A16M-SDQCR/L-11	20	16	15	150	11	25	DC□□11T3□□	FTGA03508	TW15P	1
A20Q-SDQCR/L-11	25	20	19	180	13	32				
A25R-SDQCR/L-11	32	25	24	200	17	40		FTGA03510	TW15P	1

Carbide shank type

(mm)

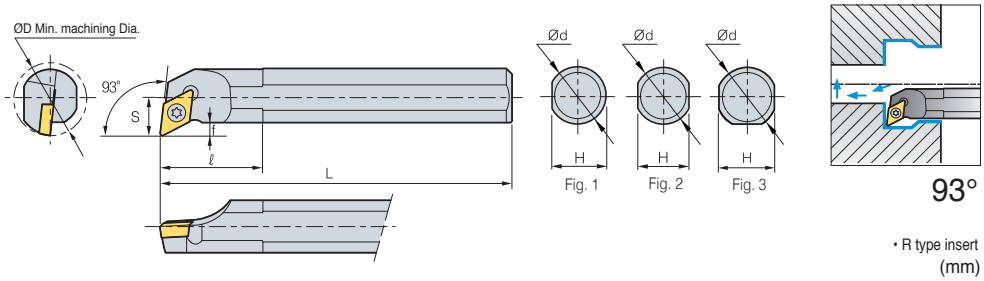
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C08K-SDQCR/L-07	10	8	7	125	6	DC□T0702□□	FTKA02555	TW07P	2
C10K-SDQCR/L-07	13	10	9	125	7				
C12M-SDQCR/L-07	16	12	11	150	9		FTKA02565	TW07P	
C16R-SDQCR/L-07	20	16	15	200	11				
C16R-SDQCR/L-11	20	16	15	200	11	DC□T11T3□□	FTGA03508	TW15P	
C20R-SDQCR/L-11	25	20	18	200	13				
C20S-SDQCR/L-11	25	20	18	250	13				
E08K-SDQCR/L-07	10	8	7	125	6	DC□T0702□□	FTKA02555	TW07P	2
E10K-SDQCR/L-07	13	10	9	125	7				
E12M-SDQCR/L-07	16	12	11	150	9		FTKA02565	TW07P	
E16R-SDQCR/L-07	20	16	15	200	11				
E16R-SDQCR/L-11	20	16	15	200	11	DC□T11T3□□	FTGA03508	TW15P	
E20R-SDQCR/L-11	25	20	18	200	13				
E20S-SDQCR/L-11	25	20	19	250	13				

Applicable inserts **B67~B69, B88**

SDUCR/L



DC□□



Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S10M-SDUCR/L-07	13	10	9	150	7	16	DC□□0702□□	FTKA02555	TW07P	2
S12M-SDUCR/L-07	16	12	11	150	9	20		FTKA02565	TW07P	2
S16R-SDUCR/L-07	20	16	14	200	11	25				
S16R-SDUCR/L-11	20	16	14	200	11	25	DC□□11T3□□	FTGA03508	TW15P	2
S20S-SDUCR/L-11	25	20	18	250	13	32				
S25R-SDUCR/L-11	32	25	23	200	17	40		FTGA03510	TW15P	3
S32S-SDUCR/L-11	40	32	30	250	22	50				
A10H-SDUCR/L-07	13	10	9.5	100	7	16	DC□□0702□□	FTKA02555	TW07P	1
A12K-SDUCR/L-07	16	12	11.5	125	9	20		FTKA02565	TW07P	1
A16M-SDUCR/L-07	20	16	15	150	11	25				
A20Q-SDUCR/L-11	25	20	19	180	13	32	DC□□11T3□□	FTGA03508	TW15P	1
A25R-SDUCR/L-11	32	25	24	200	17	40		FTGA03510	TW15P	

Carbide shank type

(mm)

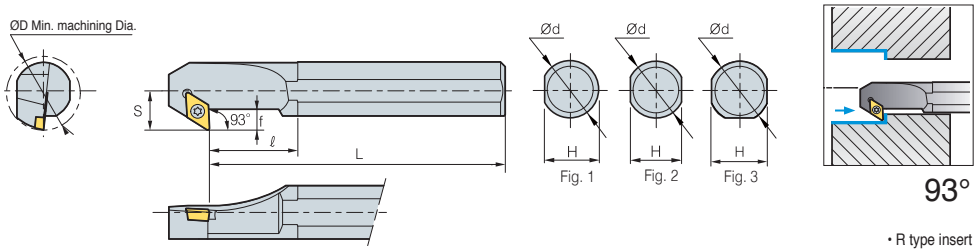
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C10K-SDUCR/L-07	13	10	9	125	7	DC□T0702□□	FTKA02555	TW07P	2
C10M-SDUCR/L-07	13	10	9	150	7				
C12M-SDUCR/L-07	16	12	11	150	9		FTKA02565	TW07P	
C12Q-SDUCR/L-07	16	12	11	180	9				
C16R-SDUCR/L-07	20	16	15	200	11				
C16S-SDUCR/L-07	20	16	15	250	11				
C16R-SDUCR/L-11	20	16	15	200	11	DC□T11T3□□	FTGA03508	TW15P	
C16S-SDUCR/L-11	20	16	15	250	11				
C20R-SDUCR/L-11	25	20	18	200	13				
C20S-SDUCR/L-11	25	20	18	250	13				
C25T-SDUCR/L-11	32	25	23	300	17		FTGA03510	TW15P	
E10K-SDUCR/L-07	13	10	9	125	7	DC□T0702□□	FTKA02555	TW07P	2
E10M-SDUCR/L-07	13	10	9	150	7				
E12M-SDUCR/L-07	16	12	11	150	9		FTKA02565	TW07P	
E12Q-SDUCR/L-07	16	12	11	180	9				
E16R-SDUCR/L-07	20	16	15	200	11				
E16S-SDUCR/L-07	20	16	15	250	11				
E16R-SDUCR/L-11	20	16	15	200	11	DC□T11T3□□	FTGA03508	TW15P	
E16S-SDUCR/L-11	20	16	15	250	11				
E20R-SDUCR/L-11	25	20	18	200	13				
E20S-SDUCR/L-11	25	20	18	250	13				
E25T-SDUCR/L-11	32	25	23	300	17		FTGA03510	TW15P	

Applicable inserts **B67~B69, B88**

SDZCR/L



DC□□



• R type insert

(mm)

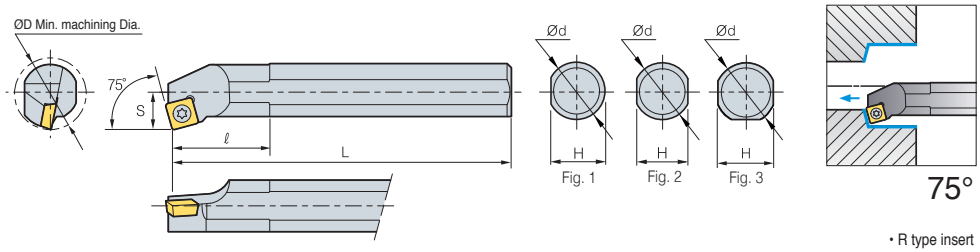
Designation	ØD	Ød	H	L	S	ℓ	f	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S16R-SDZCR/L-07	20	16	14	200	11	25	6.5	DC□□0702□□	FTKA02565	-	-	TW07P	2
S20S-SDZCR/L-07	25	20	18	250	13	32	7.5						
S25R-SDZCR/L-11	32	25	23	200	17	40	9	DC□□11T3□□	FTGA03510	-	-	TW15P	3
S32S-SDZCR/L-11	40	32	30	250	22	50	11		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L	
S40T-SDZCR/L-11	50	40	38	300	27	60	11						
A25R-SDZCR/L-11	32	25	24	200	17	40	9		FTGA03510	-	-	TW15P	1
A32S-SDZCR/L-11	40	32	30	250	22	50	11		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L	3

Applicable inserts **B67~B69, B88**

SSKCR/L



SC□□



• R type insert

(mm)

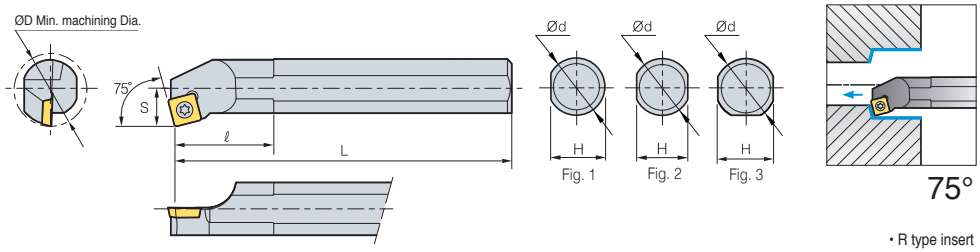
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S12M-SSKCR/L-09	16	12	11	150	9	20	SC□□09T3□□	FTGA03507	-	-	TW15P	2
S16R-SSKCR/L-09	20	16	14	200	11	25		FTGA03508	-	-	TW15P	
S20S-SSKCR/L-09	25	20	18	250	13	32						
S25R-SSKCR/L-12	32	25	23	200	17	40	SC□□1204□□	FTGA0411F	-	-	TW15P	3
S32S-SSKCR/L-12	40	32	30	250	22	50		FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L	
A12K-SSKCR/L-09	16	12	11.5	125	9	20	SC□□09T3□□	FTGA03507	-	-	TW15P	1
A16M-SSKCR/L-09	20	16	15	150	11	25		FTGA03508	-	-	TW15P	
A20Q-SSKCR/L-09	25	20	19	180	13	32						
A25R-SSKCR/L-12	32	25	24	200	17	40	SC□□1204□□	FTGA0411F	-	-	TW15P	3
A32S-SSKCR/L-12	40	32	30	250	22	50		FTGA0411F	SS42S	SFXN0610F	TW15P, HW40L	

Applicable inserts **B70~B71, B90**

SSKPR/L



SP□□



• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S12M-SSKPR/L-09	16	12	11	150	9	20	SP□□09T3□□	FTNA0307	TW09P	2
S16N-SSKPR/L-09	20	16	14	160	11	25				
S16R-SSKPR/L-09	20	16	14	200	11	25				
S20N-SSKPR/L-09	25	20	18	160	13	32				
S20S-SSKPR/L-09	25	20	18	250	13	32				
A12K-SSKPR/L-09	16	12	11.5	125	9	20	SP□□09T3□□	FTNA0307	TW09P	1
A16M-SSKPR/L-09	20	16	15	150	11	25				
A20Q-SSKPR/L-09	25	20	19	180	13	32				

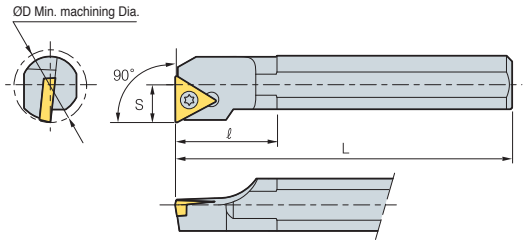
Applicable inserts **B72~B73**

• Use left handed insert for right handed holder

STFCR/L



TC□□



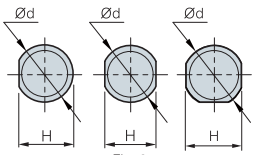
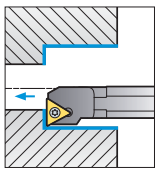


Fig. 1 Fig. 2 Fig. 3



90°

Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S10M-STFCR/L-09	13	10	9	150	7	16	TC□□0902□□	FTKA02206	-	-	TW06P	2
S12M-STFCR/L-09	16	12	11	150	9	20						
S12M-STFCR/L-11	16	12	11	150	9	20	TC□□1102□□	FTKA02565	-	-	TW07P	2
S16R-STFCR/L-11	20	16	14	200	11	25						
S20S-STFCR/L-11	25	20	18	250	13	32						
S20S-STFCR/L-16	25	20	18	250	13	32	TC□□16T3□□	FTGA03510	-	-	TW15P	2
S25R-STFCR/L-16	32	25	23	200	17	40						3
S32S-STFCR/L-16	40	32	30	250	22	50	TC□□16T3□□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L	3
S40T-STFCR/L-16	50	40	38	300	27	60						
A10H-STFCR/L-09	13	10	9.5	100	7	16	TC□□0902□□	FTKA02206	-	-	TW06P	1
A12K-STFCR/L-09	16	12	11.5	125	9	20						
A12K-STFCR/L-11	16	12	11.5	125	9	20						
A16M-STFCR/L-11	20	16	15	150	11	25	TC□□1102□□	FTKA02565	-	-	TW07P	1
A20Q-STFCR/L-11	25	20	19	180	13	32						
A25R-STFCR/L-16	32	25	24	200	17	40	TC□□16T3□□	FTKA03510	-	-	TW15P	1
A32S-STFCR/L-16	40	32	30	250	22	50		FTGA03512	ST32S	SHXN0509F	TW15P, HW35L	3

Carbide shank type

(mm)

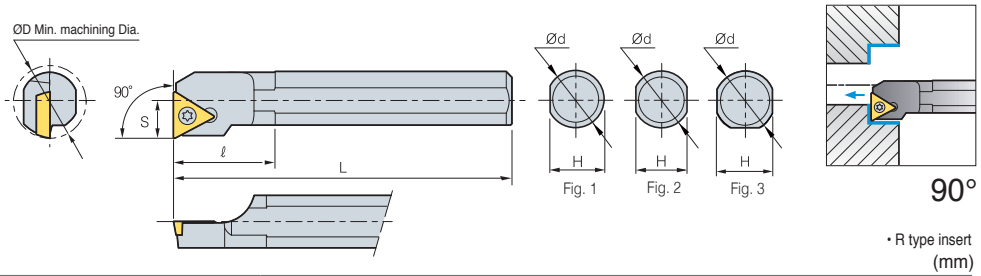
Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C08K-STFCR/L-09	10	8	7	125	5	TC□T0902□□	FTKA02206	TW06P	2
C10K-STFCR/L-09	12	10	9	125	6				
C10K-STFCR/L-11	12	10	9	125	6	TC□T1102□□	FTKA02565	TW07P	
C12M-STFCR/L-11	15	12	11	150	8				
C16R-STFCR/L-11	20	16	15	200	10				
C20R-STFCR/L-11	25	20	18	200	13				
C20S-STFCR/L-11	25	20	18	250	13				
C20R-STFCR/L-16	25	20	18	200	13	TC□T16T3□□	FTGA03510	TW15P	
C20S-STFCR/L-16	25	20	18	250	13				
E08K-STFCR/L-09	10	8	7	125	5	TC□T0902□□	FTKA02206	TW06P	
E10K-STFCR/L-09	12	10	9	125	6				
E10K-STFCR/L-11	12	10	9	125	6	TC□T1102□□	FTKA02565	TW07P	2
E12M-STFCR/L-11	15	12	11	150	8				
E16R-STFCR/L-11	20	16	15	200	11				
E20R-STFCR/L-11	25	20	18	200	13				
E20S-STFCR/L-11	25	20	18	250	13				
E20R-STFCR/L-16	25	20	18	200	13	TC□T16T3□□	FTGA03510	TW15P	
E20S-STFCR/L-16	25	20	19	250	13				

Applicable inserts **B75~B76, B91**

STFPR/L



TP□□



Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S10M-STFPR/L-11	13	10	9	150	7	16	TP□□1103□□	FTGA03507	TW15P	2
S12M-STFPR/L-11	16	12	11	150	9	20		FTGA03508	TW15P	2
S16N-STFPR/L-11	20	16	14	160	11	25				
S16R-STFPR/L-11	20	16	14	200	11	25				
S20N-STFPR/L-16	25	20	18	160	13	32	TP□□1604□□	FTGA0411F	TW15P	2
S20S-STFPR/L-16	25	20	18	250	13	32				
A10H-STFPR/L-11	13	10	9.5	100	7	16	TP□□1103□□	FTGA03507	TW15P	1
A12K-STFPR/L-11	16	12	11	125	9	20		FTGA03508	TW15P	1
A16M-STFPR/L-11	20	16	15	150	11	25				
A20Q-STFPR/L-16	25	20	19	180	13	32	TP□□1604□□	FTGA0411F	TW15P	1

Carbide shank type

(mm)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C08K-STFPR/L-08	10	8	7	125	5	TP□T0802□□	FTNA02205	TW06P	2
C10K-STFPR/L-11	12	10	9	125	6	TP□T1103□□	FTNA0305	TW09P	
C10M-STFPR/L-11	12	10	9	150	6				
C12M-STFPR/L-11	15	12	11	150	8		FTNA0307	TW09P	
C12Q-STFPR/L-11	15	12	11	180	8				
C16R-STFPR/L-11	20	16	15	200	10				
C16S-STFPR/L-11	20	16	15	250	10				
C20R-STFPR/L-11	25	20	18	200	13				
C20S-STFPR/L-11	25	20	18	250	13				
C20R-STFPR/L-16	25	20	18	200	13	TP□T1604□□	FTNA0408	TW15P	
C20S-STFPR/L-16	25	20	18	250	13				
C25T-STFPR/L-16	32	25	23	300	17				
E08K-STFPR/L-08	10	8	7	125	5	TP□T0802□□	FTNA02205	TW06P	2
E10K-STFPR/L-11	12	10	9	125	6	TP□T1103□□	FTNA0305	TW09P	
E10M-STFPR/L-11	12	10	9	150	6				
E12M-STFPR/L-11	15	12	11	150	8		FTNA0307	TW09P	
E12Q-STFPR/L-11	15	12	11	180	8				
E16R-STFPR/L-11	20	16	15	200	10				
E16S-STFPR/L-11	20	16	15	250	10				
E20R-STFPR/L-11	25	20	18	200	13				
E20S-STFPR/L-11	25	20	18	250	13				
E20R-STFPR/L-16	25	20	18	200	13	TP□T1604□□	FTNA0408	TW15P	
E20S-STFPR/L-16	25	20	18	250	13				
E25T-STFPR/L-16	32	25	23	300	17				

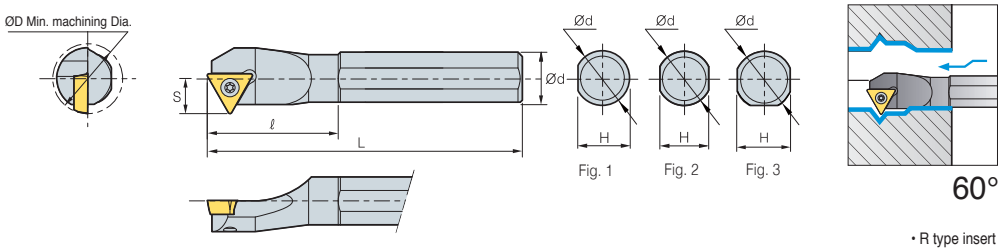
Applicable inserts **B77~B79**

• Use left handed insert for right handed holder

STWPR/L



TP□□



• R type insert

(mm)

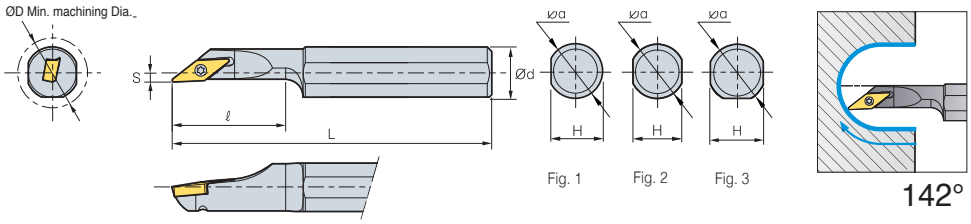
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S10M-STWPR/L-11	13	10	7	150	7	16	TPGH1102□□	FTNA0305	TW09P	2
S12M-STWPR/L-11	16	12	9	150	9	20	TPGH1103□□ TPMT1103□□	FTNA0306	TW09P	
S16Q-STWPR/L-11	20	16	14	180	11	25				
S20R-STWPR/L-11	25	20	18	200	13	32				

Applicable inserts **B77~B79**

SVJCR/L



VC□□



• R type insert

(mm)

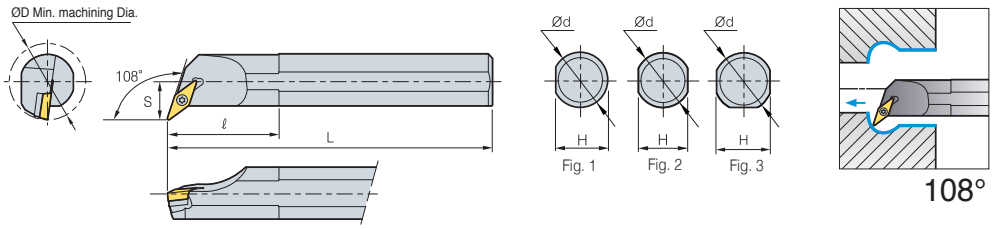
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S12M-SVJCR/L-08	16	12	11	150	9	20	VCMT0802□□	FTNA0204	TW06P	2
S16Q-SVJCR/L-08	20	16	14	180	11	25				

Applicable inserts **B82~B83**

SVQBR/L



VB□□



• R type insert

(mm)

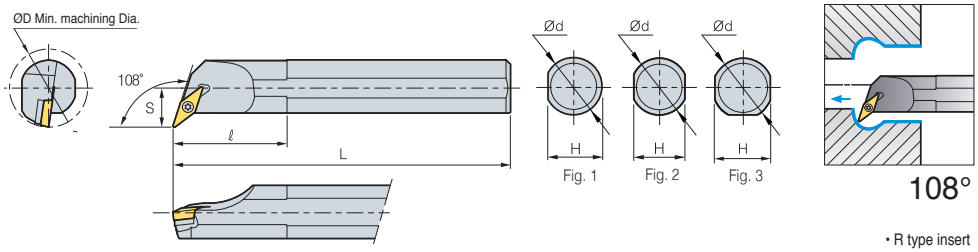
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S32S-SVQBR/L-16	40	32	30	250	22	50	VB□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L	3
S40T-SVQBR/L-16	50	40	38	300	27	60						
A32S-SVQBR/L-16	40	32	30	250	22	50						

Applicable inserts **B80~B81, B92**

SVQCR/L



VC□□



• R type insert
(mm)

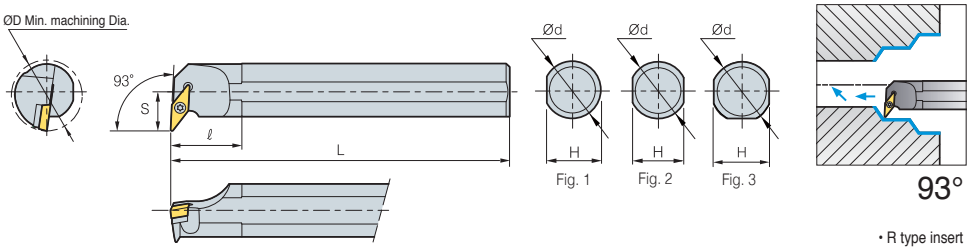
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S16R-SVQCR/L-11	20	16	14	200	11	25	VC□□1103□□	FTKA02565	-	-	TW07P	2
S20S-SVQCR/L-11	25	20	18	250	13	32						
S25R-SVQCR/L-11	32	25	23	200	17	40						3
S20S-SVQCR/L-13	25	20	18	250	13	32	VC□□1303□□	FTKA0307	-	-	TW07P	2
S25R-SVQCR/L-13	32	25	23	200	17	40						3
S25R-SVQCR/L-16	32	25	23	200	17	40	VC□□1604□□	FTGA03510	-	-	TW15P	3
S32S-SVQCR/L-16	40	32	30	250	22	50		FTGA03512	SV32S	SHXN0509F	TW15P HW35L	
S40T-SVQCR/L-16	50	40	38	300	27	60						

Applicable inserts **B82~B83, B93**

SVUBR/L



VB□□



• R type insert
(mm)

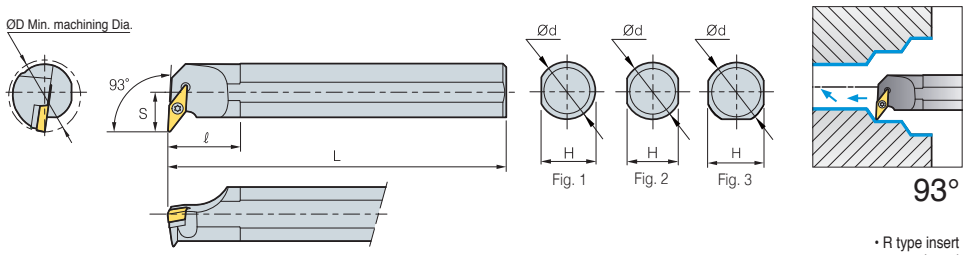
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S32S-SVUBR/L-16	40	32	30	250	22	50	VB□□1604□□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L	3
S40T-SVUBR/L-16	50	40	38	300	27	60						
A32S-SVUBR/L-16	40	32	30	250	22	50						

Applicable inserts **B80~B81, B92**

SVUCR/L



VC□□



• R type insert
(mm)

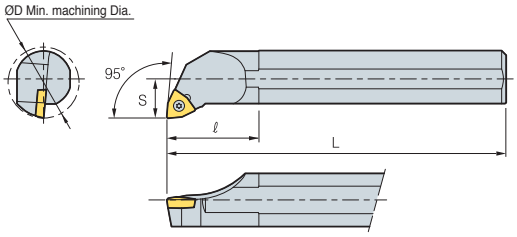
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Shim	Shim Screw	Wrench	Fig.
S16R-SVUCR/L-11	20	16	14	200	11	25	VC□□1103□□	FTKA02565	-	-	TW07P	2
S20S-SVUCR/L-11	25	20	18	250	13	32						
S25T-SVUCR/L-11	32	25	23	300	17	40						3
S20S-SVUCR/L-13	25	20	18	250	13	32	VC□□1303□□	FTKA0307	-	-	TW09P	2
S25R-SVUCR/L-13	32	25	23	200	17	40						3
S25R-SVUCR/L-16	32	25	23	200	17	40	VC□□1604□□	FTGA03510	-	-	TW15P	3
S32S-SVUCR/L-16	40	32	30	250	22	50		FTGA03512	SV32S	SHXN0509F	TW15P HW35L	
S40T-SVUCR/L-16	50	40	38	300	27	60						

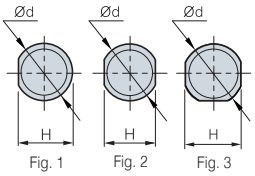
Applicable inserts **B82~B83, B93**

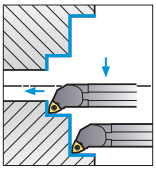
SWLCR/L



TP□□







95°

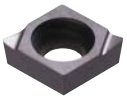
• R type insert

(mm)

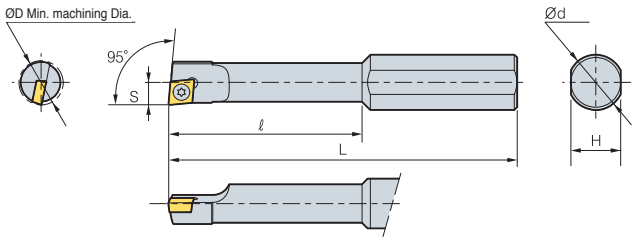
Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S25R-SWLCR/L-08	32	25	23	200	17	40	TP□□1604□□	FTGA0411F	TW15P	3
S32S-SWLCR/L-08	40	32	30	250	22	50				
A25R-SWLCR/L-08	32	25	24	200	17	40	TP□□1103□□	FTGA0411F	TW15P	1
A32S-SWLCR/L-08	40	32	30	250	22	50				3

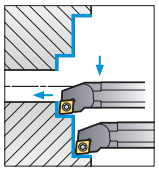
Applicable inserts **B77~B79**

SCLCR/L



CCET





95°

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S10H-SCLCR/L-0305	5	10	9	100	2.5	25	CCET0301□□	FTNA01633	TW06P
S10H-SCLCR/L-0306	6	10	9	100	3.0	25			
S10J-SCLCR/L-0407	7	10	9	110	3.5	30	CCET0401□□	FTNA0238	TW06P
S10J-SCLCR/L-0408	8	10	9	110	4.0	30			

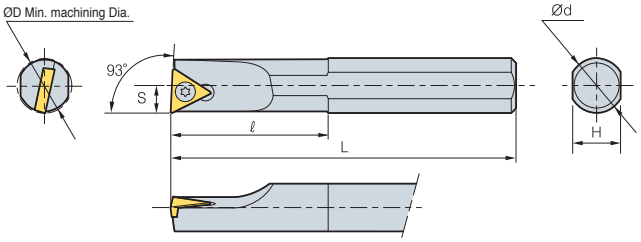
Applicable inserts **B62**

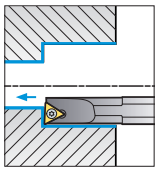
• Use left handed insert for right handed holder

STUBR/L



TB□□





93°

Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S08K-STUBR/L-06	8	8	7	125	4	30	TB□□0601□□R/L	FTNA0204	TW06P
A08F-STUBR/L-06	8	8	7.5	80	4	30			

Carbide shank type

(mm)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench
C08K-STUBR/L-06	10	8	7	125	5	TB□T0601□□	FTNA0204	TW06P
C10K-STUBR/L-06	12	10	9	125	6			
E08K-STUBR/L-06	10	8	7	125	5	TB□T0601□□	FTNA0204	TW06P
E10K-STUBR/L-06	12	10	9	125	6			

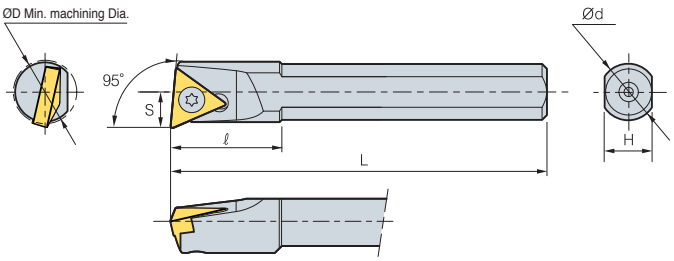
Applicable inserts **B74**

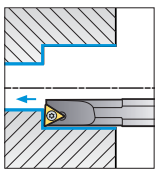
• Use left handed insert for right handed holder

STLBR/L



TB□□





95°

Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench
S06H-STLBR/L-06-SP	8	6	5	100	3.8	12	TB□□0601□□R/L	FTNA0204	TW06P

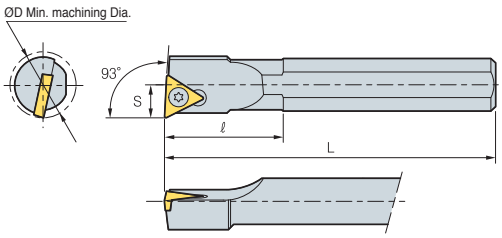
Applicable inserts **B74**

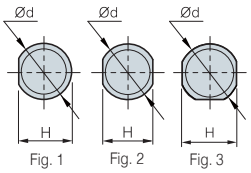
• Use left handed insert for right handed holder

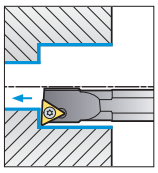
STUPR/L



TP□□







93°

Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S08K-STUPR/L-08	10	8	7	125	4	18	TP□□0802□□R/L	FTNA02205	TW06P	2
A08F-STUPR/L-08	10	8	7.5	80	4	18				

Carbide shank type

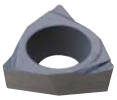
(mm)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C08K-STUPR/L-08	10	8	7	125	5	TP□T0802□□	FTNA02205	TW06P	2
C10K-STUPR/L-11	12	10	9	125	6	TP□T1103□□	FTNA0305	TW09P	
C10M-STUPR/L-11	12	10	9	150	6				
C12M-STUPR/L-11	15	12	11	150	8		FTNA0307	TW09P	
C12Q-STUPR/L-11	15	12	11	180	8				
C16R-STUPR/L-11	20	16	15	200	10				
C16S-STUPR/L-11	20	16	15	250	10				
C20R-STUPR/L-11	25	20	18	200	13				
C20S-STUPR/L-11	25	20	18	250	13				
C20R-STUPR/L-16	25	20	18	200	13	TP□T1604□□	FTNA0408	TW15P	
C20S-STUPR/L-16	25	20	18	250	13				
C25T-STUPR/L-16	32	25	23	300	17				
E08K-STUPR/L-08	10	8	7	125	5	TP□T0802□□	FTNA02205	TW06P	2
E10K-STUPR/L-11	12	10	9	125	6	TP□T1103□□	FTNA0305	TW09P	
E10M-STUPR/L-11	12	10	9	150	6				
E12M-STUPR/L-11	15	12	11	150	8		FTNA0307	TW09P	
E12Q-STUPR/L-11	15	12	11	180	8				
E16R-STUPR/L-11	20	16	15	200	10				
E16S-STUPR/L-11	20	16	15	250	10				
E20R-STUPR/L-11	25	20	18	200	13				
E20S-STUPR/L-11	25	20	18	250	13				
E20R-STUPR/L-16	25	20	18	200	13	TP□T1604□□	FTNA0408	TW15P	
E20S-STUPR/L-16	25	20	18	250	13				
E25T-STUPR/L-16	32	25	23	300	17				

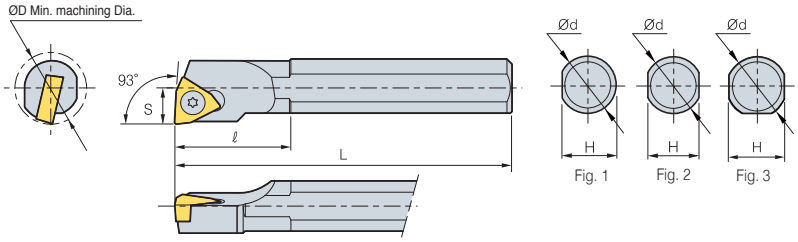
Applicable inserts **B77~B79**

• Use left handed insert for right handed holder

SWUBR/L



WB□T





93°

Steel shank type

• R type insert

(mm)

Designation	ØD	Ød	H	L	S	ℓ	Insert	Screw	Wrench	Fig.
S05H-SWUBR/L-02	5.5	5	4.5	100	2.75	-	WBGT 0201□□R/L	FTNA0203	TW06P	2
S08K-SWUBR/L-02	8	8	7	125	4	30		FTNA02033		
S08K-SWUBR/L-S3	10	8	7	125	5	18	WBGT S302□□R/L	FTNA02205	TW06P	
A08F-SWUBR/L-02	8	8	7.5	80	4	30	WBGT 0201□□R/L	FTNA0203	TW06P	
A08F-SWUBR/L-S3	10	8	7.5	80	5	16	WBGT S302□□R/L	FTNA02205	TW06P	

Carbide shank type

(mm)

Designation	ØD	Ød	H	L	S	Insert	Screw	Wrench	Fig.
C05H-SWUBR/L-02	6	5	4.4	100	3	WB□T0201□□	FTNA0203	TW06P	1
C06H-SWUBR/L-02	7	6	5.4	100	3.5				
C08K-SWUBR/L-02	9	8	7	125	4.5		FTNA02033	TW06P	2
C08K-SWUBR/L-S3	10	8	7	125	4.5	WB□TS301□□	FTNA02205	TW06P	
E06H-SWUBR/L-02	7	6	5.4	100	3.5	WB□T0201□□	FTNA0203	TW06P	1
E08K-SWUBR/L-02	9	8	7	125	4.5		FTNA02033	TW06P	2
E08K-SWUBR/L-S3	10	8	7	125	5	WB□TS301□□	FTNA02205	TW06P	

Applicable inserts **B85**

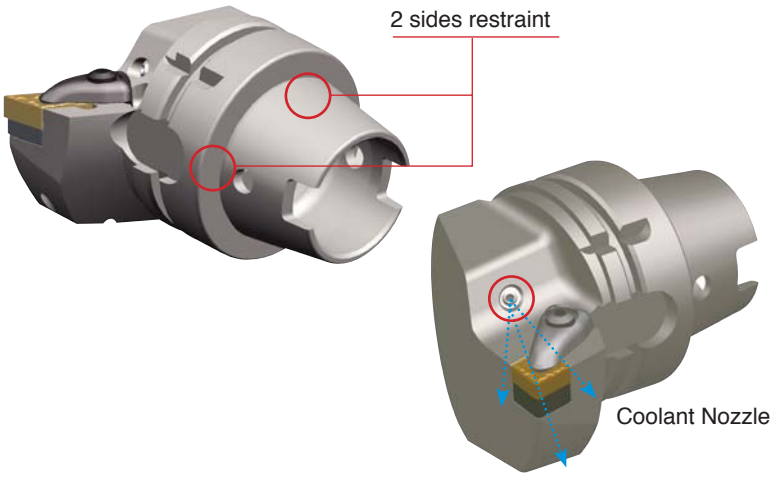
• Use left handed insert for right handed holder

※ See page B130 for applicable sleeves

2 sides restraint - side and taper part

HSK Tooling System [For Multi-task Machines]

- 2 sides restraint - side and taper part
- Toughness guaranteed for static and dynamic movements
- Precision guaranteed on shaft and repeat directions
- Suitable at high speeds
- Suitable for small work pieces
- Coolant Nozzle is easily adjustable



HSK tooling code system

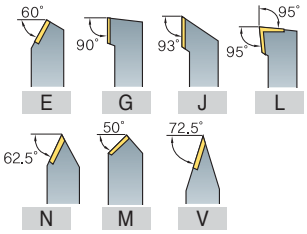
Insert Shape	Clearance angle of insert	Length of tool holder
C: 80° Diamond **D**: 55° Diamond **S**: 90° Square **T**: 60° Triangle **V**: 35° Diamond **W**: 80° Hexagon	N = 0° B = 5°	DX: 65 H: 100 L: 140

H63T D C L N R DX – 12

Taper design & size
ICTM=HSK standard

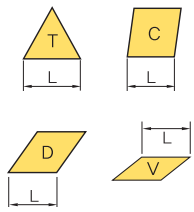
Clamping Type
D: Double Clamp
M: Multi Clamp
P: Lever Lock
S: Screw On
W: Wedge Clamp

Holder Style



Hand
R: Right
L: Left
N: No Hand

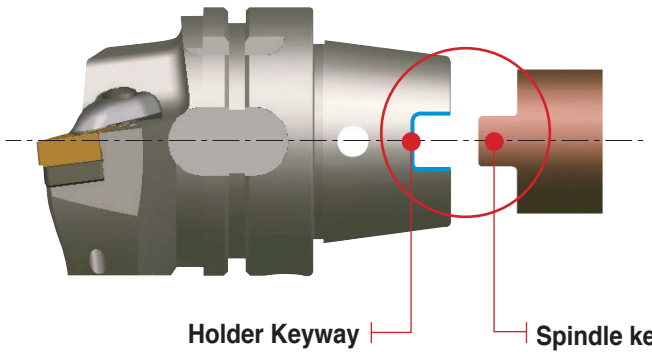
Cutting edge Length



ICTM (Interface committee for turning mill)

- Interface for Multi-task machines turning tool, which is tooling system based on ICTM standard from 17 major japanese companies cooperation and is compatible with conventional HSK-A type and common to Multi-task machines and machining centers

Tolerance of keyway has been improved: HSK-T63



Tolerance comparison (Example)

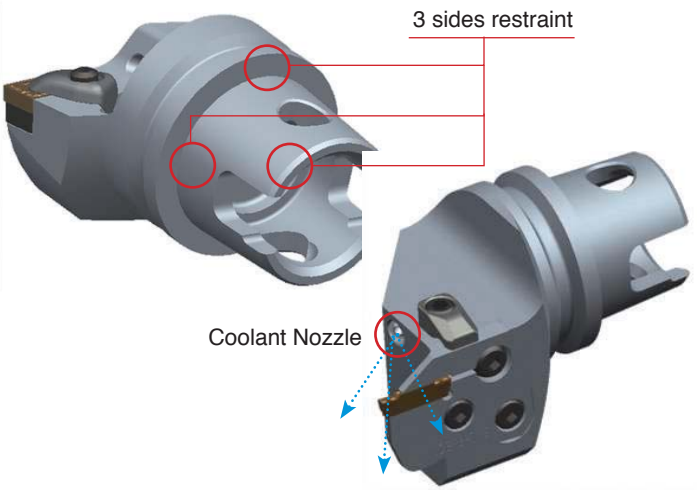
(mm)

Remarks	Maximum Tolerance	Minimum Tolerance
ICTM STANDARD HSK-T63	0.075	0.035
ISO STANDARD HSK-A63	0.33	0.08

3 Face Binding - Superior precision

KM Tooling System [For Multi-task Machines]

- 3 Face Binding / Superior precision
- Flexible Clamping System / Superior Rigidity
- Various Size & Style
- Appropriate for Turning & Milling
- Adjustable coolant direction with Coolant Nozzle



KM tooling code system

C: 80° Diamond **D**: 55° Diamond
S: 90° Square **T**: 60° Triangle
V: 35° Diamond **W**: 80° Hexagon

N = 0°
B = 5°

DX: 65
H: 100
L: 140

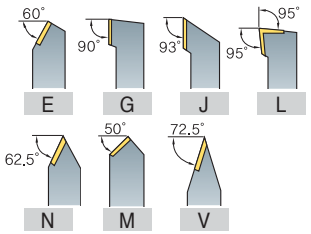
Insert Shape | **Clearance angle of insert** | **Length of tool holder**

KM50 D C L N R DX - 12

Taper design & size
50, 63UT
80ATC, 100

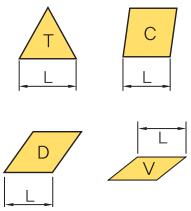
Clamping Type
D: Double Clamp
M: Multi Clamp
P: Lever Lock
S: Screw On
W: Wedge Clamp

Holder Style

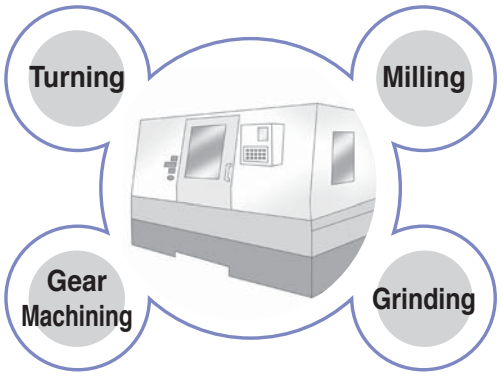


Hand
R: Right
L: Left
N: No Hand

Cutting edge Length



Multi-tasking machine



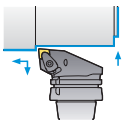
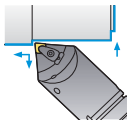
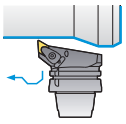
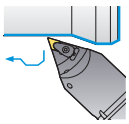
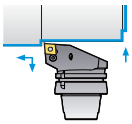
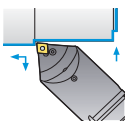
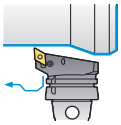
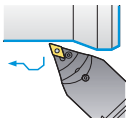
4 Machines
↓
1 Machine

KM Tooling system is superior for wide application.

External Process | Internal Process | Grooving Process | Drill Process | Parting-off Process

KM50, KM63UT, KM80, KM100 Standard and Special type can be produced.

Index for HSK Tooling System

Cutting Shape								
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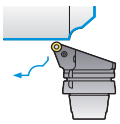
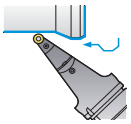
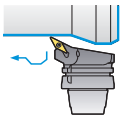
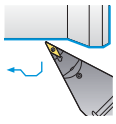
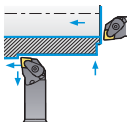
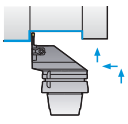
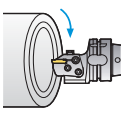
Internal turning								

Cutting Shape								
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Copying	●	●	●	●		●		
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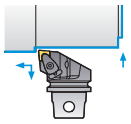
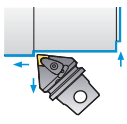
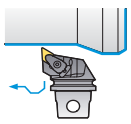
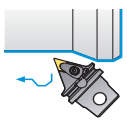
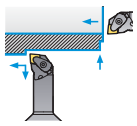
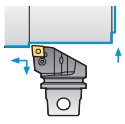
Internal turning					●			

Index for KM Tooling System

Cutting Shape						
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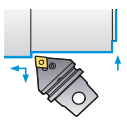
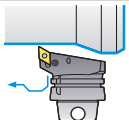
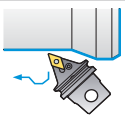
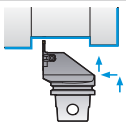
Cutting Shape						
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Turning	●	●	●	●		
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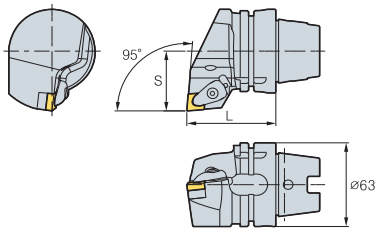
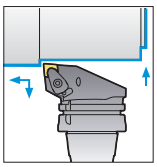
Internal turning						

DCLNR/L



CN□□





95°

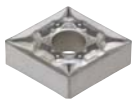
• R type insert

(mm)

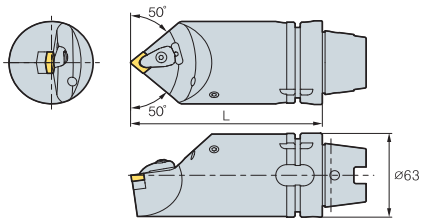
Designation	L	S	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench	Coolant Pipe
H63T-DCLNR/L-DX12	65	45	CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	CN0605	-	HW30P	CP63T

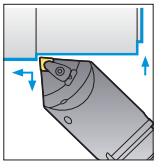
Applicable inserts **B26~B32**

DCMNN



CN□□





95°

(mm)

Designation	L	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench	Coolant Pipe
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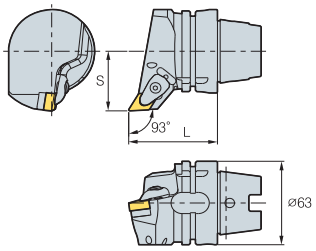
H63T-DCMNN-L12	140										

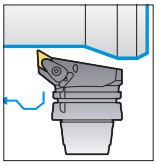
Applicable inserts **B26~B32**

DDJNR/L



DN□□





93°

• R type insert

(mm)

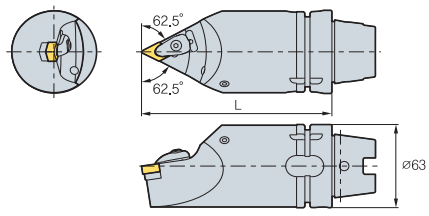
Designation	L	S	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench	Coolant Pipe
H63T-DDJNR/L-DX15	65	45	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	-	HW30P	CP63T
H63T-DDJNR/L-DX15-3	65	45	DN□□1504□□			SD44V						

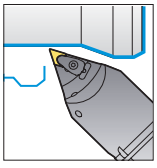
Applicable inserts **B33~B39**

DDNNN



DN□□





107.5°

(mm)

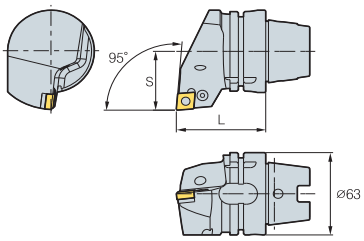
Designation	L	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench	Coolant Pipe
H63T-DDNNN-H15	100	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	KHA0808	HW30P	CP63T
H63T-DDNNN-L15	140										
H63T-DDNNN-H15-3	100	DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	KHA0808	HW30P	CP63T
H63T-DDNNN-L15-3	140										

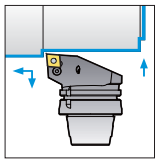
Applicable inserts **B33~B39**

PCLNR/L



CN□□





95°

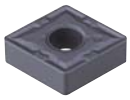
• R type insert

(mm)

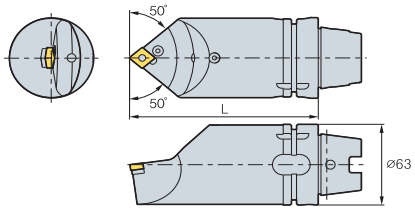
Designation	L	S	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench	Coolant Pipe
H63T-PCLNR/L-DX12	65	45	CN□□1204□□	LV4N	VHX0820N	SC42N	SP4N	LSPS4	CN0605	-	HW30L	CP63T

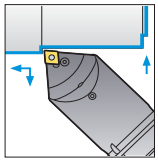
Applicable inserts B26~B32

PCMNN



CN□□





95°

(mm)

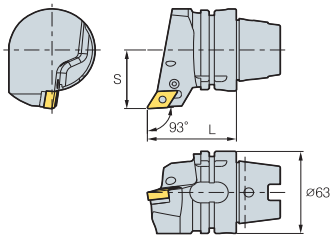
Designation	L	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench	Coolant Pipe
H63T-PCMNN-H12	100	CN□□1204□□	LV4N	VHX0820N	SC42N	SP4N	LSPS4	CN0605	KHA0808	HW30L	CP63T
H63T-PCMNN-L12	140										

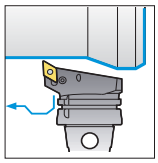
Applicable inserts B26~B32

PDJNR/L



DN□□





95°

• R type insert

(mm)

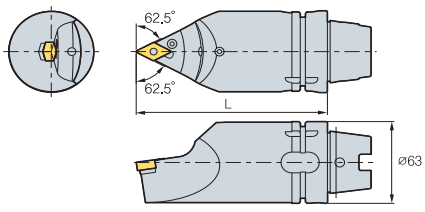
Designation	L	S	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench	Coolant Pipe
H63T-PDJNR/L-DX15	65	45	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	CN0605	-	HW30L	CP63T
H63T-PDJNR/L-DX15-3	65	45	DN□□1504□□			SD43N						

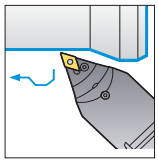
Applicable inserts B33~B39

PDNNN



DN□□





107.5°

(mm)

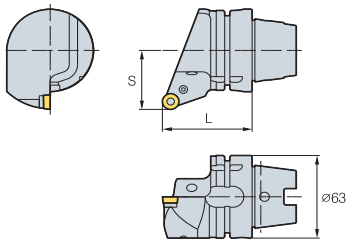
Designation	L	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench	Coolant Pipe
H63T-PDNNN-H15	100	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	CN0605	KHA0808	HW30L	CP63T
H63T-PDNNN-L15	140										
H63T-PDNNN-H15-3	100	DN□□1504□□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	CN0605	KHA0808	HW30L	CP63T
H63T-PDNNN-L15-3	140										

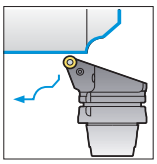
Applicable inserts B33~B39

PRGCR/L



RCMX1204M0





• R type insert

(mm)

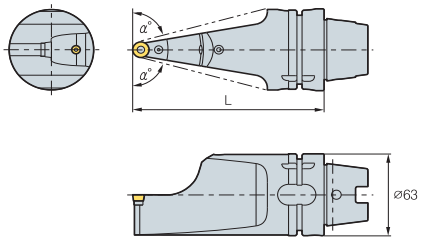
Designation	L	S	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench	Coolant Pipe
H63T-PRGCR/L-DX12	65	45	RCMX1204M0	LR12	VHX0617	SR12	SP3	LSPS3	CN0605	-	HW25L	CP63T

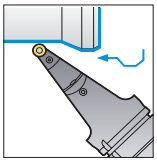
Applicable inserts **B70**

PRDCN



RCMX1204M0





(mm)

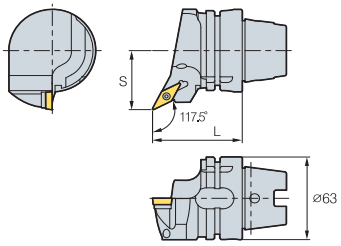
Designation	L	α°	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench	Coolant Pipe
H63T-PRDCN-H12	100	69	RCMX1204M0	LR12	VHX0617	SR12	SP3	LSPS3	CN0605	-	HW25L	CP63T
H63T-PRDCN-L12	140	75										

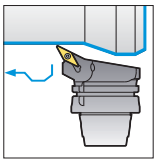
Applicable inserts **B70**

SVPBR/L



VB□T





117.5°

• R type insert

(mm)

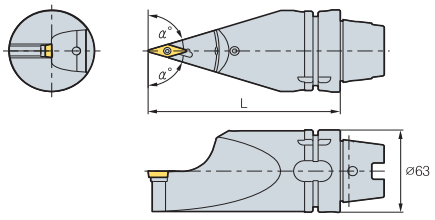
Designation	L	S	Insert	Screw	Shim Screw	Shim	Nozzle	Plug	Wrench	Wrench	Coolant Pipe
H63T-SVPBR/L-DX16	65	45	VB□T1604□□	FTGA03512	SHXN0509F	SV32S	CN0605	-	TW15P	HW32L	CP63T

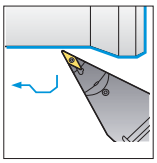
Applicable inserts **B80~B81, B92**

SVVBN



VB□T





117.5°

(mm)

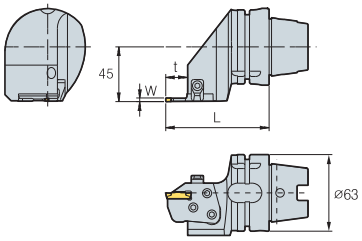
Designation	L	α°	Insert	Screw	Shim Screw	Shim	Nozzle	Plug	Wrench	Wrench	Coolant Pipe
H63T-SVVBN-H16	100	66.5	VB□T1604□□	FTGA03512	SHXN0509F	SV32S	CN0605	KHA0808	TW15P	HW32L	CP63T
H63T-SVVBN-L16	140	72.5									

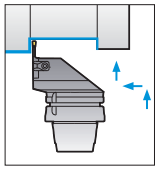
Applicable inserts **B80~B81, B92**

MCHR/L



MGMN / MGMR/L
MGGN / MRMN





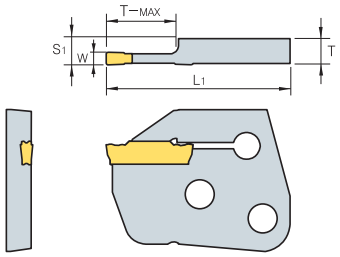
• R type insert
(mm)

Designation	L	t	W	T-MAX	Insert	Cartridge	Clamp	Clamp Screw	Hinge Screw	Screw	Nozzle	Plug	Wrench	Coolant Pipe
H63T-MCHR/L	85	18	3	16	MGMN MGMR/L MGGN MRMN	MCER/L3-T16	CHX8N	DHA0818F	RHA0613	FHGA0618	CN0605	-	HW40L	CP63T
	85	18	4	16		MCER/L4-T16								
	89	22	5	20		MCER/L5-T20								
	89	22	6	20		MCER/L6-T20								

MCER/L (Cartridge)



MGMN / MGMR/L
MGGN / MRMN



• R type insert
(mm)

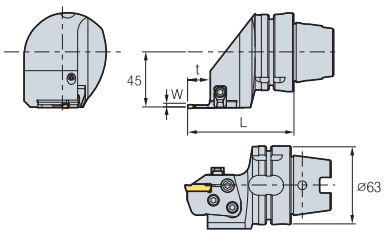
Designation		L	L1	S1	T-MAX	Insert		Tool holders
						W	Designation	
MCER/L	**3-T16**	6.00	44.5	6.35	16	3	MGMN	H63T-MCHR/L
	4-T16	5.97	44.5	6.35	16	4	MGMR/L	
	5-T20	5.87	48.5	6.35	20	5	MGGN	
	6-T20	5.82	48.5	6.35	20	6	MGMN	

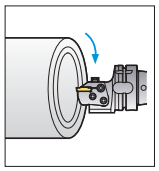
Applicable inserts **B26~B27**

MCHR/L



MFMN300
MGMN400





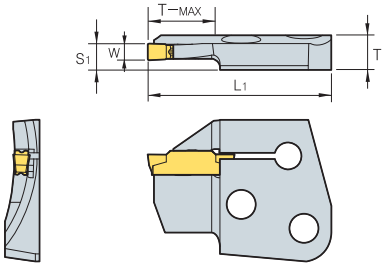
• R type insert
(mm)

Designation	L	t	W	T-MAX	Insert	Cartridge	Clamp	Clamp Screw	Hinge Screw	Screw	Nozzle	Plug	Wrench	Coolant Pipe
H63T-MCHR/L	85	18	3	16	MFMN300	MCFR/L3-24/35-T16	CHX8N	DHA0818F	RHA0613	FHGA0618	CN0605	-	HW40L	
	85	18	3	16		MCFR/L3-29/40-T16								
	85	18	3	16		MCFR/L3-34/50-T16								
	85	18	3	16		MCFR/L3-44/70-T16								
	85	18	3	16		MCFR/L3-64/99-T16								
	85	18	3	16	MGMN400	MCFR/L4-44/60-T16								
	85	18	3	16		MCFR/L4-60/120-T16								
	85	18	3	16		MCFR/L4-112/200-T16								

MCFR/L (Cartridge)



MFMN300
MGMN400

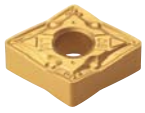


• R type insert
(mm)

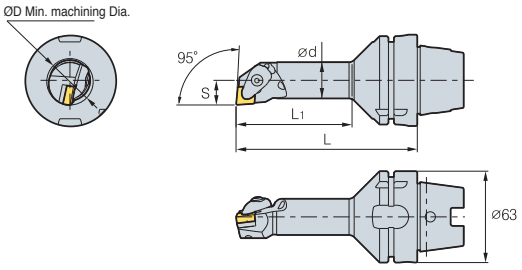
Designation		T	L1	S1	T-MAX	Insert		Tool holders
						W	Designation	
MCFR/L3-	24/35-T16	8.00	44.5	6.35	16	3	MFMN300	H63T-MCHR/L
	29/40-T16	8.00	44.5	6.35	16	3		
	34/50-T16	8.00	44.5	6.35	16	3		
	44/70-T16	8.00	44.5	6.35	16	3		
	64/99-T16	8.00	44.5	6.35	16	3		
MCFR/L4-	44/60-T16	7.97	44.5	6.35	16	4	MGMN400	
	60/120-T16	7.97	44.5	6.35	16	4		
	112/200-T16	7.97	44.5	6.35	16	4		

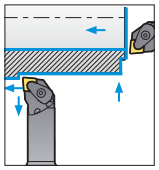
Applicable inserts B26~B27

DCLNR/L



CN□□





95°

• R type insert
(mm)

Designation	ØD	Ød	L	L1	S	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench	Coolant Pipe
H63T-A25K-DCLNR/L-12	32	25	125	80	17	CN□□1204□□	CVH4	CHX0518	SC42V	FTKA0410	SPR0714	CN0605	-	HW30P	CP63T
H63T-A32L-DCLNR/L-12	40	32	140	98	22										

Applicable inserts B26~B32

Blank Tool

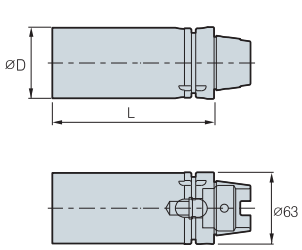


Fig. 1

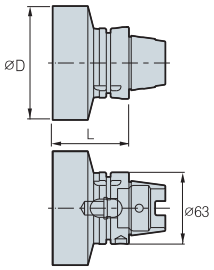
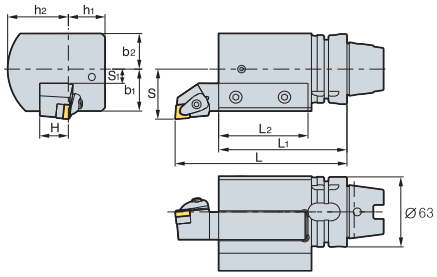


Fig. 2

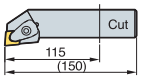
(mm)

Designation	ØD	L	Fig.	Coolant Pipe
HSK-T63-BL62-102	62	102	1	CP63T
HSK-T63-BL62-142	62	142	2	
HSK-T63-BL100-67	100	67	1	
HSK-T63-BL120-70	120	70	2	

EV2525R/L-112



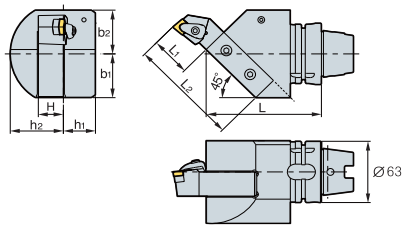
• **Holder information**
- Holder size: 25 × 25
- Before setting the holder, please cut the holder length to 115mm.



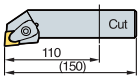
• R type insert
(mm)

Designation	L	L1	L2	H	h1	h2	S	S1	b1	b2	Screw	Plug	Nozzle	Wrench	Coolant Pipe
EV2525R/L-112	150	112	77	25	32	53	45	12.75	37.75	32	KHA1231	KHA0808	CN0605	HW50L	CP63T

EV2525R/L-115



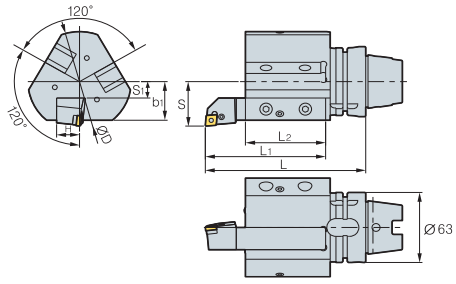
• **Holder information**
- Holder size: 25 × 25
- Before setting the holder, please cut the holder length to 110mm.



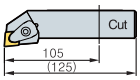
• R type insert
(mm)

Designation	L	L1	L2	H	h1	h2	b1	b2	Screw	Plug	Nozzle	Wrench	Coolant Pipe
EV2525R/L-115	115	40	110	25	32	53	45	45	KHA1231	KHA0808	CN0605	HW50L	CP63T

EV2020R/L-105-3



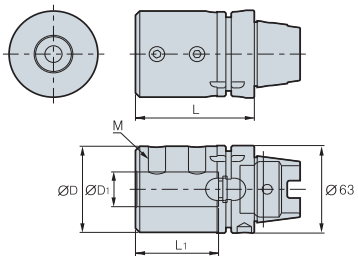
• **Holder information**
- Holder size: 20 × 20
- Before setting the holder, please cut the holder length to 105mm.



• R type insert
(mm)

Designation	L	L1	L2	H	ØD	S	S1	B1	Screw	Plug	Nozzle	Wrench	Coolant Pipe
EV2020R/L-105-3	140	105	70	20	90	40	15	35	KHA1231	KHA0808	CN0605	HW50L	CP63T

B○○-○○



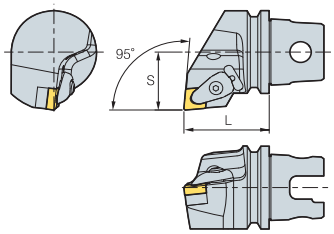
• R type insert
(mm)

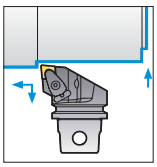
Designation	ØD	D1	L	L1	M	Screw	Wrench	Coolant Pipe
B08-65	28	8	65	40	M8	KHA1218	HW50L	CP63T
B10-70	35	10	70	45	M8			
B12-70	42	12	70	45	M8			
B16-75	48	16	75	50	M10			
B20-75	52	20	75	50	M10			
B25-83	62	25	83	58	M12			
B32-87	62	32	87	62	M12			
B40-97	65	40	97	72	M16			

DCLNR/L



CN□□





95°

• R type insert

(mm)

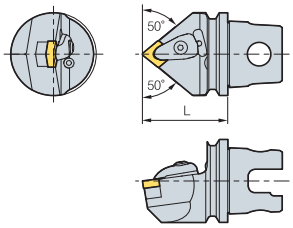
Designation	L	S	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench
KM50-DCLNR/L-C12	50	35	CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	CN0605	-	HW30P
KM63UT-DCLNR/L-D12	60	43									

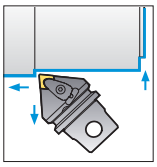
Applicable inserts **B26~B32**

DCMNN



CN□□





95°

(mm)

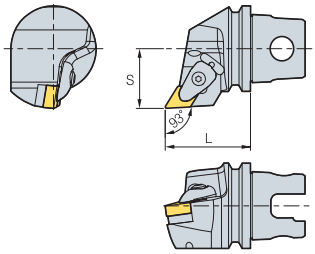
Designation	L	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench
KM50-DCMNN-C12	50	CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	CN0605	KHA0808	HW30P
KM63UT-DCMNN-D12	60									

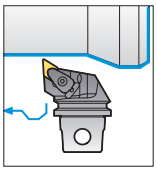
Applicable inserts **B26~B32**

DDJNR/L



DN□□





93°

• R type insert

(mm)

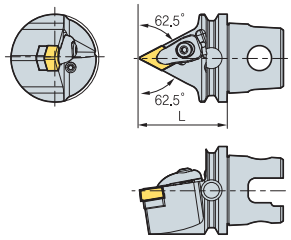
Designation	L	S	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench
KM50-DDJNR/L-C15	50	35	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	-	HW30P
KM50-DDJNR/L-C15-3	50	35	DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	-	HW30P
KM63UT-DDJNR/L-D15	60	43	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	-	HW30P
KM63UT-DDJNR/L-D15-3	60	43	DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	-	HW30P

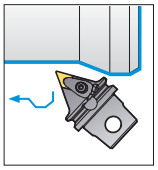
Applicable inserts **B33~B39**

DDNNN



DN□□





117.5°

(mm)

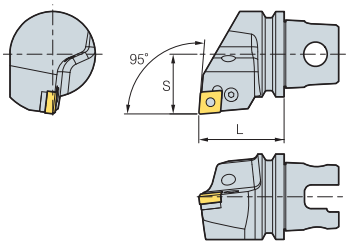
Designation	L	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench
KM50-DDNNN-C15	50	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	KHA0808	HW30P
KM50-DDNNN-C15-3	50	DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	KHA0808	HW30P
KM63UT-DDNNN-D15	60	DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	CN0605	KHA0808	HW30P
KM63UT-DDNNN-D15-3	60	DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	CN0605	KHA0808	HW30P

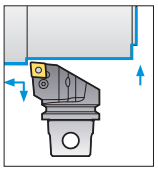
Applicable inserts **B33~B39**

PCLNR/L



CN□□





95°

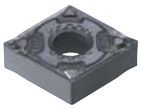
• R type insert

(mm)

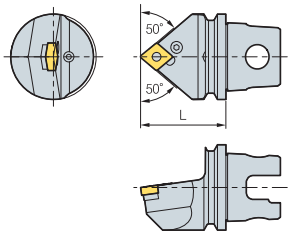
Designation	L	S	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench
KM50-PCLNR/L-C12	50	35	CN□□1204□□	LV4N	VHX0820N	SC42N	SP4N	LSPS4	CN0605	-	HW30L
KM63UT-PCLNR/L-D12	60	43									

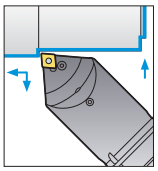
Applicable inserts **B26~B32**

PCMNN



CN□□





95°

(mm)

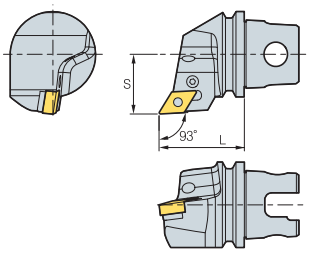
Designation	L	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench
KM50-PCMNN-C12	50	CN□□1204□□	LV4N	VHX0820N	SC42N	SP4N	LSPS4	CN0605	KHA0808	HW30L
KM63UT-PCMNN-D12	60									

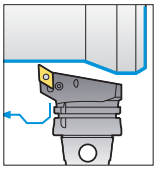
Applicable inserts **B26~B32**

PDJNR/L



DN□□





93°

• R type insert

(mm)

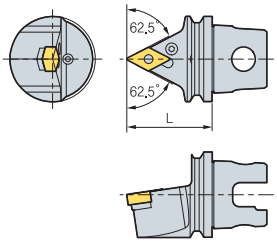
Designation	L	S	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench
KM50-PDJNR/L-C15	50	35	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	CN0605	-	HW30L
KM50-PDJNR/L-C15-3	50	35	DN□□1504□□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	CN0605	-	HW30L
KM63UT-PDJNR/L-D15	60	43	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	CN0605	-	HW30L
KM63UT-PDJNR/L-D15-3	60	43	DN□□1504□□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	CN0605	-	HW30L

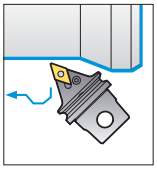
Applicable inserts **B33~B39**

PDNNN



DN□□





107.5°

(mm)

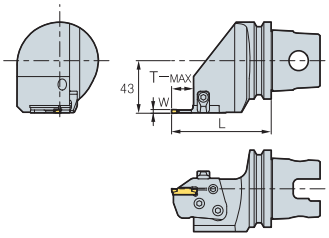
Designation	L	Insert	Lever	Screw	Shim	Shim pin	Punching	Nozzle	Plug	Wrench
KM50-PDNNN-C15	50	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	CN0605	KHA0808	HW30L
KM50-PDNNN-C15-3	50	DN□□1504□□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	CN0605	KHA0808	HW30L
KM63UT-PDNNN-D15	60	DN□□1506□□	LV4BN	VHX0821N	SD42N	SP4N	LSPS4	CN0605	KHA0808	HW30L
KM63UT-PDNNN-D15-3	60	DN□□1504□□	LV4BN	VHX0821N	SD43N	SP4N	LSPS4	CN0605	KHA0808	HW30L

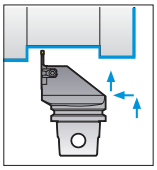
Applicable inserts **B33~B39**

MCHR/L



MGMN / MGMR/L
MGGN / MRMN





• R type insert

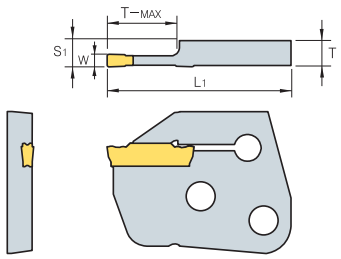
(mm)

Designation	S	L	t	W	T-MAX	Insert	Cartridge	Clamp	Clamp Screw	Hinge Screw	Screw	Nozzle	Plug	Wrench
KM50-MCHR/L	35	72.5	18	3	16	MGMN MGMR/L MGGN MRMN	MCER/L3-T16	CHX8N	DHA0818F	RHA0613	FHGA0618	CN0605	-	HW40L
	35	72.5	18	4	16		MCER/L4-T16						-	
	35	76.5	22	5	20		MCER/L5-T20							
	35	76.5	22	6	20		MCER/L6-T20							
KM63UT-MCHR/L	43	81.5	18	3	16		MCER/L3-T16	CHX8N	DHA0818F	RHA0613	FHGA0618	CN0605	-	HW40L
	43	81.5	18	4	16		MCER/L4-T16						-	
	43	85.5	22	5	20		MCER/L5-T20							
	43	85.5	22	6	20		MCER/L6-T20							

MCER/L (Cartridge)



MGMN / MGMR/L
MGGN / MRMN



• R type insert
(mm)

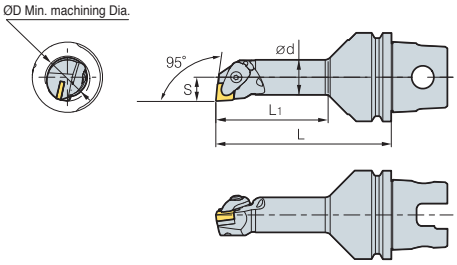
Designation		T	L1	S1	T-MAX	Insert		Tool holders
						W	Designation	
MCER/L	3-T16	6.00	44.5	6.35	16	3	MGMN	H-63T-MCHR/L
	4-T16	5.97	44.5	6.35	16	4	MGMR/L	
	5-T20	5.87	48.5	6.35	20	5	MGGN	
	6-T20	5.82	48.5	6.35	20	6	MRMN	

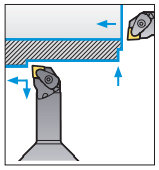
Applicable inserts C26~C27

KM○○-DCLNR/L



CN□□





95°

• R type insert
(mm)

Designation	ØD	Ød	L	L1	S	Insert	Clamp	Screw	Shim	Shim Screw	Spring	Nozzle	Plug	Wrench
KM50-A25K-DCLNR/L-12	32	25	125	80	17	CN□□1204□□	CVH4	CHX0518	SC42V	FTKA0410	SPR0714	CN0605	-	HW30P
KM50-A32L-DCLNR/L-12	40	32	140	98	22									
KM63UT-A25K-DCLNR/L-12	32	25	125	80	17									
KM63UT-A32L-DCLNR/L-12	40	32	140	98	22									

Applicable inserts B26~B32

Blank Tool

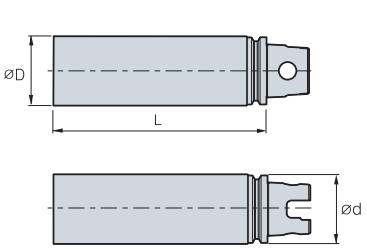


Fig. 1

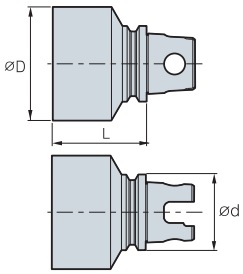


Fig. 2

(mm)

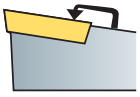
Designation	ØD	L	Ød	Fig.
KM50-BL7562	45	62	50	1
KM50-BL10562	105	62	50	2
KM63UT-BL65200	65	200	50	1
KM63UT-BL115150	115	150	50	2

S T F C R 12 C A - 16

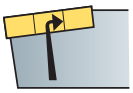
1	2	3	4	5	6	7	8	9
Method of Mounting Insert	Insert Shape	Holder Style	Relief Angle of Insert	Hand	Height of Cutting Edge	Cartridge Code	Type of Cartridge	Length of Cutting Edge

1 Method of Mounting Insert

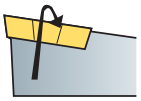
S T F C R 12 C A - 16



Top Clamping — C



Hole clamping — P



Screw on — S

2 Insert Shape

S T F C R 12 C A - 16



C



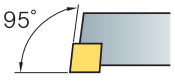
S



T

3 Holder Style

S T F C R 12 C A - 16



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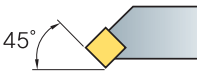

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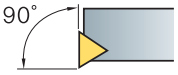

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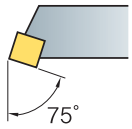

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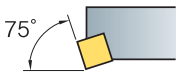

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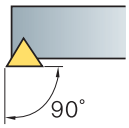

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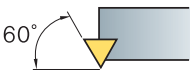

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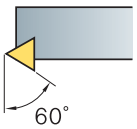
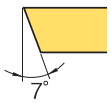


T

4 Relief Angle of Insert

S T F C R 12 C A - 16



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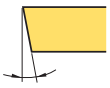

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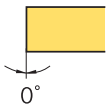
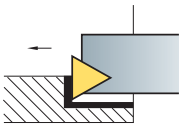
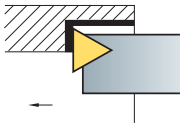


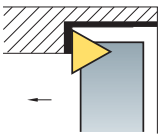
N

5 Hand

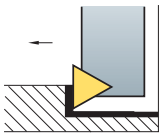
S T F C R 12 C A - 16







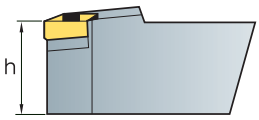
R



L

6 Height of Cutting Edge

S T F C R 12 C A - 16



7 Cartrige Code

S T F C R 12 C A - 16

C (Cartridge)

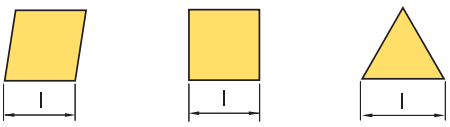
8 Type of Cartridge

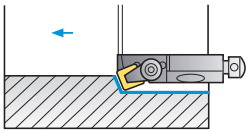
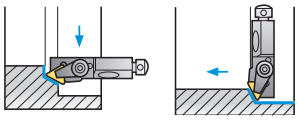
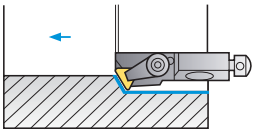
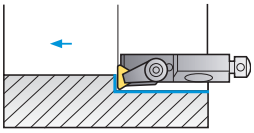
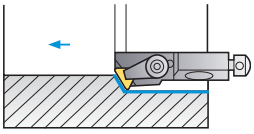
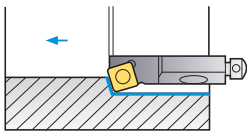
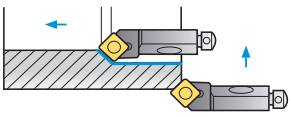
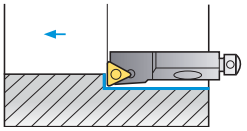
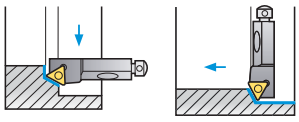
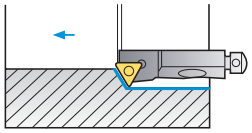
S T F C R 12 C A - 16

A (ISO5611)

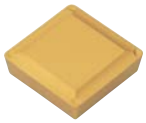
9 Length of Cutting Edge

S T F C R 12 C A - 16

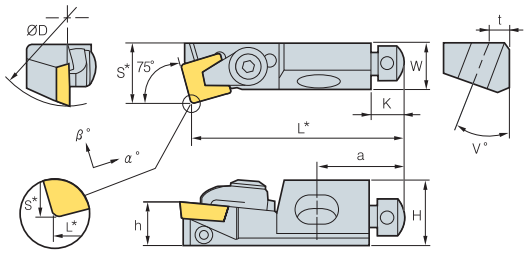


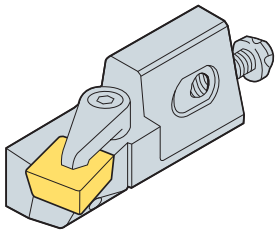
	Cutting Shape		Turning	Copying	Facing	Chamfering	Applicable inserts	Page
Clamp on System	**CSKPR/L** 	10CA–09 12CA–12	●				SP□R 0903□□ 1203□□	B222
	CTTPR/L 	10CA–11 12CA–16	●				TP□R 1103□□ 1603□□	B223
	CTWPR/L 	10CA–11 12CA–16	●				TP□R 1103□□ 1603□□	B223
	CTFPR/L 	10CA–11 12CA–16	●		●		TP□R 1103□□ 1603□□	B222
	CTSPR/L 	10CA–11 12CA–16	●				TP□R 1103□□ 1603□□	B222
Screw on System	**SSKCR/L** 	10CA–09 12CA–12	●				SC□T 09T3□□ 1204□□	B224
	SSSCR/L 	10CA–09 12CA–12	●			●	SC□T 09T3□□ 1204□□	B224
	STFCR/L 	10CA–11 12CA–16	●		●		TC□T 1102□□ 16T3□□	B224
	STTCR/L 	10CA–11 12CA–16	●		●		TC□T 1102□□ 16T3□□	B225
	STWCR/L 	10CA–11 12CA–16	●				TC□T 1102□□ 16T3□□	B225

CSKPR/L



SP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CSKPR/L	10CA-09	40	15	11	50	14	10	8	6	0	20	5	20	SP□R0903 □□
	12CA-12	50	20	15	55	20	12	8	6	0	20	6	20	1203 □□

Applicable inserts **B72~B73**

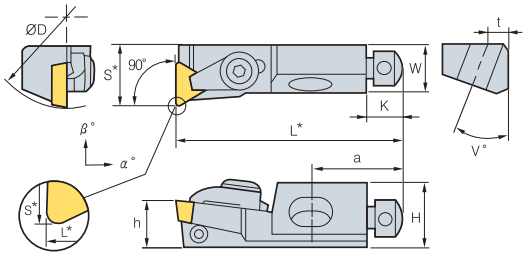
· a base Insert : r = 0.8 D = ØD Min. machining Dia.

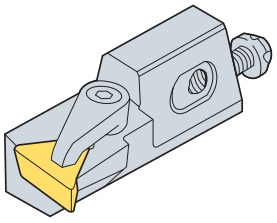
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CSKPR/L	10CA-09	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

CTFPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTFPR/L	10CA-11	40	15	11	50	14	10	8	6	0	20	5	20	TP□R1103 □□
	12CA-16	50	20	15	55	20	12	8	6	0	20	6	20	1603 □□

Applicable inserts **B77~B79**

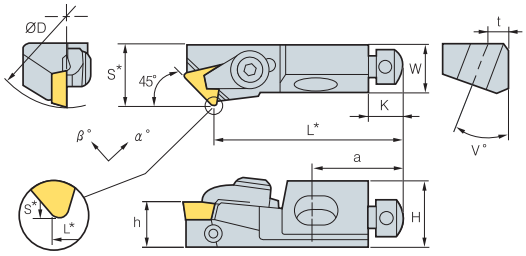
· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = ØD Min. machining Dia.

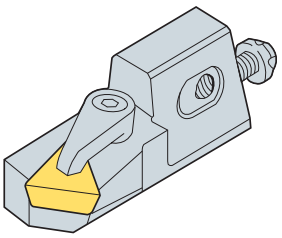
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTFPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

CTSPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTSPR/L	10CA-11	40	15	11	44	14	10	8	4	0	20	5	20	TP□R1103 □□
	12CA-16	50	20	15	47	20	12	8	5	0	20	6	20	1603 □□

Applicable inserts **B77~B79**

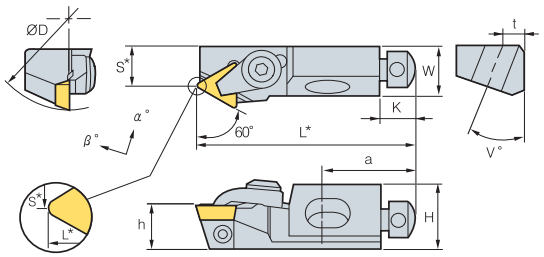
· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = ØD Min. machining Dia.

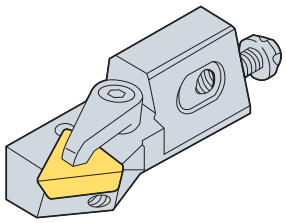
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTSPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

CTTPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTTPR/L	10CA-11	40	15	11	50	9	10	8	5	0	20	5	20	TP□R1103□□
	12CA-16	50	20	15	55	20	12	8	5	0	20	6	20	1603□□

Applicable inserts **B77~B79**

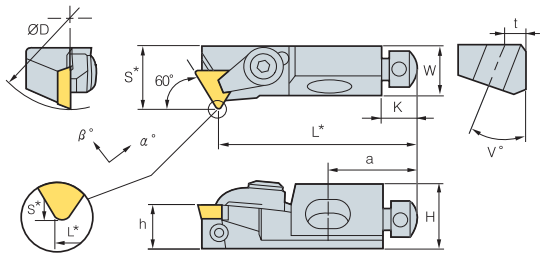
· a base Insert : r = 0.8 D = ØD Min. machining Dia.

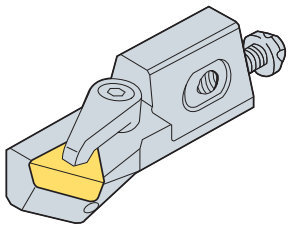
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTTPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

CTWPR/L



TP□R





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
CTWPR/L	10CA-11	40	15	11	44	14	10	8	5	0	20	5	20	TP□R1103 □□
	12CA-16	50	20	15	47	20	12	8	5	0	20	6	20	1603 □□

Applicable inserts **B77~B79**

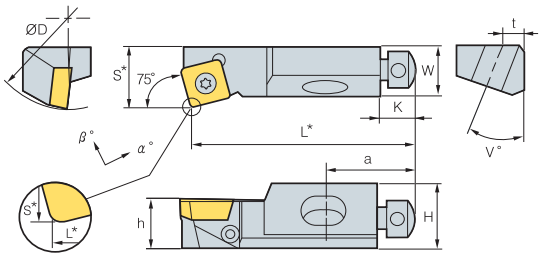
· a base Insert : r = 0.8 D = ØD Min. machining Dia.

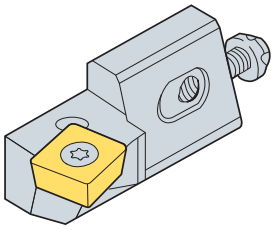
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	MountingScrew	Washer	Wrench	Wrench
CTWPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW30L	HW20L

SSKCR/L



SC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
SSKCR/L	10CA-09	40	15	11	50	14	10	8	0	-4	20	5	20	SC□□09T3□□
	12CA-12	50	20	15	55	20	12	8	0	-4	20	6	20	SC□□1204□□

Applicable inserts **B70~B71, B90**

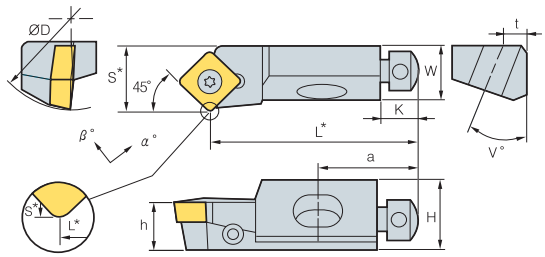
· a base Insert : r = 0.8 D = ØD Min. machining Dia.

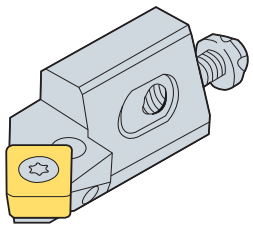
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
SSKCR/L	10CA-09	FTGA03508	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	FTGA0411F	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

SSSCR/L



SC□□





• R type insert

(mm)

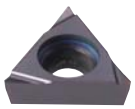
Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
SSSCR/L	10CA-09	40	15	11	44	14	10	8	-5	0	20	5	20	SC□□09T3□□
	12CA-12	50	20	15	47	20	12	8	-5	0	20	6	20	SC□□1204□□

Applicable inserts **B70~B71, B90**

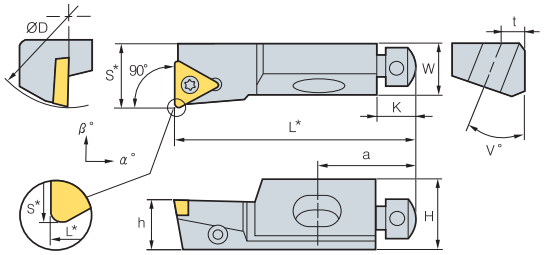
· a base Insert : r = 0.8 D = ØD Min. machining Dia.

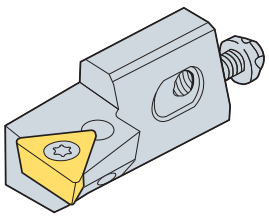
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
SSSCR/L	10CA-09	FTGA03508	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-12	FTGA0411F	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

STFCR/L



TC□□





• R type insert

(mm)

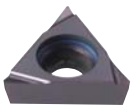
Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STFCR/L	10CA-11	40	15	11	50	14	10	8	0	-3	20	5	20	TC□□1102□□
	12CA-16	50	20	15	55	20	12	8	0	-3	20	6	20	TC□□16T3□□

Applicable inserts **B75~B76, B91**

· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STFCR/L	10CA-11	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

STTCR/L



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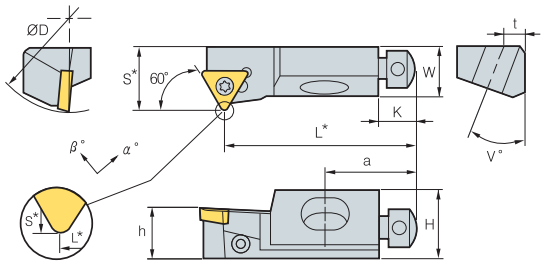
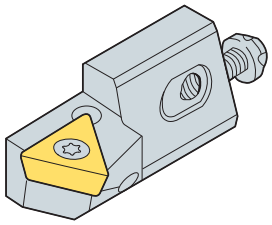




• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STTCR/L	10CA-11	40	15	11	50	9	10	8	-5	0	20	5	20	TC□□1102□□ TC□□16T3□□
	12CA-16	50	20	15	47	20	12	8	-3	0	20	6	20	

Applicable inserts **B75~B76, B91**

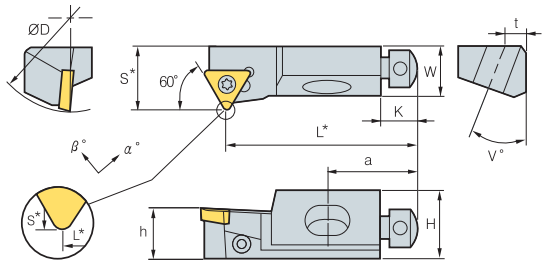
· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

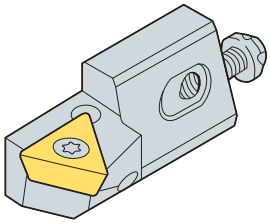
Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STTCR/L	10CA-11	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 07P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

STWCR/L



TC□□





• R type insert

(mm)

Designation		ØD	H	W	L*	S*	h	K	α°	β°	a	t	v°	Insert
STWCR/L	10CA-11	40	15	11	44	14	10	8	0	-4	20	5	20	TC□□1102□□ TC□□16T3□□
	12CA-16	50	20	15	47	20	12	8	-5	0	20	6	20	

Applicable inserts **B75~B76, B91**

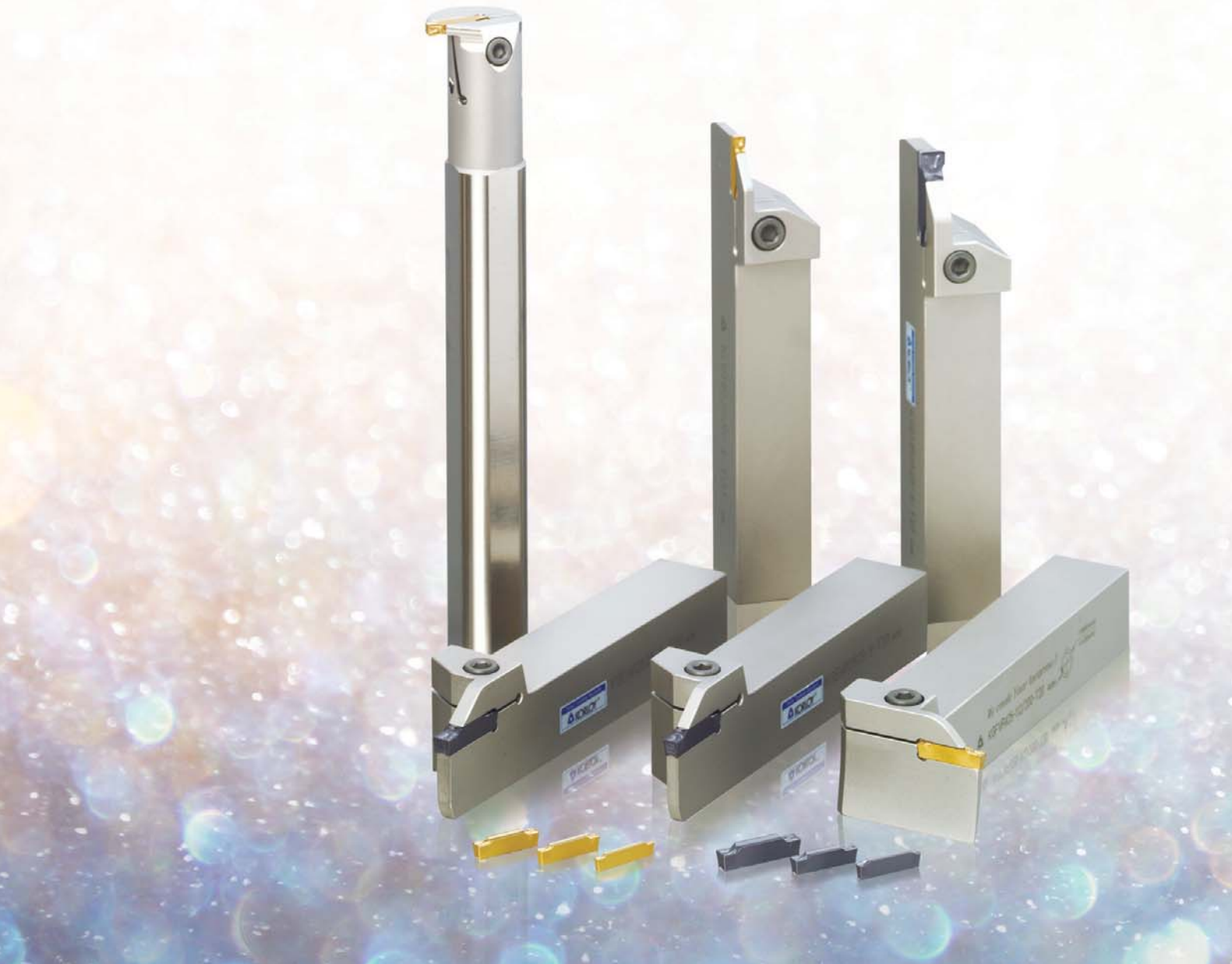
· a base Insert : r = 0.4 (l =11) r = 0.8 (l = 16) D = Min. machining Dia.

Parts		Screw	Axial Adjust Screw	Radial AdjustScrew	MountingScrew	Washer	Wrench	Wrench
STWCR/L	10CA-11	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

C

MULTI-FUNCTIONAL TOOLS

Korloy Multi-functional tools can be used for machining in grooving, parting-off, facing and forming applications. Its design ensures superior machinability and productivity.



Application Example

C02 Application Example
C04 Technical Information for Multi-Functional Tools Series

KGT

C07 Technical Information for KGT
C12 Available Insert for KGT
C14 KGT Holder
C23 KGT Blade for Parting off

MGT

C24 Technical Information for MGT
C26 Available Insert for MGT
C28 MGT Holder
C33 MGT Holder (Face Grooving)
C36 MGT Cartridge

MGT Aluminum Wheel Series

C39 Technical Information for MGT Aluminum Wheel
C40 Available Insert for MGT Aluminum Wheel
C41 MGT Aluminum Wheel

TB/TB-M

C43 Technical Information for TB/TB-M
C47 Available Insert for TB/TB-M
C50 TB/TB-M Holder

Saw-man

C51 Technical Information for Saw-man
C52 Saw-man

Fine Tools

C54 Technical Information for Fine Tools
C55 Available Insert for Fine Tools
C56 Fine Tools Holder

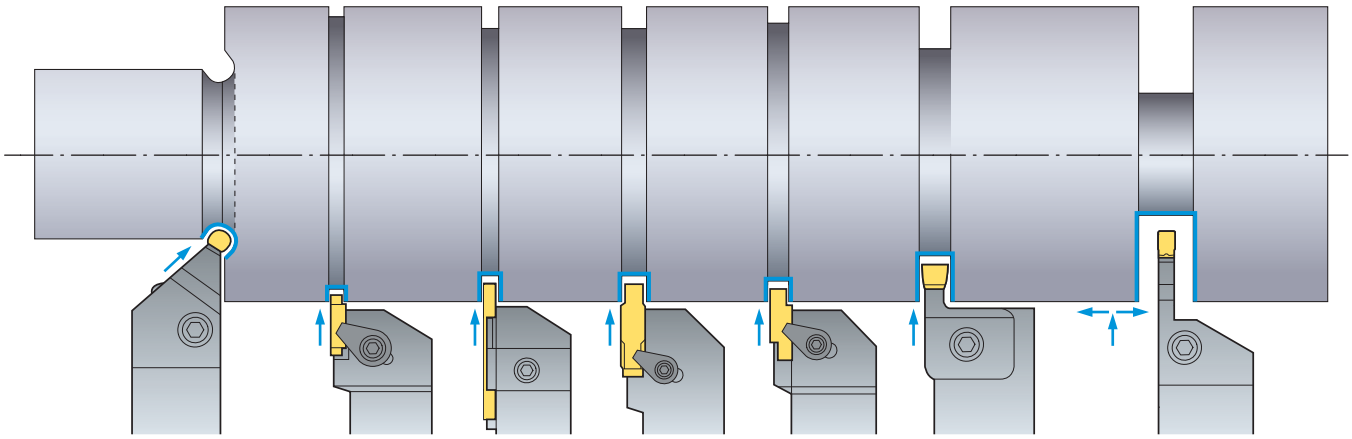
Grooving / Parting off

C57 IGH
C57 DBH
C58 GFT
C58 GFIP
C59 GH
C59 GFIK
C60 EH
C60 PH

Special Order Form

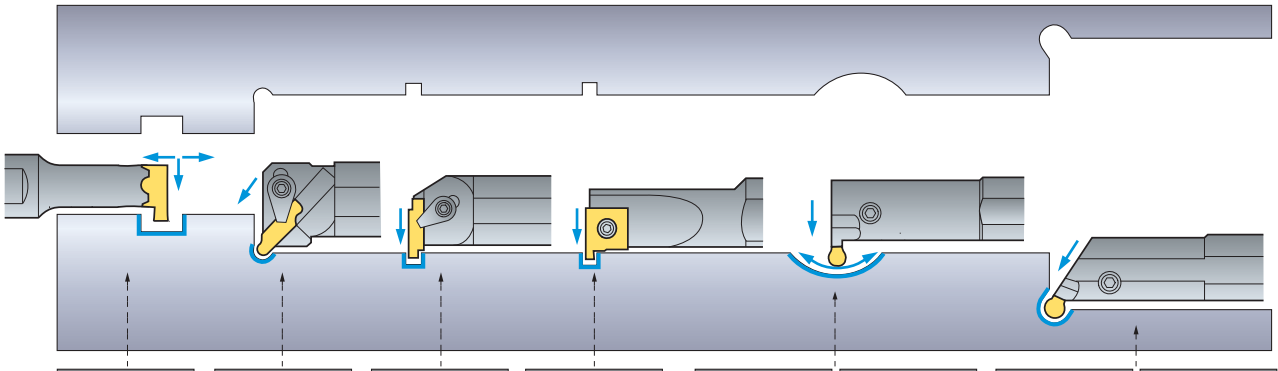
C61 MGT Special Order Form for MGT
C62 Special Order Form for V-Pulley Insert

For external machining



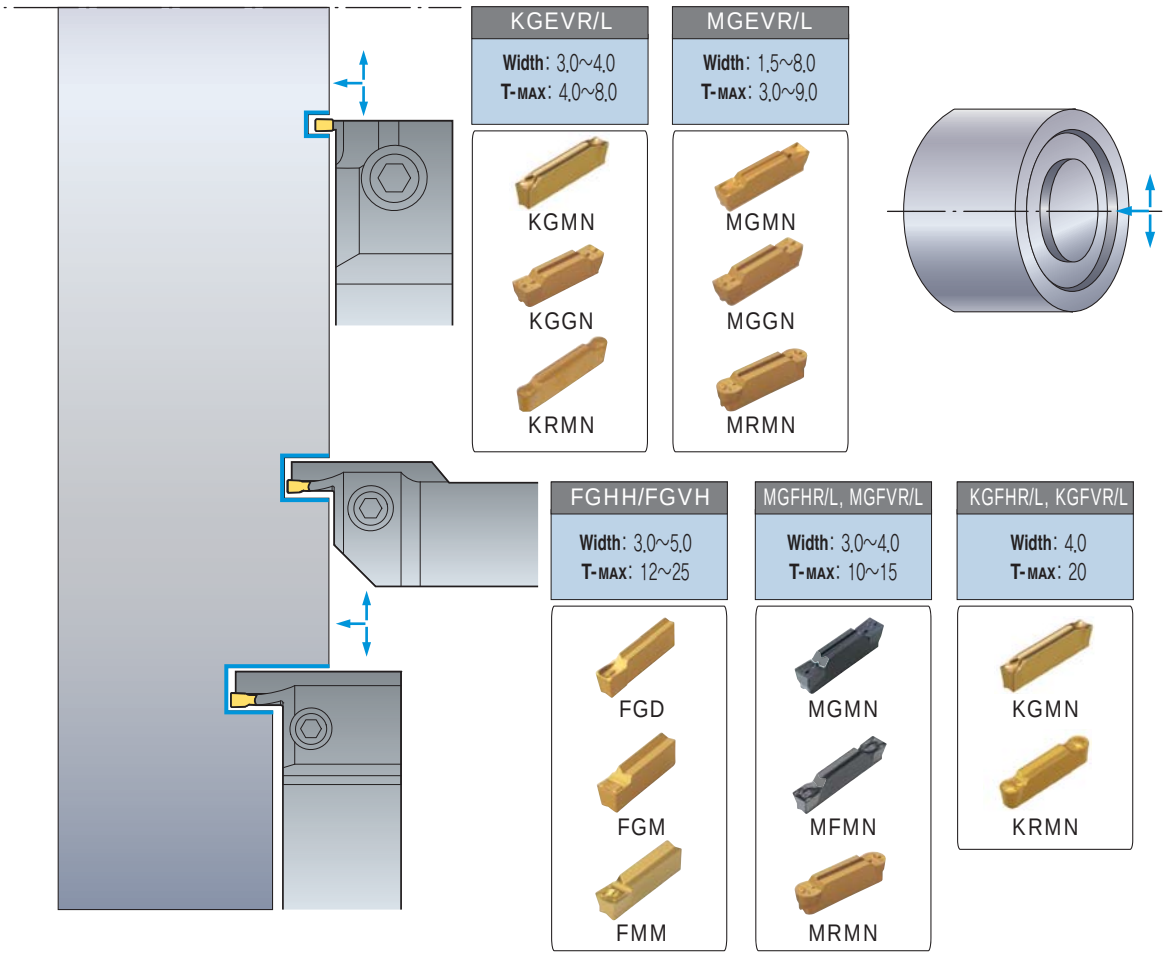
KGEUR/L	MGEUR/L	TBH	PH	GH	GFT	DBH	KGEHR/L	MGEHR/L
Width: 2.5 T-MAX: 3.0	Width: 3.0~8.0 T-MAX: 3.0~5.0	Width: 1.25~4.5 T-MAX: 1.5~5.0	Width: 3.0~5.0 ØD-MAX: 30~50	Width: 1.23~4.28 T-MAX: .5~4.0	Width: 1.1~8.0 T-MAX: 2.1~9.0	Width: 3.0~8.0 T-MAX: 14	Width: 2.0~8.0 T-MAX: 17~20	Width: 1.5~8.0 T-MAX: 10~28
KRMN	MRMN	TB TB-M	POB	GO GS	GW BF	DC DB	KGMN KRMN KGGN KRGN	MGMN MRMN MGGN MRGN

For internal machining

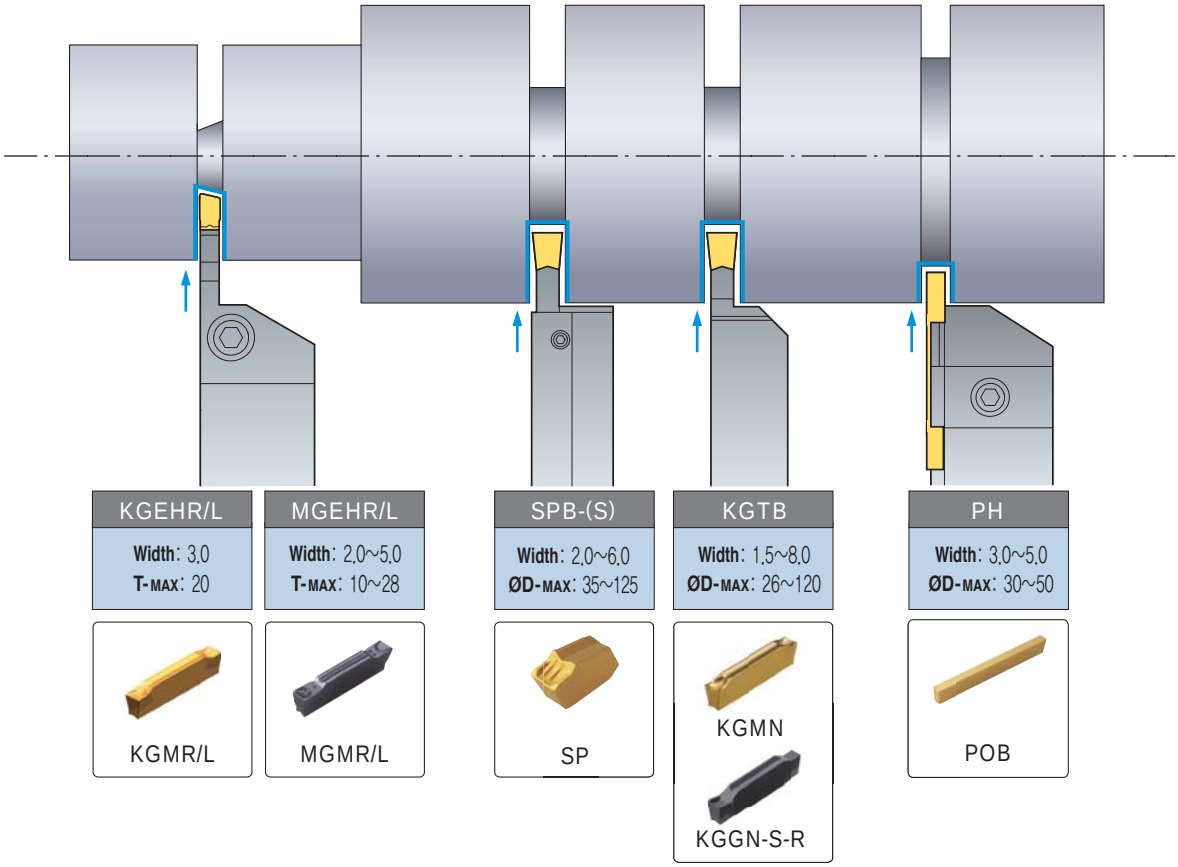


NFTIH	GFIK	GFIP	IGH	KGIVR/L	MGIVR/L	KGIUR/L	MGIUR/L
Width: 0.75~4.02 T-MAX: 1.3~4.6	Width: 2.0~8.0 T-MAX: 2.0~8.0	Width: 1.1~8.0 T-MAX: 2.1~9.0	Width: 1.25~2.8 T-MAX: 1.5~2.3	Width: 2.0~4.0 T-MAX: 7.0~8.0	Width: 1.5~8.0 T-MAX: 4.0~10	Width: 3.0 T-MAX: 3.0	Width: 3.0~8.0 T-MAX: 3.5~6.5
NFTG NFTF NFTT	GR	GW BF	IG	KGMI KRMN	MGMN MRMN MGGN MRGN	KRMN	MRMN

For face grooving

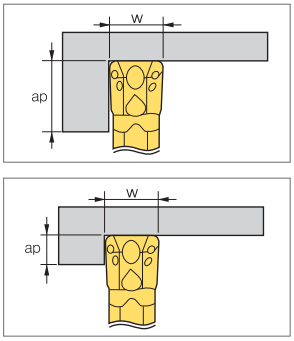


For parting off



Turning and Grooving

Selection of insert



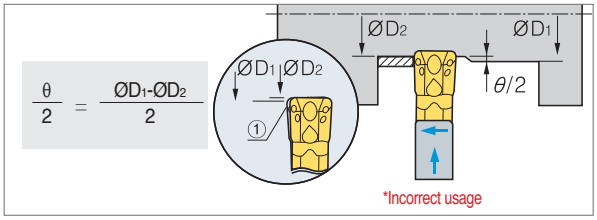
- Feed rate
  - Decide maximum feed rate after considering the insert's characteristics and machine capabilities (Fmax = W x 0.075)
  - Max feed rate should not be larger than the corner radius of the insert
  - In grooving applications, chip evacuation problems can be remedied by using step feed methods at small intervals
- Depth of cut
  - The minimum depth of cut should be bigger than corner radius of insert
  - When deciding on the max depth of cut please consider the machine's cutting load
  - Depending on the shape of the insert, deflection of work piece and clearance angle can be changed

Notice for turning

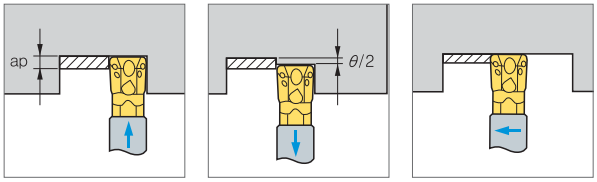
- KGT/MGT tools are designed to incur side cutting force from its clearance angle; this feature gives you advantage over a standard ISO insert
- The standard MGT insert also provides a "wiper" effect to improve surface roughness

Notice for finishing (offset need final quality)

- After desired diameter is grooved, continuous turning operation might cause some deflection of the workpiece. In these cases follow the given formula, offsetting these factors enables the desired diameter that you want

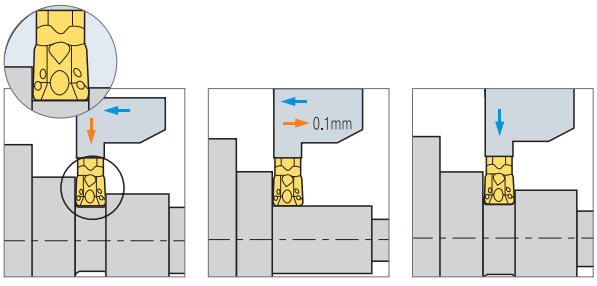


- To eliminate the difference in the machined diameter by utilizing the clearance angle (which is commonly generated during the final turning operation) follow the directions above when machining
  To obtain a good surface roughness without offsetting in an application follows the directions below
  1) Groove to the desired diameter
  2) Pull the tool backs a total distance of θ/2
  3) Continue the external turning operation to desired diameter

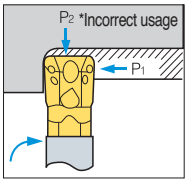


Notice for MGT turning applications

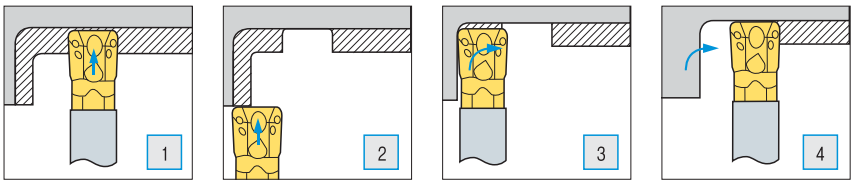
- KGT/MGT tools are available for grooving and turning as a multifunctional tool. When using a M.G.T tool keep in mind that the tool imitates a standard ISO turning application. The application uses a positive clearance angle where a tool's cutting force and depth of cut are all applied in an application. This might create normal wear on the insert, after turning, a grooving process might not meet the desired diameter on the work piece. To off set this, adjust the tool 0.004 inches and return to the original position of the grooving application



Machining workpiece with a radius bigger than the insert's corner radius

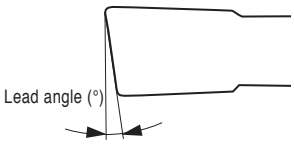
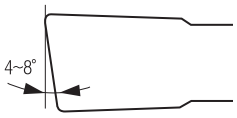
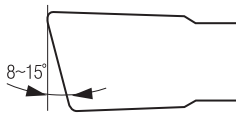


Stabilize your tool pressure. KGT/MGT tools create a cutting load when machining a workpiece with a radius larger than the corner radius of insert (shown in the picture). The unequal cutting force might initially break the insert or holder



Parting off & Grooving

Insert

Lead angle applications	Lead angle 0° (Neutral)	Lead angle 4°~ 8°	Lead angle 8°~15°
			
• 4°- Pipe (Tubing and hollow bar) • 6°- Pipe and solid bar • 8°- Solid bar • 15°- Small diameter Solid bar	• Parting off on solid bar type • Occurring the center stub when parting off • Prevent to be deflected workpiece by cutting direction during parting off • Available for use deep parting depth	• Reduce the center stub when parting off on solid bar type • Reduce the burr when parting off on tubing or hollow bar type	• Parting off on small diameter and hollow bar type • Reduce the burr and center stub when parting off on small diameter solid bar type

※ Available Inserts: MGMR/L□□□ – □□ – LP/RP, KGMR/L□□□ – □□ – PS/PT
(Lead angle) (Lead angle)

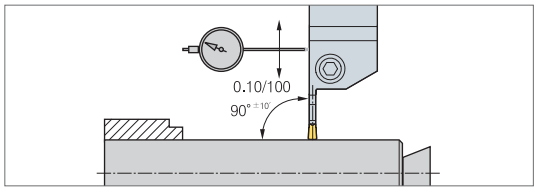
Selection of Insert



- To properly match the insert and cutting condition, the following factors should be considered
  - Width of insert • Chip breaker • Grade and nose R
- The relationship between the cutting width and cutting depth
  - Neutral type, inserts with a 0-degree lead angle are best when used an applications maximum depth of cut
  - In general alloy steel, the maximum depth of cut = W x 0.8
- Insert with lead angle
  - To reduce burrs, we recommend using insert with a lead angle.
  - Insert that have larger lead angles reduce burrs but will also decreases tool life
  - In the case where burrs are acceptable, we recommend using a neutral type insert

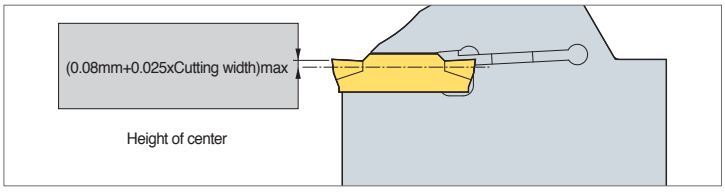
Setting of holders

- The cutting position should be exactly mounted on machined axis in order to create a perpendicular direction or 90 to minimize vibration



Setting of parting off

- The edge height of an insert should be set within ±0.1mm based on the center line
  - Parting off should be done as close to the chuck as possible to minimize vibration



Notice

- Keep a consistent cutting speed and feed
- Use proper amounts of coolant for better performance
- Properly clean the insert pocket before mounting insert

Usage

- If insert is worn, immediately replace with a new insert. This is to prevent the damage on the workpiece
- If the holder seat is worn or damaged replace with a new one immediately for stable clamping
- Do not grind or regrind the holder seat

Selection of chip breaker

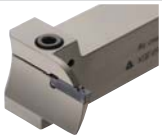
- Our chip breakers are designed to narrow chips during grooving operations. Narrow chips usually offer the following advantages
- Decreases friction between chips and the workpiece. This usually gives a better surface roughness finish
- With better chip flow, a machinist is able to increase feed rates due to a reduced cutting load

Face grooving tools

For shallow grooving

- Economical tools utilizing a double ended cutting edge system
- Newly designed chip breakers that help ensure chip control for various face grooving applications
- Korloy face grooving tools provide various holder line-ups to give you more options and benefits

MFMN300	MGMN400	Horizontal MGFHR	Vertical MGFVR
			
Cutting Width 3mm	Cutting Width 4mm	Machining Dia. Ø24~200mm	Machining Dia. Ø24~60mm

KGMN300~600	Horizontal KGFHR	Vertical KGFVR
		
Cutting Width 3~6mm	Machining Dia. Ø34~220mm	Machining Dia. Ø44~200mm

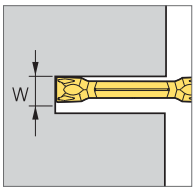
For deep grooving

- These tools are suitable for deep grooving with a single cutting edge (Tmax 25mm)
- A variety of chip breakers enable a machinist to apply a wide range of functions in machining
- A variety of holders ensures multiple application ranges

FGD	FGM	FMM	Horizontal FGHH	Vertical FGVH
				
Deep face grooving (G class)	Wide face grooving turning (G class)	Wide face grooving turning (M class)	Machining Dia. Ø25~140mm	Machining Dia. Ø25~140mm

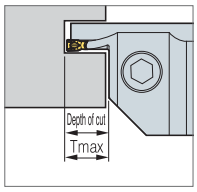
Selection system of holder

- Follow these 3 simple directions to choose the right insert and holder for your application



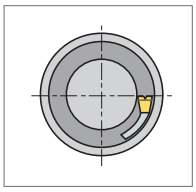
Insert and holder

Choose an insert and holder that best applies to your application according to the cutting width and part of workpiece to be machined.



Holder Tmax

Choose the holder with the shortest overhang that will still meet the cutting depth required



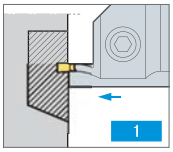
Machining Dia.

Choose the largest size of shank depending on the initial grooving diameter required in the application

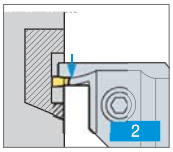
Notice: To minimize chattering, use the shortest holder according to Tmax.

Optimization of face grooving

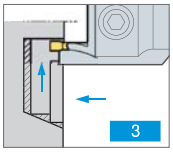
Roughing: When face grooving decreases the cutting speed 40% below a normal face turning operation



• Grooving at the initial diameter

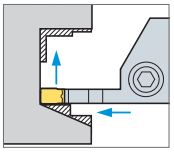


• Face turning away from center

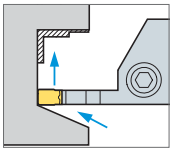


• Face turning to center

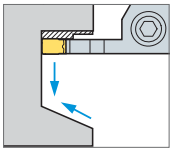
Finishing: When face grooving decreases the cutting speed 40% below a normal face turning operation



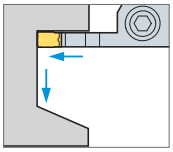
• Grooving at the initial diameter to the final cutting depth and face turning away from center



• Radius operation toward final dimension at the bottom



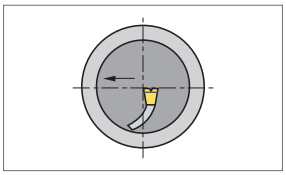
• Face turning to center



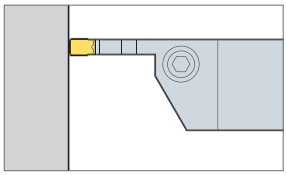
• Grooving for the right dimension you want

Notice for face grooving

- Before machining, check and adjust the following holder position



- Check the cutting edge height at the center of the workpiece
- Machine towards the center and check for burrs



- For better surface roughness, set up the insert in order to perpendicular at center line

Multi-functional machining with strong clamping system and new technology

KGT

- Double-sided inserts of KGT reduces machining cost
- Strong clamping system ensures stable and accurate machining
- New grade and new technology provide superior tool life
- Various tooling solutions of the KGT improve productivity
- The foreside and clearance face of the KGT insert having cutting edges are optimal for grooving, parting-off, turning and facing with reducing processing time
- Three-dimensional chip breaker ensures excellent chip control in various applications
- The KGT inserts with various chip breakers are available for wide application range
- Special cutting edges are available for quotation

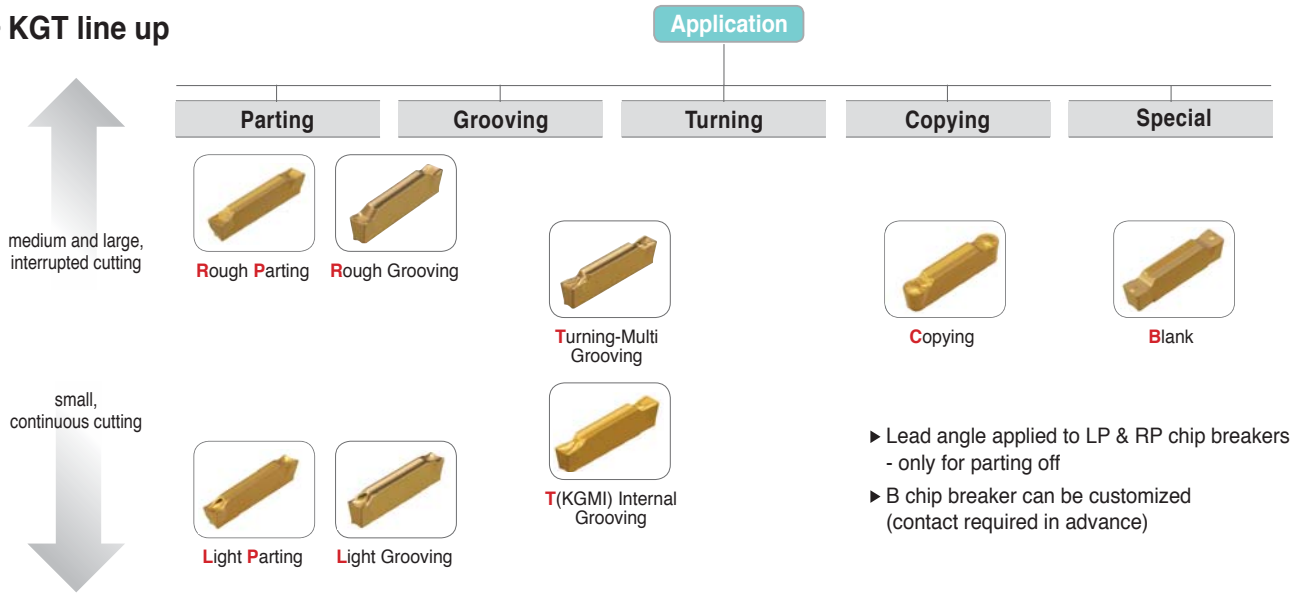
Insert code system

KG	M	N	300	-	(s)	04	-	T
KG SYSTEM (KORLOY Grooving)	Tolerance M class G class	Hand N: Neutral R: Right L: Left I: Internal	Width of cutting edge 2.0~8.0 mm		1 corner	Nose Radius 0.2 mm 0.3 mm 0.4 mm 0.8 mm		Chip Breaker L/R/T/C /LP/RP/B/A

Holder code system

KG	E	H	R/L	2525	-	3	T20
KG SYSTEM (KORLOY Grooving)	Working Style E: External Process I: Internal Process F: Facing Process	Holder Style H: Horizontal V: Vertical U: Undercut	Hand R: Right L: Left	Shank standard Height 25 mm Width 25 mm (For Internal machining : Minimum diameter for machining)		Cutting Width 2.0~8.0 mm	Maximum Depth 8~36 mm

KGT line up



- ▸ Lead angle applied to LP & RP chip breakers - only for parting off
- ▸ B chip breaker can be customized (contact required in advance)

Recommended insert

Designation	Geometry	Picture	Application									
			For external machining			For face grooving		For Internal machining		Copying	For reliefing	Special machining
			Parting	Grooving	Turning	Grooving	Turning	Grooving	Turning	Copying	Reliefing	Special
KGMN	L Light Grooving		○	◎		○						
	R Rough Grooving		○	◎		○						
	T Turning-Multi Grooving		○	◎	◎	◎	◎					
KGMI	T Internal Grooving							◎	◎			
KRMN	C Copying									◎	◎	
KGMR/L	LP Light Parting		◎									
	RP Rough Parting		◎									
KGGN	B Blank			○								◎
	A Aluminum Grooving		○	◎	○							
KRGN	A Aluminum Profiling									◎	◎	

◎ First choice, ○ Second choice

Features

Front View

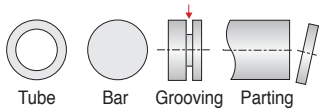


- Strong clamping ➜ Higher machining reliability
- Self-centering ➜ Higher accuracy
- Anti-chattering design ➜ Fine surface finish

C/B guide

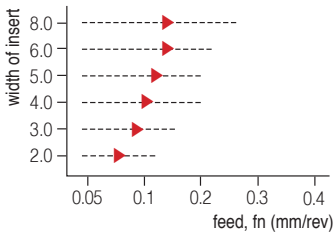
L For Light Grooving



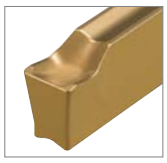


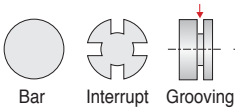
- Sharp cutting edge
- Low feed machining
- Small diameter component

- Low carbon steel
- Alloy steel
- Stainless



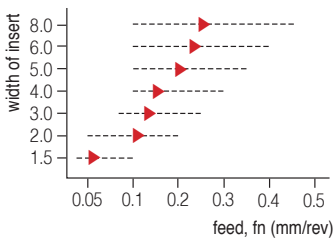
R For Rough Grooving



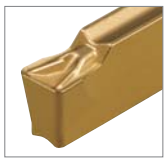


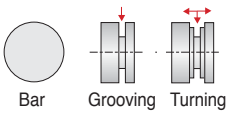
- Strong cutting edge
- High feed machining
- Interrupted cutting

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



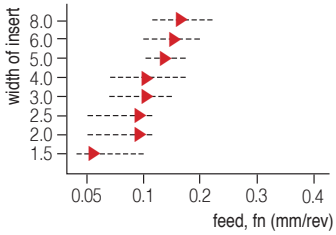
T For Turning and Multi Grooving



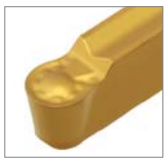


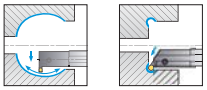
- Sharp cutting edge
- Improved chip control
- Turning & grooving machining

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



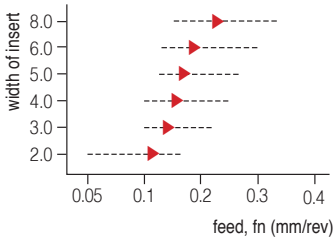
C For Copying and Relief



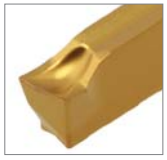


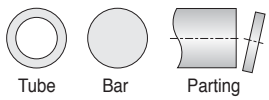
- Improved chip control
- Copying
- Relief

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



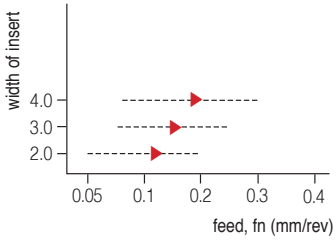
LP For Light Parting



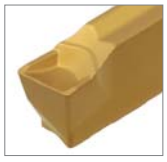


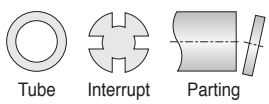
- Sharp cutting edge
- Low feed machining
- Small diameter component
- Right/left handed

- Low carbon steel
- Carbon steel
- Alloy steel
- Stainless



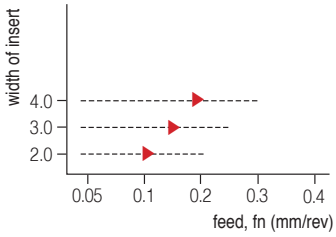
RP For Rough Parting





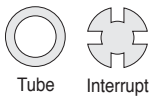
- Strong cutting edge
- High feed machining
- Interrupted cutting
- Right/left handed

- Carbon steel
- Alloy steel
- Cast iron



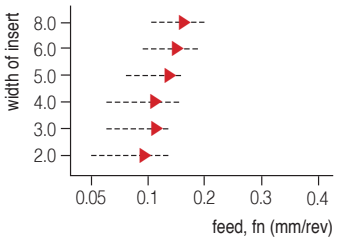
B For Precision Grooving





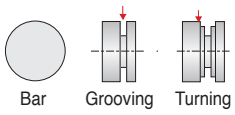
- Ground insert
- Precise tolerance
- Various cutting edge length, Nose R

- Carbon steel
- Alloy steel
- Stainless
- Cast iron



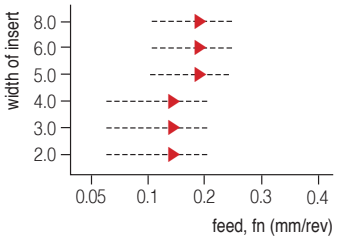
A For Aluminum Grooving





- Sharp cutting edge
- Precise tolerance

- Aluminum alloy
- Copper alloy



Grades for recommended application range

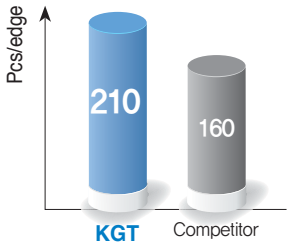
Workpiece		Grade	Order of recommended grade	Recommended cutting speed (m/min) 50 100 150 200 800
P	Steel	PC5300	1	70 – 120
		NC3225	2	130 – 220
		NC5330	3	120 – 200
	Alloy Steel	PC5300	1	60 – 105
		NC3225	2	130 – 200
		NC5330	3	90 – 180
M	Stainless steel	PC5300	1	70 – 120
		PC9030	2	70 – 115
		NC5330	3	75 – 125
K	Cast iron	PC5300	1	55 – 90
		NC5330	2	95 – 160
N	Non-ferrous metal	H01	1	200 – 790
S	HRSA	PC5300	1	20 – 35

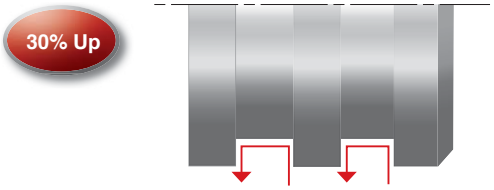
Application examples

Multi-function machining — Turning + Grooving repetition

Optimized geometry for turning + grooving - High efficiency.

- **Workpiece** SM45C
- **Cutting condition** vc = 170 (m/min), fn = 0.15 (mm/rev), ap = 2 mm, W = 3 mm, wet
- **Designation** KGMN300-04-T (PC5300)

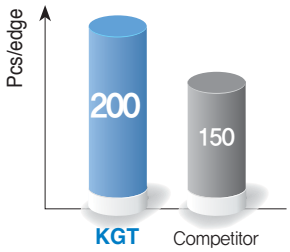


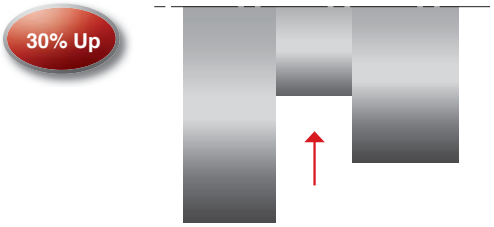


Grooving — Shoulder Grooving

Tough geometry for interrupted and deep grooving.

- **Workpiece** X5CrNI18-9
- **Cutting condition** vc = 120 (m/min), fn = 0.12 (mm/rev), ap = 5 mm, W = 4 mm, wet
- **Designation** KGMN400-03-R (PC5300)

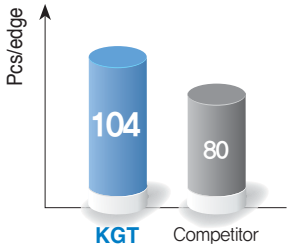


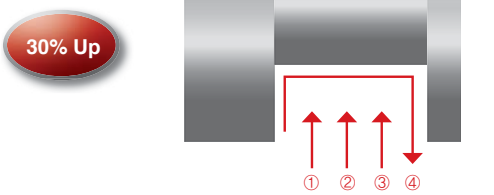


Shaft machining — Grooving (Roughing) & Turning (Finishing)

Excellent chip control for higher efficiency.

- **Workpiece** 42CrM04
- **Cutting condition** vc = 150 (m/min), fn = 0.15 (mm/rev), ap = 5 mm, W = 3 mm x 3, wet
- **Designation** KGMN300-04-T (PC5300)

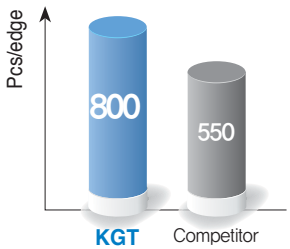


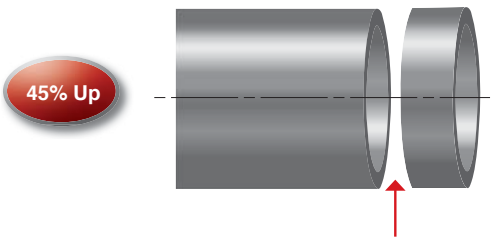


Parting off — Pipe Parting-off

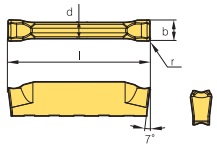
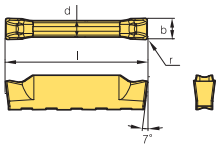
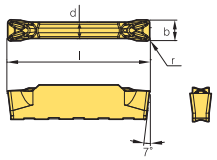
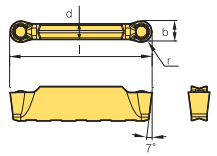
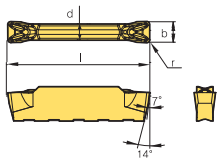
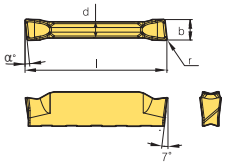
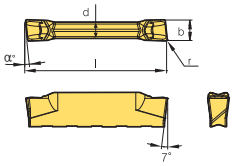
Exclusive parting-off chip breaker for longer tool life. / Sharp geometry for less burr.

- **Workpiece** X5CrNi18-9
- **Cutting condition** vc = 140 (m/min), fn = 0.15 (mm/rev), ap = 2 mm, W = 3 mm, wet
- **Designation** KGMR300-6D-LP (PC5300)



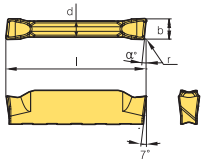
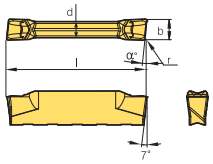
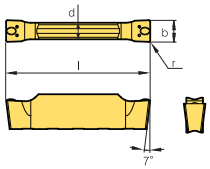
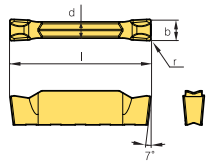
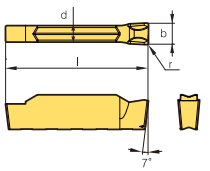
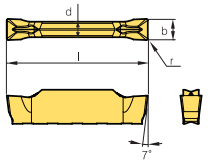
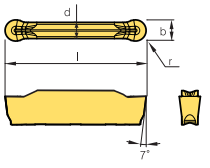


Insert

Application	Picture	Designation		Coated					Dimensions (mm)					Configuration	Page
				NC3215	NC3225	NC5330	PC5300	PC9030	b	r	l	d	α°		
Grooving	KGMN-L	KGMN	200-02-L		●	●	●	●	2.0	0.2	20	1.7	-		C14~20 C22
			300-02-L		●	●	●	●	3.0	0.2	20	2.3	-		
			400-02-L		●	●	●	●	4.0	0.2	20	3.3	-		
			500-03-L		●	●	●		5.0	0.3	25	4.1	-		
			600-03-L		●	●	●		6.0	0.3	25	5.1	-		
Grooving · Parting off	KGMN-R	KGMN	150-015-R		●	●	●		1.5	0.15	16	1.2	-		C14~20 C22
			200-02-R		●	●	●	●	2.0	0.2	20	1.7	-		
			300-02-R		●	●	●	●	3.0	0.2	20	2.3	-		
			400-03-R		●	●	●	●	4.0	0.3	20	3.3	-		
			500-03-R			●	●		5.0	0.3	25	4.1	-		
			600-03-R			●	●		6.0	0.3	25	5.1	-		
			800-04-R			●	●		8.0	0.4	30	6.1	-		
Grooving · Turning	KGMN-T	KGMN	150-015-T		●	●	●		1.5	0.15	16	1.2			C14~20 C22
			200-02-T		●	●	●	●	2.0	0.2	20	1.7	-		
			250-02-T		●	●	●		2.5	0.2	20	2.0			
			300-02-T		●	●	●	●	3.0	0.2	20	2.3	-		
			300-04-T		●	●	●	●	3.0	0.4	20	2.3	-		
			400-04-T		●	●	●	●	4.0	0.4	20	3.3	-		
			400-08-T		●	●	●	●	4.0	0.8	20	3.3	-		
			500-04-T		●	●	●	●	5.0	0.4	25	4.1	-		
			500-08-T		●	●	●	●	5.0	0.8	25	4.1	-		
			600-04-T		●	●	●	●	6.0	0.4	25	5.1	-		
			600-08-T		●	●	●		6.0	0.8	25	5.1	-		
			800-08-T		●		●		8.0	0.8	30	6.1	-		
Profiling	KRMN-C	KRMN	200-C		●	●	●		2.0	1.0	20	1.7	-		C14~21
			300-C		●	●	●		3.0	1.5	20	2.2	-		
			400-C		●	●	●		4.0	2.0	20	3.2	-		
			500-C		●	●	●		5.0	2.5	25	4.0	-		
			600-C		●	●	●		6.0	3.0	25	5.0	-		
			800-C		●	●	●		8.0	4.0	30	6.0	-		
Grooving · Internal	KGMI-T	KGMI	200-02-T				●		2.0	0.2	20	1.7	-		C22
			300-04-T				●		3.0	0.4	20	2.3	-		
			400-04-T				●		4.0	0.4	20	3.3	-		
Parting off (Right handed)	KGMR-LP	KGMR	200-6D-LP			●	●		2.0	0.2	20	1.7	6		C14 C16
			200-8D-LP						2.0	0.2	20	1.7	8		
			200-15D-LP			●	●		2.0	0.2	20	1.7	15		
			300-6D-LP			●	●		3.0	0.2	20	2.3	6		
			300-15D-LP			●	●		3.0	0.2	20	2.3	15		
			400-4D-LP			●	●		4.0	0.3	20	3.3	4		
			400-15D-LP			●	●		4.0	0.3	20	3.3	15		
			500-4D-LP						5.0	0.3	25	4.1	4		
Parting off (Right handed)	KGMR-RP	KGMR	200-6D-RP			●	●		2.0	0.2	20	1.7	6		C14 C16
			200-8D-RP						2.0	0.2	20	1.7	8		
			200-15D-RP			●	●		2.0	0.2	20	1.7	15		
			300-6D-RP			●	●		3.0	0.2	20	2.3	6		
			300-15D-RP			●	●		3.0	0.2	20	2.3	15		
			400-4D-RP			●	●		4.0	0.3	20	3.3	4		
			400-15D-RP			●	●		4.0	0.3	20	3.3	15		
			500-4D-RP						5.0	0.3	25	4.1	4		

● : Stock item

Insert

Application	Picture	Designation		Coated				Uncoated		Dimensions (mm)					Configuration	Page
				NC3215	NC5330	PC5300	PC9030	H01	H05	b	r	l	d	α°		
Parting off (Left handed)	KGML-LP	KGML	200-6D-LP							2.0	0.2	20	1.7	6		C14 C16
			200-15D-LP							2.0	0.2	20	1.7	15		
			300-6D-LP							3.0	0.2	20	2.3	6		
			300-15D-LP							3.0	0.2	20	2.3	15		
			400-4D-LP							4.0	0.2	20	3.3	4		
			400-15D-LP							4.0	0.2	20	3.3	15		
Parting off (Left handed)	KGML-RP	KGML	200-6D-RP							2.0	0.2	20	1.7	6		C14 C16
			200-15D-RP							2.0	0.2	20	1.7	15		
			300-6D-RP							3.0	0.2	20	2.3	6		
			300-15D-RP							3.0	0.2	20	2.3	15		
			400-4D-RP							4.0	0.2	20	3.3	4		
			400-15D-RP							4.0	0.2	20	3.3	15		
Grooving(Ground insert)	KGGN-B	KGGN	265-015-B							2.65	0.15	20	2.3	-		C14 C16 C17
			300-020-B							3.0	0.20	20	2.3	-		
			300-040-B							3.0	0.40	20	2.3	-		
			315-015-B							3.15	0.15	20	2.3	-		
			400-040-B							4.0	0.40	20	3.3	-		
			400-080-B							4.0	0.80	20	3.3	-		
			415-015-B							4.15	0.15	20	3.3	-		
			478-055-B							4.78	0.55	20	3.3	-		
			500-080-B							5.0	0.80	25	4.1	-		
			515-015-B							5.15	0.15	25	4.1	-		
			600-080-B							6.0	0.80	25	5.1	-		
			600-120-B							6.0	1.20	25	5.1	-		
			800-080-B							8.0	0.80	30	6.1	-		
			800-120-B							8.0	1.20	30	6.1	-		
Grooving · Parting off (Ground insert)	new KGGN-R	KGGN	200-02-R							2.0	0.2	20	1.7	-		C14~20
			300-02-R							3.0	0.2	20	2.3	-		
			400-03-R							4.0	0.3	20	3.3	-		
			500-03-R							5.0	0.3	25	4.1	-		
			600-03-R							6.0	0.3	25	5.1	-		
			800-04-R							8.0	0.4	30	6.1	-		
Grooving · Parting off (Single insert)	new KGGN-R	KGGN	200S-02-R			●				2.0	0.2	19.9	1.7	-		C23
			300S-02-R			●				3.0	0.2	19.9	2.3	-		
			400S-03-R			●				4.0	0.3	19.9	3.3	-		
			500S-03-R			●				5.0	0.3	24.9	4.1	-		
			600S-03-R			●				6.0	0.3	24.9	5.1	-		
			800S-04-R			●				8.0	0.4	24.9	6.1	-		
Aluminum Grooving	new KGGN-A	KGGN	200-02-A					●		2.0	0.2	20	1.7	-		C14~20
			300-02-A					●		3.0	0.2	20	2.3	-		
			400-04-A					●		4.0	0.4	20	3.3	-		
			500-04-A					●		5.0	0.4	25	4.1	-		
			600-04-A					●		6.0	0.4	25	5.1	-		
Aluminum Profiling	new KRGN-A	KRGN	300-A					●		3.0	1.5	20	2.3	-		C14~19
			400-A					●		4.0	2.0	20	3.3	-		
			500-A					●		5.0	2.5	25	4.1	-		
			600-A					●		6.0	3.0	25	5.1	-		
			800-A					●		8.0	4.0	30	6.1	-		

• Chip breaker 'B' : User self-grind type.

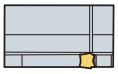
● : Stock item

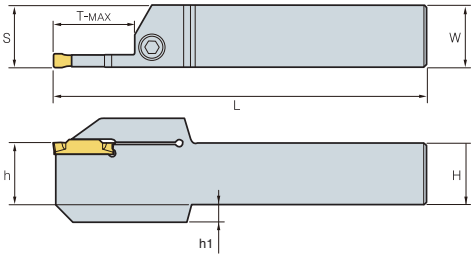
KGEHR/L

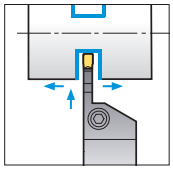
For Grooving, Turning, Parting off, Reliefing machining



KGGN KGMN
KGMR/L KRMN
KRGN







• R type insert

(mm)

Designation		H = (h)	W	L	S	h1	T-MAX	Inserts	Screw	Wrench
KGEHR/L	1616-1.5-T14	16	16	100	16.2	-	14	KGMN150-□-□	MHA0512	HW40L
	2020-1.5-T14	20	20	125	20.2	-	14			
	2525-1.5-T14	25	25	150	25.2	-	14			
	1212-2-T08	12	12	100	12.2	-	8	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	MHA0512	HW40L
	1616-2-T08	16	16	100	16.2	-	8			
	2020-2-T08	20	20	125	20.2	-	8			
	2525-2-T08	25	25	150	25.2	-	8			
	1616-2-T12	16	16	100	16.2	-	12			
	2020-2-T12	20	20	125	20.2	-	12			
	2525-2-T12	25	25	150	25.2	-	12			
	1616-2-T17	16	16	100	16.2	-	17			
	2020-2-T17	20	20	125	20.2	-	17			
	2525-2-T17	25	25	150	25.2	-	17			
	1616-2.5-T17	16	16	100	16.3	-	17	KGMN250-□-□	MHA0512	HW40L
	2020-2.5-T17	20	20	125	20.3	-	17			
	2525-2.5-T17	25	25	150	25.3	-	17			
	1616-3-T10	16	16	100	16.4	-	10	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	2020-3-T10	20	20	125	20.4	-	10			
	2525-3-T10	25	25	150	25.4	-	10			
	3232-3-T10	32	32	170	32.4	-	10			
	1616-3-T13	16	16	100	16.4	-	13			
	2020-3-T13	20	20	125	20.4	-	13			
	2525-3-T13	25	25	150	25.4	-	13			
	1616-3-T20	16	16	100	16.4	-	20			
	2020-3-T20	20	20	125	20.4	-	20			
	2525-3-T20	25	25	150	25.4	-	20			
	3232-3-T20	32	32	170	32.4	-	20			
	2525-3-T25	25	25	150	25.4	-	25			
	1616-4-T10	16	16	100	16.4	-	10	KGMN400-□-□ KGMR/L400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	2020-4-T10	20	20	125	20.4	-	10			
	2525-4-T10	25	25	150	25.4	-	10			
	3232-4-T10	32	32	150	32.4	-	10			
	1616-4-T15	16	16	100	16.4	-	15			
	2020-4-T15	20	20	125	20.4	-	15			
	2525-4-T15	25	25	150	25.4	-	15			
	1616-4-T20	16	16	100	16.4	-	20			
	2020-4-T20	20	20	125	20.4	-	20			
	2525-4-T20	25	25	150	25.4	-	20			
	3232-4-T20	32	32	170	32.4	-	20			
	1616-4-T25	16	16	100	16.4	-	25			
	2020-4-T25	20	20	125	20.4	-	25			
	2525-4-T25	25	25	150	25.4	-	25			

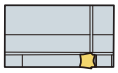
Applicable inserts C12~C13

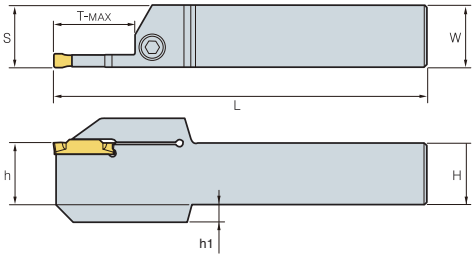
KGEHR/L

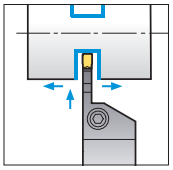
For Grooving, Turning, Parting off, Reliefing machining



KGGN KGMN
KGMR/L KRMN
KRGN







• R type insert

(mm)

Designation		H = (h)	W	L	S	h1	T-MAX	Inserts	Screw	Wrench
KGEHR/L	2020-5-T12	20	20	125	20.5	-	12	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	2525-5-T12	25	25	150	25.5	-	12			
	2020-5-T15	20	20	125	20.55	-	15			
	2525-5-T15	25	25	150	25.55	-	15			
	3232-5-T15	32	32	170	32.55	-	15			
	2020-5-T20	20	20	125	20.5	-	20			
	2525-5-T20	25	25	150	25.5	-	20			
	3232-5-T20	32	32	170	32.5	-	20		BHA0620	HW50L
	2525-5-T32	25	25	150	25.5	7	32			
	2020-6-T12	20	20	125	20.5	-	12	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	2525-6-T12	25	25	150	25.5	-	12			
	2525-6-T15	25	25	150	25.55	-	15			
	3232-6-T15	32	32	170	32.55	-	15			
	2020-6-T20	20	20	125	20.5	-	20			
	2525-6-T20	25	25	150	25.5	-	20			
	3232-6-T20	32	32	170	32.5	-	20		BHA0620	HW50L
	2525-6-T32	25	25	150	25.5	7	32			
	2525-8-T16	25	25	150	26	-	16	KGMN800-□-□ KRMN800-C KGGN800-□-□ KRGN800-□	BHA0616	HW50L
	3232-8-T16	32	32	170	33.05	-	16			
	2525-8-T25	25	25	150	26	-	25			
	3232-8-T25	32	32	170	33	-	25		BHA0620	HW50L
	2525-8-T36	25	25	150	26	7	36			
	3232-8-T36	32	32	170	33	-	36			

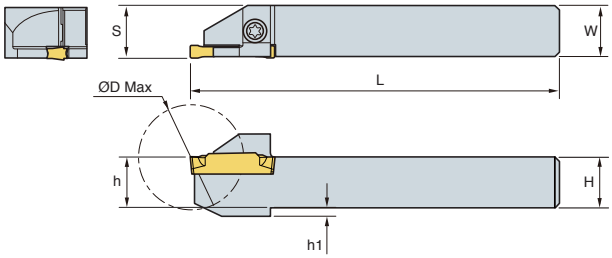
Applicable inserts **C12~C13**

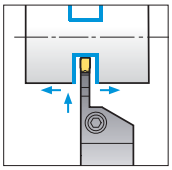
KGEHR/L-D00A (Auto Tool)

For Grooving, Turning, Parting off machining



KGGN KGMN
KGMR/L KRMN
KRGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	h1	ØD Max	Inserts	Screw	Wrench
KGEHR/L	1010-2-D20A	10	10	125	10.2	2	20	KGMN200-□-□ KGMR/L200-□-□ KRMN200-C KGGN200-□-□	ETNA0412	TW15L
	1212-2-D25A	12	12	125	12.2	2	25			
	1414-2-D25A	14	14	125	14.2	-	25			
	1616-2-D32A	16	16	125	16.2	-	32			
	1212-3-D25A	12	12	125	12.4	2	25	KGMN300-□-□ KGMR/L300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□		
	1616-3-D32A	16	16	125	16.4	-	32			

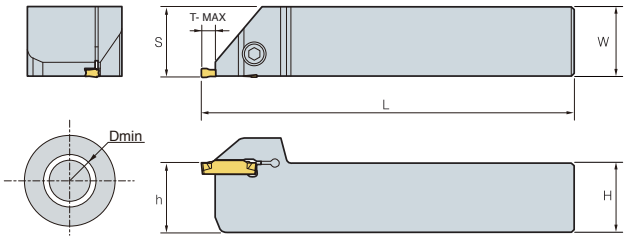
Applicable inserts C12~C13

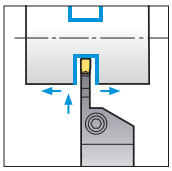
KGEHR/L-T00

For Grooving, Turning, Face grooving machining



KGMN KRMN
KGGN KRGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	ØD Min	T-MAX	Inserts	Screw	Wrench
KGEHR/L	1616-3-T00	16	16	100	16.4	80	4.8	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	2020-3-T00	20	20	125	20.4	80	4.8			
	2525-3-T00	25	25	150	25.4	80	4.8			
	1616-4-T00	16	16	100	16.4	80	4.8	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	2020-4-T00	20	20	125	20.4	80	4.8			
	2525-4-T00	25	25	150	25.4	80	4.8			
	2020-6-T00	20	20	125	20.5	80	6.0	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	2525-6-T00	25	25	150	25.5	80	6.0			

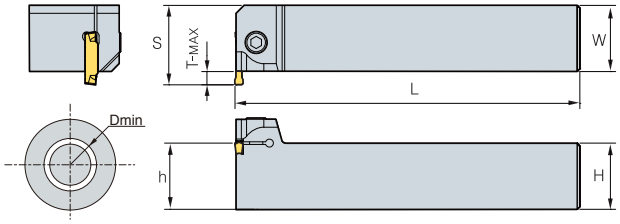
Applicable inserts C12~C13

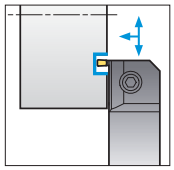
KGEVR/L-T00

For Grooving, Turning, Face grooving machining



KGMN KRMN
KRGN KGGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	ØD Min	T-MAX	Inserts	Screw	Wrench
KGEVR/L	2020-1.5 -T00	20	20	125	23.5	120	3	KGMN150-□-□	MHA0512	HW40L
	2525-1.5 -T00	25	25	150	28.5	120	3			
	3232-1.5 -T00	32	32	170	35.5	120	3			
	2020-2 -T00	20	20	125	23.5	120	3	KGMN200-□-□ KRMN200-C KGGN200-□-□-□	MHA0512	HW40L
	2525-2 -T00	25	25	150	28.5	120	3			
	3232-2 -T00	32	32	170	35.5	120	3			
	2020-2.5 -T00	20	20	125	24.5	80	4	KGMN250-□□	MHA0512	HW40L
	2525-2.5 -T00	25	25	150	29.5	80	4			
	3232-2.5 -T00	32	32	170	36.5	80	4			
	2020-3-T00	20	20	125	25	80	4.8	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	2525-3-T00	25	25	150	30	80	4.8			
	3232-3 -T00	32	32	170	37	80	4.8			
	2020-4-T00	20	20	125	25	80	4.8	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	2525-4-T00	25	25	150	30	80	4.8			
	3232-4 -T00	32	32	170	37	80	4.8			
	2020-5 -T00	20	20	125	29.5	60	6	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	2525-5 -T00	25	25	150	31.5	60	6			
	3232-5 -T00	32	32	170	38.5	60	6			
	2020-6 -T00	20	20	125	26.5	60	6	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	2525-6-T00	25	25	150	31.5	80	6			
	3232-6 -T00	32	32	170	38.5	60	6			
	2525-8 -T00	25	25	150	33.5	50	8	KGMN800-□-□ KRMN800-C KGGN800-□-□ KRGN800-□	BHA0616	HW50L
	3232-8 -T00	32	32	170	38.5	50	8			

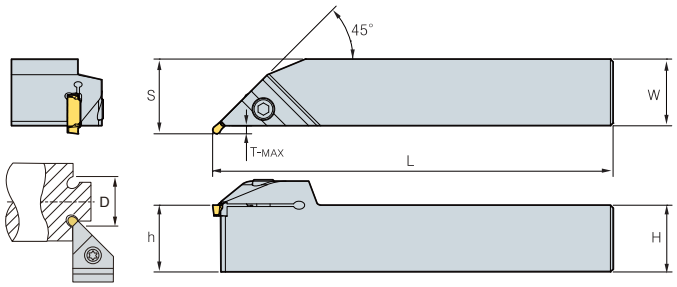
Applicable inserts C12~C13

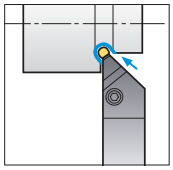
KGEUR/L

For Reliefing machining



KRMN
KRGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	ØD Min	T-MAX	Inserts	Screw	Wrench
KGEUR/L	1616-3	16	16	100	19	40	2.8	KRMN300-C KRGN300-□	MHA0512	HW40L
	2020-3	20	20	125	23	40	2.8			
	2525-3	25	25	150	28	40	2.8			
	3232-3	32	32	170	35	40	2.8			
	1616-4	16	16	100	19	40	2.8	KRMN400-C KRGN400-□	BHA0616	HW50L
	2020-4	20	20	125	23	40	2.8			
	2525-4	25	25	150	28	40	2.8			
	3232-4	32	32	170	35	40	2.8			
	2020-5	20	20	125	23.5	50	3.3	KRMN500-C KRGN500-□	BHA0616	HW50L
	2525-5	25	25	150	28.5	50	3.3			
	3232-5	32	32	170	35.5	50	3.3			
	2020-6	20	20	125	23.5	50	3.3	KRMN600-C KRGN600-□	BHA0616	HW50L
	2525-6	25	25	150	28.5	50	3.3			
	3232-6	32	32	170	35.5	50	3.3			
	2525-8	25	25	150	28.5	65	3.3	KRMN800-C KRGN800-□	BHA0616	HW50L
	3232-8	32	32	170	35.5	65	3.3			

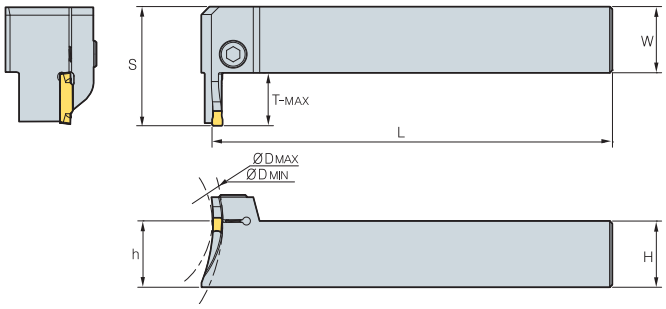
Applicable inserts **C12~C13**

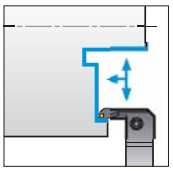
KGFVR/L

For Face grooving machining



KGMN KRMN
KGGN KRGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
KGFVR/L	325-34/50-T10	25	25	150	36	10	34	50	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	325-44/60-T15	25	25	150	41	15	44	60			
	325-54/85-T15	25	25	150	41	15	54	85			
	425-32/50-T15	25	25	150	41	15	32	50	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	425-42/60-T15	25	25	150	41	15	42	60			
	425-44/70-T20	25	25	150	45.5	20	44	70			
	425-52/85-T15	25	25	150	41	15	52	85			
	425-60/120-T20	25	25	150	45.5	20	60	120			
	425-112/200-T20	25	25	150	45.5	20	112	200			
	525-50/80-T20	25	25	150	46	20	50	80	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	525-70/110-T20	25	25	150	46	20	70	110			
	525-100/150-T20	25	25	150	46	20	100	150			
	525-140/200-T20	25	25	150	46	20	140	200			
	525-200-T20	25	25	150	46	20	200	∞			
	625-48/85-T20	25	25	150	46	20	48	85	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	625-73/150-T20	25	25	150	46	20	73	150			
	625-138/250-T20	25	25	150	46	20	138	250			
	625-250-T20	25	25	150	46	20	250	∞			

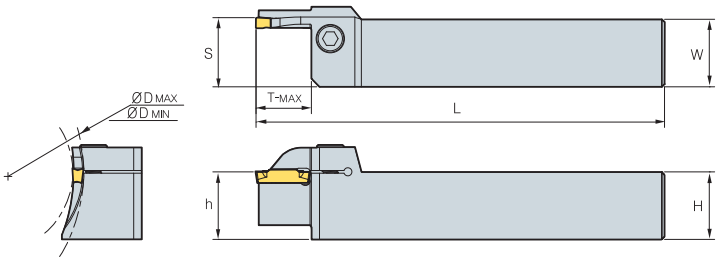
Applicable inserts C12~C13

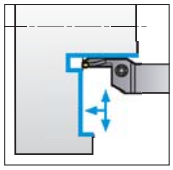
KGFHR/L

For Face grooving machining



KGMN KRMN
KGGN KRGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
KGFHR/L	320-34/50-T10	20	20	150	20.5	10	34	50	KGMN300-□-□ KRMN300-C KGGN300-□-□ KRGN300-□	MHA0512	HW40L
	320-44/70-T15	20	20	150	20.5	15	44	70			
	320-64/100-T15	20	20	150	20.5	15	64	100			
	325-34/50-T10	25	25	150	25.5	10	34	50			
	325-44/70-T15	25	25	150	25.5	15	44	70			
	325-64/100-T15	25	25	150	25.5	15	64	100			
	420-34/50-T16	20	20	150	20.5	16	34	50	KGMN400-□-□ KRMN400-C KGGN400-□-□ KRGN400-□	BHA0616	HW50L
	420-42/70-T16	20	20	150	20.5	16	42	70			
	420-62/120-T16	20	20	150	20.5	16	62	120			
	420-112/200-T16	20	20	150	20.5	16	112	200			
	425-34/50-T20	25	25	150	25.6	20	34	50			
	425-40/60-T10	25	25	150	25.6	10	40	60			
	425-44/70-T20	25	25	150	25.6	20	44	70			
	425-84/92-T20	25	25	150	25.6	20	84	92			
	425-60/120-T20	25	25	150	25.6	20	60	120			
	425-112/200-T20	25	25	150	25.6	20	112	200			
	425-200-T20	25	25	150	25.6	20	200	∞			
	525-50/80-T15	25	25	150	25.6	15	50	80	KGMN500-□-□ KRMN500-C KGGN500-□-□ KRGN500-□	BHA0616	HW50L
	525-50/80-T25	25	25	150	25.6	25	50	80			
	525-70/110-T15	25	25	150	25.6	15	70	110			
	525-70/110-T25	25	25	150	25.6	25	70	110			
	525-100/150-T25	25	25	150	25.6	25	100	150			
	525-140/200-T25	25	25	150	25.6	25	140	200			
	525-190/220-T10	25	25	150	25.6	10	190	200			
	525-200-T25	25	25	150	25.6	25	200	∞			
	625-170/190-T10	25	25	150	25.6	10	170	190	KGMN600-□-□ KRMN600-C KGGN600-□-□ KRGN600-□	BHA0616	HW50L
	625-190/220-T10	25	25	150	25.6	10	190	200			

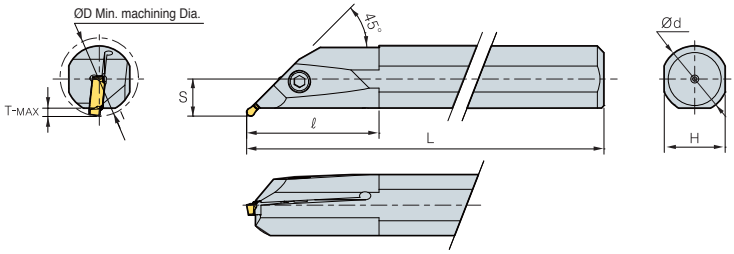
Applicable inserts **C12~C13**

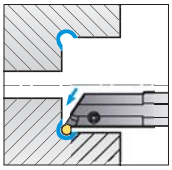
KGIUR/L

For Reliefing machining



KRMN
KRGN





• R type insert

(mm)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
KGIUR/L	3520-3	35	20	150	45	3.5	18	13	KRMN300-C KRGN300-□	MHA0512	HW40L
	4025-3	40	25	200	50	3.5	23	15.5			
	5032-3	50	32	250	65	3.5	30	19			
	3520-4	35	20	150	45	3.5	18	13	KRMN400-C KRGN400-□	MHA0512	HW40L
	4025-4	40	25	200	50	3.5	23	15.5			
	5032-4	50	32	250	65	3.5	30	19			
	4025-5	40	25	200	50	3.5	23	15.5	KRMN500-C KRGN500-□	MHA0512	HW40L
	5032-5	50	32	250	65	3.5	30	19			
	4025-6	40	25	200	50	3.5	23	15.5	KRMN600-C KRGN600-□	MHA0512	HW40L
	5032-6	50	32	250	65	3.5	30	19			
	4025-8	40	25	200	50	3.5	23	18.5	KRMN800-C KRGN800-□	MHA0512	HW40L
	5032-8	50	32	250	65	3.5	30	22			

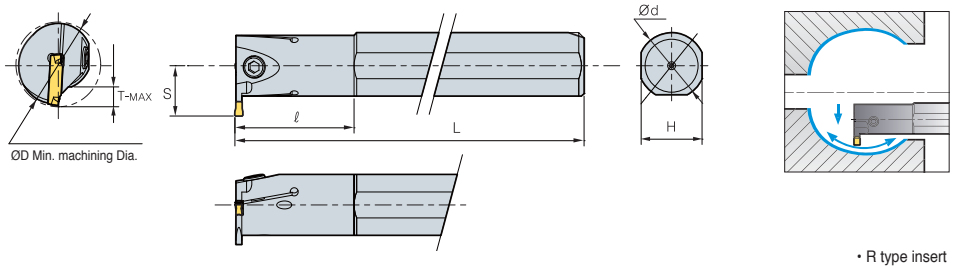
Applicable inserts **C12~C13**

KGIVR/L

For Grooving, Turning, Profiling machining



KGMI
KGMN



• R type insert

(mm)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
KGIVR/L	2016-1.5	20	16	125	35	4	15	12	KGMN150-□-□	MHB0410	HW30L
	2520-1.5	25	20	150	45	6	18	15.5		MHB0410	
	3225-1.5	32	25	200	45	7	23	19		MHA0512	HW40L
	2516-2	25	16	125	35	6.5	15	14	KGMI200-□-T	MHB0410	HW30L
	2520-2	25	20	150	45	6.5	18	15.5			
	3225-2	32	25	200	45	7	23	19		MHB0512	HW40L
	2516-2.5	25	16	125	35	6.5	15	14	KGMN250-□-□	MHB0410	HW30L
	2520-2.5	25	20	150	45	6.5	18	15.5			
	3225-2.5	32	25	200	45	7	23	19		MHA0512	HW40L
	2520-3	25	20	150	45	6.5	18	15.5	KGMI300-□-T	MHB0410	HW30L
	3225-3	32	25	200	45	7	23	19		MHA0512	HW40L
	4032-3	40	32	250	55	7.5	30	22.5		BHA0616	HW50L
	2520-4	25	20	150	45	6.5	18	15.5	KGMI400-□-T	MHB0410	HW30L
	3225-4	32	25	200	45	7	23	19		MHA0512	HW40L
	4032-4	40	32	250	55	7.5	30	22.5		BHA0616	HW50L
	3225-5	32	25	200	45	7.5	23	19.5	KGMN500-□-□	MHA0512	HW40L
	4032-5	40	32	250	55	8.5	30	23.5		BHA0616	HW50L
	3225-6	32	25	200	45	7.5	23	19.5	KGMN600-□-□	MHA0512	HW40L
	4032-6	40	32	250	55	8.5	30	23.5		BHA0616	HW50L
	4032-8	40	32	250	55	8.5	30	23.5	KGMN800-□-□	BHA0616	HW50L
	4540-8	45	40	300	70	8.5	37	26.5		BHA0616	HW50L

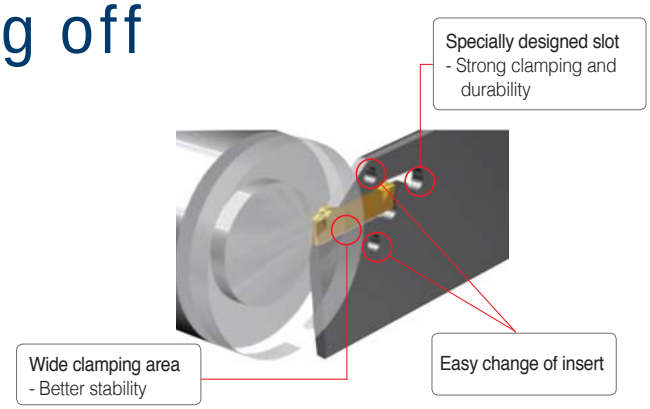
Applicable inserts **C12~C13**

• External insert: Min. machining Dia (ØD) is over 50 mm.

KGT Blade for Parting off

Features

- Parting application with the use of existing KGT inserts
- Economical machining with a double sided insert
- Specially designed slot for strong and stable clamping
- Easy change of insert with the use of exclusive wrench

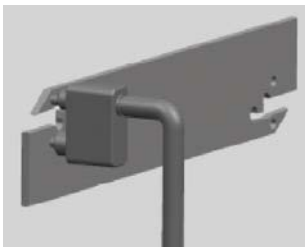


Code system

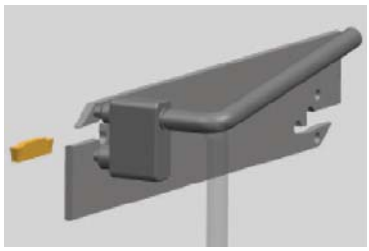
KGTB 30 32 (S)

- KGTB: KGTB system
- 30: Cutting width
- 32: Height of shank
- (S): S: Single pocket

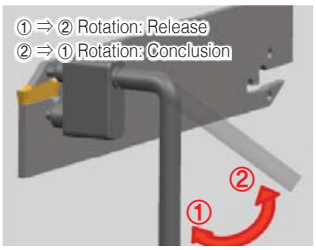
How to clamp insert



① Insert the pin of wrench into the hole of blade.



② Clamp the insert on its seat after turning the handle to 45˚~160˚ for loosening the seat.



③ Finish clamp by removing the wrench after moving it back to its original state.

KGTB



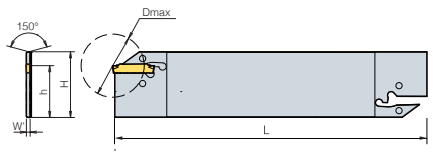


Fig. 1

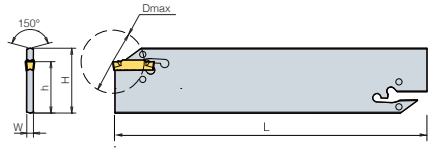


Fig. 2

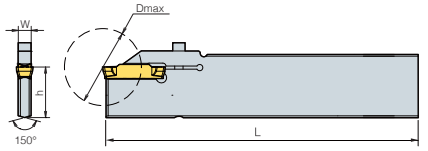


Fig. 3

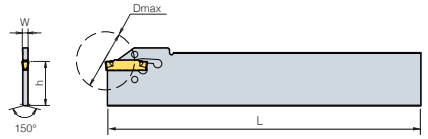


Fig. 4

(mm)

Designation		H	W	W'	L	h	ØD Max(2)	ØD Max(3)	Inserts	Wrench	Fig.
KGTB	1526S	26	2.4	1.0	150	21	-	26	KG□□150-□-□	EW1203 (Separately ordered)	4
	2026S	26	2.4	1.8	150	21	50	39	KG□□200-□-□ KG□□200S-□-R(4)		
	3026S	26	2.4	-	150	21	100	39	KG□□300-□-□ KG□□300S-□-R(4)		
	4026S	26	3.2	-	150	21	100	39	KG□□400-□-□ KG□□400S-□-R(4)		
	1532	32	2.4	1	150	25	-	26	KG□□150-□-□		1
	2032	32	2.4	1.8	150	25	50	39	KG□□200-□-□ KG□□200S-□-R(4)		
	3032	32	2.4	-	150	25	100	39	KG□□300-□-□ KG□□300S-□-R(4)		2
	4032	32	3.2	-	150	25	100	39	KG□□400-□-□ KG□□400S-□-R(4)		
	5032	32	4	-	150	25	120	49	KG□□500-□-□ KG□□500S-□-R(4)		
	6032	32	5.2	-	150	25	120	49	KG□□600-□-□ KG□□600S-□-R(4)		
	8032S(1)	32	6.2	-	150	25	80	59	KG□□800-□-□ KG□□800S-□-R(4)	HW30L	3

Applicable inserts C12~C13

(1) Screw clamping (2) 1 corner use (3) 2 corner use (4) 1 corner insert

Inserts are offered with two edges, for better economical machining

MGT

- Inserts are offered with two edges, for better economical machining
- Multi-function operations - Reduce cycle time & increase productivity with the ability to groove, turn, face or copy in an application
- Shorten time & save on tool cost - Korloy's MGT system allows a machinist to apply one tool against many applications, reducing the number of tools
- Flat Cutting Edge - MGT tools have a flat geometry on its cutting edge to ensure excellent surface finishes. Even in high Feed applications by using a wiper function, Korloy ensures excellent surface finishes in roughing operations

Insert code system

MG	M	N	300	- 04	- T
System Code	**Tolerance**	**Hand**	**Cutting Edge Width**	**Nose Radius (Nose R)**	**Chip Breaker**
MG: Multi Grooving MR: Multi Grooving Round	M: Pressed G: Ground	N: Neutral R: Right L: Left I: Internal	1.5~8.0 mm	0.2 mm 0.3 mm 0.4 mm 0.8 mm	L/R/T/M/ PS/PT/A

Holder code system

MG	E	H	R/L	2525	- 3	T15
System Code	**Application**	**Holder Type**	**Hand**	**Shank Size**	**Cutting Width**	**Maximum Depth of Cut**
MG: Multi Grooving	E: External machining I: Internal machining	H: Horizontal V: Vertical U: Undercut	R: Right L: Left	Height: 25 mm Width: 25 mm (For internal machining: Minimum diameter)	1.5~8.0 mm	15~25 mm

Geometry of chip breaker

MGM(G)N-M



- Specially designed chip breaker allows a smoother chip flow versus conventional flat-top geometries through the use of a central chip breaker
- Specially placed convex dots assists with chip control in external machining, for a smoother chip flow
- Chip breaker designed for turning & grooving applications

MGMN-G



- Specially designed chip breaker allows narrower chips to promote better chip flow
- Specifically designed for grooving applications

MRMN-M



- Full radius geometry for applications that require profiling
- Available for relief machining

MFMN300



- Specially designed chip breaker allows narrower chips to promote better chip flow
- Chip breaker specially designed for face-grooving

MRGN-A



- Specially designed high positive geometry, ideal for machining aluminum
- The chip breaker's super buffed, high rake angle allows optimal chip flow of aluminum

MGMR-PS



- Sharply designed cutting edge.
- Recommended in machining low carbon steel and stainless steel
- Specially designed chip breaker allows narrower chips to promote better chip flow.
- Able to machine Feed rates and small diameter cutting

MGMR-PT



- Stronger cutting edge with a negative land for tougher applications
- Able to machine at Feed rates as high and bar stock
- Chip breaker design helps narrows chips for better flow

MGGN-A



- Smooth chip flow
- Reduced build up on cutting edge

MGMN-L



- Sharp cutting edge
- Low cutting resistance
- For auto CNC machine
- For small Dia. processing

MGMN-R



- Strong cutting edge
- For high Feed rate processing

MGMN-T



- For turning & grooving
- Reduced chip width & smooth chip control by dot designed on the top corner

Parting off (MGMN/MGMR/L)

Workpiece	Cutting Speed (vc = m/min)										Feed (fn = mm/rev)				
	CVD					PVD				Uncoated	Cutting width (mm)				
	NC3120	NC3030	NCM325	NC5330	NC3225	PC8110	PC5300	PC9030	PC6510	ST30A	2	3	4	5	6
SM□□C	80~180	80~160		80~180	80~200		80~180				0.02~0.15	0.03~0.2	0.08~0.3	0.10~0.4	0.12~0.5
SCM	70~150	70~150	70~150	70~150	70~150		70~150				0.02~0.15	0.03~0.2	0.08~0.3	0.10~0.4	0.12~0.5
GC/GCD				50~100					50~100	50~100	0.05~0.12	0.1~0.25	0.1~0.30	0.1~0.35	0.1~0.40
STS			50~120	50~120		50~120	60~140	60~140			0.02~0.1	0.03~0.15	0.08~0.25	0.1~0.35	0.12~0.40
Non-ferrous metal (Al, Copper)										200~450	0.05~0.1	0.05~0.2	0.05~0.25	0.05~0.30	0.05~0.35

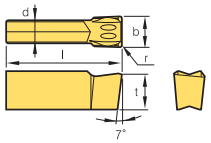
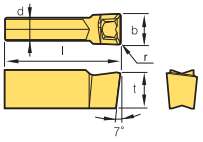
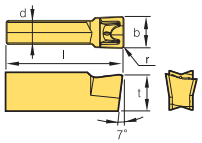
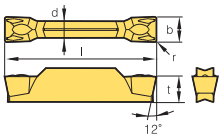
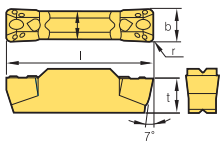
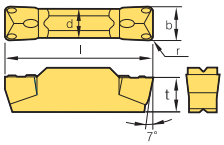
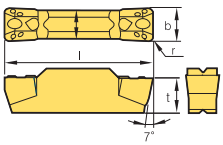
Facing (FGD/FGM/FMM/MFMN/MGMN)

Workpiece	Cutting Speed (vc = m/min)									Feed (fn = mm/rev)		
	CVD				PVD				Uncoated	Cutting width (mm)		
	NC6210	NC3030	NC5330	NC3120	PC3500	PC9030	PC8110	PC5300	H01	3	4	5
SM□□C		80~160	100~160	100~160				80~180		0.05~0.1	0.05~0.12	0.05~0.15
SCM		50~130	50~130	50~130	50~130			70~150	200~800	0.05~0.1	0.05~0.12	0.05~0.15
GC/GCD	100~200		120~150							0.05~0.1	0.05~0.12	0.05~0.15
STS			60~150			60~140	60~120	60~140		0.05~0.1	0.05~0.12	0.05~0.15
Non-ferrous metal (Al, Copper)										0.05~0.15	0.08~0.15	0.08~0.15

Grooving, Turning (MGMN/MRMN)

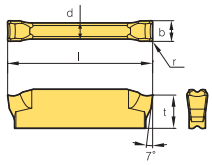
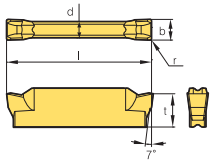
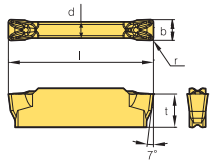
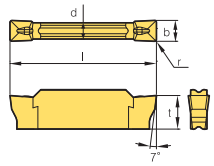
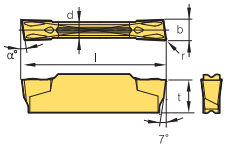
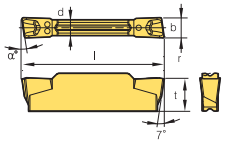
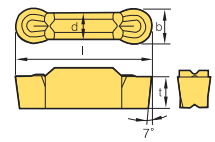
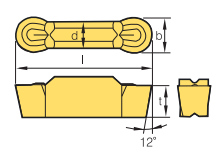
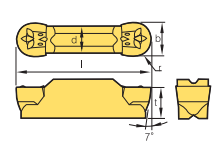
Workpiece	Cutting Speed (vc = m/min)										Feed (fn = mm/rev)					
	CVD				PVD			Cermet	Uncoated		Cutting width (mm)					
	NC3225	NC3120	NC3030	NC5330	PC9030	PC5300	PC3500	CN20	ST30A	ST20	0.5~1.0	1.0~2.0	2~3	3~4	4~5	6~8
SM□□C	80~200	80~200	80~180	80~200		80~180		80~120		80~120	0.03~0.08	0.04~0.09	0.05~0.1	0.05~0.12	0.05~0.15	0.05~0.2
SCM	80~180	80~180	80~180	80~180		80~160	80~180	80~120	80~120	80~120	0.03~0.07	0.04~0.08	0.05~0.08	0.05~0.1	0.05~0.12	0.05~0.15
GC/GCD				60~130		60~130					0.03~0.07	0.04~0.08	0.05~0.08	0.05~0.1	0.05~0.10	0.05~0.12
STS				60~100	60~140				60~100		0.03~0.08	0.04~0.09	0.05~0.10	0.05~0.12	0.05~0.12	0.05~0.15
Non-ferrous metal (Al, Copper)									150~400		0.05~0.12	0.05~0.15	0.05~0.15	0.08~0.15	0.08~0.15	0.10~0.20

Insert

Application	Picture	Designation		Coated							Uncoated	Dimensions (mm)					Configuration	Page
				NC3030	NC3120	NC3225	NC5330	NC6315	PC5300	PC8110	PC9030	H01	b	r	l	d	t	
Face Grooving	FGD 	FGD	300R-03	●									3.0	0.3	15.0	2.0	4.0		C34 C35
			400R-04	●									4.0	0.4	15.0	3.0	4.5		
			500R-04	●									5.0	0.4	15.0	4.0	5.0		
	FGM 	FGM	300R-03										3.0	0.3	15.0	2.0	4.0		C34 C35
			400R-04	●									4.0	0.4	15.0	3.0	4.5		
			500R-04										5.0	0.4	15.0	4.0	5.0		
	FMM 	FMM	300R-03	●						●			3.0	0.3	15.0	2.0	3.91		C34 C35
			400R-04	●									4.0	0.4	15.0	3.0	3.96		
			500R-04										5.0	0.4	15.0	4.0	4.42		
Face Grooving	MFMN 	MFMN	300				●						3.0	0.2	18.0	2.0	3.0		C33 C38
Grooving · Turning	MGGN-M 	MGGN	300-02-M										3.0	0.2	21.0	2.35	4.8		C28 C30 C32 C38
			300-04-M										3.0	0.4	21.0	2.35	4.8		
			300-08-M										3.0	0.8	21.0	2.35	4.8		
			400-02-M										4.0	0.2	21.0	3.3	4.8		
			400-04-M										4.0	0.4	21.0	3.3	4.8		
			400-08-M										4.0	0.8	21.0	3.3	4.8		
			500-02-M										5.0	0.2	26.0	4.1	5.8		
			500-04-M										5.0	0.4	26.0	4.1	5.8		
			500-08-M										5.0	0.8	26.0	4.1	5.8		
			600-02-M										6.0	0.2	26.0	5.0	5.8		
			600-04-M										6.0	0.4	26.0	5.0	5.8		
			600-08-M										6.0	0.8	26.0	5.0	5.8		
Grooving	MGMN-G 	MGMN	150-G	●					●	●		●	1.5	0.15	16.0	1.2	3.5		C28 C30 C32 C38
			200-G	●	●					●		●	2.0	0.2	16.0	1.6	3.5		
			250-G	●					●	●			2.5	0.2	18.5	2.0	3.85		
			300-G	●	●		●			●			3.0	0.3	21.0	2.35	4.8		
			400-G	●	●				●	●			4.0	0.3	21.0	3.3	4.8		
			500-G										5.0	0.5	26.0	4.1	5.8		
			600-G										6.0	0.8	26.0	5.0	5.8		
Grooving · Turning	MGMN-M 	MGMN	200-M	●	●		●		●	●		●	2.0	0.2	16.0	1.6	3.5		C28 C30 C32 C38
			250-M	●	●				●	●			2.5	0.2	18.5	2.0	3.85		
			300-02-M				●						3.0	0.2	21.0	2.35	4.8		
			300-M	●	●	●			●	●	●	●	3.0	0.4	21.0	2.35	4.8		
			350-03-M										3.5	0.3	21.0	2.9	4.8		
			400-02-M										4.0	0.2	21.0	3.3	4.8		
			400-M	●	●	●	●		●	●	●	●	4.0	0.4	21.0	3.3	4.8		
			500-04-M	●									5.0	0.4	26.0	4.1	5.8		
			500-M	●	●	●	●						5.0	0.8	26.0	4.1	5.8		
			600-M	●	●		●						6.0	0.8	26.0	5.0	5.8		
			800-M	●			●						8.0	0.8	31.0	6.0	6.5		

● : Stock item

Insert

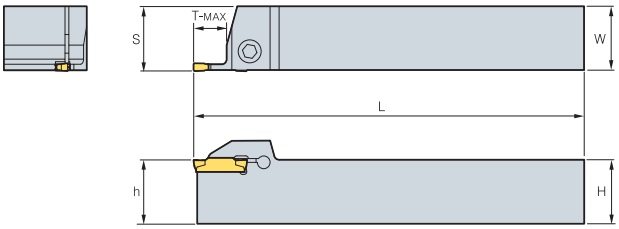
Application	Picture	Designation		Coated							Uncoated		Dimensions (mm)						Configuration	Page
				NC3030	NC3120	NC3225	NC5330	NC6315	PC5300	PC8100	PC9030	H01	H05	b	r	l	d	t	α°	
Grooving	MGMN-L	MGMN	200-02-L											2.0	0.2	16	1.60	3.5	-		C28 C30 C32 C33
			300-02-L						●					3.0	0.2	21	2.35	4.8	-		
			400-02-L						●					4.0	0.2	21	3.3	4.8	-		
			200-04-L											2.0	0.4	20	1.7	3.5	-		
			300-04-L											3.0	0.4	20	2.3	4.0	-		
			400-04-L											4.0	0.4	20	3.3	4.0	-		
			500-04-L						●					5.0	0.4	26	4.1	5.8	-		
Grooving · Parting off	MGMN-R	MGMN	200-02-R											2.0	0.2	16	1.60	3.5	-		C28 C30 C32 C33
			300-02-R	●					●					3.0	0.2	21	2.35	4.8	-		
			400-02-R	●					●					4.0	0.2	21	3.3	4.8	-		
			200-04-R											2.0	0.4	20	1.7	3.5	-		
			300-04-R											3.0	0.4	20	2.3	4.0	-		
			400-04-R											4.0	0.4	20	3.3	4.0	-		
			500-04-R	●					●					5.0	0.4	26	4.1	5.8	-		
Grooving · Turning	MGMN-T	MGMN	200-T											2.0	0.2	16	1.60	3.5	-		C28 C30 C32 C33
			300-T	●					●					3.0	0.4	21	2.35	4.8	-		
			400-T	●					●					4.0	0.4	21	3.3	4.8	-		
			500-T						●					5.0	0.8	26	4.1	5.8	-		
Grooving	MGGN-A	MGGN	300-02-A											3.0	0.2	21	2.35	4.8	-		C28 C30 C32 C38
			300-04-A											3.0	0.4	21	2.35	4.8	-		
			300-08-A											3.0	0.8	21	2.35	4.8	-		
			400-02-A											4.0	0.2	21	3.3	4.8	-		
			400-04-A											4.0	0.4	21	3.3	4.8	-		
			400-08-A											4.0	0.8	21	3.3	4.8	-		
			500-02-A											5.0	0.2	26	4.1	5.8	-		
			500-04-A											5.0	0.4	26	4.1	5.8	-		
			500-08-A											5.0	0.8	26	4.1	5.8	-		
Parting off	MGMR/L-PS	MGMR/L	300-6D-PS											3.0	0.2	21	2.35	4.8	6		C28 C30
			300-8D-PS											3.0	0.2	21	2.35	4.8	8		
			300-15D-PS											3.0	0.2	21	2.35	4.8	15		
			400-4D-PS											4.0	0.3	21	3.3	4.8	4		
			500-4D-PS											5.0	0.3	26	4.1	5.8	4		
Parting off	MGMR/L-PT	MGMR/L	200-6D-PT						●					2.0	0.2	16	1.6	3.6	6		C28 C30
			300-6D-PT				●							3.0	0.2	21	2.35	4.8	6		
			300-8D-PT											3.0	0.2	21	2.35	4.8	8		
			300-15D-PT											3.0	0.2	21	2.35	4.8	15		
			400-4D-PT											4.0	0.3	21	3.3	4.8	4		
			500-4D-PT											5.0	0.3	26	4.1	5.8	4		
Aluminum	MRGN-A	MRGN	400-A									●		4.0	2.0	21.0	3.3	4.8	-		C28 C29 C31 C32
			500-A											5.0	2.5	26.0	4.1	5.8	-		
	MRGN-A	MRGN	600-A									●		6.0	3.0	26.0	5.0	5.8	-		C28 C29 C31 C32
			800-A									●		8.0	4.0	31.0	6.0	6.5	-		
Reliefing Profiling	MRMN-M	MRMN	200-M	●	●									2.0	1.0	16.0	1.50	3.5	-		C28 ~32 C38
			300-M	●	●		●		●	●				3.0	1.5	21.0	2.35	4.8	-		
			400-M	●	●		●							4.0	2.0	21.0	3.3	4.8	-		
			500-M	●					●					5.0	2.5	26.0	4.1	5.8	-		
			600-M	●			●							6.0	3.0	26.0	5.0	5.8	-		
			800-M	●			●							8.0	4.0	31.0	6.0	6.5	-		

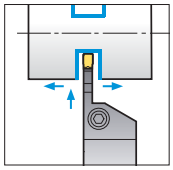
● : Stock item

MGEHR/L

For Grooving, Turning, Parting off, Reliefing, Profiling machining







MGMN MGMR
MGGN MRMN
MRGN

• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	1616-1.5	16	16	100	16.2	14	MGMN150-G	LTX0514	TW20L
	2020-1.5	20	20	125	20.2	14			
	2525-1.5	25	25	150	25.2	14			
	1212-2	12	12	100	14.25	14	MGMN200-G MGMN200-M MGMR200-□□-□□	MHA0512	HW40L
	1616-2	16	16	100	16.25	14			
	2020-2	20	20	125	20.25	14			
	2525-2	25	25	150	25.25	14			
	1616-2.5	16	16	100	16.30	16	MGMN250-G MGMN250-M	MHA0512	HW40L
	2020-2.5	20	20	125	20.30	16			
	2525-2.5	25	25	150	25.30	16			
	1616-3	16	16	100	16.35	18	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMR300-□□-□□ MGMN300-□□-L/R	BHA0616	HW50L
	2020-3	20	20	125	20.4	18			
	2020-3-T10	20	20	125	20.4	10			
	2525-3	25	25	150	25.4	18			
	2525-3-T10	25	25	150	25.4	10			
	3232-3	32	32	170	32.4	18			
	3232-3-T10	32	32	170	32.4	10			
	2020-4	20	20	125	20.4	18	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMR400-□□-□□ MGMN400-□□-L/R		
	2020-4-T10	20	20	125	20.4	10			
	2525-4	25	25	150	25.4	18			
	2525-4-T10	25	25	150	25.4	10			
	3232-4	32	32	170	32.4	18			
	3232-4-T10	32	32	170	32.4	10			
	2020-5	20	20	150	20.5	23	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMR500-□□-□□ MGMN500-□□-L/R		
	2020-5-T15	20	20	150	20.5	15			
	2525-5	25	25	150	25.5	23			
	2525-5-T15	25	25	150	25.5	15			
	3232-5	32	32	170	32.5	23			
	3232-5-T15	32	32	170	32.5	15			
	2020-6	20	20	125	20.6	23	MGMN600-M MGGN600-□□-M MRMN600-M		
	2020-6-T15	20	20	125	20.6	15			
	2525-6	25	25	150	25.6	23			
	2525-6-T15	25	25	150	25.6	15			
	3232-6	32	32	170	32.6	23			
	3232-6-T15	32	32	170	32.6	15			
	2525-8	25	25	150	26.1	28	MRMN800-M MGMN800-M		
	2525-8-T15	25	25	150	26.1	15			
	3232-8	32	32	170	33.1	28			
	3232-8-T15	32	32	170	33.1	16			
	2525-6A	25	25	150	25.6	23	MRGN600-A		
	2525-6A-T15	25	25	150	25.6	15			
	3232-6A	32	32	170	32.6	23			
	3232-6A-T15	32	32	170	32.6	15			
	2525-8A	25	25	150	26.1	28	MRGN800-A		
	2525-8A-T15	25	25	150	26.1	16			
	3232-8A	32	32	170	33.1	28			
	3232-8A-T15	32	32	170	33.1	15			

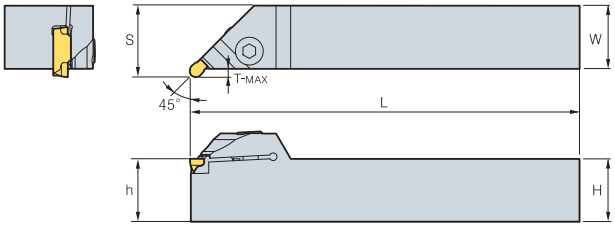
Applicable inserts C26~C27

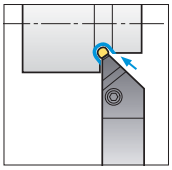
MGEUR/L

For Reliefing, Profiling machining



MRMN
MRGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEUR/L	2020-3	20	20	125	23	3	MRMN300-M	BHA0616	HW50L
	2525-3	25	25	150	28	3			
	3232-3	32	32	170	35	3			
	2020-4	20	20	125	23	3	MRMN400-M		
	2525-4	25	25	150	28	3			
	3232-4	32	32	170	35	3			
	2020-5	20	20	125	24	4	MRMN500-M		
	2525-5	25	25	150	29	4			
	3232-5	32	32	170	36	4			
	2020-6	20	20	125	24	4	MRMN600-M		
	2525-6	25	25	150	29	4			
	3232-6	32	32	170	36	4			
	2525-8	25	25	150	30	5	MRMN800-M		
	3232-8	32	32	170	37	5			
	2525-6A	25	25	150	29	4	MRGN600-A		
	3232-6A	32	32	170	36	4			
	2525-8A	25	25	150	30	5	MRGN800-A		
	3232-8A	32	32	170	37	5			

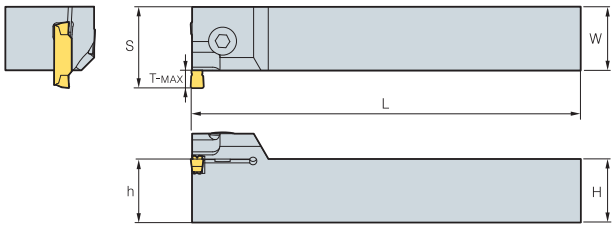
Applicable inserts **C26~C27**

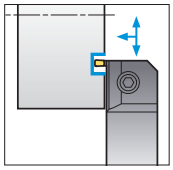
MGEVR/L

For Grooving, Turning, Profiling machining



MGMN MGGN
MRMN MRGN





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	Min. machining Dia. (ØD)	Inserts	Screw	Wrench
MGEVR/L	2020-1.5	20	20	125	23	3	85	MGMN150-G	LTX0514	TW20L
	2525-1.5	25	25	150	28	3	85			
	3232-1.5	32	32	170	35	3	85			
	2020-2	20	20	125	23.5	3.5	65	MGMN200-M MGMN200-G	BHA0616	HW50L
	2525-2	25	25	150	28.5	3.5	65			
	3232-2	32	32	170	35.5	3.5	65			
	2020-2.5	20	20	125	24	4	65	MGMN250-M MGMN250-G		
	2525-2.5	25	25	150	29	4	65			
	3232-2.5	32	32	170	36	4	65			
	2020-3	20	20	125	25.5	5	75	MGMN300-M/T MGGN300-□-M MRMN300-M MGMN300-□□-L/R		
	2525-3	25	25	150	30.5	5	75			
	3232-3	32	32	170	37.5	5	75			
	2020-4	20	20	125	25.5	5	70	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R		
	2525-4	25	25	150	30.5	5	70			
	3232-4	32	32	170	37.5	5	70			
	2020-5	20	20	125	27	7	75	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R		
	2525-5	25	25	150	32	7	75			
	3232-5	32	32	170	39	7	75			
	2020-6	20	20	125	27	7	70	MGMN600-M MGGN600-□□-M MRMN600-M		
	2525-6	25	25	150	32	7	70			
	3232-6	32	32	170	39	7	70			
	2525-8	25	25	150	34	9	50	MRMN800-M MGMN800-M		
	3232-8	32	32	170	41	9	50			
	2525-6A	25	25	150	32	7	70	MRGN600-A		
	3232-6A	32	32	170	39	7	70			
	2525-8A	25	25	150	34	9	45	MRGN800-A		
	3232-8A	32	32	170	41	9	45			

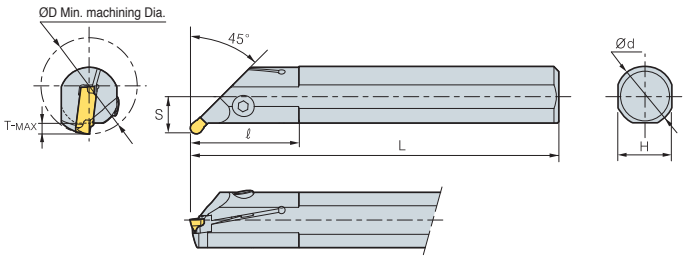
Applicable inserts C26~C27

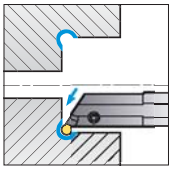
MGIUR/L

For Reliefing, Profiling machining



MRMN
MRGN





• R type insert

(mm)

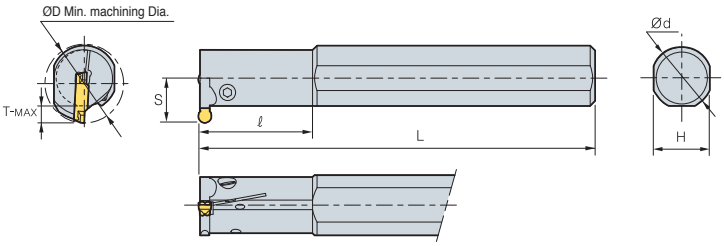
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	3520-3	35	20	150	45	3.5	18	13	MRMN300-M	MHA0512	HW40L
	4025-3	40	25	200	45	3.5	23	15.5			
	5032-3	50	32	250	65	3.5	30	19			
	3520-4	35	20	150	45	3.5	18	13	MRMN400-M		
	4025-4	40	25	200	45	3.5	23	15.5			
	5032-4	50	32	250	65	3.5	30	19			
	4025-5	40	25	200	45	3.5	23	15.5	MRMN500-M	BHA0616 BHA0620	HW50L
	5032-5	50	32	250	65	3.5	30	19			
	4025-6	40	25	200	45	3.5	23	19	MRMN600-M	BHA0616 BHA0620	
	5032-6	50	32	250	65	3.5	30	19			
	4025-8	40	25	200	45	6.5	23	15.5	MRMN800-M	BHA0616 BHA0620	
	5032-8	50	32	250	65	6.5	30	19			
	4025-6A	40	25	200	45	3.5	23	15.5	MRGN600-A	BHA0616 BHA0620	
	5032-6A	50	32	250	65	3.5	30	19			
	4025-8A	40	25	200	45	5.0	23	18.5	MRGN800-A	BHA0616 BHA0620	
	5032-8A	50	32	250	65	6.5	30	22			

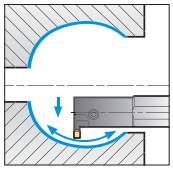
Applicable inserts **C26~C27**

MGIVR/L

For Grooving, Turning, Profiling machining







MGMN MRMN
MGGN MRGN

• R type insert

(mm)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIVR/L	2016-1.5	20	16	125	35	3.5	15	11.3	MGMN150-G	MHB0310	HW25L
	2520-1.5	25	20	150	45	3.5	18	13.1		MHA0512	HW40L
	2925-1.5	29	25	200	45	3.5	23	16.2			
	2016-2	20	16	125	35	4.5	15	12.4	MGMN200-G	MHB0310	HW25L
	2520-2	25	20	150	45	4.5	18	14.0	MGMN200-M	MHA0512	HW40L
	2925-2	29	25	200	45	4.5	23	17.2	MRMN200-M		
	2016-2.5	20	16	125	35	4.5	15	12.5	MGMN250-G	MHB0310	HW25L
	2520-2.5	25	20	150	45	4.5	18	15.1	MGMN250-M	MHA0512	HW40L
	2925-2.5	29	25	200	45	4.5	23	18.2			
	2520-3	25	20	150	45	5	18	15.6	MGMN300-M/G/T MGGN300-□□-M MRMN300-M MGMN300-□□-L/R	MHA0512	HW40L
	3125-3	31	25	200	45	6	23	18.9			
	3732-3	37	32	250	65	6	30	21.5			
	2520-4	25	20	150	45	6	18	15.6	MGMN400-M/G/T MGGN400-□□-M MRMN400-M MGMN400-□□-L/R		
	3125-4	31	25	200	45	6	23	18.9			
	3732-4	37	32	250	65	6	30	21.5			
	3125-5	31	25	200	45	8	23	19.4	MGMN500-M/G/T MGGN500-□□-M MRMN500-M MGMN500-□□-L/R	BHA0616	HW50L
	3732-5	37	32	250	65	8	30	21.5		BHA0620	
	3125-6	31	25	200	45	8	23	19.4	MGMN600-MG MGGN600-□□-M MRMN600-M	BHA0616	
	3732-6	37	32	250	65	8	30	21.5		BHA0620	
	3732-8	37	32	250	65	10	30	23.4	MRMN800-M MGMN800-M		
	4540-8	45	40	300	70	10	37	27.2			
	3125-6A	31	25	200	45	8	23	19.4	MRGN600-A	BHA0616	
	3732-6A	37	32	250	65	8	30	21.5		BHA0620	
	3732-8A	37	32	250	65	10	30	23.4	MRGN800-A		
	4540-8A	45	40	300	70	10	37	27.2			

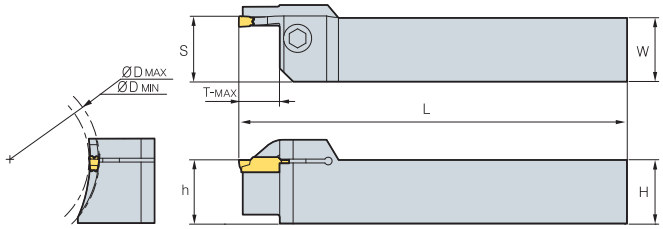
Applicable inserts C26~C27

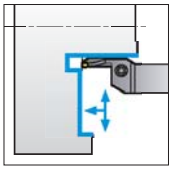
MGFHR/L

For Face Grooving machining



MFMN
MGMN





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
MGFHR/L	325-24/35-T10	25	25	150	25.6	10	24	35	MFMN300	BHA0616	HW50L
	325-29/40-T10	25	25	150	25.6	10	29	40			
	325-34/50-T10	25	25	150	25.6	10	34	50			
	325-44/70-T10	25	25	150	25.6	10	44	70			
	325-64/99-T10	25	25	150	25.6	10	64	99			
	425-42/63-T15	25	25	150	25.6	15	42	63			
	425-62/120-T15	25	25	150	25.6	15	62	120	MGMN400-M/T		
	425-112/200-T15	25	25	150	25.6	15	112	200	MGMN400-□□-L/R		

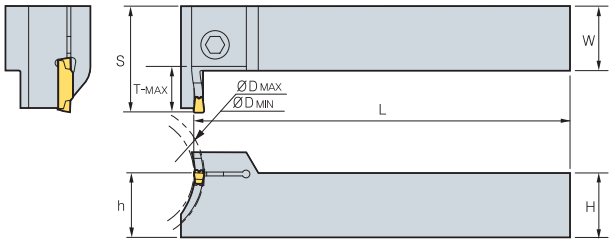
Applicable inserts C26~C27

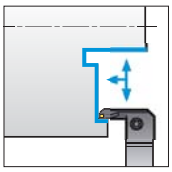
MGFVR/L

For Face Grooving machining



MFMN
MGMN





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
MGFVR/L	325-24/35-T10	25	25	150	36	10	24	35	MFMN300	MHA0512	HW40L
	325-29/40-T10	25	25	150	36	10	29	40			
	325-34/50-T10	25	25	150	36	10	34	50			
	325-44/70-T10	25	25	150	36	10	44	70			
	325-64/99T10	25	25	150	36	10	64	99			
	425-44/60-T15	25	25	150	41	15	44	60	MGMN400-M/T	BHA0616	HW50L
	425-60/120-T15	25	25	150	41	15	60	120	MGMN400-□□-L/R		
	425-112/200-T15	25	25	150	41	15	112	200			

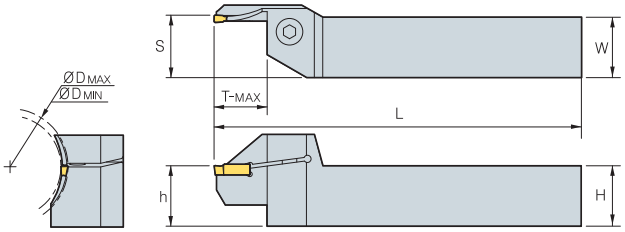
Applicable inserts C26~C27

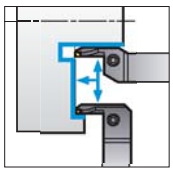
FGHH

For Face Grooving, Turning machining



FGD FGM FMM





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
FGHH	320R - 25/30	20	20	125	20.6	12	25	30	FMM300R-03	BHA0616	HW50L
	30/35	20	20	125	20.6	12	30	35			
	35/48	20	20	125	20.6	12	35	48			
	48/60	20	20	125	20.6	22	48	60	FGD300R-03 FGM300R-03		
	60/75	20	20	125	20.6	22	60	75			
	75/100	20	20	125	20.6	22	75	100			
	100/140	20	20	125	20.6	22	100	140			
	325R - 25/30	25	25	150	25.6	12	25	30	FMM300R-03		
	30/35	25	25	150	25.6	12	30	35			
	35/48	25	25	150	25.6	12	35	48			
	48/60	25	25	150	25.6	22	48	60	FGD300R-03 FGM300R-03		
	60/75	25	25	150	25.6	22	60	75			
	75/100	25	25	150	25.6	22	75	100			
	100/140	25	25	150	25.6	22	100	140			
	420R - 25/30	20	20	125	20.6	12	25	30	FMM400R-04		
	30/35	20	20	125	20.6	12	30	35			
	35/48	20	20	125	20.6	12	35	48			
	48/60	20	20	125	20.6	25	48	60	FGD400R-04 FGM400R-04		
	60/75	20	20	125	20.6	25	60	75			
	75/100	20	20	125	20.6	25	75	100			
	100/140	20	20	125	20.6	25	100	140			
	425R - 25/30	25	25	150	25.6	12	25	30	FMM400R-04		
	30/35	25	25	150	25.6	12	30	35			
	35/48	25	25	150	25.6	12	35	48			
	48/60	25	25	150	25.6	25	48	60	FGD400R-04 FGM400R-04		
	60/75	25	25	150	25.6	25	60	75			
	75/100	25	25	150	25.6	25	75	100			
	100/140	25	25	150	25.6	25	100	140			
	520R - 25/30	20	20	125	20.6	12	25	30	FMM500R-04		
	30/35	20	20	125	20.6	12	30	35			
	35/40	20	20	125	20.6	20	35	40			
	40/48	20	20	125	20.6	20	40	48			
	48/60	20	20	125	20.6	25	48	60	FGD500R-04 FGM500R-04		
	60/75	20	20	125	20.6	25	60	75			
	75/100	20	20	125	20.6	25	75	100			
	100/140	20	20	125	20.6	25	100	140			
	525R - 25/30	25	25	150	25.6	12	25	30	FMM500R-04		
	30/35	25	25	150	25.6	12	30	35			
	35/40	25	25	150	25.6	20	35	40			
	40/48	25	25	150	25.6	20	40	48			
	48/60	25	25	150	25.6	25	48	60	FGD500R-04 FGM500R-04		
	60/75	25	25	150	25.6	25	60	75			
	75/100	25	25	150	25.6	25	75	100			
	100/140	25	25	150	25.6	25	100	140			

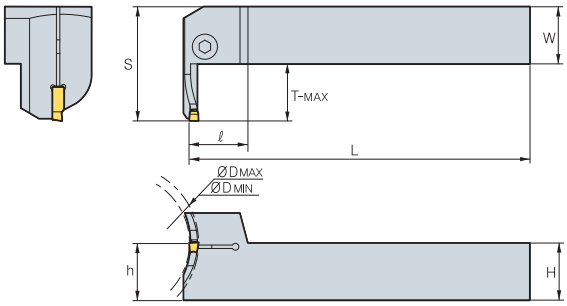
Applicable inserts C26~C27

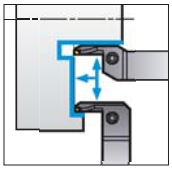
FGVH

For Face Grooving, Turning machining



FGD FGM FMM





• R type insert

(mm)

Designation		H = (h)	W	L	S	T-MAX	ØD		Inserts	Screw	Wrench
							Min	Max			
FGVH	320R - 25/30	20	20	125	20.6	12	25	30	FMM300R-03	BHA0616	HW50L
	30/35	20	20	125	20.6	12	30	35			
	35/48	20	20	125	20.6	12	35	48			
	48/60	20	20	125	20.6	22	48	60	FGD300R-03 FGM300R-03		
	60/75	20	20	125	20.6	22	60	75			
	75/100	20	20	125	20.6	22	75	100			
	100/140	20	20	125	20.6	22	100	140			
	325R - 25/30	25	25	150	25.6	12	25	30	FMM300R-03		
	30/35	25	25	150	25.6	12	30	35			
	35/48	25	25	150	25.6	12	35	48			
	48/60	25	25	150	25.6	22	48	60	FGD300R-03 FGM300R-03		
	60/75	25	25	150	25.6	22	60	75			
	75/100	25	25	150	25.6	22	75	100			
	100/140	25	25	150	25.6	22	100	140			
	420R - 25/30	20	20	125	20.6	12	25	30	FMM400R-04		
	30/35	20	20	125	20.6	12	30	35			
	35/48	20	20	125	20.6	12	35	48			
	48/60	20	20	125	20.6	25	48	60	FGD400R-04 FGM400R-04		
	60/75	20	20	125	20.6	25	60	75			
	75/100	20	20	125	20.6	25	75	100			
	100/140	20	20	125	20.6	25	100	140			
	425R - 25/30	25	25	150	25.6	12	25	30	FMM400R-04		
	30/35	25	25	150	25.6	12	30	35			
	35/48	25	25	150	25.6	12	35	48			
	48/60	25	25	150	25.6	25	48	60	FGD400R-04 FGM400R-04		
	60/75	25	25	150	25.6	25	60	75			
	75/100	25	25	150	25.6	25	75	100			
	100/140	25	25	150	25.6	25	100	140			
	520R - 25/30	20	20	125	20.6	12	25	30	FMM500R-04		
	30/35	20	20	125	20.6	12	30	35			
	35/40	20	20	125	20.6	20	35	40			
	40/48	20	20	125	20.6	20	40	48			
	48/60	20	20	125	20.6	25	48	60	FGD500R-04 FGM500R-04		
	60/75	20	20	125	20.6	25	60	75			
	75/100	20	20	125	20.6	25	75	100			
	100/140	20	20	125	20.6	25	100	140			
	525R - 25/30	25	25	150	25.6	12	25	30	FMM500R-04		
	30/35	25	25	150	25.6	12	30	35			
	35/40	25	25	150	25.6	20	35	40			
	40/48	25	25	150	25.6	20	40	48			
	48/60	25	25	150	25.6	25	48	60	FGD500R-04 FGM500R-04		
	60/75	25	25	150	25.6	25	60	75			
	75/100	25	25	150	25.6	25	75	100			
	100/140	25	25	150	25.6	25	100	140			

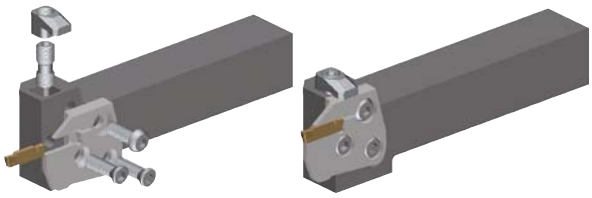
Applicable inserts C26~C27

MGT cartridge

Features

- Compatible and Economical due to divided cartridge & exclusive holder system from existing single body system
- Interchangeable cartridge
  - Various assembly depends on working style
  - Reduce cutting tool costs by over 30%
  - Setting with upper clamp & side screw
- Strong & Stable setting force
  - Simultaneous assembly of insert & cartridge
  - Easy assembly & tool exchange
- Stable assembly system
  - Simple & Superior setting force

Stable Assembly thanks to double screw & clamp



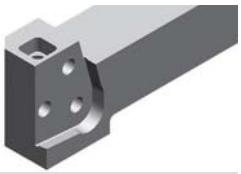
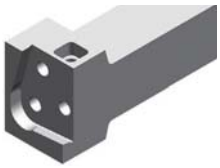
Simple & Strong Setting

Holder code system

MC	H	R/L	25	25
MGT-Cartridge System	Holder Style	Hand	Height (mm)	Width (mm)

H: Horizontal
V: Vertical

Holder

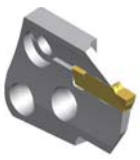
	Horizontal Type		Vertical Type	
				
	MCHR	MCHL	MCVR	MCVL
Available cartridge	External process: MCER Facing process: MCFL	External process: MCEL Facing process: MCFR	External process: MCEL Facing process: MCFR	External process: MCER Facing process: MCFL

Cartridge code system

MC	F	R/L	3	24/35	T16
MGT-Cartridge System	Working Style	Hand	Cutting Width (mm)	Facing Dia. (mm)	Maximum Depth (mm)

E: External Process
F: Facing Process

Cartridge

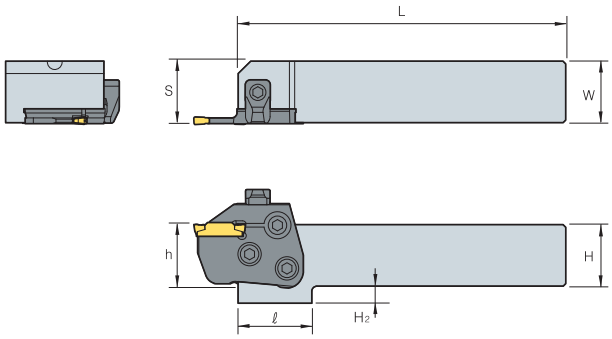
External Process		Facing Process	
			
MCER	MCEL	MCFR	MCFL

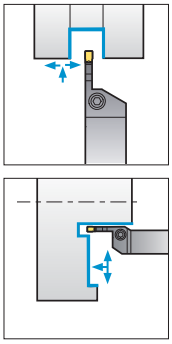
MCHR/L (Holder)

For Grooving, Turning, Parting off, Reliefing, Profiling machining



MCER/L
MCFR/L





• R type insert

(mm)

Designation		H = (h)	W	L	S	ℓ	H_2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping Screw	Wrench
MCHR/L	2020	20	20	133	20.7	30	12	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	25	25	133	25.7	30	7						
	3232	32	32	153	32.7	-	-						

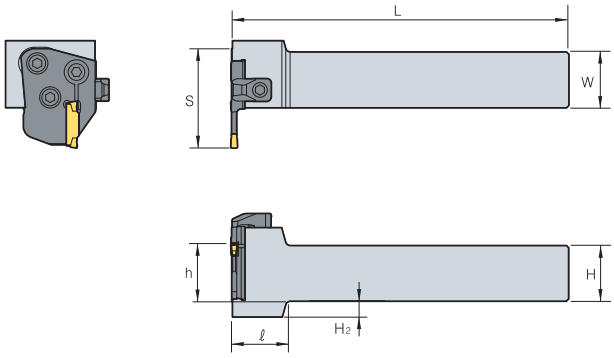
Applicable inserts **C38**

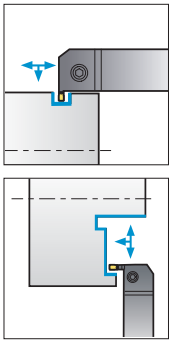
MCVR/L (Holder)

For Face Grooving, Turning machining



MCER/L
MCFR/L





• R type insert

(mm)

Designation		H = (h)	W	L	S	ℓ	H_2	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping Screw	Wrench
MCVR/L	2020	20	20	150	38	30	12	MCER/L MCFR/L	CXH8N	DHA0818F	RHA0613	FHGA0618	HW40L
	2525	25	25	150	43	30	7						
	3232	32	32	170	50	-	-						

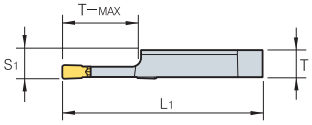
Applicable inserts **C38**

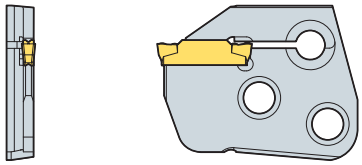
MCER/L (Cartridge)

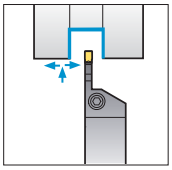
For Grooving, Turning, Parting off, Reliefing, Profiling machining



MGMN MGMR
MGGN MRMN







• R type insert

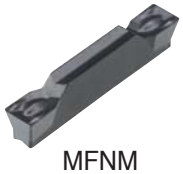
(mm)

Designation		T	L_1	S_1	T-MAX	Inserts		Holder
						Width	Designation	
MCER/L	3-T16	6.00	44.5	6.35	16	3	MGMN	
	4-T16	5.97	44.5	6.35	16	4	MGMR/L	MCVR/L
	5-T20	5.87	48.5	6.35	20	5	MGGN	MCHR/L
	6-T20	5.82	48.5	6.35	20	6	MRMN	

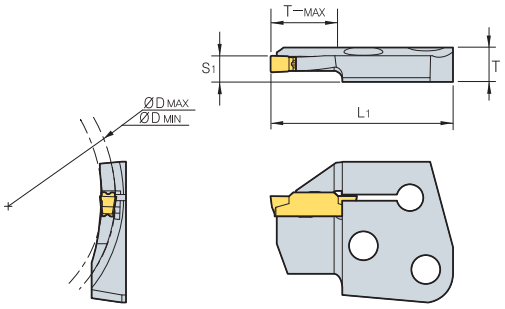
Applicable inserts C26~C27

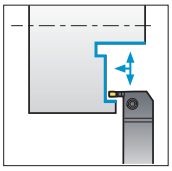
MCFR/L (Cartridge)

For Face Grooving, Turning machining



MFNM
MGMN





• R type insert

(mm)

Designation		T	L_1	S_1	T-MAX	ØD		Inserts		Holder
						Min	Max	Width	Designation	
MCFR/L	3-24/35-T16	8.00	44.5	6.35	16	24	35	3	MFMN300	MCVR/L MCHR/L
	3-29/40-T16	8.00	44.5	6.35	16	29	40	3		
	3-34/50-T16	8.00	44.5	6.35	16	34	50	3		
	3-44/70-T16	8.00	44.5	6.35	16	44	70	3		
	3-64/99-T16	8.00	44.5	6.35	16	64	99	3		
	4-44/60-T16	7.97	44.5	6.35	16	44	60	4	MGMN400	
	4-60/120-T16	7.97	44.5	6.35	16	60	120	4		
	4-112/200-T16	7.97	44.5	6.35	16	112	200	4		

Applicable inserts C26~C27

MGT - Machining aluminum wheels

Features

- Optimally designed inserts for aluminum wheel machining
- Longer tool life when matched with the best grade for application
- Unique clamping mechanism places a strong clamp over the insert
- A variety of insert types for multi application functions

Insert code system

MR	G	N	6	-	A
System Code	Tolerance	Hand	Cutting Edge Width		Chip Breaker
MR: Multi Grooving Round shape MV: Multi Grooving V shape	G: Ground	N: Neutral	6 mm, 8 mm		A/AM/AP/A5

Holder code system

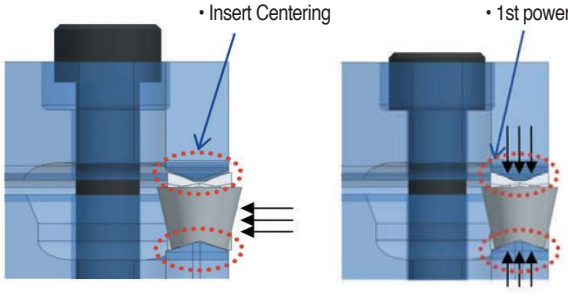
MG	E	H	R/L	25N	-	8	A	-	MR
System Code	Application	Holder Type	Hand	Shank Size		Cutting Width	Chip Breaker		Insert Type
MG: Multi Grooving	E: External machining I: Internal machining	H: Horizontal V: Vertical U: Undercut X: Special	R: Right L: Left	Height: 25 mm Width: 25 mm (For internal machining: Minimum diameter)		1.5~8.0 mm	A/AM/ AP/A5		MR: ROUND shape MV: V shape

Various insert types

MRGN type : Full "Round" geometry

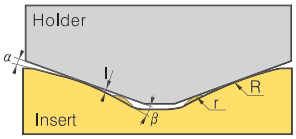
MRGN-A (For general)	MRGN-A5 (For copying)	MRGN-AM (Medium finishing)	MRGN-AP (PCD)	MVGN-A (For fine finishing)
				
High rake angle, Sharp cutting edge	Reinforced clamping force	For ductile cast iron	Improved chip control	High rake and relief angle

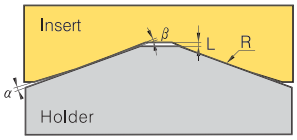
New clamping system



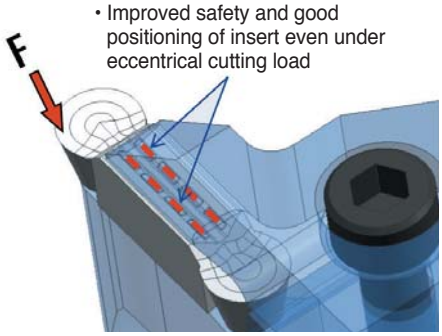
•Reinforcing the clamping force due to radius designed on the top & bottom side of insert and convex"DOT"on the top of insert

PATENT



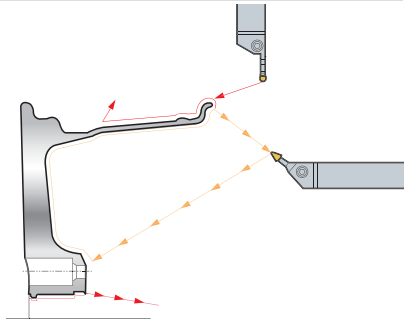
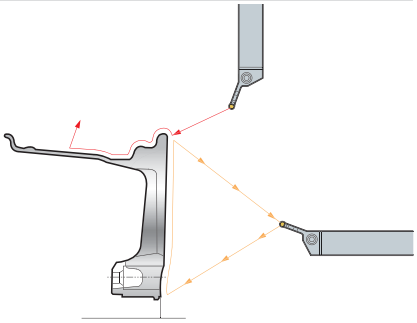
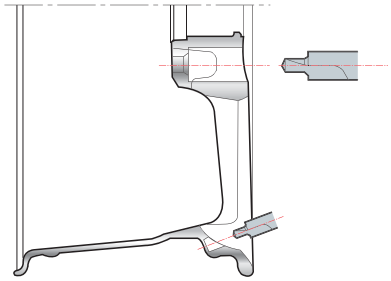


• Improved safety and good positioning of insert even under eccentrical cutting load



Available Insert for MGT Aluminum Wheel

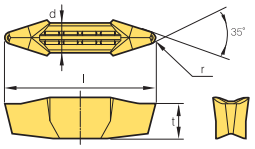
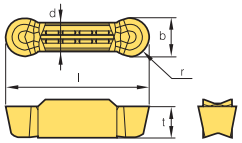
Application of aluminum wheels

Machining A	Machining B	Machining C
		

Recommended cutting condition

Workpiece		Hardness Brinell (HB)	kc (MPa)	vc (m/min)	fn (mm/rev)
Aluminum alloy (Forged)	Unhardened	50~70	500~600	1,000~2,500	0.1~0.6
	Hardened	90~110	700~900	300~1,000	0.1~0.5
Aluminum alloy (Cast)	Unhardened	70~80	700~800	300~1,000	0.1~0.5
	Hardened	80~110	800~950	200~600	0.1~0.4
Copper alloy		90~110	700~900	300~800	0.1~0.5
Magnesium alloy		70~80	700~800	300~1,000	0.1~0.5

Insert

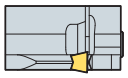
Application	Picture	Designation		Coated	Uncoated	Dimensions (mm)					Configuration	Page
				DP150	G10	b	r	l	d	t		
For Aluminum Wheel	MVGN 	MVGN	8N-A-R1.2			-	1.2	30.0	6.0	6.9		C40
			8N-A-R1.6			-	1.6	30.0	6.0	6.9		
	MRGN-A 	MRGN	6N-A		●	6.0	3.0	26.0	5.0	5.9		C39 C40
			6N-AM			6.0	3.0	26.0	5.0	5.9		
			6N-AP			6.0	3.0	26.0	5.0	5.9		
			6N-A5		●	6.0	3.0	26.0	5.0	5.9		
			8N-A			8.0	4.0	30.0	6.0	6.5		
			8N-AM			8.0	4.0	30.0	6.0	6.5		
			8N-AP			8.0	4.0	30.0	6.0	6.5		
			8N-A5		●	8.0	4.0	30.0	6.0	6.5		

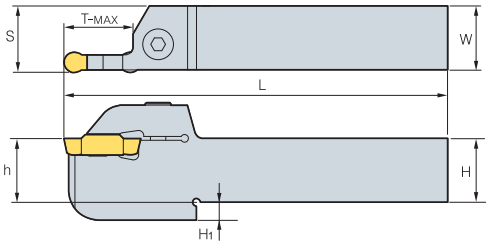
● : Stock item

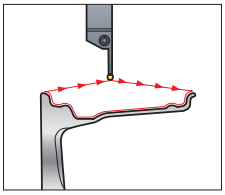
MGEHR/L



MRGN







• R type insert

(mm)

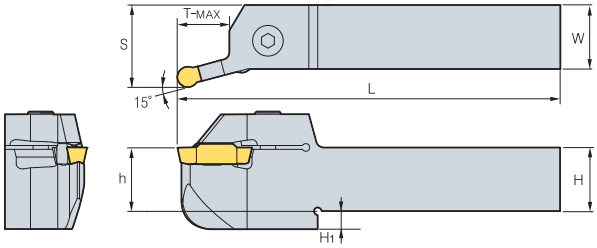
Designation		H = (h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	25N-6A	25	7	25	150	25.55	23.5	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	32N-6A	32	8	32	150	32.55	27			
	25N-6A5	25	7	25	150	25.55	23.5	MRGN6N-A5		
	32N-6A5	32	8	32	150	32.55	27			
	25N-8A	25	7	25	150	25.55	23.5	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	32N-8A	32	8	32	150	32.55	27			
	25N-8A5	25	7	25	150	25.55	23.5	MRGN8N-A5		
	32N-8A5	32	8	32	150	32.55	27			

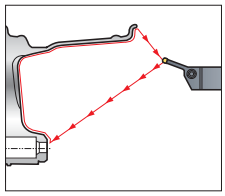
Applicable inserts **C40**

MGEHR/L-15



MRGN





• R type insert

(mm)

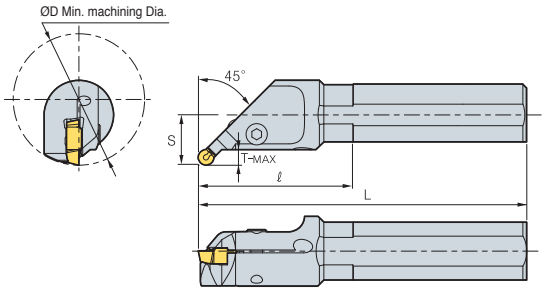
Designation		H = (h)	H1	W	L	S	T-MAX	Inserts	Screw	Wrench
MGEHR/L	25N-6A-15	25	7	25	150	32.2	20	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	32N-6A-15	32	8	32	150	39.2	25			
	25N-6A5-15	25	7	25	150	32.2	20	MRGN6N-A5		
	32N-6A5-15	32	8	32	150	39.2	25			
	25N-8A-15	25	7	25	150	32.2	20	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	32N-8A-15	32	8	32	150	39.2	25			
	25N-8A5-15	25	7	25	150	32.2	20	MRGN8N-A5		
	32N-8A5-15	32	8	32	150	39.2	25			

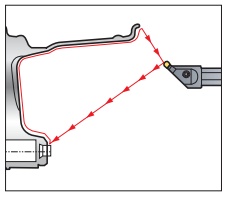
Applicable inserts **C40**

MGIUR/L-MR



MRGN





• R type insert

(mm)

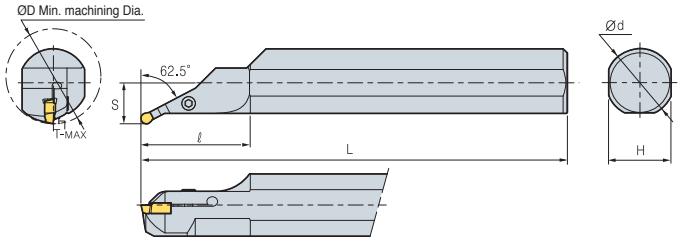
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIUR/L	6832-8A-MR	68	32	170	65	7	30	26	MRGN8N-A/AM/AP MRGN8N-A5	BHA0620	HW50L
	6832-8A5-MR	68	32	170	65	7	30	26			

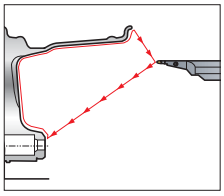
Applicable inserts **C40**

MGIXR/L-MR



MRGN





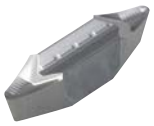
• R type insert

(mm)

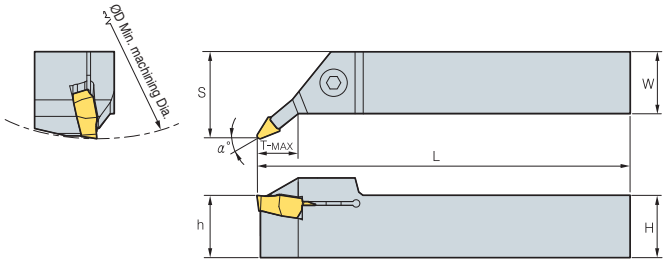
Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
MGIXR/L	7050-8A-MR	70	50	350	80	5.5	46	30.2	MRGN8N-A/AM/AP MRGN8N-A5	BHA0620	HW50L
	7050-8A5-MR	70	50	350	80	5.5	46	30.2			

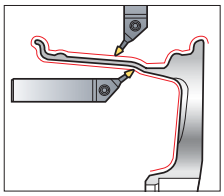
Applicable inserts **C40**

MGEXR/L



MVGN





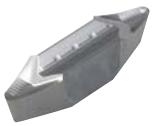
• R type insert

(mm)

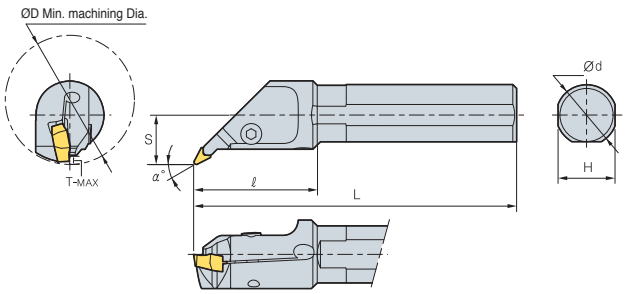
Designation		H = (h)	W	L	S	T-MAX	α°	Inserts	Screw	Wrench
MGEXR/L	25N-8A-5V	25	25	150	29	23.5	5	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0620	HW50L
	25N-8A-22.5V	25	25	150	35	27	22.5			

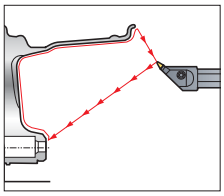
Applicable inserts **C40**

MGIUR/L-MV



MVGN





• R type insert

(mm)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	α°	Inserts	Screw	Wrench
MGIUR/L	6832-8A-MV	68	32	170	65	4.5	30	26	27.5	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0620	HW50L

Applicable inserts **C40**

Economical 3-corner insert for high precision grooving

TB/TB-M



- Economical 3-corner insert for grooving
- Various cutting edge size ranging from 1.25~4.5mm
- High accuracy ground insert ensures high precision machining
- Stable chip control optimized for automated grooving process

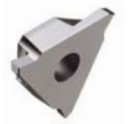
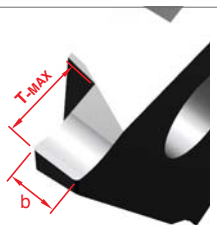
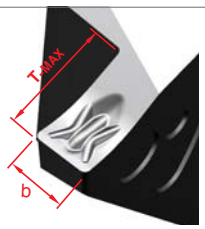
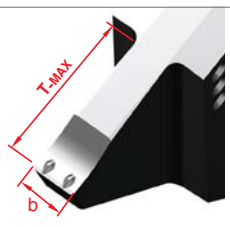
Insert code system

TB	5	150	N	-	010	-	M
Triangle Blade	Inscribed circle	Cutting edge width	Hand		Nose R		Chip breaker
	3: 9.525 mm 4: 12.7 mm 5: 15.875 mm	0.5~4.5 mm	N: Neutral R: Right L: Left		0.00~0.40 mm		None M

Holder code system

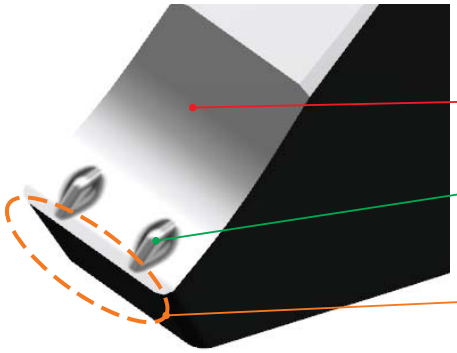
TBH	5	25	R
Triangle Blade Holder	Inscribed circle	Shank size	Hand
	3: 9.525 mm 4: 12.7 mm 5: 15.875 mm	10~25 mm	R: Right L: Left

TB/TB-M

Specification		TB3000R/L, TB4000R/L	TB4000R-M	TB5000N-000-M
Designation		TB3125R/L~TB3430R/L (Inscribed circle of 9.525 mm) TB4125R/L~TB4430R/L (Inscribed circle of 12.7 mm)	TB4150R-M ~TB4450R-M (Inscribed circle of 12.7 mm)	TB5050N-000-M ~ TB5318N-020-M (Inscribed circle of 15.875 mm)
Insert shape				
Features	Chip breaker	Ground chip breaker	Pressed chip breaker	Pressed chip breaker
	Hand	Right/Left-handed	Right-handed	Neutral
	Cutting edge width (b)	1.25~4.3 mm	1.5~4.5 mm	0.5~3.18 mm
	Depth of cut (T-MAX)	~ 4.5 mm	~ 4.5 mm	~ 6.5 mm
	Shape	○	X	X
	Cutting edge width	○	○	○
Chip breaker shape				
Application range		P	P, M, K	P, M, K
Grade		CN2000, PC5300	CN2000, PC5300	PC5300

TB-M chip breaker

- Minimized cutting force at high speed and high feed → Smooth chip evacuation outside each groove
- High precision cutting performance → Exceptional surface finish and accurate dimensions
- Excellent chip flow and cutting results → Ideal for automated and unmanned production

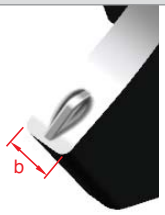


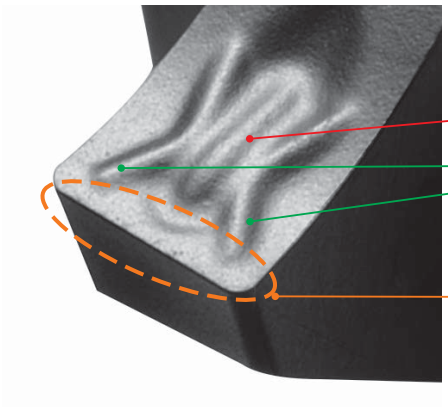
TB5-M Chip breaker

Lowered back area: Minimizes chip frictions to prevent overload when evacuating chips

Beveled protruding dots: Facilitate smooth chip evacuation outside each groove. Minimize chip control work load at high depth of cuts. Form chip curls at regular intervals

Cutting edge land: Prevents chipping and improves machining stability in interrupted cutting

Designation	TB5050N·M ~TB5120N·M	TB5140N·M ~TB5178N·M	TB5196N·M ~TB5239N·M	TB5247N·M ~TB5287N·M	TB5300N·M ~TB5318N·M
Shape					
Cutting edge width (b)	0.5~1.2 mm	1.40~1.78 mm	1.96~2.39 mm	2.47~2.87 mm	3.0~3.18 mm

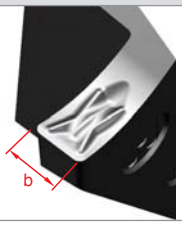
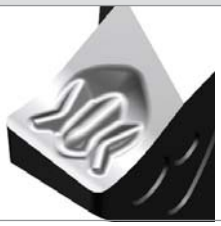


TB4-M Chip breaker

Sub dots: Control stability of chip curls at high feed

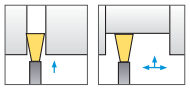
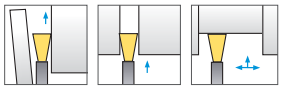
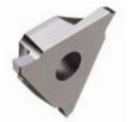
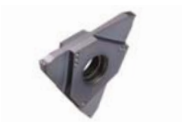
Main dots: Show exceptional chip control in turning and chamfering applications. Facilitate smooth chip evacuation outside each groove . Form chip curls at regular intervals

Sharp cutting edges: Deliver sharp cutting performance

Designation	TB4150R·M~TB4185R·M	TB4200R·M~TB4228R·M	TB4300R·M~TB4350R·M	TB4400R·M~TB4450R·M
Shape				
Cutting edge width (b)	1.5~1.85 mm	2.0~2.8 mm	3.0~3.5 mm	4.0~4.5 mm

Guide for TB

(mm)

TB					TB3/TB4	TB4-M	TB5-M
Recommended machining method							
Cutting edge width W	Depth of cut T-MAX			Recommended feed rate (mm/rev)			
	TB3/TB4	TB4-M	TB5-M				
0.05	-	-	2.5	0.05 (0.03~0.1)	-	-	●
0.80	-	-	1.6		-	-	●
1.00	-	-	3.5		-	-	●
1.04	-	-	2.0		-	-	●
1.20	-	-	2.0		-	-	●
1.25	2.0	-	2.0		●	-	-
1.40	2.0	-	6.5	0.1 (0.03~0.15)	●	-	●
1.45	2.0	-	-		●	-	-
1.47	-	-	6.5		-	-	●
1.50	3.5	3.5	6.5		●	●	●
1.57	-	-	6.5		-	-	●
1.70	-	-	6.5		-	-	●
1.75	3.5	3.5	-		●	●	-
1.78	-	-	6.5		-	-	●
1.85	3.5	3.5	-		●	●	-
1.96	-	-	6.5		-	-	●
2.00	3.5	3.5	6.5		●	●	●
2.15	3.5	3.5	-	0.12 (0.03~0.2)	●	●	-
2.22	6.5	-	6.5		-	-	●
2.30	3.5	3.5	6.5		●	●	●
2.39	-	-	6.5		-	-	●
2.47	-	-	6.5		-	-	●
2.50	4.0	4.0	6.5		●	●	●
2.65	4.0	4.0	6.5		●	●	-
2.70	-	-	6.5		-	-	●
2.80	4.0	4.0	-		●	●	-
2.87	-	-	6.5		-	-	●
3.00	4.0	4.0	6.5		●	●	●
3.15	-	-	6.5	0.15 (0.05~0.2)	-	-	●
3.18	-	-	6.5		-	-	●
3.30	4.0	-	-		●	-	-
3.50	5.0	5.0	-		●	●	-
4.00	5.0	5.0	-		●	●	-
4.30	5.0	5.0	-		●	●	-
4.50	5.0	5.0	-		●	●	-

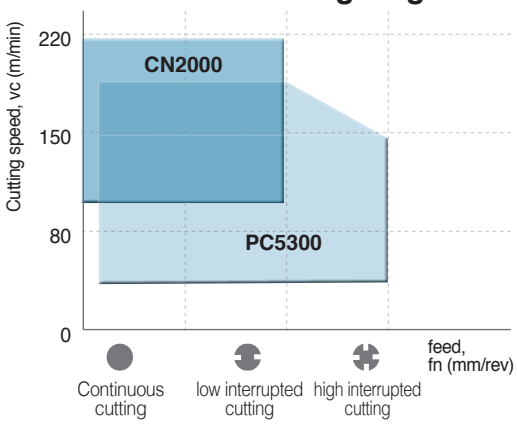
● : Stock item

Recommended cutting conditions

Workpiece		CN2000 (Cermet)			PC5300 (Coated)		
		Min.	Recommended	Max.	Min.	Recommended	Max.
P	SMOOC type	100	**160**	220	80	**140**	200
	SCM type	100	**150**	200	80	**130**	180
M	STS type	-	-	-	40	**80**	150
K	GC, GCD type	-	-	-	80	**130**	180

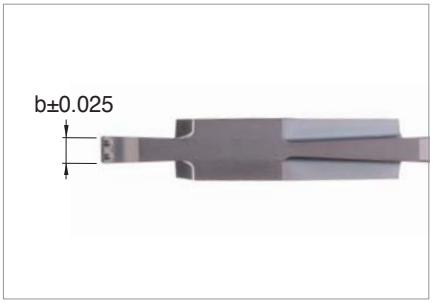
Recommended cutting speed, vc (m/min)

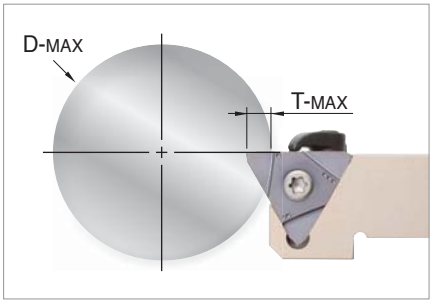
Recommended cutting range

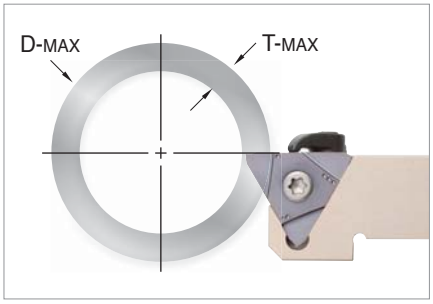


TB5-M machining range

- There is a limit to cutting diameters of TB5-M when depth of cuts are over 5 mm
  (e.g. When cutting with a TB5200N-020-M insert at the depth of 6.2 mm, Ø60 D-MAX is available)
- N.L = No limit



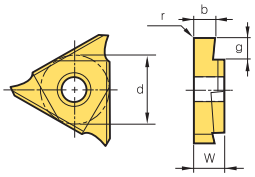
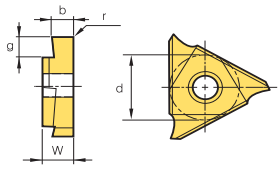




(mm)

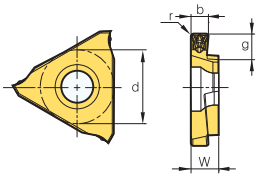
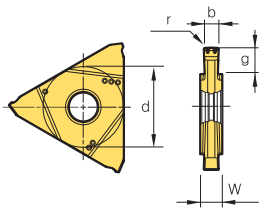
Designation		b	r	g (T-MAX)	ØD-MAX								
					T≤3.0	T≤3.5	T≤4.0	T≤4.5	T≤5.0	T≤5.5	T≤6.0	T≤6.4	T≤6.5
TB	5050N-000-M	0.50	0.00	1.0	-	-	-	-	-	-	-	-	-
	5050N-004-M	0.50	0.04	2.5	-	-	-	-	-	-	-	-	-
	5080N-000-M	0.80	0.00	1.6	-	-	-	-	-	-	-	-	-
	5100N-006-M	1.00	0.06	3.5	-	-	-	-	-	-	-	-	-
	5104N-000-M	1.04	0.00	2.0	-	-	-	-	-	-	-	-	-
	5120N-000-M	1.20	0.00	2.0	-	-	-	-	-	-	-	-	-
	5140N-000-M	1.40	0.00	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5147N-000-M	1.47	0.00	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5150N-010-M	1.50	0.10	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5150N-015-M	1.50	0.15	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5157N-015-M	1.57	0.15	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5170N-010-M	1.70	0.10	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5178N-018-M	1.78	0.18	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5196N-015-M	1.96	0.15	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5200N-020-M	2.00	0.20	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5222N-015-M	2.22	0.15	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5230N-020-M	2.30	0.20	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5239N-015-M	2.39	0.15	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5247N-020-M	2.47	0.20	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5250N-020-M	2.50	0.20	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5270N-010-M	2.70	0.10	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5287N-020-M	2.87	0.20	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5300N-000-M	3.00	0.00	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5300N-020-M	3.00	0.20	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5300N-040-M	3.00	0.40	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5315N-015-M	3.15	0.15	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40
	5318N-020-M	3.18	0.20	6.5	N.L	N.L	N.L	N.L	N.L	Ø300	Ø170	Ø60	Ø40

Insert

Shape	Designation		Dimensions (mm)					Coated	Cermet	Configuration
			b	g (T-MAX)	r	w	d	PC5300	CN2000	
	TB (Right-handed)	3125R	1.25	1.5	0.2	4.76	9.525			
		3145R	1.45							
		3175R	1.75	2.5						
		3185R	1.85							
		3200R	2.00							
		3230R	2.30	3.5	0.3					
		3280R	2.80							
		3330R	3.30							
		3430R	4.30		0.4					
		4125R	1.25	2.0	0.2	4.76	12.7	●	●	
		4145R	1.45					●	●	
		4150R	1.50	3.5				●	●	
		4175R	1.75					●	●	
		4185R	1.85					●	●	
		4200R	2.00					●	●	
		4215R	2.15					●	●	
		4230R	2.30					●	●	
		4250R	2.50	4.0	0.3			●	●	
		4265R	2.65					●	●	
		4280R	2.80					●	●	
		4300R	3.00					●	●	
		4330R	3.30					●	●	
		4350R	3.50	5.0				●	●	
		4400R	4.00		0.4			●	●	
		4430R	4.30					●	●	
		4450R	4.50					●	●	
	TB (Left-handed)	3125L	1.25	1.5	0.2	4.76	9.525			
		3145L	1.45							
		3175L	1.75	2.5						
		3185L	1.85							
		3200L	2.00							
		3230L	2.30	3.5	0.3					
		3280L	2.80							
		3330L	3.30							
		3430L	4.30		0.4					
		4125L	1.25	2.0	0.2	4.76	12.7			
		4145L	1.45							
		4150L	1.50	3.5						
		4175L	1.75							
		4185L	1.85							
		4200L	2.00							
		4215L	2.15							
		4230L	2.30							
		4250L	2.50	4.0	0.3					
		4265L	2.65							
		4280L	2.80							
		4300L	3.00							
		4330L	3.30							
		4350L	3.50	5.0						
		4400L	4.00		0.4					
		4430L	4.30							
		4450L	4.50							

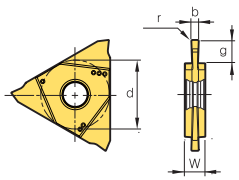
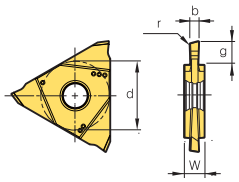
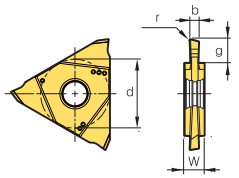
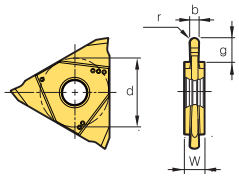
● : Stock item

Insert

Shape	Designation		Dimensions (mm)					Coated	Cermet	Configuration
			b	g (T-MAX)	r	w	d	PC5300	CN2000	
	TB (Right-handed)	4150R-M	1.50	3.5	0.20	4.76	12.7	●	●	
		4175R-M	1.75					●	●	
		4185R-M	1.85					●	●	
		4200R-M	2.00					●	●	
		4215R-M	2.15					●	●	
		4230R-M	2.30					●	●	
		4250R-M	2.50	4.0	0.30			●	●	
		4265R-M	2.65					●	●	
		4280R-M	2.80					●	●	
		4300R-M	3.00					●	●	
		4330R-M	3.30					●	●	
		4350R-M	3.50	5.0				●	●	
		4400R-M	4.00		0.40			●	●	
		4430R-M	4.30					●	●	
		4450R-M	4.50					●	●	
	TB (Neutral)	5050N-000-M	0.50	1.0	0.00	4.50	15.875	●		
		5050N-004-M	0.50	2.5	0.04			●		
		5080N-000-M	0.80	1.6	0.00			●		
		5100N-006-M	1.00	3.5	0.06			●		
		5104N-000-M	1.04	2.0	0.00			●		
		5120N-000-M	1.20	2.0	0.00			●		
		5140N-000-M	1.40	6.5	0.00			●		
		5147N-000-M	1.47		0.00			●		
		5150N-010-M	1.50		0.10			●		
		5150N-015-M	1.50		0.15			●		
		5157N-015-M	1.57		0.15			●		
		5170N-010-M	1.70		0.10			●		
		5178N-018-M	1.78		0.18			●		
		5196N-015-M	1.96		0.15			●		
		5200N-020-M	2.00		0.20			●		
		5222N-015-M	2.22		0.15			●		
		5230N-020-M	2.30		0.20			●		
		5239N-015-M	2.39		0.15			●		
		5247N-020-M	2.47		0.20			●		
		5250N-020-M	2.50		0.20			●		
		5270N-010-M	2.70		0.10			●		
		5287N-020-M	2.87		0.20			●		
		5300N-000-M	3.00		0.00			●		
		5300N-020-M	3.00		0.20			●		
		5300N-040-M	3.00		0.40			●		
		5315N-015-M	3.15		0.15			●		
		5318N-020-M	3.18		0.20			●		

● : Stock item

Insert

Shape	Designation		Dimensions (mm)						Coated	Cermet	Configuration
			b	g (T-MAX)	r	a°	w	d	PC5300	CN2000	
	**TB** (Neutral)	**5050N-004-P**	0.50	1.0	0.04						
		5100N-010-P	1.00	3.5	0.10						
		5150N-010-P	1.50	6.5	0.10						
		5150N-020-P	1.50	6.5	0.20						
		5200N-010-P	2.00	6.5	0.10	-	4.50	15.875			
		5200N-020-P	2.00	6.5	0.20						
		5239N-015-P	2.39	6.5	0.15						
		5250N-020-P	2.50	6.5	0.20						
		5300N-020-P	3.00	6.5	0.20						
	**TB** (Neutral, Right cutting)	**5100R-6D-P**	1.00	3.5	0.05	6	4.50	15.875			
		5100R-15D-P	1.00	3.5	0.05	15					
		5150R-6D-P	1.50	6.5	0.05	6					
		5150R-15D-P	1.50	6.5	0.05	15					
		5200R-6D-P	2.00	6.5	0.10	6					
		5200R-15D-P	2.00	6.5	0.10	15					
	**TB** (Neutral, Left cutting)	**5100L-6D-P**	1.00	3.5	0.05	6	4.50	15.875			
		5100L-15D-P	1.00	3.5	0.05	15					
		5150L-6D-P	1.50	6.5	0.05	6					
		5150L-15D-P	1.50	6.5	0.05	15					
		5200L-6D-P	2.00	6.5	0.10	6					
		5200L-15D-P	2.00	6.5	0.10	15					
	**TB** (Neutral, Round shape)	**5157N-079-P**	1.57	6.5	0.79						
		5200N-100-P	2.00	6.5	1.00	-	4.50	15.875			
		5239N-120-P	2.39	6.5	1.20						
		5300N-150-P	3.00	6.5	1.50						

TBH



TB3000R/L
TB4000R-M

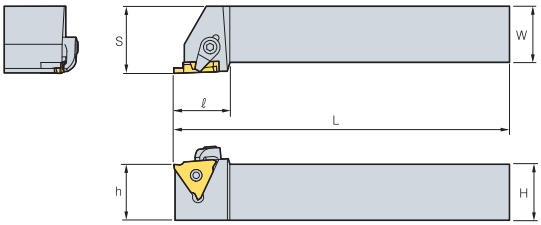
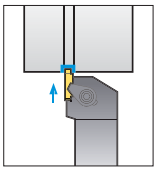
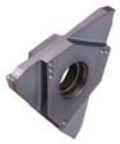


Fig. 1



• R type insert



TB5000N-000-M

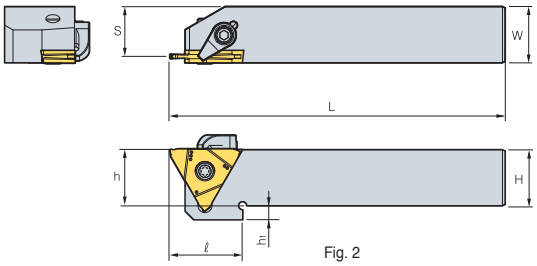


Fig. 2

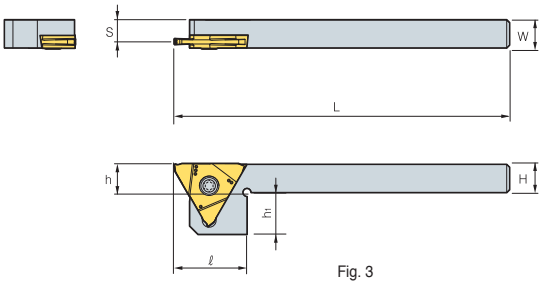


Fig. 3

(mm)

Designation		H = (h)	W	L	ℓ	h1	S	Applicable insert	Clamp	Clamp screw	Screw	Wrench	Fig.
TBH	320R/L-23	20	20	125	25.5	-	25	TB3125~3230R/L	CS6R1	DHA0617	-	HW30L	1
	320R/L-33	20	20	125	25.5	-	25	TB3280~3330R/L					
	320R/L-43	20	20	125	25.5	-	25	TB3430R/L					
	325R/L-23	25	25	150	25.5	-	30	TB3125~3230R/L					
	325R/L-33	25	25	150	25.5	-	30	TB3280~3330R/L					
	325R/L-43	25	25	150	25.5	-	30	TB3430R/L					
	420R/L-23	20	20	125	25.5	-	25	TB4125~4230R/L					
	420R/L-33	20	20	125	25.5	-	25	TB4250~4330R/L					
	420R/L-45	20	20	125	25.5	-	25	TB4350~4450R/L					
	425R/L-23	25	25	150	25.5	-	30	TB4125~4230R/L					
	425R/L-33	25	25	150	25.5	-	30	TB4250~4330R/L					
	425R/L-45	25	25	150	25.5	-	30	TB4350~4450R/L					
TBH	510R/L	10	10	125	25	15	7.8	TB5050~5318N	-	-	FTNA0512	TW20L	3
	512R/L	12	12	125	25	13	9.8						
	516R/L	16	16	125	26	9	13.8		CS6R1	DHA0617	FTNA0516	HW30L, TW20L	2
	520R/L	20	20	125	26	5	17.8						
	525R/L	25	25	150	-	0	22.8						

For deep hole grooving/parting off

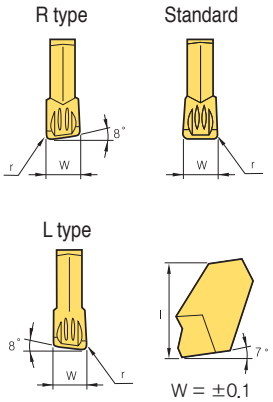
Saw-man

Features of parting insert

- Possible to machine a wide range of workpieces such as steel, cast iron, stainless steel, etc.
- Extended tool life due to low resistance rake angle
- Minimized burr due to minimal Nose R
- Various lead angle available
- Narrow chip curl due to dots on rake surface of insert

Workpiece	Cutting Speed (vc = m/min)										Feed (fn = mm/rev)				
	CVD					PVD				Uncoated	Cutting width (mm)				
	NC3120	NC3030	NCM325	NC5330	NC3225	PC8110	PC5300	PC9030	PC6510	ST30A	2	3	4	5	6
SM□□C	80~180	80~160		80~180	80~200		80~180				0.02~0.15	0.03~0.2	0.08~0.3	0.10~0.4	0.12~0.5
SCM	70~150	70~150	70~150	70~150	70~150		70~150				0.02~0.15	0.03~0.2	0.08~0.3	0.10~0.4	0.12~0.5
GC/GCD				50~100					50~100	50~100	0.05~0.12	0.1~0.25	0.1~0.30	0.1~0.35	0.1~0.40
STS			50~120	50~120		50~120	60~140	60~140			0.02~0.1	0.03~0.15	0.08~0.25	0.1~0.35	0.12~0.40
Non-ferrous metal (Al, Copper)										200~450	0.05~0.1	0.05~0.2	0.05~0.25	0.05~0.30	0.05~0.35

Insert

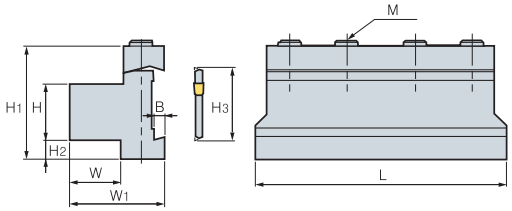
Application	Picture	Designation		Coated									Uncoated	Dimensions (mm)			Configuration
				NC3120	NC3225	NC3030	NCM325	NC5330	PC3500	PC8105	PC8110	PC5300	PC9030	ST30A	W	l	r	
Parting tools		SP	160												1.6	7.8	0.16	
			180												1.8	9.3	0.16	
			200			●	●	●			●	●	●		2.2	9.3	0.2	
			200R			●							●		2.2	9.3	0.2	
			200L										●		2.2	9.3	0.2	
			300	●		●	●	●			●	●	●	●	3.1	11.3	0.2	
			300R			●	●				●				3.1	11.3	0.2	
			300L			●									3.1	11.3	0.2	
			400	●		●	●	●			●	●	●		4.1	11.3	0.25	
			400R			●					●				4.1	11.3	0.25	
			400L			●									4.1	11.3	0.25	
			500			●	●	●			●	●			5.1	11.4	0.3	
			500R												5.1	11.4	0.3	
			500L												5.1	11.4	0.3	
			600			●		●				●			6.4	11.4	0.35	
			600R												6.4	11.4	0.35	
			600L												6.4	11.4	0.35	

● : Stock item

SMBB (Block)



SPB□□□(-S)
KGTB□□32



(mm)

Designation		H	W	H3	L	H1	H2	W1	B	M	Blades	Wrench
SMBB	1626	16	12	26	86	43	13	30	5.3	3-M6	SPB□26(-S)	HW50L
	2026	20	19	26	86	43	9	38	5.3	3-M6		
	2032	20	19	32	100	50	13	38	5.3	4-M6	SPB□32(-S) KGTB□□32	
	2526	25	23	26	86	43	4	42	5.3	4-M6	SPB□26(-S)	
	2532	25	23	32	110	50	8	42	5.3	4-M6	SPB□32(-S) KGTB□□32	
	3232	32	30	32	110	54	5	48	5.3	4-M6		

Applicable inserts C51

SPB/SPB-S (Blades)



SP

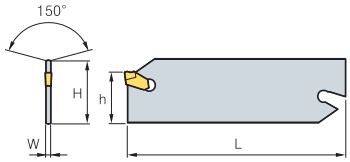


Fig. 1

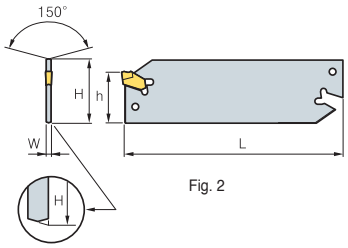
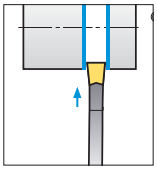


Fig. 2

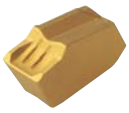


(mm)

Designation		H	W	L	h	Inserts	Wrench		Fig.
SPB	226	26	1.6	110	21	SP200, 200R/L	SW50L	-	1
	326	26	2.4	110	21	SP300, 300R/L			
	426	26	3.2	110	21	SP400, 400R/L			
	526	26	4.0	110	21	SP500, 500R/L			
	626	26	5.2	110	21	SP600, 600R/L			
	232	32	1.6	150	25	SP200, 200R/L			
	332	32	2.4	150	25	SP300, 300R/L			
	432	32	3.2	150	25	SP400, 400R/L			
	532	32	4.0	150	25	SP500, 500R/L			
	632	32	5.2	150	25	SP600, 600R/L			
SPB	226-S	26	1.6	110	21	SP200, 200R/L	-	SW15S (Separately ordered)	2
	326-S	26	2.4	110	21	SP300, 300R/L			
	426-S	26	3.2	110	21	SP400, 400R/L			
	526-S	26	4.0	110	21	SP500, 500R/L			
	626-S	26	5.2	110	21	SP600, 600R/L			
	232-S	32	1.6	150	25	SP200, 200R/L			
	332-S	32	2.4	150	25	SP300, 300R/L			
	432-S	32	3.2	150	25	SP400, 400R/L			
	532-S	32	4.0	150	25	SP500, 500R/L			
	632-S	32	5.2	150	25	SP600, 600R/L			

Applicable inserts C51

SPH/SPH-S (Holder)



SP

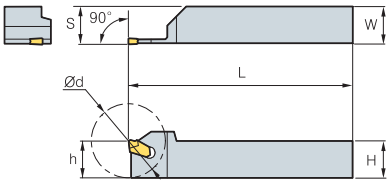


Fig. 1

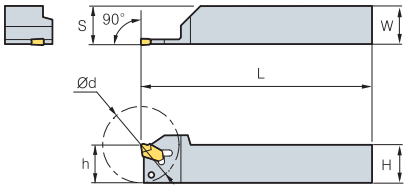
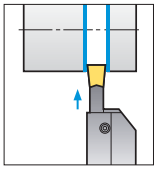


Fig. 2



• R type insert

(mm)

Designation		H = (h)	W	L	Ød	S	Inserts	Wrench		Fig.
SPH	316R/L	16	16	100	32	16.3	SP300, 300R/L	SW50L	-	1
	320R/L	20	20	120	40	20.3	SP300, 300R/L			
	420R/L	20	20	120	50	20.4	SP400, 400R/L			
	520R/L	20	20	120	60	20.5	SP500, 500R/L			
	325R/L	25	25	150	50	25.3	SP300, 300R/L			
	425R/L	25	25	150	60	25.4	SP400, 400R/L			
	525R/L	25	25	150	70	25.5	SP500, 500R/L			
SPH	316R/L-S	16	16	100	32	16.3	SP300, 300R/L	-	SW15S (Separately ordered)	2
	320R/L-S	20	20	120	40	20.3	SP300, 300R/L			
	420R/L-S	20	20	120	50	20.4	SP400, 400R/L			
	520R/L-S	20	20	120	60	20.5	SP500, 500R/L			
	325R/L-S	25	25	150	50	25.3	SP300, 300R/L			
	425R/L-S	25	25	150	60	25.4	SP400, 400R/L			
	525R/L-S	25	25	150	70	25.5	SP500, 500R/L			

Applicable inserts **C51**

Six kinds of inserts can be used in one holder for various operations

Fine Tools

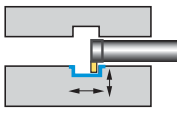


- Strong clamping system and specially designed insert are suitable for small diameter machining
- Six kinds of inserts can be clamped in one holder for various operations
- Guaranteed long tool life due to good toughness substrate with new TiAlN
- High accuracy ground insert ensures high precision machining

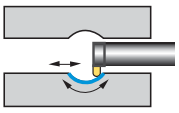
Application range

• Internal grooving, Profiling, Threading and Boring at Ø8 mm~Ø16 mm

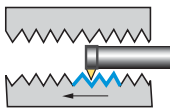
Features



(Grooving, Turning)



(Forming)



(Threading)

Code system

NFTIH 08 3 12 - S

08	3	12	S
Minimum Diameter	Overhang (ℓ/ØD)	Shank Dia.	Shank Type S: Steel, C: Carbide

Recommended cutting condition

Workpiece	Grade	Cutting Condition				
			Min. machining Dia.			
	PC130		Ø8	Ø11	Ø14	Ø16
Carbon steel	◎	vc (m/min)	30~80	30~100	30~100	30~100
		fn (m/rev)	0.01~0.04	0.01~0.05	0.02~0.05	0.02~0.06
Alloy steel	◎	vc (m/min)	30~80	30~100	30~100	30~100
		fn (m/rev)	0.01~0.02	0.01~0.04	0.02~0.04	0.02~0.05
Cast iron	○	vc (m/min)	30~80	30~100	30~100	30~100
		fn (m/rev)	0.01~0.05	0.01~0.05	0.02~0.05	0.02~0.05
Non-ferrous alloy	○	vc (m/min)	70~150	100~150	100~150	100~150
		fn (m/rev)	0.02~0.06	0.02~0.06	0.02~0.06	0.02~0.06

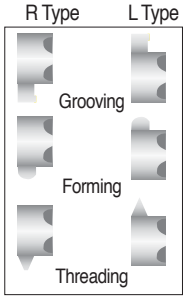
Note
- In case of chattering, reduce the cutting speed and feed
- To find the optimal cutting conditions, advise to gradually increase from the lowest cutting condition of the above recommendation
- In case of the unilateral grooving depth over 1 mm, work to the step feed rate

Clamping system

Screw	Insert	Holder



+



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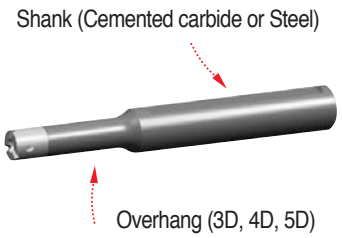
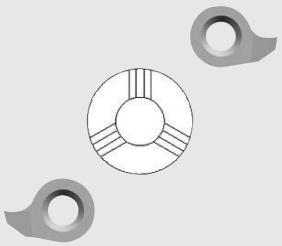
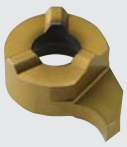
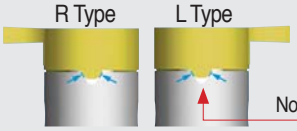


• Available R/L type insert with one holder



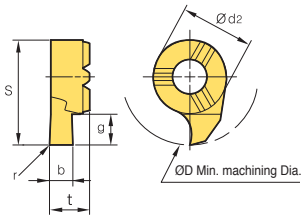
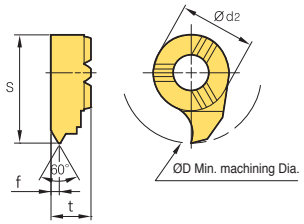


Stable clamping according to the tripod structure



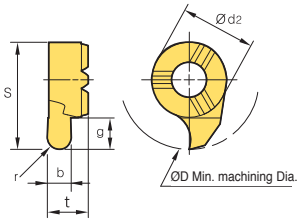
No-Spin-System design for strong clamping

Insert

Application	Picture	Designation		Coated PC5300 R	Coated PC5300 L	ØD	b	r	S	g	Ød2	t	Pitch	f	Configuration
Grooving		NFTG	08075R/L	●		8	0.75	-	7.75	1.3	5.9	3.85	-	-	
			08085R/L	●		8	0.85	-	7.75	1.3	5.9	3.85	-	-	
			08095R/L	●		8	0.95	-	7.75	1.3	5.9	3.85	-	-	
			08121R/L	●		8	1.21	-	7.75	1.3	5.9	3.85	-	-	
			08141R/L	●		8	1.41	-	7.75	1.3	5.9	3.85	-	-	
			08152R/L	●		8	1.52	-	7.75	1.3	5.9	3.85	-	-	
			08171R/L	●		8	1.71	-	7.75	1.3	5.9	3.85	-	-	
			08202R/L	●		8	2.02	-	7.75	1.3	5.9	3.85	-	-	
			11075R/L	●		11	0.75	-	10.7	1.8	8.0	4.9	-	-	
			11085R/L	●		11	0.85	-	10.7	1.8	8.0	4.9	-	-	
			11095R/L	●		11	0.95	-	10.7	1.8	8.0	4.9	-	-	
			11121R/L	●		11	1.21	-	10.7	2.6	8.0	4.9	-	-	
			11141R/L	●		11	1.41	-	10.7	2.6	8.0	4.9	-	-	
			11152 R/L	●		11	1.52	-	10.7	2.6	8.0	4.9	-	-	
			11171R/L	●		11	1.71	-	10.7	2.6	8.0	4.9	-	-	
			11202R/L	●		11	2.02	-	10.7	2.6	8.0	4.9	-	-	
			11202R/L-02	●		11	2.02	0.2	10.7	2.6	8.0	4.9	-	-	
			11252R/L	●		11	2.52	-	10.7	2.6	8.0	4.9	-	-	
			11302R/L	●		11	3.02	-	10.7	2.6	8.0	4.9	-	-	
			14075R/L			14	0.75	-	13.5	1.8	9.0	5.85	-	-	
			14085R/L	●		14	0.85	-	13.5	1.8	9.0	5.85	-	-	
			14095R/L	●		14	0.95	-	13.5	1.8	9.0	5.85	-	-	
			14121R/L	●		14	1.21	-	13.5	4.3	9.0	5.85	-	-	
			14141R/L	●		14	1.41	-	13.5	4.3	9.0	5.85	-	-	
			14152R/L	●		14	1.52	-	13.5	4.3	9.0	5.85	-	-	
			14171R/L	●		14	1.71	-	13.5	4.3	9.0	5.85	-	-	
			14202R/L	●		14	2.02	-	13.5	4.3	9.0	5.85	-	-	
			14252R/L	●		14	2.52	-	13.5	4.3	9.0	5.85	-	-	
			14302R/L	●		14	3.02	-	13.5	4.3	9.0	5.85	-	-	
			16075R/L			16	0.75	-	15.7	1.8	11	5.8	-	-	
			16085R/L			16	0.85		15.7	1.8	11	5.8	-	-	
			16095R/L	●		16	0.95	-	15.7	1.8	11	5.8	-	-	
			16121R/L	●		16	1.21	-	15.7	4.6	11	5.8	-	-	
			16141R/L	●		16	1.41	-	15.7	4.6	11	5.8	-	-	
			16171R/L	●		16	1.71	-	15.7	4.6	11	5.8	-	-	
			16202R/L	●		16	2.02	-	15.7	4.6	11	5.8	-	-	
			16252R/L	●		16	2.52	-	15.7	4.6	11	5.8	-	-	
			16302R/L	●		16	3.02	-	15.7	4.6	11	5.8	-	-	
			16352R/L	●		16	3.52	-	15.7	4.6	11	5.8	-	-	
			16402R/L	●		16	4.02	-	15.7	4.6	11	5.8	-	-	
Threading		NFTT	0805MR/L	●		8	-	-	7.75	-	6	3.85	0.5	1.0	
			0810MR/L	●		8	-	-	7.75	-	6	3.85	1.0	1.0	
			0815MR/L	●		8	-	-	7.75	-	6	3.85	1.5	1.2	
			1110MR/L	●		11	-	-	10.7	-	8	4.9	1.0	1.2	
			1115MR/L	●		11	-	-	10.7	-	8	4.9	1.5	1.2	
			1120MR/L	●		11	-	-	10.7	-	8	4.9	2.0	1.2	
			1125MR/L	●		11	-	-	10.7	-	8	4.9	2.5	1.2	
			1410MR/L	●		14	-	-	13.5	-	9	5.85	1.0	1.2	
			1415MR/L	●		14	-	-	13.5	-	9	5.85	1.5	1.2	
			1420MR/L			14	-	-	13.5	-	9	5.85	2.0	1.2	
			1425MR/L	●		14	-	-	13.5	-	9	5.85	2.5	1.2	
			1610MR/L			16	-	-	15.7	-	11	5.8	1.0	1.2	
			1615MR/L			16	-	-	15.7	-	11	5.8	1.5	1.2	
			1620MR/L	●		16	-	-	15.7	-	11	5.8	2.0	1.2	
			1625MR/L			16	-	-	15.7	-	11	5.8	2.5	1.2	
			1630MR/L			16	-	-	15.7	-	11	5.8	3.0	1.5	
			1635MR/L			16	-	-	15.7	-	11	5.8	3.5	1.6	
			1640MR/L			16	-	-	15.7	-	11	5.8	4.0	1.8	

● : Stock item

Insert

Application	Picture	Designation		Coated PC5300 R	Coated PC5300 L	D	b	r	S	g	Ød2	t	Configuration
Profiling		NFTF	08082R/L	●		8	0.82	0.41	7.75	1.3	5.9	3.85	
			08122R/L	●		8	1.22	0.61	7.75	1.3	5.9	3.85	
			08182R/L	●		8	1.82	0.91	7.75	1.3	5.9	3.85	
			11082R/L	●		11	0.82	0.41	10.7	2.6	8	4.9	
			11122R/L			11	1.22	0.61	10.7	2.6	8	4.9	
			11182R/L			11	1.82	0.91	10.7	2.6	8	4.9	
			11202R/L	●		11	2.02	1.01	10.7	2.6	8	4.9	
			11302R/L	●		11	3.02	1.51	10.7	2.6	8	4.9	
			14122R/L	●		14	1.22	0.61	13.5	4.3	9	5.85	
			14182R/L	●		14	1.82	0.91	13.5	4.3	9	5.85	
			14202R/L	●		14	2.02	1.01	13.5	4.3	9	5.85	
			14222R/L			14	2.22	1.11	13.5	4.3	9	5.85	
			14302R/L			14	3.02	1.51	13.5	4.3	9	5.85	
			16182R/L	●		16	1.82	0.91	15.7	4.6	11	5.8	
			16222R/L	●		16	2.22	1.11	15.7	4.6	11	5.8	
			16302R/L	●		16	3.02	1.51	15.7	4.6	11	5.8	
			16402R/L	●		16	4.02	2.01	15.7	4.6	11	5.8	

●: Stock item

NFTIH



NFTF
NFTT
NFTG

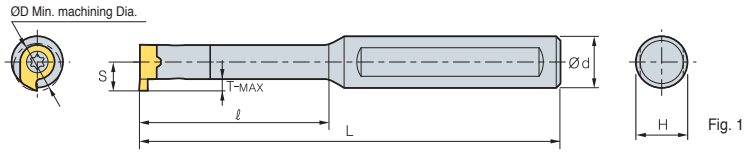


Fig. 1

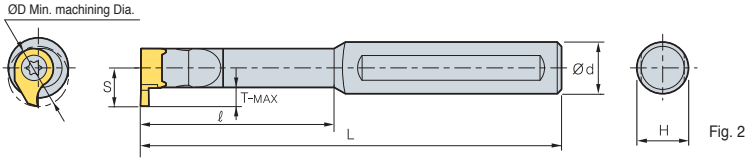


Fig. 2

• For NFTIH14~.
• R type insert

(mm)

Designation		ØD	Ød	L	ℓ	T-MAX	H	S	Inserts NFTG: Grooving NFTT: Threading NFTF: Forming	Screw	Wrench	Fig.
NFTIH	08206C	8	6	65	-	1.0	4	4.8	NFTG08□□□R/L NFTT08□□□R/L NFTF08□□□R/L	PTKA02508	TW08P	1
	08212C	8	12	70	16	1.0	10	4.8				
	08312C	8	12	80	24	1.0	10	4.8				
	08312S	8	12	80	24	1.0	10	4.8				
	08412C	8	12	90	32	1.0	10	4.8				
	08512C	8	12	100	40	1.0	10	4.8				
	11208C	11	8	80	-	2.3	7	6.7	NFTG11□□□R/L NFTT11□□□R/L NFTF11□□□R/L	PTKA03510	TW15P	2
	11212C	11	12	75	22	2.3	11	6.7				
	11312C	11	12	95	33	2.3	11	6.7				
	11312S	11	12	95	33	2.3	11	6.7				
	11412C	11	12	110	44	2.3	11	6.7				
	11512C	11	12	120	55	2.3	11	6.7				
	14012C	14	12	75	20	4.0	11	9.0	NFTG14□□□R/L NFTT14□□□R/L NFTF14□□□R/L	PTKA0412	TW15P	2
	14016C	14	16	75	20	4.0	15	9.0				
	14112C	14	12	100	34	4.0	11	9.0				
	14116C	14	16	100	34	4.0	15	9.0				
	14212C	14	12	110	45	4.0	11	9.0				
	14216C	14	16	110	45	4.0	15	9.0				
	14312C	14	12	130	64	4.0	11	9.0				
	14316C	14	16	130	64	4.0	15	9.0				
	16312C	16	12	130	48	4.3	11	10.2	NFTG16□□□R/L NFTT16□□□R/L NFTF16□□□R/L	PTKA0512	TW20P	2
	16312S	16	12	130	48	4.3	11	10.2				
	16412C	16	12	130	64	4.3	11	10.2				
	16512C	16	12	150	80	4.3	11	10.2				
	16316C	16	16	130	48	4.3	15	10.2				
	16416C	16	16	130	64	4.3	15	10.2				
	16516C	16	16	150	80	4.3	15	10.2				

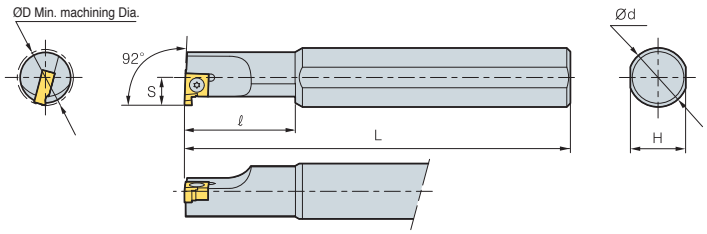
Applicable inserts **C55~C56**

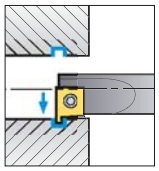
●: Stock item

IGH For Internal grooving



IG





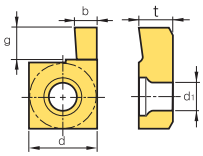
• R type insert

(mm)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Screw	Wrench
IGH	214R/L	14	16	15	150	25	6.6	IG125~280	FTKA02565	TW07P
	216R/L	16	16	15	150	30	7.6			
	220R/L	20	20	18	200	40	9.6			

Applicable inserts C57

Insert

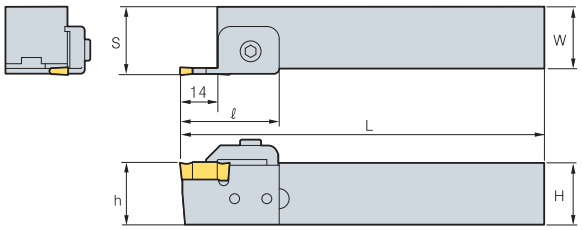
Application	Picture	Designation		Coated NC3215	Coated NC3120	Coated NC3225	Uncoated H01	Uncoated G10	Uncoated ST30A	Dimensions (mm) b	g	t	d	d1	Configuration
Internal grooving		IG	125						●	1.25	1.5	3.18	6.35	2.8	
			145						●	1.45	1.5	3.18	6.35	2.8	
			175						●	1.75	1.5	3.18	6.35	2.8	
			200						●	2.0	2.3	3.18	6.35	2.8	
			230						●	2.3	2.3	3.18	6.35	2.8	
			280						●	2.8	2.3	3.18	6.35	2.8	

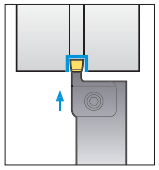
●: Stock item

DBH For Deep and Wide grooving



DB DC





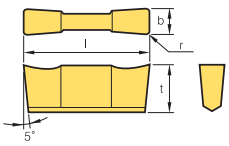
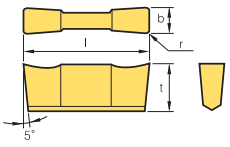
• R type insert

(mm)

Designation		H = (h)	W	L	ℓ	S *	S **	Inserts *	Inserts **	Clamp	Clamp Screw	Screw	Locator	Wrench	
DBH	320R/L	20	20	150	40	22.3	22.8	DB300 DC300	DB400 DC400	CGH5R1	MHA0512	MHB0410	LD34	HW30L	HW40L
	325R/L	25	25	150	40	27.3	27.8								
	520R/L	20	20	150	40	23.8	24.3	DB500 DC500	DB600	CGH5R2	MHA0512	MHB0410	LD56	HW30L	HW40L
	525R/L	25	25	150	40	28.8	29.3								
	720R/L	20	20	150	40	25.8	26.3	DB700	DB800	CGH5R3	MHA0512	MHB0410	LD78	HW30L	HW40L
	725R/L	25	25	150	40	30.8	31.3								

Applicable inserts C57

Insert

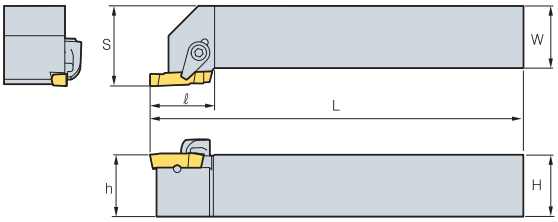
Application	Picture	Designation		Cermet CN2000	Coated NC3215	Coated NC3120	Coated NC3225	Uncoated H01	Uncoated G10	Dimensions (mm) b	l	t	r	Configuration
Grooving		DB	300							3.0	20	7.5	0.2	
			400							4.0	20	7.5	0.2	
			500							5.0	20	7.5	0.2	
			600							6.0	20	7.5	0.2	
			700							7.0	20	7.5	0.2	
			800							8.0	20	7.5	0.2	
		DC	300							3.0	20	7.5	0.2	
			400							4.0	20	7.5	0.25	
			500							5.0	20	7.5	0.3	

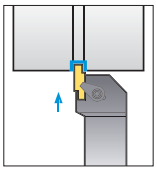
●: Stock item

GFT For External grooving



GW BF





• R type insert

(mm)

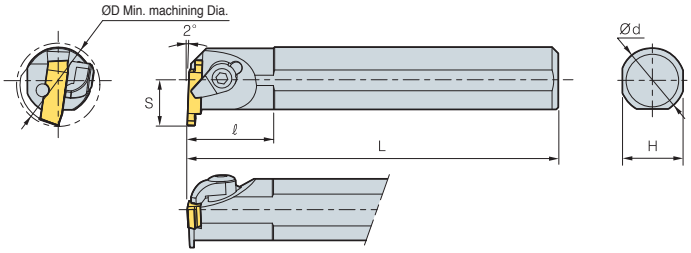
Designation		H = (h)	W	L	ℓ	S	Inserts	Clamp	Screw	Pin	Wrench
GFT	320R/L	20	20	125	23.5	25	GW110~300R/L,BF3	CS5R1	DHA0514	PN0310	HW25L
	325R/L	25	25	150	23.5	32					
	525R/L	25	25	150	25.5	32	GW315~500R/L,BF5	CS6R1	DHA0617	PN0310	HW30L
	825R/L	25	25	150	28.5	32	GW600~800R/L,BF8	CS8R1	DHA0820	PN0314	HW40L

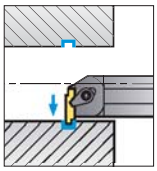
Applicable inserts **C58** • Use right-hand insert for left-hand holder

GFIP For Internal grooving



BF GW





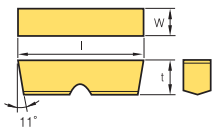
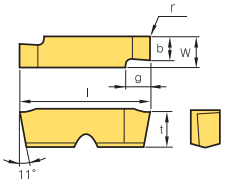
• R type insert

(mm)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
GFIP	316R/L	20	16	15	150	17	11	GW110~300R/L,BF3	CH5R2	CR04	CHX0513	PN0310	HW25L
	320R/L	26	20	18	150	22	13						
	325R/L	32	25	23	200	22	17		CH6R2	CR05	CHX0616	PN0310	HW30L
	340R/L	50	40	37	300	32	27						
	525R/L	32	25	23	200	22	17	GW315~500R/L,BF5					
	540R/L	50	40	37	300	32	27						
	840R/L	50	40	37	300	32	27	GW600~800R/L,BF8	CS8R1	-	DHA0820	PN0314	HW40L

Applicable inserts **C58** • Use right-hand insert for left-hand holder

Insert

Application	Picture	Designation		Uncoated ST30A		Dimensions (mm) b	g	W	l	t	r	Configuration
Blank		BF	-3	●				3.1	16.4	5.26	-	
			-5					5.1	22.4	6.26	-	
			-8					8.1	27.4	7.26	-	
				R	L							
Grooving		GW	110R/L	●	●	1.1	2.1	3.1	16	5.0	0.2	
			130R/L	●	●	1.3	2.3	3.1	16	5.0	0.2	
			160R/L	●	●	1.6	2.6	3.1	16	5.0	0.2	
			185R/L	●	●	1.85	2.9	3.1	16	5.0	0.2	
			215R/L	●	●	2.15	3.2	3.1	16	5.0	0.2	
			265R/L	●	●	2.65	3.7	3.1	16	5.0	0.2	
			300R/L	●	●	3.0	4.0	3.1	16	5.0	0.2	
			315R/L	●	●	3.15	4.2	5.1	22	6.0	0.3	
			415R/L		●	4.15	5.2	5.1	22	6.0	0.3	
			500R/L			5.0	6.0	5.1	22	6.0	0.3	
			600R/L			6.0	7.0	8.1	27	7.0	0.3	
			800R/L			8.0	9.0	8.1	27	7.0	0.3	

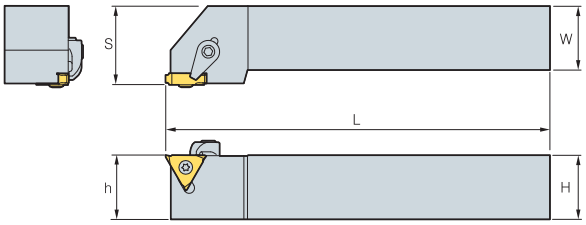
●: Stock item

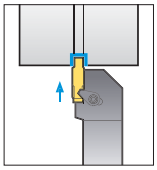
GH

For O-ring grooving
Snap-ring grooving



GO GS





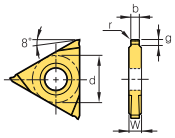
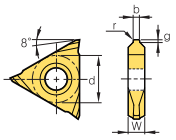
• R type insert

(mm)

Designation		H = (h)	W	L	S	Inserts	Clamp	Clamp Screw	Screw	Wrench
GH	2020R/L-3	20	20	125	22	GS125~280	CS6R1	DHA0617	PTMA03508	TW09P-HW30L
	2525R/L-3	25	25	150	27	GO250				
	2020R/L-4	20	20	125	21	GS330 / 430				
	2525R/L-4	25	25	150	26	GO320 / 410				

Applicable inserts C59

Insert

Application	Picture	Designation		Coated		Uncoated			Dimensions (mm)					Configuration
				NC3120	NC3225	H01	ST20	ST30A	b	g	W	r	d	
Grooving(Narrow · O-ring · Snap-ring)		GO	250						2.5	1.5	3.3	0.35	9.525	
			320						3.2	2.0	3.8	0.35	9.525	
			410						4.1	2.5	4.5	0.65	9.525	
		GS	125				●		1.23	1.5	2.5	0.2	9.525	
			145				●		1.43	1.5	2.5	0.2	9.525	
			175				●		1.73	2.0	2.5	0.2	9.525	
			185						1.83	2.0	2.5	0.2	9.525	
			200				●		2.03	2.5	2.5	0.2	9.525	
			230				●		2.28	3.5	2.8	0.2	9.525	
			280						2.78	3.5	3.3	0.3	9.525	
			330						3.28	4.0	3.8	0.3	9.525	
			430						4.28	4.0	4.5	0.4	9.525	

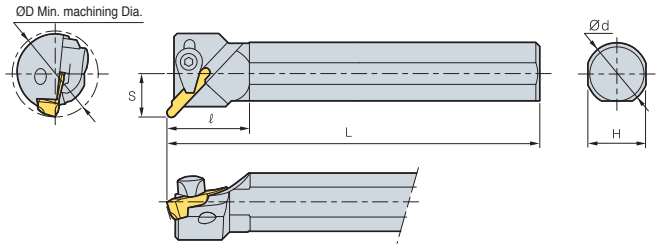
●: Stock item

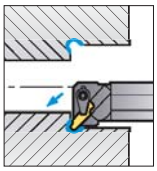
GFIK

For Reliefing



GR





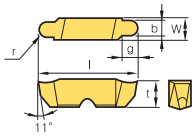
• R type insert

(mm)

Designation		ØD	Ød	H	L	ℓ	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
GFIK	316R/L	22	16	15	150	21.5	11	GR3□□	CH5R2	CR04	CHX0513	PN0310	HW25L
	325R/L	32	25	23	200	21.5	17		CS5R1	-	DHA0514	PN0310	HW25L
	340R/L	50	40	37	300	35.4	27						
	525R/L	32	25	23	200	27.5	17	GR5□□	CS6R1	-	DHA0617	PN0314	HW30L
	540R/L	50	40	37	300	39.5	27						
	840R/L	50	40	37	300	41.8	27	GR8□□	CS8R1	-	DHA0820	PN0314	HW40L

Applicable inserts C59

Insert

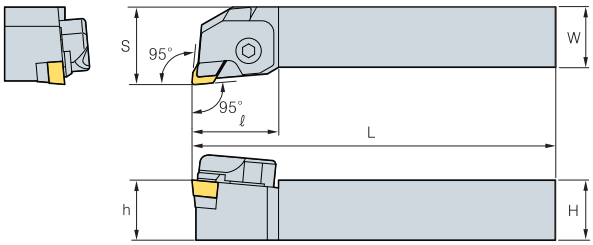
Application	Picture	Designation		Coated		Uncoated			Dimensions (mm)						Configuration
				NC3120	NC3225	H01	ST20	ST30A	b	g	W	l	t	r	
Reliefing		GR	310R						2.0	2.0	3.1	15.9	5.0	1.0	
			315R						3.0	2.9	3.1	15.9	5.0	1.5	
			520R						4.0	4.0	5.1	21.9	6.0	2.0	
			525R						5.0	5.0	5.1	21.8	6.0	2.5	
			830R						6.0	6.0	8.1	26.8	7.0	3.0	
			840R						8.0	8.0	8.1	26.7	7.0	4.0	

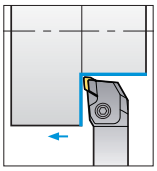
●: Stock item

EH Regrinding type insert



ESB





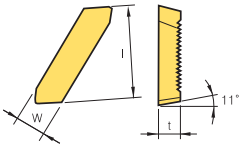
• R type insert

(mm)

Designation		H = (h)	W	L	ℓ	S	Inserts	Clamp	Clamp Screw	Chip Breaker	Shim	Shim Screw	Wrench
EH	620R	20	20	125	36	27	ESB34	CTH6R2	BHA0616	CB20	SES33C	SHX0310	HW50L HW20L
	625R	25	25	150	36	32							

Applicable inserts **C60**

Insert

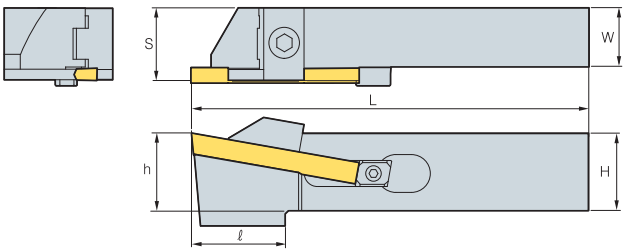
Application	Picture	Designation		Uncoated ST10	Uncoated ST20	Dimensions (mm) W	Dimensions (mm) l	Dimensions (mm) t	Configuration
General Machining		ESB	34			9.525	30.0	6.35	

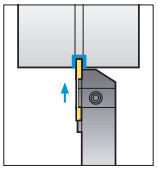
● : Stock item

PH For Parting off Deep grooving



POB





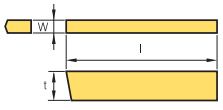
• R type insert

(mm)

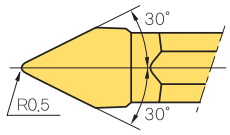
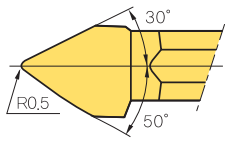
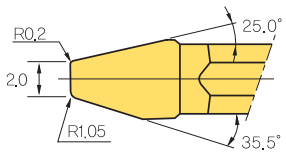
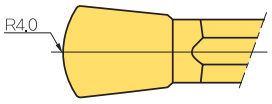
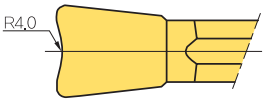
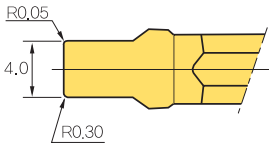
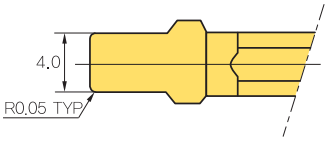
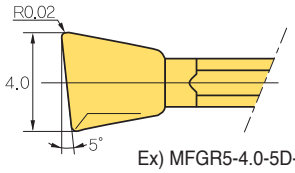
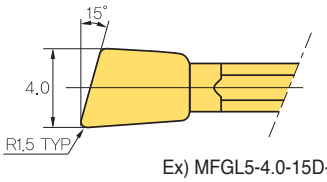
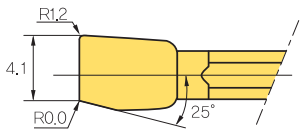
Designation		H	W	L	ℓ	S	h	Max (Ø)	Inserts	Clamp	Clamp Screw	Stopper	Stopper Screw	Wrench
PH	320R/L	19	19	150	34	22.25	19	30	POB300	CGH6R1	BHA0616	STP5	KHD0510	HW25L-HW50L
	325R/L	25	19	150	34	22.25	25	40						
	420R/L	19	19	150	34	23.5	19	30	POB400	CGH6R2	BHA0616	STP5	KHD0510	HW25L-HW50L
	425R/L	25	19	150	34	23.5	25	40						
	520R/L	19	19	150	34	24.4	19	50	POB500	CTH 6R3	BHA0616	STP5	KHD0510	HW25L-HW50L
	525R/L	25	19	150	34	24.4	25	50						

Applicable inserts **C60**

Insert

Application	Picture	Designation		Uncoated ST10	Uncoated ST20	Dimensions (mm) W	Dimensions (mm) l	Dimensions (mm) t	Configuration
Grooving · Parting off		POB	300		●	3.0	55	6.0	
			400		●	4.0	55	7.0	
			500		●	5.0	55	8.0	

● : Stock item

Code system	Configuration
M F G N 4 - 0.5R - 30D ① ② ③ ④ ⑤ ⑥ ⑦ ① Multi ② Forming ③ Grinding ④ Feed Direction ⑤ Clamp part: 4 mm ⑥ Nose Radius: 0.5 ⑦ Degree: 30°	 Ex) MFGN4-0.5R-30D
MFGN4 - 0.5R - L 50 D - R 30D ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Nose Radius: 0.5 ③ Left ④ Degree: 50° ⑤ Right ⑥ Degree > 30°	 Ex) MFGN4-0.5R-L50D-R30D
MFGN4 - 2.0 - R 020 250 - L 105 335 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ① Refer to No. 1 ② Width of cutting edge: 2.0 mm ③ Right ④ Nose Radius: 0.20 ⑤ Degree: 25.0° ⑥ Left ⑦ Nose Radius: 1.05 ⑧ Degree: 35.5°	 Ex) MFGN4-2.0-R020250-L105335
MFGN5 - 4.0R F ① ② ③ ① Refer to No. 1 ② Radius: 4.0 ③ Front (Concave)	 Ex) MFGN5-4.0RF
MFGN5 - 4.0R B ① ② ③ ① Refer to No. 1 ② Radius: 4.0 ③ Back (Concave)	 Ex) MFGN5-4.0RB
MFGN5 - 4.0 - R 005 - L 030 ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Width of cutting edge: 4.0 mm ③ Right ④ Nose Radius: 0.05 ⑤ Left ⑥ Nose Radius: 0.30	 Ex) MFGN5-4.0-R005-L030
MFGN5 - 4.0 - 0.05 R ① ② ③ ① Refer to No. 1 ② Width of cutting edge: 4.0 mm ③ Nose Radius: 0.05	 Ex) MFGN5-4.0-0.05R
MFG R 5 - 4.0 - 5D - R 002 - L 115 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ① Refer to No. 1 ② Right ③ Clamp part: 5 mm ④ Width of cutting edge: 4.0 mm ⑤ Lead angle: 5° ⑥ Right ⑦ Nose Radius: 0.02 ⑧ Left ⑨ Nose Radius: 1.15	 Ex) MFGR5-4.0-5D-R002-L115
MFG L 5 - 4.0 - 15D - 1.5R ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Left ③ Clamp part: 5 mm ④ Width of cutting edge: 4.0 mm ⑤ Lead angle: 15° ⑥ Right Nose Radius: 1.5	 Ex) MFGL5-4.0-15D-1.5R
MFG R 5 - 4.10 - 25D - R012 - L000 ① ② ③ ④ ⑤ ⑥ ⑦ ① Refer to No. 1 ② Right ③ Clamp part: 5 mm ④ Width of cutting edge: 4.1 mm ⑤ Degree: 25° ⑥ Right Nose Radius: 1.2 ⑦ Left Nose Radius: 0.0	 Ex) MFGR5-4.10-25D-R012-L000

Special Order Form for V-Pulley Insert

Code system

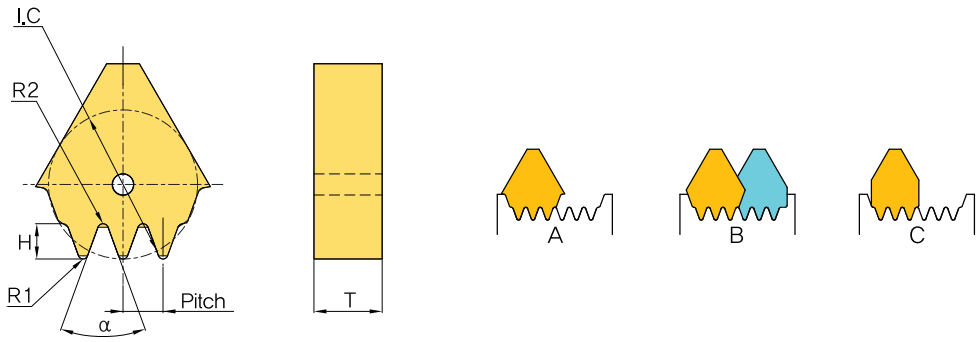
KP	27	064	-	R0.425	N3
KORLOY PULLEY	ØD	W		R1	No. of flutes

■ Ex)

I.C	T	R	Z
Ø 12.7	6.4	0.425	3

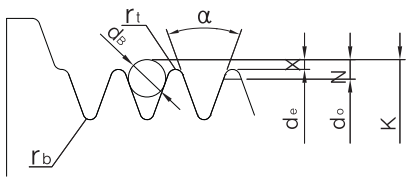
▶ Special types are available for quotation

Insert for machining of pulley



▶ For reference: KS specifications and cods for V-pulley for vehicles(PK)

Diameter

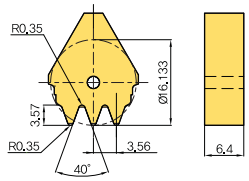
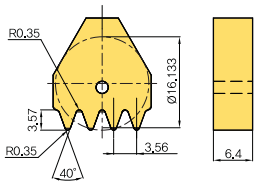
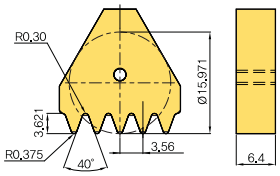
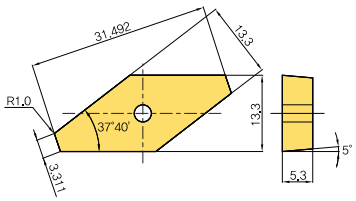


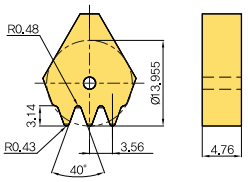
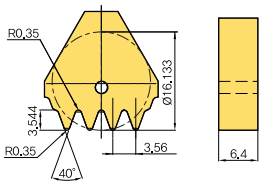
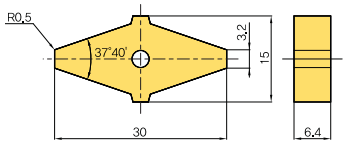
- d_e: Effective diameter
- d_o: Outer diameter
- K: Diameter of ball or rod
- d_a: Diameter of ball for inspection or rod

Code system

P	6	PK96.3
Pulley	No. of groove	Cross section of groove / Effective diameter(mm)

Cross section		PH	PJ	PK	PL	PM
Pitch of grrove		1.6±0.03	2.34±0.03	3.56±0.05	4.7±0.05	9.4±0.08
Groove angle	±0.5°	40°	40°	40°	40°	40°
rt	Min.	0.15	0.2	0.25	0.4	0.75
rb	Max.	0.3	0.4	0.5	0.4	0.75
dB	±0.01	1	1.5	2.5	3.3	6.4
Application		electrical, electronics instrument	Machine with light duty, Compressor, Pump	Vehicles	Small agricultural machine	Large agricultural machine

Specifications	Standard designation
	KP27064-R0.35-N3 (DF356-3B)
	KP27064-R0.35-N4 (DF356-4B)
	KP27064-R0.375-N5 (DF356-5B)
	VF13M522

Specifications	Standard designation
	KP27064-R0.43-N3 (DF356-3SR)
	KP27064-R0.35-N4-A (DF356-4X)
	UF320

D

THREADING

Korloy threading tools are available for machining various shapes of thread at various pitches while ensuring high quality performances



Threading Code System

D02 Threading Holder Code System

D02 Threading Insert Code System

Technical information forThreading

D03 Technical Information for Threading

D09 Threading Insert with Chip Breaker

Thread Inserts

D10 Partial Profile 60˚

D11 Partial Profile 55˚

D12 ISO Metric

D16 American UN

D18 With Worth

D22 British Standard Pipe Thread

D22 National Pipe Thread

D23 National Pipe Thread-Dry seal

D23 Round DIN 405

D24 Trapez DIN 103

D24 American ACME

D25 Stub ACME

D26 UNJ (Unified Constant Thread)

D28 American Buttress (ABUT)

D28 British Buttress (BBUT)

D29 Metric Buttress (SAGE)/API

D30 API Buttress Casing (BUT)

D30 API Round Casing & Tubing (APIRD)

D30 Extreme Line Casing (EL)

Thread Holders

D31 External Holder

D32 Internal Holder

D33 Vertical Type Holder

Thread Milling

D34 Technical Information for Thread Milling

D44 Thread Milling Inserts

D49 Thread Milling Holder

Solid Threading Endmills

D50 Technical Information for Solid Threading Endmills

D51 Solid Threading Endmills

TAP

D61 Technical Information for Tap

D65 Carbide Tap

D69 HSS Tap



Threading holder code system

E R H 10 (N) - 11 (C)

1 Holder type | 2 Hand of insert | 3 Name | 4 Height of shank | 5 Shim | 6 Insert size (mm) | 7 Clamping system

1 Holder type
E R H 10 (N) - 11 (C)

E: For External I: For Internal

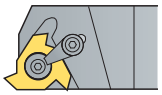
2 Hand of insert
E R H 10 (N) - 11 (C)

R: Right handed L: Left handed

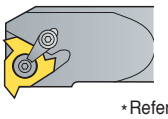
3 Name
E R H 10 (N) - 11 (C)

H: Holder

4 Height of shank
E R H 10 (N) - 11 (C)



- External
  8, 10, 12, 16, 20, 25, 32, 40, 50



- Internal
  10, 12, 13, 16, 20, 25, 32, 49, 50, 60

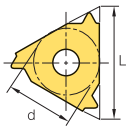
*Refer to the specification for shank diameter information

5 Shim
E R H 10 (N) - 11 (C)

No code: Shim required
N: No shim required

6 Insert size (mm)
E R H 10 (N) - 11 (C)

11: d = 6.35
16: d = 9.525
22: d = 12.7
27: d = 15.875



7 Clmaping system
E R H 10 (N) - 11 (C)

No code: Screw on system
C: Clamp on system

Threading insert code system

E R M 16 - 1.5 ISO

1 Insert type | 2 Hand of insert | 3 Chip breaker | 4 Insert size (mm) | 5 Pitch | 6 Type

1 Insert type
E R M 16 - 1.5 ISO

E: External thread I: Internal thread

2 Hand of insert
E R M 16 - 1.5 ISO

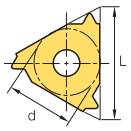
R: Right handed L: Left handed

3 Chip breaker
E R M 16 - 1.5 ISO

M: With chip breaker

4 Insert size (mm)
E R M 16 - 1.5 ISO

11: d = 6.35
16: d = 9.525
22: d = 12.7
27: d = 15.875



Insert shape


< ER/IR >


< ERM/IRM >

5 Pitch
E R M 16 - 1.5 ISO

Full profile	
mm	tpi
0.35-6.0	72-3

Partial profile		
	mm	tpi
A	0.5-1.5	48-16
AG	0.5-3.0	48-8
G	1.75-3.0	14-8
N	3.5-5.0	7-5
Q	5.5-6.0	4.5-4

6 Type
E R M 16 - 1.5 ISO

Partial profile 60°
Partial Profile 55°
ISO Metric (Full Profile)
American UN (Full Profile) UN, UNC, UNF, UNEF
Whitworth (Full Profile) BSW, BSF, BSP
British Standard Pipe thread (Full Profile) BSPT
National Pipe Thread (Full Profile) NPT
National Pipe Threads-Dryseal (Full Profile) NPTF
Round DIN 405
Trapez DIN 103
American ACME
Stub ACME
UNJ
American Buttress
British Buttress
Metric Buttress-Sagengewinde
API
API Buttress Casing
API Round Casing & Tubing
EL-Extreme Line

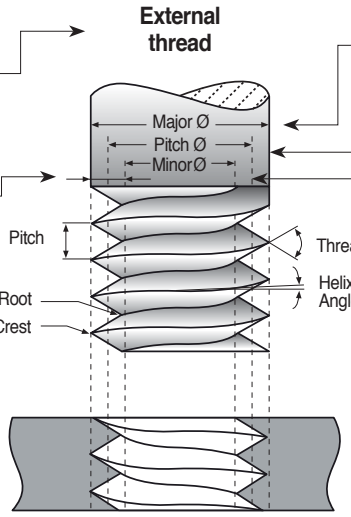
Special features

External thread
A thread on the external surface of a cylinder screw or cone

Depth of thread
The distance between the crest and root measured from normal to theaxis

Pitch
The distance between the corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the tpi (threads per inch), which is the reciprocal of the pitch

Nominal diameter
The diameter of which the diameter limits are derived by the application of deviation allowances and tolerances



Internal thread
A thread on the internal surface of a cylinder or cone

Major diameter
The largest diameter of a screw thread

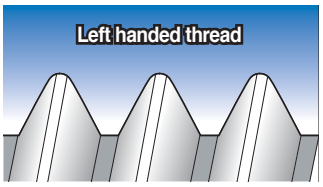
Pitch diameter
On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal

Minor diameter
The smallest diameter of a screw thread

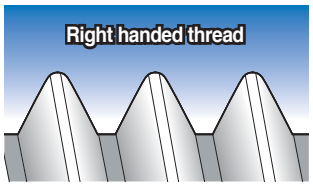
Helix angle
For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

Straight thread
A thread formed on a cylinder

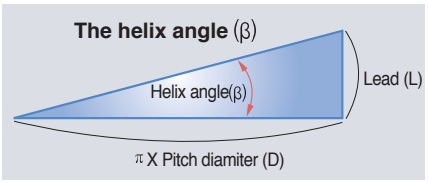
Taper thread
A thread formed on a cone



A thread which, when viewed axially, winds in a counter clockwise and receding direction. All left handed threads are designated LH



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right handed unless they are specified

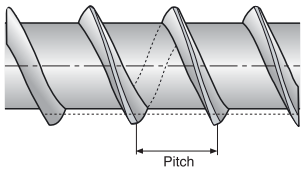


For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead

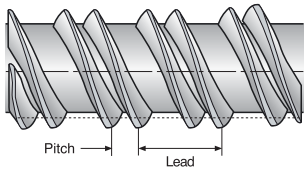
Machining a multi-start thread

- A thread in which the lead is an integral multiple, greater than one, of the pitch. A multi-start thread permits a more rapid advance without a coarser (larger) thread form

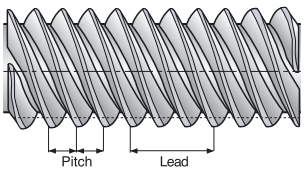
First start machined



Second start machined

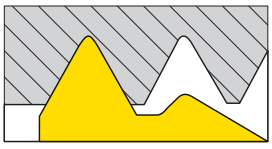


Third start machined (Final, 3 starts thread)



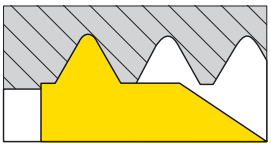
Insert profile style

Partial profile



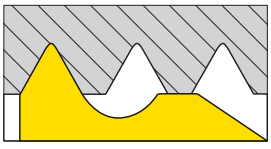
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle

Full profile



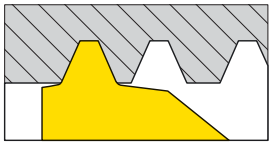
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required

Full profile for fine pitches



The full profile for Fine Pitches will form a complete thread
The topping of the outer diameter is generated by second tooth

Semifull

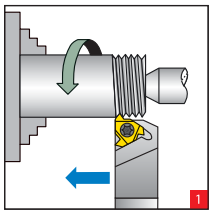


The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter Mainly used for trapezoidal profiles

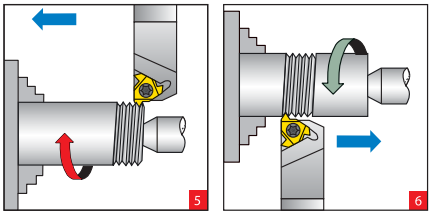
Thread turning method

Thread	Inserts & Tool holder	Rotation	Feed direction	Helix method	Drawing no.
Right Hand Externa	EX RH	Counter clockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN LH	Counter clockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Clockwise	Towards chuck	Regular	5
	EX RH	Counter clockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Clockwise	Towards chuck	Regular	7
	IN RH	Counter clockwise	From chuck	Reversed	8

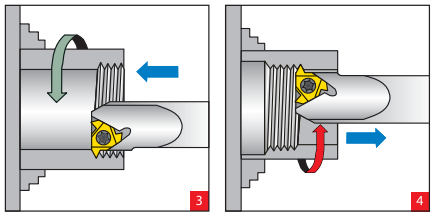
External RH thread



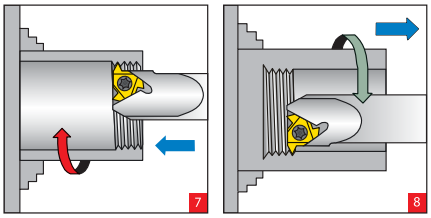
External LH thread



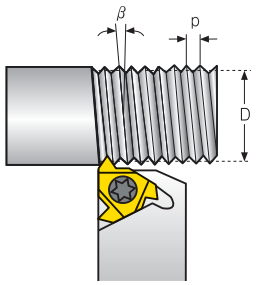
Internal RH thread



Internal LH thread



Calculating the helix angle (β)



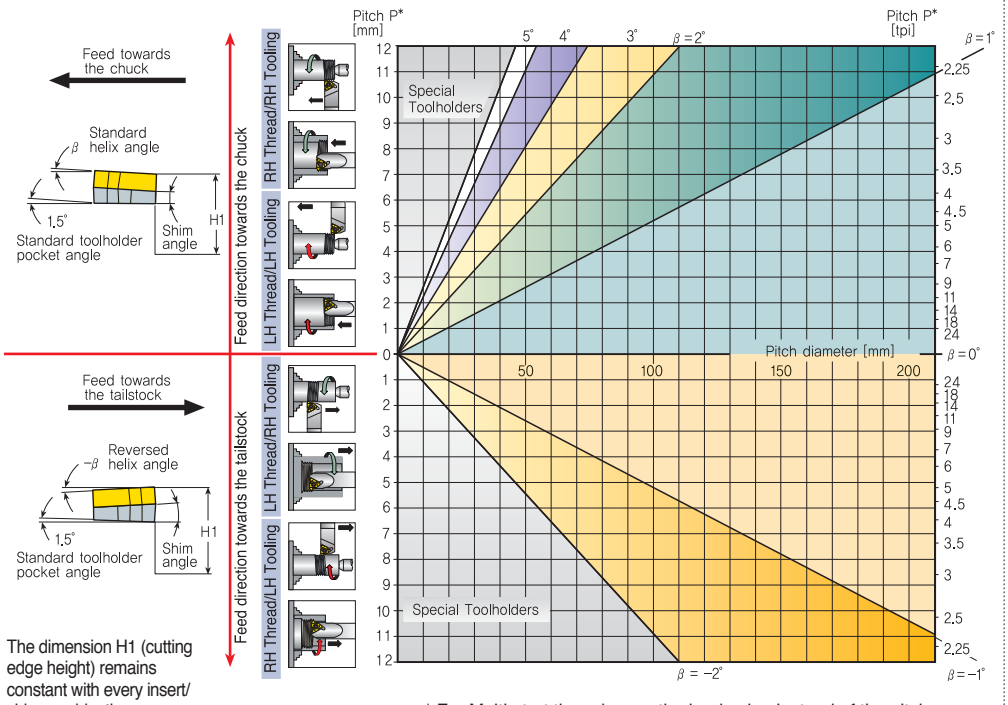
• The helix angle is calculated by the following formula:

$$\beta = \tan^{-1}\frac{P \times N}{\pi \times D}$$

β: Helix angle (°)
P: Pitch (mm)
N: No. of starts
D: Pitch diameter (mm)
Lead = P x N

• The helix angle can also be found from the diagram below

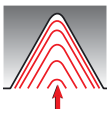
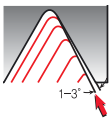
Helix angle diagram



The dimension H1 (cutting edge height) remains constant with every insert/ shim combination

* For Multi-start threads, use the lead value instead of the pitch

Thread infeed method

Infeed		Application		
	Radial infeed	• When the pitch is smaller than 16 tpi • For material with short chips • For work with hardened material	⇒	Radial infeed is the simplest and quickest method The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation Radial infeed is recommended in 3 cases
	Flank infeed (modified)	• When the thread pitch is greater than 16 tpi. Using the radial method,the effective cutting edge length is too large, resulting in chatter. for TRAPEZ and ACME. The radial method results in three cutting edges, making chip flow very difficult	⇒	Flank infeed is recommended in the following cases
	Alternate flank infeed	• This method divides the load equally on both flanks, resulting in equal wear along the cutting edges Alternate flank infeed requires more complicated programming, and is not available on all lathes	⇒	Use of the alternate flank method is recommended especially in large pitches and for materials with long chips

Shim

Standard shim

ATE (External) ATI (Through)



Helix angle 1.5°

Insert size							
	d	9.525		12.7		15.875	
	L	16		22		27	
Holder		ER(L)H	IR(L)H	ER(L)H	IR(L)H	ER(L)H	IR(L)H
Ordering code		ATE16	ATI16	ATE22	ATI22	ATE27	ATI27

※ Standard shim has lead angle 1.5°

Application grade

Grade	Features		Available insert type
PC5300	Universal grade	• For chip breaker type only • Stable machining on a wide application due to fine-grained carbide substrate with balanced heat resistance and toughness • Excellent wear resistance and oxidation resistance due to AiTN coating film Outstanding performance on high speed machining	ERM/IRM (Insert with Chip breaker)
PC3030T	Specialized grade for threading inserts	• A tough sub-micron substrate with TiAlN coating provides good fracture toughness and excellent wear resistance • Outstanding performance on STS and hard to cut materials	ER/IR (Ground insert)
PC9070	Specialized grade for threading inserts	• Strong wear resistance in stainless machining thanks to multilayer PVD coatings	ER/IR (Ground insert)

Recommended cutting speed as per workpiece (vc)

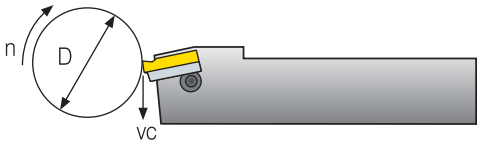
Workpiece		● ◄·····► ✿
P	Carbon steel, Alloy steel, Cast Steel	PC5300 PC3030T
M	Stainless steel, Heat resistant steel, Titanium alloy steel	PC5300 PC3030T PC9070
K	Carbon Iron, Aluminum, Cast Steel, Copper	PC5300 PC3030T

Recommended cutting speed as per workpiece (vc)

Workpiece			Hardness brinell (HB)	vc (m/min) PC3030T	PC9070	PC5300
P	Carbon steel	Low carbon (C=0.1-0.25 %)	125	115~190		110~190
		Medium carbon (C=0.25-0.55 %)	150	100~175		100~165
		High carbon (C=0.55-0.85 %)	170	90~155		90~155
	Low alloy steel (alloying elements ≤ 5%)	Non-hardened	180	100~180		100~180
		Hardened	275	75~140		75~140
		Hardened	350	70~135		70~135
	High alloy steel (alloying elements > 5%)	Annealed	200	80~120		80~120
		Hardened	325	50~100		50~100
	Cast steel	Low alloy (alloying elements <5%)	200	70~130		70~130
		High alloy (alloying elements >5%)	225	60~120		60~120
M	Stainless steel ferritic	Non-hardened	200	70~130	70~150	70~130
		Hardened	330	50~95	60~125	50~95
	Stainless steel austenitic	Austenitic	180	80~120	90~160	80~120
		Super austenitic	200	30~100	40~120	30~100
	Stainless steel cast ferritic	Non-hardened	200	90~120	90~150	90~120
		Hardened	330	65~110	65~120	65~110
	Stainless steel cast austenitic	Austenitic	200	85~110	85~120	85~110
		Hardened	330	60~100	60~110	60~100
	High temperature alloy	Annealed (Iron based)	200	45~60		45~60
		Aged (Iron based)	280	30~50		30~50
		Annealed (Nickel or Cobalt based)	250	20~30		20~30
		Aged (Nickel or Cobalt based)	350	15~25		15~25
	Titanium alloy	99.5% pure Titanium	400Rm	140~170		140~170
		Titanium alloy	1050Rm	50~70		50~70
K	Extra hard steel	Hardened & tempered	55HRC	45~60		45~60
	Malleable cast iron	Ferritic (short chips)	130	70~120		70~120
		Pearlitic (long chips)	230	70~120		70~120
	Gray cast iron	Low tensile strength	180	70~130		70~130
		High tensile strength	260	60~100		60~100
	Nodular SG iron	Ferritic	160	125~160		125~160
		Pearlitic	260	90~120		90~120
	Aluminum alloy wrought	Non-aging	60	100~250		100~250
		Aged	100	80~180		80~180
	Aluminum alloy	Cast	75	200~400		200~400
		Cast & aged	90	200~280		200~280
		Cast Si 13-22%	130	60~150		60~180
	Copper and copper alloy	Brass	90	80~120		80~210
		Bronze and non-leaded copper	100	80~120		80~210

Calculation of n [RPM]

$$n = \frac{vc \times 1000}{\pi \times D} \qquad vc = \frac{\pi \times D \times n}{1000}$$



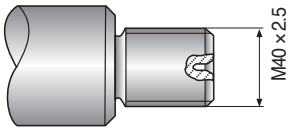
n: Revolution Per Minute [min^{-1}]
vc: Cutting Speed [m/min]
D: Workpiece Diameter [mm]

Number of passes

Pitch																
	mm	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	8.00
	tpi	48	32	24	20	16	14	12	10	8	7	6	5.5	5	4.5	4	3
No. of passes		4~6	4~7	4~8	5~9	6~10	7~12	7~12	8~14	9~16	10~18	11~18	11~19	12~20	12~20	12~20	15~24

※ One cutting depth is calculated by total cutting depth divided into machining times
ex) ER16-1.5ISO, hmin 0.92: If 10 times machining, one cutting depth is 0.092 (0.92/10)

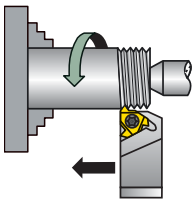
Step by step thread turning



Application

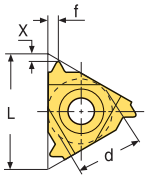
- Thread: External right hand ISO metric M40x2.5
- Material: 4140 (25 HRC)

1 Choose the thread turning method



Feed direction towards the chuck was chosen
Therefore an external right hand insert and an external right hand holder will be used

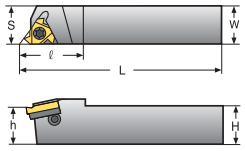
2 Choose the insert size



Chosen insert: ER16-2.5 ISO

Insert size	Pitch	Ordering code	Shim	Tool holder
d	mm	RH (Right Hand)	RH (Right Hand)	
9.525	2.5	ER16-2.5ISO	ATE16	ERH□□-16

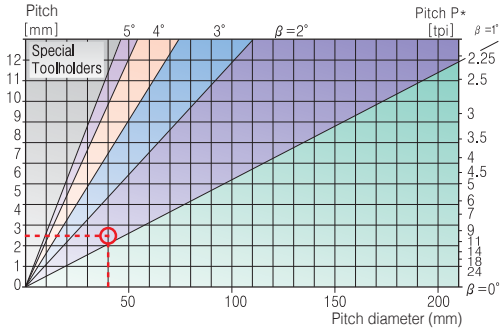
3 Choose the tool holder



Chosen tool holder: ERH 25-16

Insert size	Ordering code	Dimensions (mm)				
d	RH (Right Hand)	H=h	W	S	L	ℓ
9.525	ERH25-16	25	25	25	153.6	30

4 Determine the helix angle



From the table, using a pitch of 2.5 mm(10 tpi) and a workpiece diameter of 40mm (1.57"), we find the helix angle to be 1.5°

5 Choose the correct shim

Resultant Helix angle		1.5°
Insert size	d	9.525
	L	16
Ordering code		ATE16

6 Choose the carbide grade and cutting speed

Workpiece			HB	vc (m/min)
				PC3030T
P	Low alloy steel (alloying elements ≤ 5%)	Non-hardened	180	85~145
		Hardened	275	75~140
		Hardened	350	70~135

- Carbide grade chosen: PC3030T
- Cutting speed: 140m/min

7 Determine the number of passes

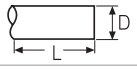
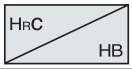
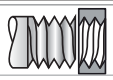
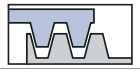
Pitch	mm	1.50	1.75	2.00	2.50	3.00	3.50	4.00
	tpi	16	14	12	10	8	7	6
No.of passes		6~10	7~12	7~12	8~14	9~16	10~18	11~18

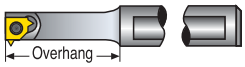
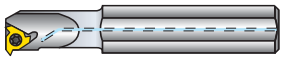
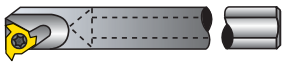
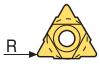
- Carbide grade chosen: PC3030T
- Cutting speed: 140m/min

8 Summary

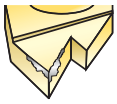
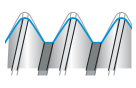
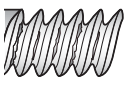
Thread type	ISO M40 x 2.5 External right hand
1. Feed direction	Towards the chuck
2. Insert and grade	ER16-2.5ISO, PC3030T
3. Tool holder	ERH25-16
4. Helix angle	1.5°
5. Shim	ATE16
6. Cutting speed	140m/min
7. Number of passes	10

Cutting condition depending on

Workpiece	Material type	
	Material dimension	
	Diameter and length chipflow character	
	Material hardness	
Thread application	External or internal	
	Profile shape	
	Surface finish	
Machine	Machine stability	
	Max. RPM	
	Clamping system stability	

Coolant	Coolant type	
Holders	Holder cross section area	
	Holder overhang	
	Through coolant option	
	Shank type: Carbide, alloy,	
Insert	Carbide implant grade	
	Profile shape: Pitch and depth	
	Nose radius	
	Chip breaker style	

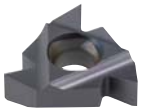
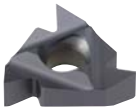
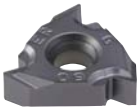
Trouble shooting

Problem	Possible cause	Solution
 **Increased flank wear**	Cutting speed too high	Reduce cutting speed/use coated insert
	Depth of cut too low/too many passes	Increase the depth of cut per pass
	Unsuitable carbide grade	Use a coated carbide grade
	Insufficient cooling	Increase coolant flow rate
 **Uneven cutting edge wear**	Incorrect helix angle	Choose the correct shim
	Wrong infeed method	Use the Alternating Flank Infeed method
 **Extreme plastic deformation**	Depth of cut too large	Decrease depth of cut/ increase number of passes
	Insufficient cooling	Increase coolant flow rate
	Cutting speed too high	Reduce cutting speed
	Unsuitable carbide grade	Use a tougher carbide
	Nose radius too small	Use an insert with a larger radius, if possible
 **Cutting edge breakage**	Depth of cut too large	Decrease depth of cut/ increase number of passes.
	Extreme plastic deformation	Use a tougher carbide
	Insufficient cooling	Increase flow rate and/ or correct flow direction
	Unsuitable ca rbide grade	Use a tougher carbide
	Instability	Check stability of the system
 **Built-up edge**	Incorrect cutting speed	Change the cutting speed
	Unsuitable carbide grade	Use a coated carbide
 **Thread profile is too shallow**	The tool is not at the workpiece axis height	Change tool height
	Insert is not machining the thread crest	Measure the workpiece diameter
	Worn insert	Change the cutting edge sooner
 **Poor surface quality**	Too low cutting speed	Increase cutting speed
	Wrong shim	Choose correct shim
	Flank infeed method is not appropriate	Use the alternate flank or radial infeed method

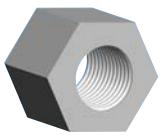
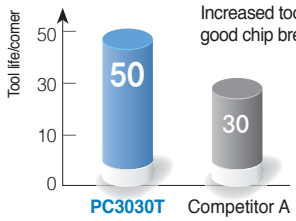
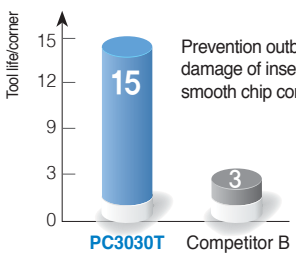
Threading insert with chip breaker

Features

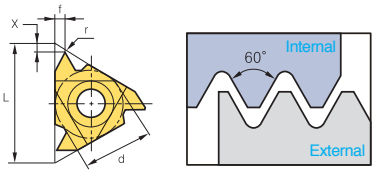
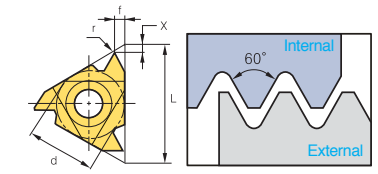
- Economical insert
- Good toughness and high accuracy as ground type inserts
- Exclusive insert design improves chip control
- New grade for general application of various kinds of workpieces

Type	Ground insert		Insert with a chip breaker			
C/B Code	None		None		U	
Designation	ER16-1.5ISO		ERM16-1.5ISO		ERM16-1.5ISO-U	
Machining	External	Internal	External	Internal	External	Internal
Insert Shape						
Chip Shape						
Class	P, M, K, N, S		P, M, K		P, M, K	
Application	G-Class		M-Class		M-Class	
Features	• Groove-shaped chip breaker with superior chip evacuation lowers cutting load • Enables high precision machining • Applicable for machining of various shapes of threads • Applicable for machining of various workpieces		• Unique 3 dimensional chip breaker improves machinability with good chip control • Excellent cutting edge treatment technology ensures high precision sharp cutting edge		• Groove-shaped chip breaker with superior chip evacuation lowers cutting load • Reduces machining pass by 10~30% • Excellent cutting edge treatment achieves high precision sharp cutting edge	

Application examples

KORLOY		ERM16-1.5ISO [PC3030T]	IRM16-2.0ISO [PC3030T]
Competitor tools		ER16-1.5ISO [A-Maker]	IR16-2.0ISO [B-Maker]
Workpiece	Material	SCM440	STS304
	Figure		
Cutting condition	Cutting speed (m/min)	63	120
	Pass	8	9
	Machining	Radial infeed	Radial infeed
	Pitch	1.5	2.0
Coolant		Wet	Wet
Result			

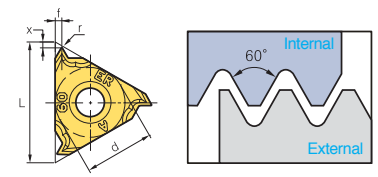
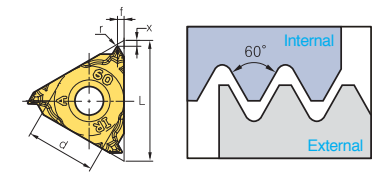
Partial profile 60°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ER 11-A60	●	●	EL 11-A60			0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	
	16-A60	●	●	16-A60	●		0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G60	●		16-G60	●		1.75~3.0	14~8	9.525	16	0.27	1.2	1.7	
	16-AG60	●	●	16-AG60	●		0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N60	●	●	22-N60	●		3.5~5.0	7~5	12.7	22	0.53	1.7	2.5	
	27-Q60	●		27-Q60			5.5~6.0	4.5~4	15.875	27	0.64	2.1	3.1	
Internal	IR 11-A60	●	●	IL 11-A60	●	●	0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	
	16-A60	●	●	16-A60	●		0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G60	●		16-G60	●		1.75~3.0	14~8	9.525	16	0.16	1.2	1.7	
	16-AG60	●	●	16-AG60	●		0.5~3.0	48~8	9.525	16	0.05	1.2	1.7	
	22-N60	●	●	22-N60	●		3.5~5.0	7~5	12.7	22	0.30	1.7	2.5	
	27-Q60	●	●	27-Q60			5.5~6.0	4.5~4	15.875	27	0.30	1.8	2.7	

Applicable holders **D31, D32**

●: Stock item

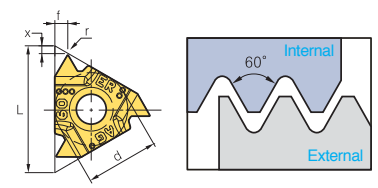
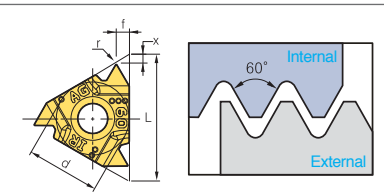
Partial profile 60° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-A60	●				0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G60	●				1.75~3.0	14~8	9.525	16	0.27	1.2	1.7	
	16-AG60	●				0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N60	●				3.5~5.0	7~5	12.7	22	0.53	1.7	2.5	
Internal	IRM 11-A60	●				0.5~1.5	48~16	6.35	11	0.08	0.8	0.9	
	16-A60	●				0.5~1.5	48~16	9.525	16	0.08	0.8	0.9	
	16-G60	●				1.75~3.0	14~8	9.525	16	0.12	1.2	1.7	
	16-AG60	●				0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N60	●				3.5~5.0	7~5	12.7	22	0.30	1.7	2.5	

Applicable holders **D31, D32**

●: Stock item

Partial profile 60° (U chip breaker) new

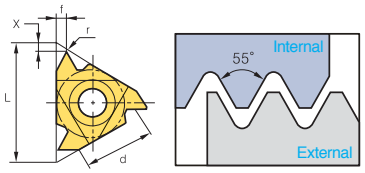
Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-AG60-U					0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
Internal	IRM 16-AG60-U					0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	

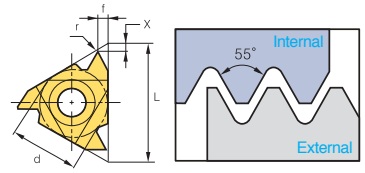
Applicable holders **D31, D32**

●: Stock item

Partial profile 55°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ER 11-A55			EL 11-A55			0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	
	16-A55	●		16-A55			0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G55	●		16-G55			1.75~3.0	14~8	9.525	16	0.21	1.2	1.7	
	16-AG55	●		16-AG55	●		0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	
	22-N55	●		22-N55			3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	
	27-Q55			27-Q55			5.5~6.0	4.5~4	15.875	27	0.60	2.0	2.9	
Internal	IR 11-A55	●		IL 11-A55	●		0.5~1.5	48~16	6.35	11	0.05	0.8	0.9	
	16-A55	●		16-A55			0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G55	●		16-G55			1.75~3.0	14~8	9.525	16	0.21	1.2	1.7	
	16-AG55	●		16-AG55	●		0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	
	22-N55	●		22-N55			3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	
	27-Q55			27-Q55			5.5~6.0	4.5~4	15.875	27	0.60	2.0	2.9	



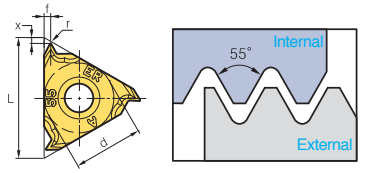


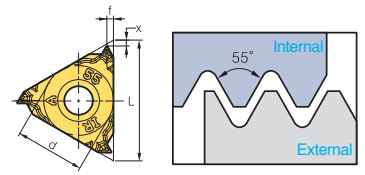
Applicable holders **D31, D32**

●: Stock item

Partial profile 55° (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-A55	●				0.5~1.5	48~16	9.525	16	0.08	0.8	0.9	
	16-G55	●				1.75~3.0	14~8	9.525	16	0.21	1.2	1.7	
	16-AG55	●				0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	
	22-N55	●				3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	
Internal	IRM 11-A55	●				0.5~1.5	48~16	6.35	11	0.08	0.8	0.9	
	16-A55	●				0.5~1.5	48~16	9.525	16	0.05	0.8	0.9	
	16-G55					1.75~3.0	14~8	9.525	16	0.08	1.2	1.7	
	16-AG55	●				0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	
	22-N55	●				3.5~5.0	7~5	12.7	22	0.43	1.7	2.5	



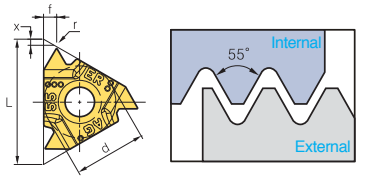


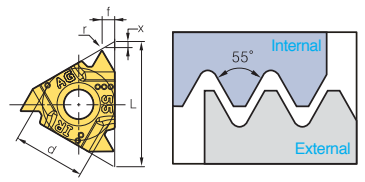
Applicable holders **D31, D32**

●: Stock item

Partial profile 55° (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Pitch (tpi)	d	L	r	x	f	Picture
External	ERM 16-AG55-U					0.5~3.0	48~8	9.525	16	0.07	1.2	1.7	
Internal	IRM 16-AG55-U					0.5~3.0	48~8	9.525	16	0.08	1.2	1.7	

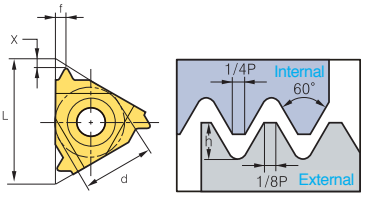




Applicable holders **D31, D32**

●: Stock item

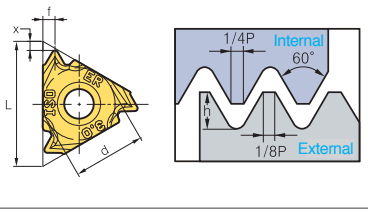
ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-0.35ISO			EL 11-0.35ISO			0.35	6.35	11	0.21	0.8	0.4	
	11-0.4ISO			11-0.4ISO			0.4	6.35	11	0.25	0.7	0.4	
	11-0.45ISO			11-0.45ISO			0.45	6.35	11	0.28	0.7	0.4	
	11-0.5ISO			11-0.5ISO			0.5	6.35	11	0.31	0.6	0.4	
	11-0.6ISO			11-0.6ISO			0.6	6.35	11	0.37	0.6	0.6	
	11-0.7ISO			11-0.7ISO			0.7	6.35	11	0.43	0.6	0.6	
	11-0.75ISO			11-0.75ISO			0.75	6.35	11	0.46	0.6	0.6	
	11-0.8ISO			11-0.8ISO			0.8	6.35	11	0.49	0.6	0.6	
	11-1.0ISO			11-1.0ISO			1.0	6.35	11	0.61	0.7	0.7	
	11-1.25ISO		●	11-1.25ISO			1.25	6.35	11	0.77	0.8	0.9	
	11-1.5ISO	●		11-1.5ISO			1.5	6.35	11	0.92	0.8	1.0	
	11-1.75ISO			11-1.75ISO			1.75	6.35	11	1.07	0.8	1.1	
	16-0.35ISO			16-0.35ISO			0.35	9.525	16	0.21	0.8	0.4	
	16-0.4ISO			16-0.4ISO			0.4	9.525	16	0.25	0.7	0.4	
	16-0.45ISO	●		16-0.45ISO			0.45	9.525	16	0.28	0.7	0.4	
	16-0.5ISO	●		16-0.5ISO	●		0.5	9.525	16	0.31	0.6	0.4	
	16-0.6ISO	●		16-0.6ISO			0.6	9.525	16	0.37	0.6	0.6	
	16-0.7ISO	●		16-0.7ISO			0.7	9.525	16	0.43	0.6	0.6	
	16-0.75ISO	●		16-0.75ISO			0.75	9.525	16	0.46	0.6	0.6	
	16-0.8ISO	●	●	16-0.8ISO			0.8	9.525	16	0.49	0.6	0.6	
	16-1.0ISO	●	●	16-1.0ISO	●		1.0	9.525	16	0.61	0.7	0.7	
	16-1.25ISO	●	●	16-1.25ISO			1.25	9.525	16	0.77	0.8	0.9	
	16-1.5ISO	●	●	16-1.5ISO	●		1.5	9.525	16	0.92	0.8	1.0	
	16-1.75ISO	●	●	16-1.75ISO			1.75	9.525	16	1.07	0.9	1.2	
	16-2.0ISO	●	●	16-2.0ISO	●		2.0	9.525	16	1.23	1.0	1.3	
	16-2.5ISO	●	●	16-2.5ISO			2.5	9.525	16	1.53	1.1	1.5	
	16-3.0ISO	●	●	16-3.0ISO			3.0	9.525	16	1.84	1.2	1.6	
	22-3.5ISO	●	●	22-3.5ISO			3.5	12.7	22	2.15	1.6	2.3	
	22-4.0ISO	●	●	22-4.0ISO	●		4.0	12.7	22	2.45	1.6	2.3	
	22-4.5ISO	●	●	22-4.5ISO			4.5	12.7	22	2.78	1.7	2.4	
	22-5.0ISO	●	●	22-5.0ISO			5.0	12.7	22	3.07	1.7	2.5	
	27-5.5ISO			27-5.5ISO			5.5	15.875	27	3.37	1.9	2.7	
	27-6.0ISO		●	27-6.0ISO			6.0	15.875	27	3.68	2.0	2.9	

Applicable holders D31

●: Stock item

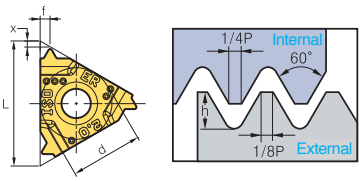
ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ERM 16-1.0ISO	●				1.0	9.525	16	0.61	0.7	0.7	
	16-1.25ISO					1.25	9.525	16	0.77	0.8	0.9	
	16-1.5ISO	●				1.5	9.525	16	0.93	0.8	1.0	
	16-1.75ISO	●				1.75	9.525	16	1.09	0.9	1.2	
	16-2.0ISO	●				2.0	9.525	16	1.25	1.0	1.3	
	16-2.5ISO	●				2.5	9.525	16	1.55	1.1	1.5	
	16-3.0ISO	●				3.0	9.525	16	1.87	1.2	1.6	

Applicable holders D31

●: Stock item

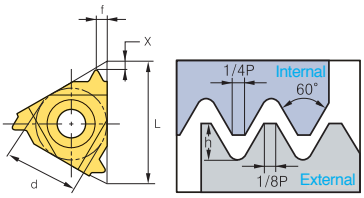
ISO Metric (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ERM 16-1.5ISO-U					1.5	9.525	16	0.93	0.8	1.0	
	16-2.0ISO-U					2.0	9.525	16	1.25	1.0	1.3	

Applicable holders D31

●: Stock item

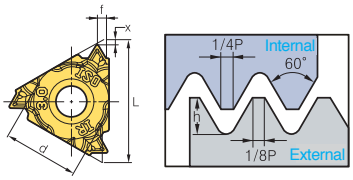
ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IR 11-0.35ISO			IL 11-0.35ISO			0.35	6.35	11	0.20	0.8	0.3	
	11-0.4ISO			11-0.4ISO			0.4	6.35	11	0.23	0.8	0.4	
	11-0.45ISO			11-0.45ISO			0.45	6.35	11	0.26	0.8	0.4	
	11-0.5ISO	●		11-0.5ISO	●		0.5	6.35	11	0.29	0.6	0.4	
	11-0.6ISO			11-0.6ISO			0.6	6.35	11	0.35	0.6	0.6	
	11-0.7ISO			11-0.7ISO			0.7	6.35	11	0.40	0.6	0.6	
	11-0.75ISO	●		11-0.75ISO	●		0.75	6.35	11	0.43	0.6	0.6	
	11-0.8ISO			11-0.8ISO			0.8	6.35	11	0.46	0.6	0.6	
	11-1.0ISO	●	●	11-1.0ISO	●	●	1.0	6.35	11	0.58	0.6	0.7	
	11-1.25ISO	●	●	11-1.25ISO			1.25	6.35	11	0.72	0.8	0.9	
	11-1.5ISO	●	●	11-1.5ISO	●		1.5	6.35	11	0.87	0.8	1.0	
	11-1.75ISO		●	11-1.75ISO			1.75	6.35	11	1.01	0.9	1.1	
	11-2.0ISO	●	●	11-2.0ISO	●		2.0	6.35	11	1.15	0.9	1.1	
	11-2.5ISO	●		11-2.5ISO	●		2.5	6.35	11	1.44	0.8	1.1	
	16-0.35ISO			16-0.35ISO			0.35	9.525	16	0.20	0.8	0.3	
	16-0.4ISO			16-0.4ISO			0.4	9.525	16	0.23	0.8	0.4	
	16-0.45ISO			16-0.45ISO			0.45	9.525	16	0.26	0.8	0.4	
	16-0.5ISO	●		16-0.5ISO			0.5	9.525	16	0.29	0.6	0.4	
	16-0.6ISO			16-0.6ISO			0.6	9.525	16	0.35	0.6	0.6	
	16-0.7ISO			16-0.7ISO			0.7	9.525	16	0.40	0.6	0.6	
	16-0.75ISO	●		16-0.75ISO			0.75	9.525	16	0.43	0.6	0.6	
	16-0.8ISO			16-0.8ISO			0.8	9.525	16	0.46	0.6	0.6	
	16-1.0ISO	●	●	16-1.0ISO			1.0	9.525	16	0.58	0.6	0.7	
	16-1.25ISO	●	●	16-1.25ISO			1.25	9.525	16	0.72	0.8	0.9	
	16-1.5ISO	●	●	16-1.5ISO			1.5	9.525	16	0.87	0.8	1.0	
	16-1.75ISO	●	●	16-1.75ISO			1.75	9.525	16	1.01	0.9	1.2	
	16-2.0ISO	●	●	16-2.0ISO	●		2.0	9.525	16	1.15	1.0	1.3	
	16-2.5ISO	●	●	16-2.5ISO	●		2.5	9.525	16	1.44	1.1	1.5	
	16-3.0ISO	●	●	16-3.0ISO	●		3.0	9.525	16	1.73	1.1	1.5	
	22-3.5ISO	●	●	22-3.5ISO			3.5	12.7	22	2.02	1.6	2.3	
	22-4.0ISO	●	●	22-4.0ISO	●		4.0	12.7	22	2.31	1.6	2.3	
	22-4.5ISO	●	●	22-4.5ISO			4.5	12.7	22	2.60	1.6	2.4	
	22-5.0ISO	●	●	22-5.0ISO			5.0	12.7	22	2.89	1.6	2.3	
	27-5.5ISO			27-5.5ISO			5.5	15.875	27	3.17	1.6	2.3	
	27-6.0ISO	●		27-6.0ISO	●		6.0	15.875	27	3.46	1.8	2.5	

Applicable holders D32

●: Stock item

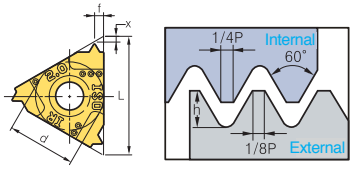
ISO Metric (M chip breaker)

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IRM 11-1.5ISO	●				1.5	6.35	11	0.85	0.8	1.0	
	16-1.0ISO	●				1.0	9.525	16	0.58	0.6	0.7	
	16-1.25ISO					1.25	9.525	16	0.72	0.8	0.9	
	16-1.5ISO	●				1.5	9.525	16	0.85	0.8	1.0	
	16-1.75ISO					1.75	9.525	16	1.01	0.9	1.2	
	16-2.0ISO	●				2.0	9.525	16	1.12	1.0	1.3	
	16-2.5ISO	●				2.5	9.525	16	1.44	1.1	1.5	
	16-3.0ISO	●				3.0	9.525	16	1.69	1.1	1.5	

Applicable holders **D32**

●: Stock item

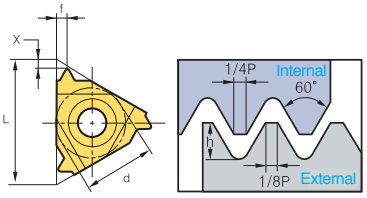
ISO Metric (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IRM 16-1.5ISO-U					1.5	9.525	16	0.85	0.8	1.0	
	16-2.0ISO-U					2.0	9.525	16	1.12	1.0	1.3	

Applicable holders **D32**

●: Stock item

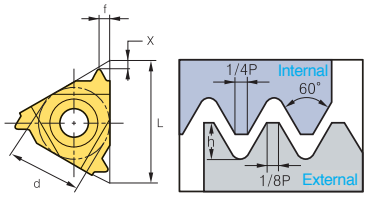
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)					Picture
							(tpi)	d	L	hmin	X	f	
External	ER 11-72UN			EL 11-72UN			72	6.35	11	0.22	0.8	0.4	
	11-64UN			11-64UN			64	6.35	11	0.24	0.8	0.4	
	11-56UN			11-56UN			56	6.35	11	0.28	0.7	0.4	
	11-48UN			11-48UN			48	6.35	11	0.32	0.6	0.6	
	11-44UN			11-44UN			44	6.35	11	0.35	0.6	0.6	
	11-40UN			11-40UN			40z	6.35	11	0.39	0.6	0.6	
	11-36UN			11-36UN			36	6.35	11	0.43	0.6	0.6	
	11-32UN			11-32UN			32	6.35	11	0.49	0.6	0.6	
	11-28UN			11-28UN			28	6.35	11	0.56	0.6	0.7	
	11-27UN			11-27UN			27	6.35	11	0.58	0.7	0.8	
	11-24UN			11-24UN			24	6.35	11	0.65	0.7	0.8	
	11-20UN			11-20UN			20	6.35	11	0.78	0.8	0.9	
	11-18UN			11-18UN			18	6.35	11	0.87	0.8	1.0	
	11-16UN			11-16UN			16	6.35	11	0.97	0.9	1.1	
	11-14UN			11-14UN			14	6.35	11	1.11	0.9	1.1	
	16-72UN			16-72UN			72	9.525	16	0.22	0.8	0.4	
	16-64UN			16-64UN			64	9.525	16	0.24	0.8	0.4	
	16-56UN			16-56UN			56	9.525	16	0.28	0.7	0.4	
	16-48UN			16-48UN			48	9.525	16	0.32	0.6	0.6	
	16-44UN			16-44UN			44	9.525	16	0.35	0.6	0.6	
	16-40UN			16-40UN			40	9.525	16	0.39	0.6	0.6	
	16-36UN			16-36UN			36	9.525	16	0.43	0.6	0.6	
	16-32UN	●		16-32UN			32	9.525	16	0.49	0.6	0.6	
	16-28UN			16-28UN			28	9.525	16	0.56	0.6	0.7	
	16-27UN			16-27UN			27	9.525	16	0.58	0.7	0.8	
	16-24UN	●	●	16-24UN			24	9.525	16	0.65	0.7	0.8	
	16-20UN	●	●	16-20UN			20	9.525	16	0.78	0.8	0.9	
	16-18UN	●	●	16-18UN			18	9.525	16	0.87	0.8	1.0	
	16-16UN	●	●	16-16UN			16	9.525	16	0.97	0.9	1.1	
	16-14UN	●	●	16-14UN			14	9.525	16	1.11	1.0	1.2	
	16-13UN			16-13UN			13	9.525	16	1.20	1.0	1.3	
	16-12UN	●	●	16-12UN			12	9.525	16	1.30	1.1	1.4	
	16-11.5UN			16-11.5UN			11.5	9.525	16	1.35	1.1	1.5	
	16-11UN	●	●	16-11UN			11	9.525	16	1.42	1.1	1.5	
	16-10UN	●	●	16-10UN			10	9.525	16	1.56	1.1	1.5	
	16-9UN	●		16-9UN			9	9.525	16	1.73	1.2	1.7	
	16-8UN	●		16-8UN			8	9.525	16	1.95	1.2	1.6	
	22-7UN			22-7UN			7	12.7	22	2.22	1.6	2.3	
	22-6UN			22-6UN			6	12.7	22	2.60	1.6	2.3	
	22-5UN			22-5UN			5	12.7	22	3.12	1.7	2.5	
	27-4.5UN			27-4.5UN			4.5	15.875	27	3.46	1.9	2.7	
	27-4UN			27-4UN			4	15.875	27	3.89	2.1	3.0	

Applicable holders D31

●: Stock item

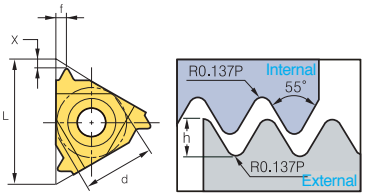
American UN (UN, UNC, UNF, UNEF, UNS)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch	Dimensions (mm)					Picture
							(tpi)	d	L	hmin	X	f	
Internal	IR 11-72UN			IL 11-72UN			72	6.35	11	0.20	0.8	0.3	
	11-64UN			11-64UN			64	6.35	11	0.23	0.8	0.4	
	11-56UN			11-56UN			56	6.35	11	0.26	0.7	0.4	
	11-48UN			11-48UN			48	6.35	11	0.31	0.6	0.6	
	11-44UN			11-44UN			44	6.35	11	0.33	0.6	0.6	
	11-40UN			11-40UN			40	6.35	11	0.37	0.6	0.6	
	11-36UN			11-36UN			36	6.35	11	0.41	0.6	0.6	
	11-32UN			11-32UN			32	6.35	11	0.46	0.6	0.6	
	11-28UN			11-28UN			28	6.35	11	0.52	0.6	0.7	
	11-27UN			11-27UN			27	6.35	11	0.54	0.7	0.8	
	11-24UN			11-24UN			24	6.35	11	0.61	0.7	0.8	
	11-20UN		●	11-20UN			20	6.35	11	0.73	0.8	0.9	
	11-18UN	●		11-18UN			18	6.35	11	0.81	0.8	1.0	
	11-16UN		●	11-16UN			16	6.35	11	0.92	0.9	1.1	
	11-14UN			11-14UN			14	6.35	11	1.05	0.9	1.1	
	11-12UN		●	11-12UN			12	6.35	11	1.22	0.8	1.1	
	11-11UN	●		11-11UN			11	6.35	11	1.33	0.8	1.1	
	16-72UN			16-72UN			72	9.525	16	0.20	0.8	0.3	
	16-64UN			16-64UN			64	9.525	16	0.23	0.8	0.4	
	16-56UN			16-56UN			56	9.525	16	0.26	0.7	0.4	
	16-48UN			16-48UN			48	9.525	16	0.31	0.6	0.6	
	16-44UN			16-44UN			44	9.525	16	0.33	0.6	0.6	
	16-40UN			16-40UN			40	9.525	16	0.37	0.6	0.6	
	16-36UN			16-36UN			36	9.525	16	0.41	0.6	0.6	
	16-32UN			16-32UN			32	9.525	16	0.51	0.6	0.6	
	16-28UN			16-28UN			28	9.525	16	0.52	0.6	0.7	
	16-27UN			16-27UN			27	9.525	16	0.54	0.7	0.8	
	16-24UN			16-24UN			24	9.525	16	0.61	0.7	0.8	
	16-20UN	●		16-20UN			20	9.525	16	0.73	0.8	0.9	
	16-18UN		●	16-18UN			18	9.525	16	0.81	0.8	1.0	
	16-16UN	●	●	16-16UN			16	9.525	16	0.92	0.9	1.1	
	16-14UN	●		16-14UN			14	9.525	16	1.05	0.9	1.2	
	16-13UN			16-13UN			13	9.525	16	1.13	1.0	1.3	
	16-12UN	●	●	16-12UN			12	9.525	16	1.22	1.1	1.4	
	16-11.5UN			16-11.5UN			11.5	9.525	16	1.28	1.1	1.5	
	16-11UN	●	●	16-11UN			11	9.525	16	1.33	1.1	1.5	
	16-10UN	●		16-10UN	●		10	9.525	16	1.47	1.1	1.5	
	16-9UN		●	16-9UN			9	9.525	16	1.63	1.2	1.7	
	16-8UN	●	●	16-8UN	●		8	9.525	16	1.83	1.2	1.5	
	22-7UN			22-7UN			7	12.7	22	2.09	1.6	2.3	
	22-6UN			22-6UN			6	12.7	22	2.44	1.6	2.3	
	22-5UN			22-5UN			5	12.7	22	2.93	1.7	2.3	
	27-4.5UN			27-4.5UN			4.5	15.875	27	3.26	1.9	2.4	
	27-4UN			27-4UN			4	15.875	27	3.67	2.1	2.7	

Applicable holders D32

●: Stock item

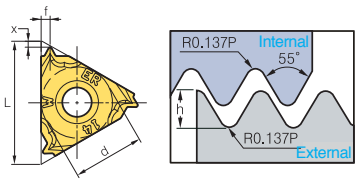
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-72W			EL 11-72W			72	6.35	11	0.23	0.7	0.4	
	11-60W			11-60W			60	6.35	11	0.27	0.7	0.4	
	11-56W			11-56W			56	6.35	11	0.29	0.7	0.4	
	11-48W			11-48W			48	6.35	11	0.34	0.6	0.6	
	11-40W			11-40W			40	6.35	11	0.41	0.6	0.6	
	11-36W			11-36W			36	6.35	11	0.45	0.6	0.6	
	11-32W			11-32W			32	6.35	11	0.51	0.6	0.6	
	11-28W			11-28W			28	6.35	11	0.58	0.6	0.7	
	11-26W			11-26W			26	6.35	11	0.63	0.7	0.8	
	11-24W			11-24W			24	6.35	11	0.68	0.7	0.8	
	11-22W			11-22W			22	6.35	11	0.74	0.8	0.9	
	11-20W			11-20W			20	6.35	11	0.81	0.8	0.9	
	11-19W			11-19W			19	6.35	11	0.86	0.8	1.0	
	11-18W			11-18W			18	6.35	11	0.90	0.8	1.0	
	11-16W			11-16W			16	6.35	11	1.02	0.9	1.1	
	11-14W			11-14W			14	6.35	11	1.16	1.0	1.2	
	16-72W			16-72W			72	9.525	16	0.23	0.7	0.4	
	16-60W			16-60W			60	9.525	16	0.27	0.7	0.4	
	16-56W			16-56W			56	9.525	16	0.29	0.7	0.4	
	16-48W			16-48W			48	9.525	16	0.34	0.6	0.6	
	16-40W			16-40W			40	9.525	16	0.41	0.6	0.6	
	16-36W			16-36W			36	9.525	16	0.45	0.6	0.6	
	16-32W			16-32W			32	9.525	16	0.51	0.6	0.6	
	16-30W			16-30W			30	9.525	16	0.55	0.6	0.7	
	16-28W	●	●	16-28W			28	9.525	16	0.58	0.6	0.7	
	16-26W			16-26W			26	9.525	16	0.63	0.7	0.8	
	16-24W			16-24W			24	9.525	16	0.68	0.7	0.8	
	16-22W			16-22W			22	9.525	16	0.74	0.8	0.9	
	16-20W			16-20W			20	9.525	16	0.81	0.8	0.9	
	16-19W	●	●	16-19W			19	9.525	16	0.86	0.8	1.0	
	16-18W	●		16-18W			18	9.525	16	0.90	0.8	1.0	
	16-16W	●		16-16W			16	9.525	16	1.02	0.9	1.1	
	16-14W	●	●	16-14W			14	9.525	16	1.16	1.0	1.2	
	16-12W	●		16-12W			12	9.525	16	1.36	1.1	1.4	
	16-11W	●	●	16-11W			11	9.525	16	1.48	1.1	1.5	
	16-10W	●		16-10W			10	9.525	16	1.63	1.1	1.5	
	16-9W			16-9W			9	9.525	16	1.81	1.2	1.7	
	16-8W	●		16-8W			8	9.525	16	2.03	1.2	1.5	
	22-7W			22-7W			7	12.7	22	3.32	1.6	2.3	
	22-6W			22-6W			6	12.7	22	2.71	1.6	2.3	
	22-5W			22-5W			5	12.7	22	3.25	1.7	2.4	
	27-4.5W			27-4.5W			4.5	15.875	27	3.61	1.8	2.6	
	27-4W			27-4W			4	15.875	27	4.07	2.0	2.9	

Applicable holders D31

●: Stock item

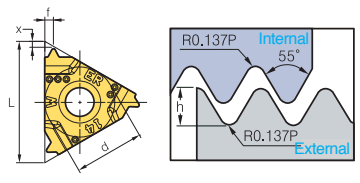
Whitworth (M chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ERM 16-11W	●				14	9.525	16	1.16	1.0	1.2	
	16-14W	●				11	9.525	16	1.48	1.1	1.5	
	16-19W	●				19	9.525	16	0.86	0.8	1.0	

Applicable holders D31

●: Stock item

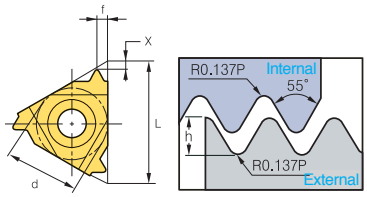
Whitworth (U chip breaker) new

Type	Designation (Right)	PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ERM 16-14W-U					14	9.525	16	1.16	1.0	1.2	
	16-11W-U					11	9.525	16	1.48	1.1	1.5	

Applicable holders D31

●: Stock item

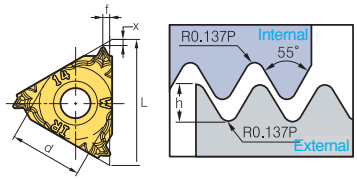
Whitworth (BSW, BSF, BSP, BSB)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IR 11-72W			IL 11-72W			72	6.35	11	0.23	0.7	0.4	
	11-60W			11-60W			60	6.35	11	0.27	0.7	0.4	
	11-56W			11-56W			56	6.35	11	0.29	0.7	0.4	
	11-48W			11-48W			48	6.35	11	0.34	0.6	0.6	
	11-40W			11-40W			40	6.35	11	0.41	0.6	0.6	
	11-36W			11-36W			36	6.35	11	0.45	0.6	0.6	
	11-32W			11-32W			32	6.35	11	0.51	0.6	0.6	
	11-28W			11-28W			28	6.35	11	0.58	0.6	0.7	
	11-26W			11-26W			26	6.35	11	0.63	0.7	0.8	
	11-24W			11-24W			24	6.35	11	0.68	0.7	0.8	
	11-22W			11-22W			22	6.35	11	0.74	0.8	0.9	
	11-20W			11-20W			20	6.35	11	0.81	0.8	0.9	
	11-19W	●	●	11-19W	●		19	6.35	11	0.86	0.8	1.0	
	11-18W			11-18W	●		18	6.35	11	0.90	0.8	1.0	
	11-16W			11-16W	●		16	6.35	11	1.02	0.9	1.1	
	11-14W	●		11-14W	●		14	6.35	11	1.16	0.9	1.1	
	11-12W			11-12W	●		12	6.35	11	1.32	0.9	1.2	
	16-72W			16-72W			72	9.525	16	0.23	0.7	0.4	
	16-60W			16-60W			60	9.525	16	0.27	0.7	0.4	
	16-56W			16-56W			56	9.525	16	0.29	0.7	0.4	
	16-48W			16-48W			48	9.525	16	0.34	0.6	0.6	
	16-40W			16-40W			40	9.525	16	0.41	0.6	0.6	
	16-36W			16-36W			36	9.525	16	0.45	0.6	0.6	
	16-32W			16-32W			32	9.525	16	0.51	0.6	0.6	
	16-30W			16-30W			30	9.525	16	0.55	0.6	0.7	
	16-28W			16-28W			28	9.525	16	0.58	0.6	0.7	
	16-26W			16-26W			26	9.525	16	0.63	0.7	0.8	
	16-24W			16-24W			24	9.525	16	0.68	0.7	0.8	
	16-22W			16-22W			22	9.525	16	0.74	0.8	0.9	
	16-20W			16-20W			20	9.525	16	0.81	0.8	0.9	
	16-19W			16-19W			19	9.525	16	0.86	0.8	1.0	
	16-18W			16-18W			18	9.525	16	0.90	0.8	1.0	
	16-16W			16-16W			16	9.525	16	1.02	0.9	1.1	
	16-14W	●		16-14W			14	9.525	16	1.16	1.0	1.2	
	16-12W	●		16-12W			12	9.525	16	1.36	1.1	1.4	
	16-11W	●	●	16-11W			11	9.525	16	1.48	1.1	1.5	
	16-10W	●		16-10W			10	9.525	16	1.63	1.1	1.5	
	16-9W	●		16-9W			9	9.525	16	1.81	1.2	1.7	
	16-8W	●		16-8W			8	9.525	16	2.03	1.2	1.5	
	22-7W			22-7W			7	12.7	22	3.32	1.6	2.3	
	22-6W			22-6W			6	12.7	22	2.71	1.6	2.3	
	22-5W			22-5W			5	12.7	22	3.25	1.7	2.4	
	27-4.5W			27-4.5W			4.5	15.875	27	3.61	1.8	2.6	
	27-4W			27-4W			4	15.875	27	4.07	2.0	2.9	

Applicable holders **D32**

●: Stock item

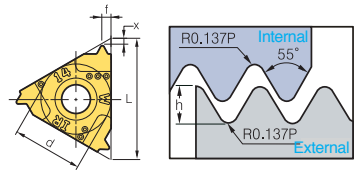
Whitworth (M chip breaker) new

Type	Designation (Right)		PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (Left)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IRM	16-14W					14	9.525	16	1.16	1.0	1.2	
		16-11W	●				11	9.525	16	1.48	1.1	1.5	

Applicable holders D32

●: Stock item

Whitworth (U chip breaker) new

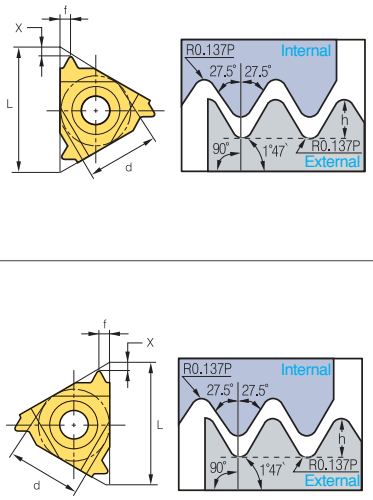
Type	Designation (Right)		PC3030T	PC5300	Designation (Left)	PC3030T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IRM	16-14W-U					14	9.525	16	1.16	1.0	1.2	
		16-11W-U					11	9.525	16	1.48	1.1	1.5	

Applicable holders D32

●: Stock item

British Standard Pipe Thread (BSPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-28BSPT			EL 11-28BSPT			28	6.35	11	0.58	0.6	0.6	
	11-19BSPT			11-19BSPT			19	6.35	11	0.86	0.8	0.9	
	11-14BSPT			11-14BSPT			14	6.35	11	1.16	0.9	1.0	
	16-28BSPT			16-28BSPT			28	9.525	16	0.58	0.6	0.6	
	16-19BSPT		●	16-19BSPT			19	9.525	16	0.86	0.8	0.9	
	16-14BSPT		●	16-14BSPT			14	9.525	16	1.16	1.0	1.2	
	16-11BSPT	●	●	16-11BSPT			11	9.525	16	1.48	1.1	1.5	
Internal	IR 11-28BSPT			IL 11-28BSPT			28	6.35	11	0.58	0.6	0.6	
	11-19BSPT		●	11-19BSPT			19	6.35	11	0.86	0.8	0.9	
	11-14BSPT		●	11-14BSPT			14	6.35	11	1.16	0.9	1.0	
	16-28BSPT			16-28BSPT			28	9.525	16	0.58	0.6	0.6	
	16-19BSPT	●	●	16-19BSPT			19	9.525	16	0.86	0.8	0.9	
	16-14BSPT	●	●	16-14BSPT			14	9.525	16	1.16	1.0	1.2	
	16-11BSPT		●	16-11BSPT			11	9.525	16	1.48	1.1	1.5	

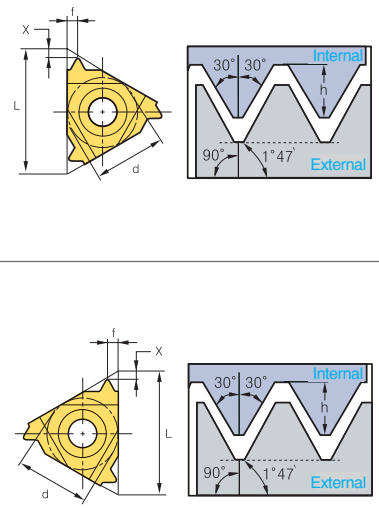


Applicable holders **D31, D32**

●: Stock item

National Pipe Thread (NPT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-27NPT			EL 11-27NPT			27	6.35	11	0.66	0.7	0.8	
	11-18NPT			11-18NPT			18	6.35	11	1.01	0.8	1.0	
	11-14NPT			11-14NPT			14	6.35	11	1.33	0.8	1.0	
	16-27NPT			16-27NPT			27	9.525	16	0.66	0.7	0.8	
	16-18NPT	●	●	16-18NPT			18	9.525	16	1.01	0.8	1.0	
	16-14NPT	●	●	16-14NPT			14	9.525	16	1.33	0.9	1.2	
	16-11.5NPT	●		16-11.5NPT			11.5	9.525	16	1.64	1.1	1.5	
	16-8NPT	●		16-8NPT			8	9.525	16	2.42	1.3	1.8	
Internal	IR 11-27NPT			IL 11-27NPT			27	6.35	11	0.66	0.7	0.8	
	11-18NPT	●		11-18NPT			18	6.35	11	1.01	0.8	1.0	
	11-14NPT	●	●	11-14NPT	●		14	6.35	11	1.33	0.8	1.0	
	16-27NPT			16-27NPT			27	9.525	16	0.66	0.7	0.8	
	16-18NPT			16-18NPT			18	9.525	16	1.01	0.8	1.0	
	16-14NPT	●	●	16-14NPT			14	9.525	16	1.33	0.9	1.2	
	16-11.5NPT	●	●	16-11.5NPT	●		11.5	9.525	16	1.64	1.1	1.5	
	16-8NPT	●		16-8NPT	●		8	9.525	16	2.42	1.3	1.8	

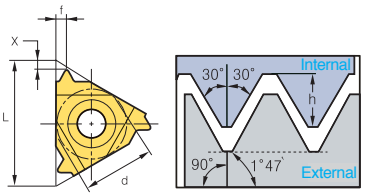


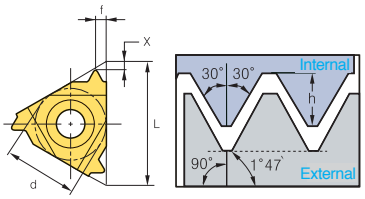
Applicable holders **D31, D32**

●: Stock item

National Pipe Threads-Dryseal (NPTF)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-27NPTF			EL 11-27NPTF			27	6.35	11	0.64	0.7	0.8	
	11-18NPTF			11-18NPTF			18	6.35	11	1.00	0.8	1.0	
	11-14NPTF			11-14NPTF			14	6.35	11	1.35	0.8	1.0	
	16-27NPTF			16-27NPTF			27	9.525	16	0.64	0.7	0.8	
	16-18NPTF	●		16-18NPTF			18	9.525	16	1.00	0.8	1.0	
	16-14NPTF			16-14NPTF			14	9.525	16	1.35	0.9	1.2	
	16-11.5NPTF			16-11.5NPTF			11.5	9.525	16	1.63	1.1	1.5	
	16-8NPTF			16-8NPTF			8	9.525	16	2.38	1.3	1.8	
Internal	IR 11-27NPTF			IL 11-27NPTF			27	6.35	11	0.64	0.7	0.8	
	11-18NPTF			11-18NPTF			18	6.35	11	1.00	0.8	1.0	
	11-14NPTF			11-14NPTF			14	6.35	11	1.35	0.8	1.0	
	16-27NPTF			16-27NPTF			27	9.525	16	0.64	0.7	0.8	
	16-18NPTF			16-18NPTF			18	9.525	16	1.00	0.8	1.0	
	16-14NPTF			16-14NPTF			14	9.525	16	1.35	0.9	1.2	
	16-11.5NPTF			16-11.5NPTF			11.5	9.525	16	1.63	1.1	1.5	
	16-8NPTF			16-8NPTF			8	9.525	16	2.38	1.3	1.8	



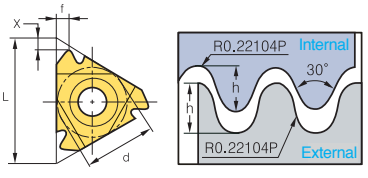


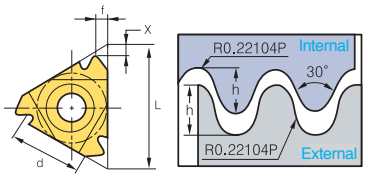
Applicable holders **D31, D32**

●: Stock item

Round DIN 405

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 16-10RD			EL 16-10RD			10	9.525	16	1.27	1.1	1.2	
	16-8RD			16-8RD			8	9.525	16	1.59	1.4	1.3	
	16-6RD			16-6RD			6	9.525	16	2.12	1.5	1.7	
	22-6RD			22-6RD			6	12.7	22	2.12	1.5	1.7	
	22-4RD			22-4RD			4	12.7	22	3.18	2.2	2.3	
	27-4RD			27-4RD			4	15.875	27	3.18	2.2	2.3	
Internal	IR 16-10RD			IL 16-10RD			10	9.525	16	1.27	1.1	1.2	
	16-8RD			16-8RD			8	9.525	16	1.59	1.4	1.4	
	16-6RD			16-6RD			6	9.525	16	2.12	1.4	1.5	
	22-6RD			22-6RD			6	12.7	22	2.12	1.5	1.7	
	22-4RD			22-4RD			4	12.7	22	3.18	2.2	2.3	
	27-4RD			27-4RD			4	15.875	27	3.18	2.2	2.3	



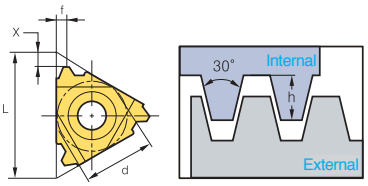


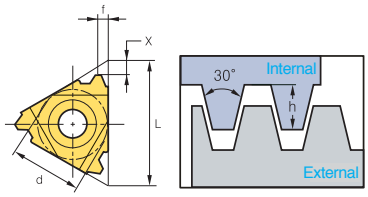
Applicable holders **D31, D32**

●: Stock item

Trapez DIN 103 (TR)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	d	L	hmin	X	f	Picture
External	ER 11-1.5TR			EL 11-1.5TR			1.5	6.35	11	0.90	0.8	0.9	
	16-1.5TR			16-1.5TR			1.5	9.525	16	0.90	1.0	1.1	
	16-2.0TR	●		16-2.0TR	●		2.0	9.525	16	1.25	1.1	1.3	
	16-3.0TR	●	●	16-3.0TR			3.0	9.525	16	1.75	1.3	1.5	
	22-4.0TR	●	●	22-4.0TR	●		4.0	12.7	22	2.25	1.7	1.9	
	22-5.0TR	●	●	22-5.0TR	●		5.0	12.7	22	2.75	2.1	2.5	
	27-6.0TR	●	●	27-6.0TR			6.0	15.875	27	3.50	2.3	2.7	
Internal	IR 11-1.5TR			IL 11-1.5TR	●		1.5	6.35	11	0.90	0.8	0.9	
	16-1.5TR			16-1.5TR	●		1.5	9.525	16	0.90	1.0	1.1	
	16-2.0TR			16-2.0TR	●		2.0	9.525	16	1.25	1.1	1.3	
	16-2.5TR			16-2.5TR			2.5	9.525	16	1.53	1.2	1.4	
	16-3.0TR	●		16-3.0TR	●		3.0	9.525	16	1.75	1.3	1.5	
	22-4.0TR	●	●	22-4.0TR	●		4.0	12.7	22	2.25	1.7	1.9	
	22-5.0TR	●	●	22-5.0TR			5.0	12.7	22	2.75	2.1	2.5	
	27-6.0TR	●	●	27-6.0TR	●		6.0	15.875	27	3.50	2.3	2.7	



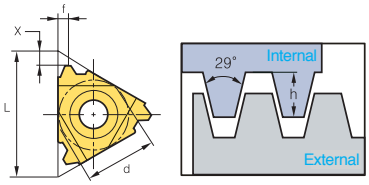


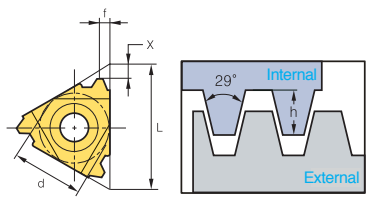
Applicable holders **D31, D32**

●: Stock item

American ACME (ACME)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	d	L	hmin	X	f	Picture
External	ER 11-16ACME			EL 11-16ACME			16	6.35	11	0.92	1.0	1.1	
	16-16ACME			16-16ACME			16	9.525	16	0.92	1.0	1.1	
	16-14ACME			16-14ACME			14	9.525	16	1.03	1.0	1.2	
	16-12ACME			16-12ACME			12	9.525	16	1.19	1.1	1.2	
	16-10ACME			16-10ACME			10	9.525	16	1.52	1.3	1.4	
	16-8ACME			16-8ACME			8	9.525	16	1.84	1.4	1.5	
	16-6ACME			16-6ACME			6	9.525	16	2.37	1.7	1.9	
	22-6ACME	●		22-6ACME			6	12.7	22	2.37	1.8	2.1	
	22-5ACME			22-5ACME			5	12.7	22	2.79	2.0	2.3	
	27-4ACME			27-4ACME			4	15.875	27	3.43	2.4	2.7	
Internal	IR 11-16ACME			IL 11-16ACME			16	6.35	11	0.92	0.9	0.9	
	16-16ACME			16-16ACME			16	9.525	16	0.92	1.0	1.1	
	16-14ACME			16-14ACME			14	9.525	16	1.03	1.1	1.2	
	16-12ACME			16-12ACME			12	9.525	16	1.19	1.2	1.3	
	16-10ACME			16-10ACME			10	9.525	16	1.52	1.2	1.3	
	16-8ACME			16-8ACME			8	9.525	16	1.84	1.4	1.5	
	16-6ACME			16-6ACME			6	9.525	16	2.37	1.7	1.9	
	22-6ACME			22-6ACME			6	12.7	22	2.37	1.8	2.1	
	22-5ACME			22-5ACME			5	12.7	22	2.79	2.0	2.3	
	27-4ACME	●		27-4ACME			4	15.875	27	3.43	2.3	2.6	

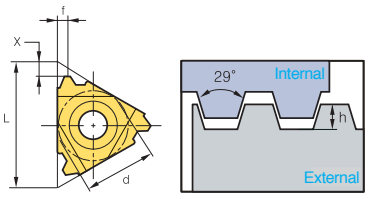
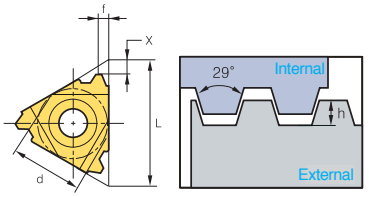




Applicable holders **D31, D32**

●: Stock item

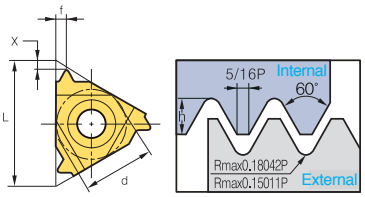
Stub ACME (STACME)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-16STACME			EL 11-16STACME			16	6.35	11	0.60	1.0	1.0	
	16-16STACME			16-16STACME			16	9.525	16	0.60	1.0	1.0	
	16-14STACME			16-14STACME			14	9.525	16	0.67	1.1	1.1	
	16-12STACME			16-12STACME			12	9.525	16	0.76	1.2	1.2	
	16-10STACME			16-10STACME			10	9.525	16	1.02	1.2	1.3	
	16-8STACME			16-8STACME			8	9.525	16	1.21	1.4	1.5	
	16-6STACME			16-6STACME			6	9.525	16	1.52	1.7	1.8	
	22-6STACME			22-6STACME			6	12.7	22	1.52	1.7	1.8	
	22-5STACME			22-5STACME			5	12.7	22	1.78	2.1	2.3	
	27-4STACME			27-4STACME			4	15.875	27	2.16	2.3	2.4	
	27-3STACME			27-3STACME			3	15.875	27	2.79	2.9	2.9	
Internal	IR 11-16STACME			IL 11-16STACME			16	6.35	11	0.60	1.0	1.0	
	16-16STACME			16-16STACME			16	9.525	16	0.60	1.0	1.0	
	16-14STACME			16-14STACME			14	9.525	16	0.67	1.1	1.1	
	16-12STACME			16-12STACME			12	9.525	16	0.76	1.1	1.2	
	16-10STACME			16-10STACME			10	9.525	16	1.02	1.2	1.3	
	16-8STACME			16-8STACME			8	9.525	16	1.21	1.4	1.5	
	16-6STACME			16-6STACME			6	9.525	16	1.52	1.7	1.8	
	22-6STACME			22-6STACME			6	12.7	22	1.52	1.7	1.8	
	22-5STACME			22-5STACME			5	12.7	22	1.78	2.1	2.3	
	27-4STACME			27-4STACME			4	15.875	27	2.16	2.3	2.4	
	27-3STACME			27-3STACME			3	15.875	27	2.79	2.9	2.9	

Applicable holders **D31, D32**

●: Stock item

UNJ (Unified constant thread)

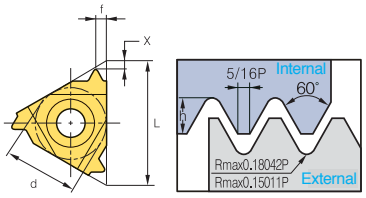
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-48UNJ			EL 11-48UNJ			48	6.35	11	0.31	0.6	0.5	
	11-44UNJ			11-44UNJ			44	6.35	11	0.33	0.6	0.6	
	11-40UNJ			11-40UNJ			40	6.35	11	0.37	0.6	0.6	
	11-36UNJ			11-36UNJ			36	6.35	11	0.41	0.6	0.6	
	11-32UNJ			11-32UNJ			32	6.35	11	0.46	0.6	0.7	
	11-28UNJ			11-28UNJ			28	6.35	11	0.52	0.7	0.7	
	11-24UNJ			11-24UNJ			24	6.35	11	0.61	0.7	0.8	
	11-20UNJ			11-20UNJ			20	6.35	11	0.73	0.8	0.9	
	11-18UNJ			11-18UNJ			18	6.35	11	0.81	0.8	1.0	
	11-16UNJ			11-16UNJ			16	6.35	11	0.92	0.9	1.1	
	11-14UNJ			11-14UNJ			14	6.35	11	1.05	1.0	1.2	
	16-48UNJ			16-48UNJ			48	9.525	16	0.31	0.6	0.5	
	16-44UNJ			16-44UNJ			44	9.525	16	0.33	0.6	0.6	
	16-40UNJ			16-40UNJ			40	9.525	16	0.37	0.6	0.6	
	16-36UNJ			16-36UNJ			36	9.525	16	0.41	0.6	0.6	
	16-32UNJ			16-32UNJ			32	9.525	16	0.46	0.6	0.7	
	16-28UNJ			16-28UNJ			28	9.525	16	0.52	0.7	0.7	
	16-24UNJ			16-24UNJ			24	9.525	16	0.61	0.7	0.8	
	16-20UNJ			16-20UNJ			20	9.525	16	0.73	0.8	0.9	
	16-18UNJ			16-18UNJ			18	9.525	16	0.81	0.8	1.0	
	16-16UNJ			16-16UNJ			16	9.525	16	0.92	0.9	1.1	
	16-14UNJ			16-14UNJ			14	9.525	16	1.05	1.0	1.2	
	16-13UNJ			16-13UNJ			13	9.525	16	1.13	1.0	1.3	
	16-12UNJ			16-12UNJ			12	9.525	16	1.22	1.1	1.3	
	16-11UNJ			16-11UNJ			11	9.525	16	1.33	1.2	1.5	
	16-10UNJ			16-10UNJ			10	9.525	16	1.47	1.2	1.5	
	16-9UNJ			16-9UNJ			9	9.525	16	1.63	1.3	1.7	
	16-8UNJ			16-8UNJ			8	9.525	16	1.83	1.2	1.6	
	22-7UNJ			22-7UNJ			7	12.7	22	2.09	1.7	2.3	
	22-6UNJ			22-6UNJ			6	12.7	22	2.44	1.7	2.3	
	22-5UNJ			22-5UNJ			5	12.7	22	2.93	1.8	2.5	
	27-4.5UNJ			27-4.5UNJ			4.5	15.875	27	3.26	2.0	2.7	
	27-4UNJ			27-4UNJ			4	15.875	27	3.67	2.2	3.0	

Applicable holders D31

●: Stock item

UNJ (Unified constant thread)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
Internal	IR 11-48UNJ			IL 11-48UNJ			48	6.35	11	0.28	0.6	0.5	
	11-44UNJ			11-44UNJ			44	6.35	11	0.30	0.6	0.6	
	11-40UNJ			11-40UNJ			40	6.35	11	0.33	0.6	0.6	
	11-36UNJ			11-36UNJ			36	6.35	11	0.37	0.6	0.6	
	11-32UNJ			11-32UNJ			32	6.35	11	0.42	0.6	0.7	
	11-28UNJ			11-28UNJ			28	6.35	11	0.47	0.7	0.7	
	11-24UNJ			11-24UNJ			24	6.35	11	0.55	0.7	0.8	
	11-20UNJ			11-20UNJ			20	6.35	11	0.66	0.8	0.9	
	11-18UNJ			11-18UNJ			18	6.35	11	0.74	0.8	1.0	
	11-16UNJ			11-16UNJ			16	6.35	11	0.83	0.9	1.1	
	11-14UNJ			11-14UNJ			14	9.525	11	0.95	1.0	1.2	
	16-48UNJ			16-48UNJ			48	9.525	16	0.28	0.6	0.5	
	16-44UNJ			16-44UNJ			44	9.525	16	0.30	0.6	0.6	
	16-40UNJ			16-40UNJ			40	9.525	16	0.33	0.6	0.6	
	16-36UNJ			16-36UNJ			36	9.525	16	0.37	0.6	0.6	
	16-32UNJ			16-32UNJ			32	9.525	16	0.42	0.6	0.7	
	16-28UNJ			16-28UNJ			28	9.525	16	0.47	0.7	0.7	
	16-24UNJ			16-24UNJ			24	9.525	16	0.55	0.7	0.8	
	16-20UNJ			16-20UNJ			20	9.525	16	0.66	0.8	0.9	
	16-18UNJ			16-18UNJ			18	9.555	16	0.74	0.8	1.0	
	16-16UNJ			16-16UNJ			16	9.525	16	0.83	0.9	1.1	
	16-14UNJ			16-14UNJ			14	9.525	16	0.95	1.0	1.2	
	16-13UNJ			16-13UNJ			13	9.525	16	1.02	1.0	1.3	
	16-12UNJ			16-12UNJ			12	9.525	16	1.11	1.1	1.3	
	16-11UNJ			16-11UNJ			11	9.525	16	1.21	1.2	1.5	
	16-10UNJ			16-10UNJ			10	9.525	16	1.33	1.2	1.5	
	16-9UNJ			16-9UNJ			9	9.525	16	1.48	1.3	1.7	
	16-8UNJ			16-8UNJ			8	9.525	16	1.66	1.2	1.6	
	22-7UNJ			22-7UNJ			7	12.7	22	1.90	1.7	2.3	
	22-6UNJ			22-6UNJ			6	12.7	22	2.21	1.7	2.3	
	22-5UNJ			22-5UNJ			5	12.7	22	2.66	1.8	2.5	
	27-4.5UNJ			27-4.5UNJ			4.5	15.875	27	2.95	2.0	2.7	
	27-4UNJ			27-4UNJ			4	15.875	27	3.32	2.2	3.0	

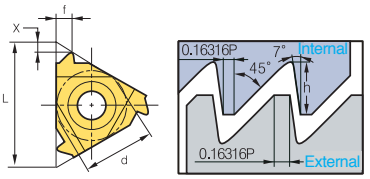


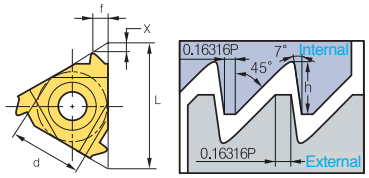
Applicable holders **D32**

●: Stock item

American Buttress (ABUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 11-20ABUT			EL 11-20ABUT			20	6.35	11	0.84	1.0	1.4	
	11-16ABUT			11-16ABUT			16	6.35	11	1.05	1.3	1.9	
	16-20ABUT			16-20ABUT			20	9.525	16	0.84	1.0	1.4	
	16-16ABUT			16-16ABUT			16	9.525	16	1.05	1.3	1.9	
	16-12ABUT			16-12ABUT			12	9.525	16	1.40	1.4	2.0	
	16-10ABUT			16-10ABUT			10	9.525	16	1.68	1.5	2.3	
	22-8ABUT			22-8ABUT			8	12.7	22	2.10	2.0	3.2	
	22-6ABUT			22-6ABUT			6	12.7	22	2.80	2.2	3.5	
Internal	IR 11-20ABUT			IL 11-20ABUT			20	6.35	11	0.84	1.0	1.4	
	11-16ABUT			11-16ABUT			16	6.35	11	1.05	1.3	1.9	
	16-20ABUT			16-20ABUT			20	9.525	16	0.84	1.0	1.4	
	16-16ABUT			16-16ABUT			16	9.525	16	1.05	1.3	1.9	
	16-12ABUT			16-12ABUT			12	9.525	16	1.40	1.4	2.0	
	16-10ABUT			16-10ABUT			10	9.525	16	1.68	1.5	2.3	
	22-8ABUT			22-8ABUT			8	12.7	22	2.10	2.0	3.2	
	22-6ABUT			22-6ABUT			6	12.7	22	2.80	2.2	3.5	



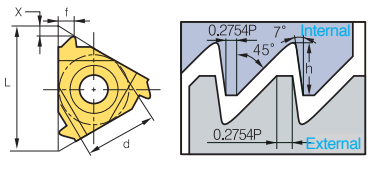


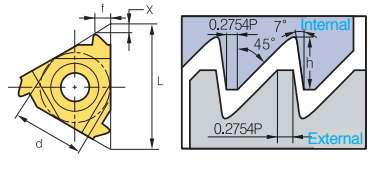
Applicable holders **D31, D32**

●: Stock item

British Buttress (BBUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 16-16BBUT			EL 16-16BBUT			16	9.525	16	0.80	1.1	1.6	
	16-12BBUT			16-12BBUT			12	9.525	16	1.07	1.4	2.1	
	16-10BBUT			16-10BBUT			10	9.525	16	1.28	1.4	2.2	
	16-8BBUT			16-8BBUT			8	9.525	16	1.61	1.6	2.5	
	22-8BBUT			22-8BBUT			8	12.7	22	1.61	1.6	2.5	
Internal	IR 16-16BBUT			IL 16-16BBUT			16	9.525	16	0.80	1.1	1.6	
	16-12BBUT			16-12BBUT			12	9.525	16	1.07	1.4	2.1	
	16-10BBUT			16-10BBUT			10	9.525	16	1.28	1.4	2.2	
	16-8BBUT			16-8BBUT			8	9.525	16	1.61	1.6	2.5	
	22-8BBUT			22-8BBUT			8	12.7	22	1.61	1.6	2.5	



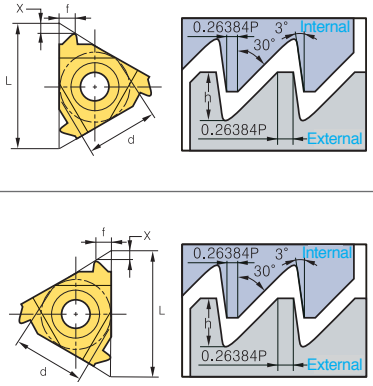


Applicable holders **D31, D32**

●: Stock item

Metric Buttress (SAGE)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 16-2.0SAGE			EL 16-2.0SAGE			2.0	9.525	16	1.74	1.47	2.08	
	22-2.0SAGE			22-2.0SAGE			2.0	12.7	22	1.74	1.47	2.08	
	22-3.0SAGE	●		22-3.0SAGE			3.0	12.7	22	2.60	1.79	2.60	
	27-4.0SAGE			27-4.0SAGE			4.0	15.875	27	3.55	1.93	3.20	
Internal	IR 16-2.0SAGE			IL 16-2.0SAGE			2.0	9.525	16	1.50	1.52	2.2	
	22-3.0SAGE			22-3.0SAGE			3.0	12.7	22	2.25	1.66	2.9	
	27-4.0SAGE			27-4.0SAGE			4.0	5/8	27	3.09	2.12	3.2	

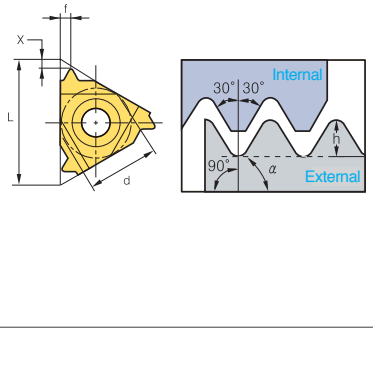


Applicable holders **D31, D32**

●: Stock item

API

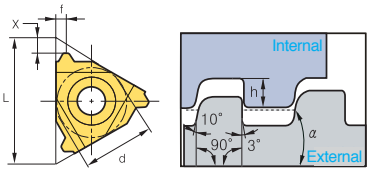
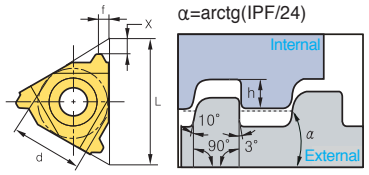
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER 22-4API382			EL 22-4API382			4	12.7	22	3.09	2.1	2.8	
	22-4API383			22-4API383			4	12.7	22	3.08	2.1	2.8	
	22-4API502			22-4API502			4	12.7	22	3.75	2.0	2.9	
	22-4API503			22-4API503			4	12.7	22	3.74	2.0	2.9	
	22-5API403			22-5API403			5	12.7	22	2.99	1.8	2.6	
	22-6API551			22-6API551			6	12.7	22	1.41	2.6	2.0	
	27-4API382			27-4API382			4	15.875	27	3.09	2.1	2.8	
	27-4API383			27-4API383			4	15.875	27	3.08	2.1	2.8	
	27-4API502			27-4API502			4	15.875	27	3.75	2.1	3.1	
	27-4API503			27-4API503			4	15.875	27	3.74	2.1	3.1	
	27-5API403			27-5API403			5	15.875	27	2.99	1.9	2.7	
Internal	IR 22-4API382			IL 22-4API382			4	12.7	22	3.09	2.1	2.8	
	22-4API383			22-4API383			4	12.7	22	3.08	2.1	2.8	
	22-4API502			22-4API502			4	12.7	22	3.75	2.1	3.1	
	22-4API503			22-4API503			4	12.7	22	3.74	2.0	2.9	
	22-5API403	●		22-5API403			5	12.7	22	2.99	1.8	2.6	
	22-6API551			22-6API551			6	12.7	22	1.41	2.6	2.0	
	27-4API382			27-4API382			4	15.875	27	3.09	2.1	2.8	
	27-4API383			27-4API383			4	15.875	27	3.08	2.1	2.8	
	27-4API502			27-4API502			4	15.875	27	3.75	2.1	3.1	
	27-4API503			27-4API503			4	15.875	27	3.74	2.1	3.1	
	27-5API403			27-5API403			5	15.875	27	2.99	1.9	2.7	



Applicable holders **D31, D32**

●: Stock item

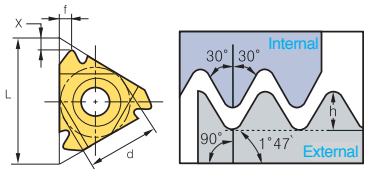
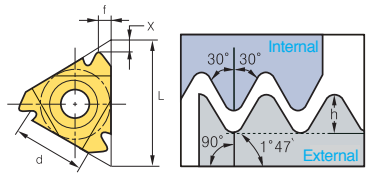
API Buttress Casing (BUT)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	IPF	d	L	hmin	X	f	Picture
External	ER 22-5BUT75			EL 22-5BUT75			5	0.75	12.7	22	1.55	3.1	1.9	
	22-5BUT1			22-5BUT1			5	1	12.7	22	1.55	3.1	1.9	
Internal	IR 22-5BUT75			IL 22-5BUT75			5	0.75	12.7	22	1.55	2.8	1.9	
	22-5BUT1			22-5BUT1			5	1	12.7	22	1.55	2.8	1.9	

Applicable holders **D31, D32**

●: Stock item

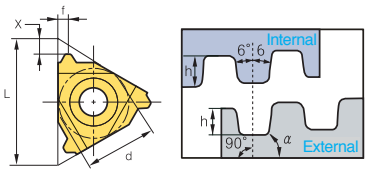
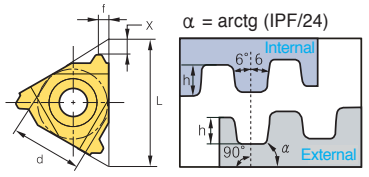
API Round Casing & Tubing (APIRD)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	d	L	hmin	X	f	Picture
External	ER 16-10APIRD	●		EL 16-10APIRD			10	9.525	16	1.41	1.2	1.4	
	16-8APIRD	●		16-8APIRD			8	9.525	16	1.81	1.3	1.5	
Internal	IR 16-10APIRD	●		IL 16-10APIRD			10	9.525	16	1.41	1.2	1.4	
	16-8APIRD	●		16-8APIRD			8	9.525	16	1.81	1.3	1.5	

Applicable holders **D31, D32**

●: Stock item

Extreme Line Casing (EL)

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (tpi)	IPF	d	L	hmin	X	f	Picture
External	ER 22-6EL15			EL 22-6EL15			6	1.5	12.7	22	1.21	1.9	1.9	
	22-5EL125			22-5EL125			5	1.25	12.7	22	1.71	2.3	2.4	
Internal	IR 22-6EL15			IL 22-6EL15			6	1.5	12.7	22	1.39	1.8	1.9	
	22-5EL125			22-5EL125			5	1.25	12.7	22	1.91	2.2	2.4	

Applicable holders **D31, D32**

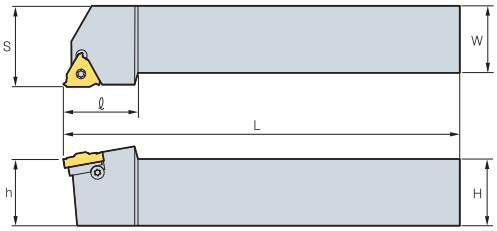
●: Stock item

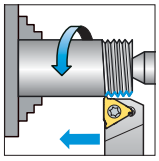
ER(L)H

(Screw on system)









Righthand drawing

(mm)

Designation		Inscribed circle	H	W	L	S	H	ℓ	Insert screw	Shim screw	Screw RH	Screw LH	Wrench
ER(L)H	08N-11	6.35	8	8	136.4	11	8	17.5	ST11N	-	-	-	TW08P
	10N-11	6.35	10	10	70.0	11	10	17.5					
	12N-11	6.35	12	12	80.0	12	12	17.5					
	12N-16	9.525	12	12	83.2	16	12	22	ST16N	-	-	-	TW10P
	09-16	9.525	9.52	9.52	63.6	16	9.52	20.5	ST16	STA16	ATE16	ATI22	TW10P
	12-16	9.525	12	12	83.2	16	12	22					
	16-16	9.525	16	16	100.0	16	16	20.5					
	20-16	9.525	20	20	128.6	20	20	30					
	25-16	9.525	25	25	153.6	25	25	30					
	32-16	9.525	32	32	173.6	32	32	30					
	25-22	12.7	25	25	155.7	25	25	36	ST22	STA22	ATE22	ATI22	TW20P
	32-22	12.7	32	32	175.7	32	32	36					
	40-22	12.7	40	40	205.7	40	40	36					
	25-27	15.875	25	25	151.6	32	25	35	ST27	STA27	ATE27	ATI27	TW25L
	32-27	15.875	32	32	176.6	32	32	40					
	40-27	15.875	40	40	206.6	40	40	40					
	50-27	15.875	50	50	256.6	50	50	40					

Applicable inserts **D10~D13, D16, D18, D19, D22, D23~D26**

• Helix angle is 1.5° for all holders

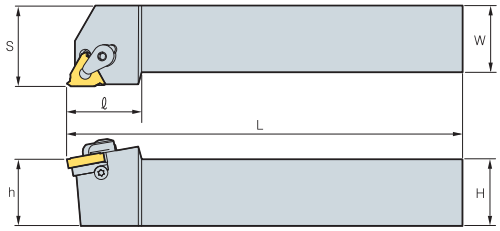
• No shim needed for N type holder

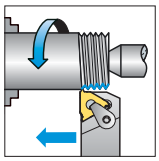
ER(L)H-C

(Clamp on system)









Righthand drawing

(mm)

Designation		Inscribed circle	H	W	L	S	H	ℓ	Shim screw	Clamp	Screw RH	Screw LH	Wrench
ER(L)H	20-16C	9.525	20	20	128.6	20	20	30	STA16	CTH16	ATE16	ATI16	TW10P TW15P
	25-16C	9.525	25	25	153.6	25	25	30					
	32-16C	9.525	32	32	173.6	32	32	30					
	25-22C	12.7	25	25	155.7	25	25	36	STA22	CTH22	ATE22	ATI22	TW20P
	32-22C	12.7	32	32	175.7	32	32	36					
	40-22C	12.7	40	40	205.7	40	40	36					
	25-27C	15.875	25	25	151.6	25	25	35	STA27	CTH27	ATE27	ATI27	TW25L
	32-27C	15.875	32	32	176.6	32	32	40					
	40-27C	15.875	40	40	206.6	40	40	40					
	50-27C	15.875	50	50	256.6	50	50	40					

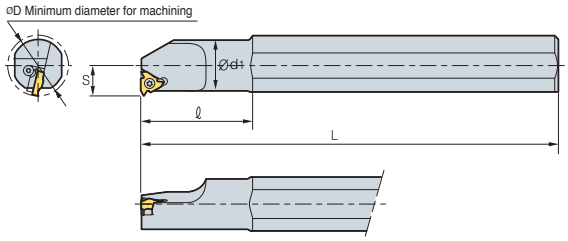
Applicable inserts **D10~D13, D16, D18, D19, D22, D23~D26**

• Helix angle is 1.5° for all holders

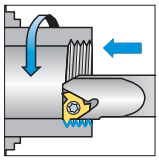
IR(L)H

(Screw on system)









Righthand drawing

(mm)

Designation		Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Insert screw	Shim screw	Screw RH	Screw LH	Wrench
IR(L)H	10DN-11	6.35	13	10	10.0	9.5	100	7.3	-	ST11N	-	-	-	TW08P
	10N-11	6.35	13	20	10.0	18.0	180	7.3	25					
	13N-11	6.35	16	20	13.0	18.0	180	8.9	32					
	13N-16	9.525	17	20	12.7	18.0	180	10.3	32	ST16N	-	-	-	TW10P
	16N-16	9.525	20	20	16.0	18.0	180	11.5	40					
	16DN-16	9.525	20	16	16.0	15.2	150	11.3	32					
	20-16	9.525	24	20	20.0	18.0	180	13.4	40	ST16	STA16	ATI16	ATE16	TW10P
	25-16	9.525	29	32	25.0	29.0	250	16.3	60					
	25D-16	9.525	29	25	24.5	22.6	200	16.1	45					
	32-16	9.525	36	32	32.0	29.0	250	19.6	60					
	40-16	9.525	44	40	40.0	36.0	300	23.8	60					
	20N-22	12.7	27	20	20.0	18.0	180	15.6	50	ST22N	-	-	-	TW20P
	25-22	12.7	32	32	25.0	29.0	250	17.4	60	ST22	STA22	ATI22	ATE22	TW20P
	25D-22	12.7	32	25	24.6	22.6	200	17.2	45					
	32-22	12.7	39	32	32.0	29.0	250	21.5	60					
	40-22	12.7	47	40	40.0	36.0	300	25.8	60					
	32-27	15.875	40	32	32.0	29.0	250	22.4	60	ST27	STA27	ATI27	ATE27	TW25L
	40-27	15.875	48	40	40.0	36.0	300	26.4	60					
	50-27	15.875	58	50	50.0	45.0	350	31.4	75					
	60-27	15.875	69	60	60.0	54.0	400	36.4	75					

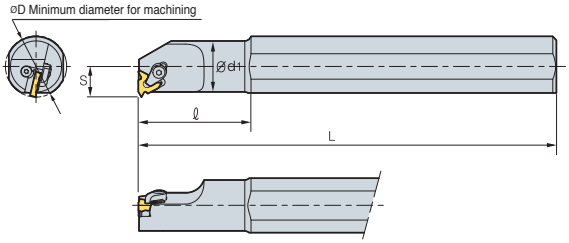
Applicable inserts **D10, D11, D14, D15, D17, D20~D25, D27~D30**

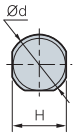
• Helix angle is 1.5° for all holders • No shim needed for N type holder

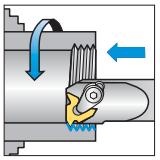
IR(L)H-C

(Clamp on system)









Righthand drawing

(mm)

Designation		Inscribed circle	ØD	Ød	Ød1	H	L	S	ℓ	Shim screw	Clamp	Screw RH	Screw LH	Wrench
IR(L)H	20-16C	9.525	24	20	20.0	18.0	180	13.4	50	STA16	CTH16	ATI16	ATE16	TW10P TW15P
	25-16C	9.525	29	32	25.0	28.0	250	16.3	60					
	25D-16C	9.525	29	25	24.6	22.6	200	16.1	45					
	32-16C	9.525	36	32	32.0	29.0	250	19.6	60					
	40-16C	9.525	44	40	40.0	36.0	300	23.8	60					
	25-22C	12.7	32	32	25.0	29.0	250	17.4	60	STA22	CTH22	ATI22	ATE22	TW20P
	25D-22C	12.7	32	25	24.6	22.6	200	17.2	45					
	32-22C	12.7	39	32	32.0	29.0	250	21.5	60					
	40-22C	12.7	47	40	40.0	36.0	300	25.8	60					
	32-27C	15.875	40	32	32.0	29.0	250	22.4	60	STA27	CTH27	ATI27	ATE27	TW25L
	40-27C	15.875	48	40	40.0	36.0	300	26.4	60					
	50-27C	15.875	58	50	50.0	45.0	350	31.4	75					
	60-27C	15.875	69	60	60.5	54.0	400	36.4	75					

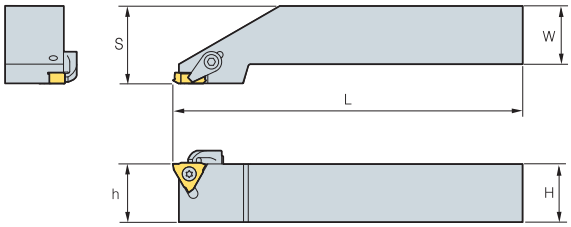
Applicable inserts **D10, D11, D14, D15, D17, D20~D25, D27~D30**

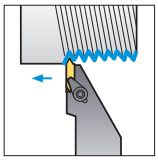
• Helix angle is 1.5° for all holders

VTH



VETR



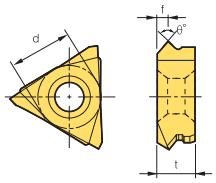


Righthand drawing

(mm)

Designation		H = (h)	W	L	S	Insert	Clamp	Clamp screw	Screw	Wrench
VTH	2020R	20	20	125	26.4	VETR	CS6R1	DHA0617	FTKA03510	TW15P, HW30L
	2525R	25	25	150	33.4					
	3225R	32	25	170	33.4					

Vertical type thread insert

Picture	Designation		Cermet	Uncoated	Dimensions			Configuration
			CN20	ST10	Pitch (mm)	θ	f	
	VETR	080			0.8	60°	1.4	 d : 9.525 t : 4.76
		100		●	1.0	60°	1.4	
		125			1.25	60°	1.4	
		150		●	1.5	60°	1.2	
		175			1.75	60°	1.2	
		200		●	2.0	60°	1.2	
		250			2.5	60°	1.4	
		300		●	3.0	60°	1.6	
		150F	●	●	0.8~1.5	60°	1.4	
		300F	●	●	1.5~3.0	60°	1.6	

● : Stock item

Thread milling holders code system

TM S R L 25 - 11

1 Insert style | 2 Holder style | 3 Hand | 4 Shank type | 5 Shank dia. | 6 Cutting edge length

1 Insert style
TM S R L 25 - 11

Thread Milling Holder

2 Holders style
TM S R L 25 - 11

S: Shank Type

3 Hand
TM S R L 25 - 11

R: Right Hand L: Left Hand

4 Shank type
TM S R L 25 - 11

None: Standard
L: Long Type
T: Taper Type

5 Shank dia.
TM S R L 25 - 11

25: 25.0

6 Cutting edge length
TM S R L 25 - 11

10: 10.4
11: 11
16: 16
22: 22
27: 27
38: 38.5

Thread milling inserts code system

TM 2 I 16 - 1.5 ISO

1 Insert style | 2 Cutting edge | 3 Type of insert | 4 Cutting edge length | 5 Pitch | 6 Type

1 Insert style
TM 2 I 16 - 1.5 ISO

Thread Milling Holder

2 Cutting edge
TM 2 I 16 - 1.5 ISO

None: 1 cutting edge
2: 2 cutting edge

3 Type of insert
TM 2 I 16 - 1.5 ISO

I: Internal
E: External
EI: External & Internal

4 Cutting edge length
TM 2 I 16 - 1.5 ISO

10: 10.4
11: 11
16: 16
22: 22
27: 27
38: 38.5

5 Pitch
TM 2 I 16 - 1.5 ISO

mm: 0.5~6.0 tpi: 48~6

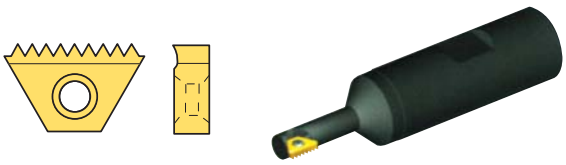
6 Type
TM 2 I 16 - 1.5 ISO

ISO Metric
American UN (UNC, UNF, UNEF)
UNJ
Whit Worth (BSW, BSF, BSP, BSB)
National Pipe Thread (NPT)
National Pipe Thread (NPTF)
British Standard Pipe Thread (BSPT)

Thread milling

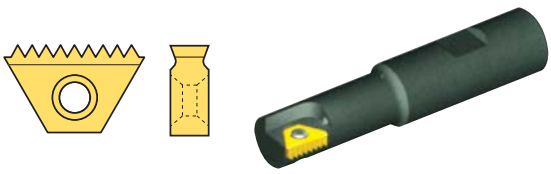
The right tool for the job

Small diameter type



Tool holder: TMSR **Insert**: TM L = 10.4 mm
For small bore diameters down to 9.5 mm

Standard type



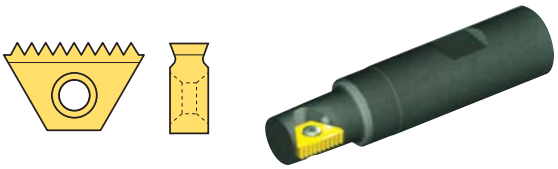
Tool holder: TMSR **Insert**: TM2
For standard length threads

Long type



Tool holder: TMSR **Insert**: TM2
For long or remote threads

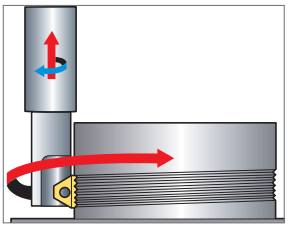
Tapered type



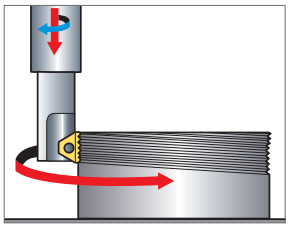
Tool holder: TMSR **Insert**: TM2 (BSPT, NPT, NPTF)
For standard length threads

Thread milling methods

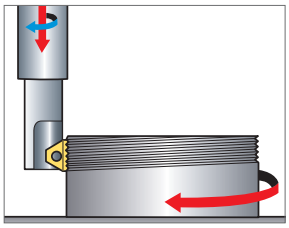
External threading



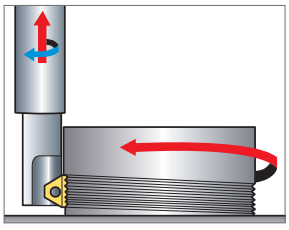
Right handed thread
conventional milling



Left handed thread
down milling

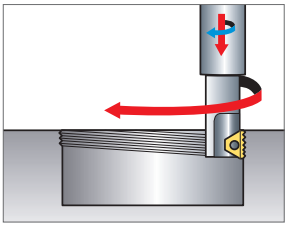


Right handed thread
down milling

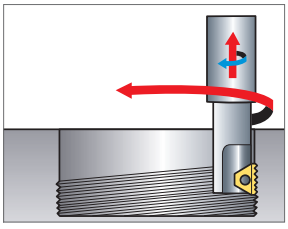


Left handed thread
conventional milling

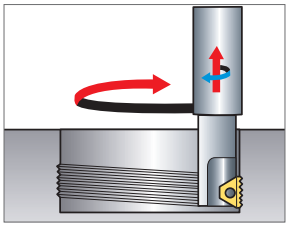
Internal threading



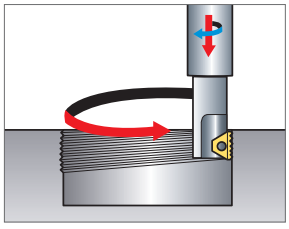
Right handed thread
down milling



Left handed thread
conventional milling

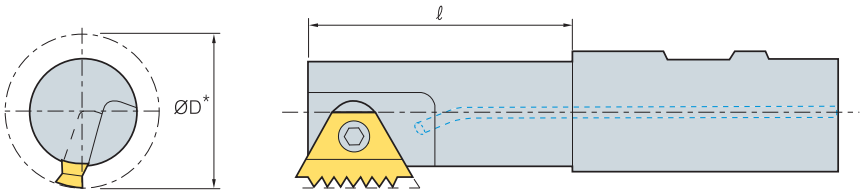


Right handed thread
conventional milling



Left handed thread
down milling

Tooling recommendation for given internal thread specification

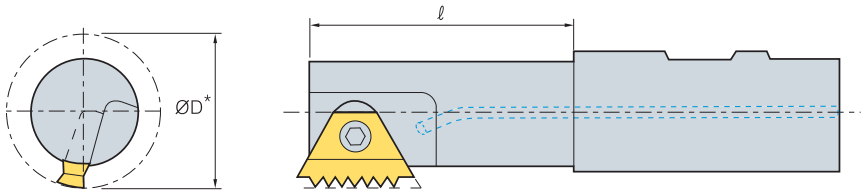


ISO

Pitch (mm)	Nominal dia. (mm)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
0.75	11	TMSR 12-10	TM2I 10-0.75ISO	12.0	9.0	0.43
1.0	12-14	TMSR 12-10	TM2I 10-1.0ISO	12.0	9.0	0.58
	15-18	TMSR 12-11	TM2I 11-1.0ISO	12.0	11.5	
	20	TMSR 16-16	TM2I 16-1.0ISO	22.0	17.0	
	22	TMSR 20-22	TM2I 22-1.0ISO	29.0	19.0	
	24	TMSR 20-16	TM2I 16-1.0ISO	43.0	20.0	
	25-28	TMSRL 25-16	TM2I 16-1.0ISO	25.0	22.0	
1.25	14	TMSR 12-10	TM2I 10-1.25ISO	12.0	9.0	0.72
1.5	14-15	TMSR 12-10	TM2I 10-1.5ISO	12.0	9.0	0.87
	16-20	TMSR 12-11	TM2I 11-1.5ISO	12.0	11.5	
	22	TMSR 16-16	TM2I 16-1.5ISO	22.0	17.0	
	24	TMSR 20-22	TM2I 22-1.5ISO	29.0	19.0	
	25-26	TMSR 20-16	TM2I 16-1.5ISO	43.0	20.0	
	27-30	TMSRL 25-16	TM2I 16-1.5ISO	25.0	22.0	
	35-42	TMSR 25-27	TM2I 27-1.5ISO	52.0	30.0	
	45	TMSR 32-27	TM2I 27-1.5ISO	58.0	37.0	
2.0	22	TMSRT 16-16	TM2I16-2.0ISO	22.0	15.5	1.15
	24	TMSR 16-16	TM2I 16-2.0ISO	22.0	17.0	
	25	TMSR 20-22	TM2I 22-2.0ISO	29.0	19.0	
	27	TMSR 20-16	TM2I 16-2.0ISO	43.0	20.0	
	28-32	TMSRL 25-16	TM2I 16-2.0ISO	25.0	22.0	
	39-42	TMSR 25-27	TM2I 27-2.0ISO	52.0	30.0	
	45-48	TMSR 32-27	TM2I 27-2.0ISO	58.0	37.0	
3.0	42-48	TMSR 25-27	TM2I 27-3.0ISO	52.0	30.0	1.73
	50-52	TMSR 32-27	TM2I 27-3.0ISO	58.0	37.0	
4.0	45-52	TMSR 25-27	TM2I 27-4.0ISO	52.0	30.0	2.31
	55	TMSR 32-38	TM2I 38-4.0ISO	55.0	35.0	
	56-58	TMSR 32-27	TM2I 27-4.0ISO	58.0	37.0	
	60-65	TMSR 40-38	TM2I 38-4.0ISO	65.0	46.0	
5.0	48-52	TMSR 32-38	TM2I 38-5.0ISO	55.0	35.0	2.89
5.5	56	TMSR 32-38	TM2I 38-5.5ISO	55.0	35.0	3.17
	60	TMSR 40-38	TM2I 38-5.5ISO	65.0	46.0	
6.0	64-68	TMSR 40-38	TM2I 38-6.0ISO	65.0	46.0	3.46

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation for given internal thread specification

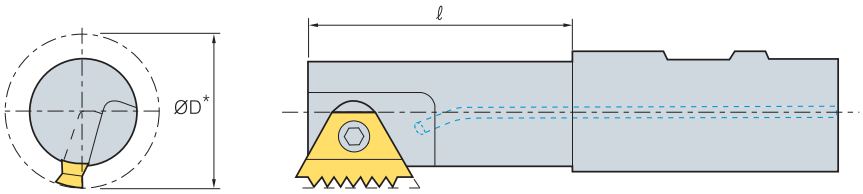


UN

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
32	7/16-1/2	TMSR 12-10	TMI 10-32UN	12.0	9.0	0.46
	9/16-11/16	TMSR 12-11	TM2I 11-32UN	12.0	11.5	
	3/4-13/16	TMSR 16-16	TM2I 16-32UN	22.0	17.0	
	7/8-15/16	TMSR 20-16	TM2I 16-32UN	43.0	20.0	
	1	TMSR 25-16	TM2I 16-32UN	25.0	22.0	
28	7/16-1/2	TMSR 12-10	TMI 10-28UN	12.0	9.0	0.52
	9/16-3/4	TMSR 12-11	TM2I 11-28UN	12.0	115	
	13/16-7/8	TMSR 16-16	TM2I 16-28UN	22.0	17.0	
	15/16	TMSR 20-16	TM2I 16-28UN	43.0	20.0	
	1-1 1/8	TMSRL 25-16	TM2I 16-28UN	25.0	22.0	
24	9/16-11/16	TMSR 12-11	TM2I 11-24UN	12.0	11.5	0.61
20	1/2-9/16	TMSR 12-10	TMI 10-20UN	12.0	9.0	0.73
	5/8-13/16	TMSR 12-11	TM2I 11-20UN	12.0	11.5	
	7/8	TMSR 16-16	TM2I 16-20UN	22.0	17.0	
	15/16-1	TMSR 20-16	TM2I 16-20UN	43.0	20.0	
	1 1/16-1 1/8	TMSRL 25-16	TM2I 16-20UN	25.0	22.0	
	1 3/8-1 5/8	TMSR 25-27	TM2I 27-20UN	52.0	30.0	
	1 11/16-1 13/16	TMSR 32-27	TM2I 27-20UN	28.0	37.0	
18	5/8	TMSR 12-11	TM2I 11-18UN	12.0	11.5	0.81
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-18UN	25.0	22.0	
	1 7/16-1 5/8	TMSR 25-27	TM2I 27-18UN	52.0	30.0	
	1 11/16	TMSR 32-27	TM2I 27-18UN	58.0	37.0	
16	11/16-13/16	TMSR 12-11	TM2I 11-16UN	12.0	11.5	0.92
	7/8-15/16	TMSR 16-16	TM2I 16-16UN	22.0	17.0	
	1	TMSR 20-16	TM2I 16-16UN	43.0	20.0	
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-16UN	25.0	22.0	
	1 7/16-1 5/8	TMSR 25-27	TM2I 27-16UN	52.0	30.0	
	1 11/16-1 7/8	TMSR 32-27	TM2I 27-16UN	58.0	37.0	
14	7/8	TMSR 12-11	TM2I 11-14UN	12.0	11.5	1.05
12	7/8	TMSRT 16-16	TM2I 16-12UN	22.0	15.5	1.22
	15/16	TMSR 16-16	TM2I 16-12UN	22.0	17.0	
	1	TMSR 20-22	TM2I 22-12UN	29.0	19.0	
	1 1/16	TMSR 20-16	TM2I 16-12UN	43.0	20.0	
	1 1/8-1 1/4	TMSRL 25-16	TM2I 16-12UN	25.0	22.0	
	1 1/2-1 11/16	TMSR 25-27	TM2I 27-12UN	52.0	30.0	
	1 3/4-1 15/16	TMSR 32-27	TM2I 27-12UN	58.0	37.0	
8	1 11/16-1 15/16	TMSR 25-27	TM2I 27-8UN	52.0	30.0	1.83
	2-1 1/8	TMSR 32-27	TM2I 27-8UN	58.0	37.0	
6	2-2 1/8	TMSR 25-27	TM2I 27-6UN	52.0	30.0	2.44
	2 1/4	TMSR 32-27	TM2I 27-6UN	58.0	37.0	
	2 3/8-2 1/2	TMSR 40-38	TM2I 38-6UN	65.0	46.0	
4.5	2-2 1/4	TMSR 32-38	TM2I 38-4.5UN	55.0	35.0	3.26
4	2 1/2	TMSR 40-38	TM2I 38-4UN	65.0	46.0	3.67

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation for given internal thread specification



UNJ

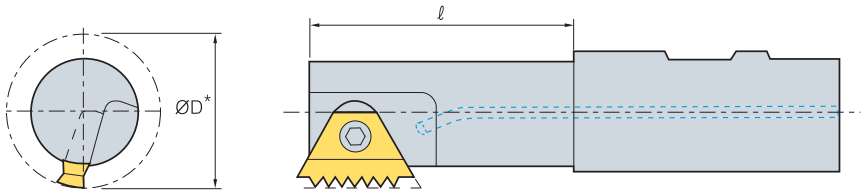
Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
24	9/16-11/16	TMSR 12-11	TM2I 11-24UNJ	12.0	11.5	0.55
20	1/2	TMSR 12-10	TMI 10-20UNJ	12.0	9.0	0.66
	3/4-13/16	TMSR 12-11	TM2I 11-20UNJ	12.0	11.5	
	7/8	TMSR 16-16	TM2I 16-20UNJ	22.0	17.0	
	15/16-1	TMSR 20-16	TM2I 16-20UNJ	43.0	20.0	
18	5/8	TMSR 12-11	TM2I 11-18UNJ	12.0	11.5	0.74
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-18UNJ	25.0	22.0	
16	11/16-13/16	TMSR 12-11	TM2I 11-16UNJ	12.0	11.5	0.83
	7/8-15/16	TMSR 16-16	TM2I 16-16UNJ	22.0	17.0	
	1	TMSR 20-16	TM2I 16-16UNJ	43.0	20.0	
	1 1/16-1 3/16	TMSRL 25-16	TM2I 16-16UNJ	25.0	22.0	
	1 7/16-1 5/8	TMSR 25-27	TM2I 27-16UNJ	52.0	30.0	
	1 11/16-1 7/8	TMSR 32-27	TM2I 27-16UNJ	58.0	37.0	
14	7/8	TMSR 12-11	TM2I 11-14UNJ	12.0	11.5	0.95
12	7/8	TMSRT 16-16	TM2I 16-12UNJ	22.0	15.5	1.11
	15/16-1	TMSR 16-16	TM2I 16-12UNJ	22.0	17.0	
	1 1/16	TMSR 20-16	TM2I 16-12UNJ	43.0	20.0	
	1 1/8-1 1/4	TMSRL 25-16	TM2I 16-12UNJ	25.0	22.0	
	1 1/2-1 11/16	TMSR 25-27	TM2I 27-12UNJ	52.0	30.0	
	1 3/4-1 15/16	TMSR 32-27	TM2I 27-12UNJ	58.0	37.0	

W

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
26	1/2-9/16	TMSR 12-10	TMEI 10-26W	12.0	9.0	0.63
	5/8-3/4	TMSR 12-11	TM2EI 11-26 W	12.0	11.5	
	13/16-7/8	TMSR 16-16	TM2EI 16-26W	22.0	17.0	
	15/16-1	TMSR 20-16	TM2EI 16-26W	43.0	20.0	
	1 1/16-1 1/8	TMSRL 25-16	TM2EI 16-26W	25.0	22.0	
20	9/16	TMSR 12-10	TM2EI 10-20W	12.0	9.0	0.81
	5/8-13/16	TMSR 12-11	TM2EI 11-20W	12.0	11.5	
	7/8-15/16	TMSR 16-16	TM2EI 16-20W	22.0	17.0	
	1	TMSR 20-16	TM2EI 16-20W	43.0	20.0	
	1 1/16-1 3/16	TMSRL 25-16	TM2EI 16-20W	25.0	22.0	
16	13/16	TMSR 16-16	TM2EI 16-16W	22.0	15.5	1.02
	7/8-15/16	TMSR 16-16	TM2EI 16-16W	22.0	17.0	
	1-1 1/16	TMSR 20-16	TM2EI 16-16W	43.0	20.0	
	1 1/8-1 1/4	TMSRL 25-16	TM2EI 16-16W	25.0	22.0	
	1.4-1 5/8	TMSR 25-27	TM2EI 27-16W	52.0	30.0	
	1 3/4-1.9	TMSR 32-27	TM2EI 27-16W	28.0	37.0	
12	1 1/2-1 3/4	TMSR 25-27	TM2EI 27-12W	52.0	30.0	1.36
	1 7/8	TMSR 32-27	TM2EI 27-12W	58.0	37.0	
8	1 7/8-1.9	TMSR 25-27	TM2EI 27-8W	52.0	30.0	2.03
	2.1-2 1/8	TMSR 32-27	TM2EI 27-8W	58.0	37.0	
7	2	TMSR 25-27	TM2EI 27-7W	52.0	30.0	2.32
6	2.1-2 1/8	TMSR 25-27	TM2EI 27-6W	52.0	30.0	2.71
	2 1/4	TMSR 32-38	TM2EI 38-6W	55.0	35.0	
	2 3/8-2.6	TMSR 32-27	TM2EI 27-6W	58.0	37.0	
	2 5/8-2 3/4	TMSR 40-38	TM2EI 38-6W	65.0	46.0	
5	3	TMSR 40-38	TM2EI 38-5W	65.0	46.0	3.25
4.5	3 1/2	TMSR 40-38	TM2EI 38-4.5W	65.0	46.0	3.61

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Tooling recommendation for given internal thread specification



BSPT

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
19	3/8	TMSR 21-11	TM2EI 11-19 BSPT	20.0	11.5	0.86
14	1/2-3/4	TMSRT 16-11	TM2EI 16-14 BSPT	22.0	15.5	1.16
11	1-1 1/4	TMSRT 20-16	TM2EI 16-11 BSPT	23.0	19.0	1.48
	1 1/2	TMSR 25-27	TM2EI 27-11 BSPT	52.0	30.0	
	2-6	TMSRT 32-27	TM2EI 27-11 BSPT	58.0	37.0	

NPT

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPT	22.0	15.5	1.33
	3/4	TMSRT 20-16	TM2EI 16-14 NPT	23.0	19.0	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPT	23.0	19.0	1.64
	1 1/4	TMSR 25-27	TM2EI 27-11.5 NPT	52.0	30.0	
	1 1/2-2	TMSRT 32-27	TM2EI 27-11.5 NPT	58.0	37.0	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPT	58.0	37.0	2.42
	3-24	TMSR 40-38	TM2EI 38-8 NPT	65.0	46.0	

NPTF

Pitch (tpi)	Nominal dia. (inch)	Holder	Insert	ℓ-Tool holder overhang	D-Tool cutting dia.*	Min.Thread depth (Profile depth)
14	1/2	TMSRT 16-16	TM2EI 16-14 NPTF	22.0	15.5	1.35
	3/4	TMSRT 20-16	TM2EI 16-14 NPTF	23.0	19.0	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPTF	23.0	19.0	1.63
	1 1/2	TMSR 25-27	TM2EI 27-11.5 NPTF	52.0	30.0	
	2	TMSRT 32-27	TM2EI 27-11.5 NPTF	58.0	37.0	
8	2 1/2	TMSRT 32-27	TM2EI 27-8 NPTF	58.0	37.0	2.38
	3	TMSR 40-38	TM2EI 38-8 NPTF	65.0	46.0	

• The recommended holder is the largest for the given thread specification
* Holder with smaller or equal cutting diameters (D2) can also be used

Minimum bore diameters for thread milling

Pitch		0.5	0.6	0.7	0.75 0.80	0.9	1.0	1.25	1.5	1.75	2.0	-	2.5	3.0	3.5	4.0	4.5	5.0	5.5	-	6.0	-
	tpi	48	44	36	32	28	26 24	20 19	18 16	14	13 12	11.5 11	10	9 8	7	6	-	5	-	4.5	-	4
Holder designation	diameter	**Minimum diameter for machining**																				
TMSR 12-10	9.0	9.5	9.7	9.9	10.0	10.4	10.7	11.4	12.0													
TMSR 20-10	9.0	9.5	9.7	9.9	10.0	10.4	10.7	11.4	12.0													
TMSR 12-11	11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1												
TMSR 20-11	11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1												
TMSRL 25-11	11.5	12.0	12.2	12.4	12.5	12.9	13.2	13.9	14.5	15.1												
TMSRT 16-16	15.5	16.0	16.2	16.4	16.5	16.9	17.2	17.9	18.5	19.0	19.5	20.0										
TMSR 16-16	17.0	17.6	17.8	18.0	18.2	18.7	19.0	19.6	20.0	20.5	21.0	21.5										
TMSR 16-22	17.0	17.6	17.8	18.0	18.2	18.7	19.0	19.6	20.0	20.5	21.0	21.5										
TMSR 20-22	19.0	19.7	20.0	20.2	20.4	20.8	21.0	21.6	22.0	22.5	23.0	23.5										
TMSRT 20-16	19.0	19.7	20.0	20.2	20.4	20.8	21.0	21.6	22.0	22.5	23.0	23.5										
TMSR 20-16	20.0	20.7	21.0	21.2	21.4	21.8	22.0	22.6	23.0	23.5	24.0	24.5										
TMSRW 25-22	22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5										
TMSRL 25-22	22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5										
TMSRL 25-16	22.0	22.7	23.0	23.2	23.4	23.8	24.0	24.6	25.0	25.5	26.0	26.5										
TMSR 25-27	30.0	30.7	31.0	31.2	31.4	31.8	32.0	32.8	33.5	34.1	34.6	35.6	36.6	39.0	42.0	45.0	48.0					
TMSRL 25-27	30.0	30.7	31.0	31.2	31.4	31.8	32.0	32.8	33.5	34.1	34.6	35.6	36.6	39.0	42.0	45.0	48.0					
TMSR 32-38	35.0								38.5	39.1	39.6	40.6	42.0	44.0	47.0	50.0	53.4	42.5	50.0	44.6	57.5	56.6
TMSR 32-27	37.0	38.0	38.2	38.4	38.6	39.1	39.5	40.4	41.0	41.5	42.0	43.0	44.0	46.5	49.0	52.0	55.5					
TMSRL 32-27	37.0	38.0	38.2	38.4	38.6	39.1	39.5	40.4	41.0	41.5	42.0	43.0	44.0	46.5	49.0	52.0	55.5					
TMSRT 32-27	37.0	38.0	38.2	38.4	38.6	39.1	39.5	40.0	41.0	41.5	42.0	43.0	44.0	46.5	49.0	52.0	55.5					
TMSR 40-38	46.0								49.5	50.1	50.6	51.6	53.0	55.0	55.2	55.6	55.0	52.5	54.0	54.5	57.5	56.6
TMSRL 40-38	46.0								49.5	50.1	50.6	51.6	53.0	55.0	55.2	55.6	55.0	52.5	54.0	54.5	57.5	56.6

- In order to perform a thread milling operation, a milling machine with three-axis control capability of helical interpolation is required
- Helical interpolation is a CNC function producing tool movement along a helical path. This helical motion combines circular movement in one plane with a simultaneous linear motion in a plane perpendicular to the first. For example, the path from point A to point B (Fig,A) on the envelope of the cylinder combines a circular movement in the x-y plane with a linear displacement in the z direction
- On most CNC systems this function can be executed in two different ways:

  - GO2: Helical interpolation in a clockwise direction
  - GO3: Helical interpolation in a counter-clockwise direction

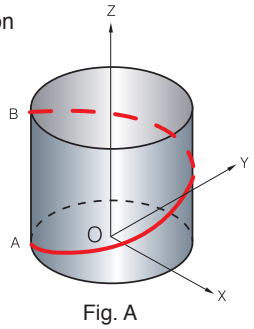


Fig. A

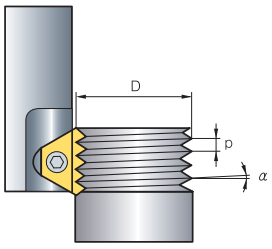


Fig. B

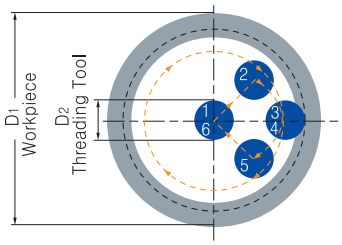
- The thread milling operation (Fig. B) consists of circular rotation of fhe tool around its own axis togerther with an orbiting motion along the bore or workpiece circumference. During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry create the required thread form. There are three acceptable ways of approaching the workpiece with the tool to initiate production of the thread:

  1. Tangential Arc Approach
  2. Radial Approach
  3. Tangential Line Approach

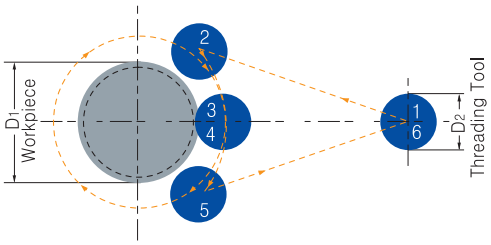
Tangential arc approach

- With this method, the tool enters and exits the workpiece smoothly. No marks are left on the workpiece and there is no vibration, even with harder materials. Although it requires slightly more complex programming than the radial approach (see below), this is the method recommended for machining the highest quality threads

Internal thread



External thread

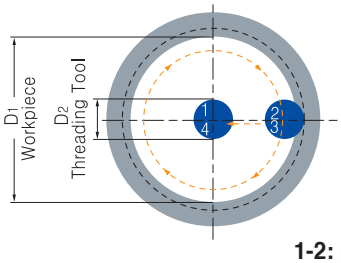


1-2: rapid approach
2-3: tool entry along tangential arc, with simultaneous feed along z-axis
3-4: helical movement during one full orbit (360°)
4-5: tool exit along tangential arc, with continuing feed along z-axis
5-6: rapid return

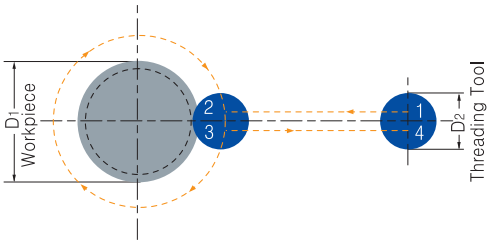
Radial approach

- This is the simplest method. There are two characteristics worth nothing about the radial approach:
  A. a small vertical mark may be lift at the entry (and exit) point. This is of no significance to the thread itself
  B. when using this method with very hard materials, there may be a tendency of the tool to vibrate as it approaches the full cutting depth
- Note: Radial feed during entry to the full profile depth should only be 1/3 of the subsequent circular feed

Internal thread



External thread

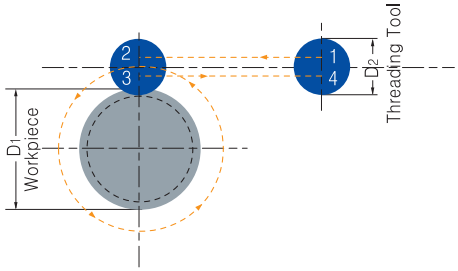


1-2: radial entry
2-3: helical movement during one full orbit (360°)
3-4: radial exit

Tangential line approach

- This method is very simple, and has all of the advantages of the tangential arc method
  However, it is applicable only with external threads

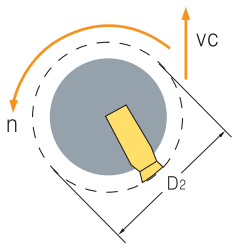
External thread



1-2: radial entry with simultaneous feed along z axis
2-3: helical movement during one full orbit (360°)
3-4: radial exit

Preparing for the thread milling operation

Calculation of rotational velocity and feed at the cutting edge



$$n = \frac{vc \times 1000}{\pi \times D2}$$

$$vc = \frac{n \times \pi \times D2}{1000}$$

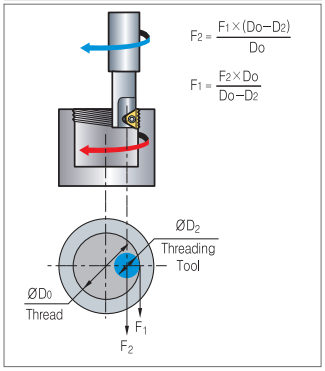
$$F1 = n \times z \times fn$$

n: Rotational Velocity [R.P.M]
vc: Cutting Speed [m/min]
D2: Tool holder Cutting Dia. [mm]
F1: Real Feed rate at the Cutting edges [mm/min]
z: No. of Cutting Edges
fn: Feed per Rooth per Rotation [mm/rev]

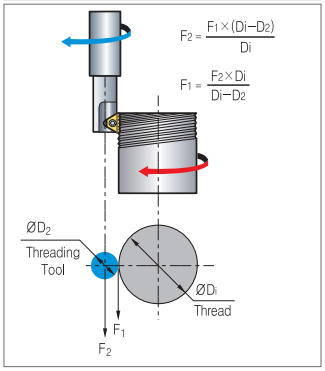
Calculation of feed rates at the tool center line

- On most CNC machines, the feed rate required for programming is that of the center-line of the tool. When dealing with linear tool movement, the feed rate at the cutting edge and the center line are identical, but with circular tool movement this is not the case The equations define the relationship between feed rates at the cutting edge and at the tool center line

Internal thread



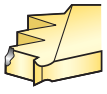
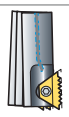
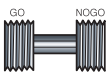
External thread



Grades and applications

- Grade: PC9570T
- Application: First Choice for steel and cast iron A tough sub-micron substrate with TiCN coating
  Provides good fracture toughness and excellent wear resistance

Trouble shooting

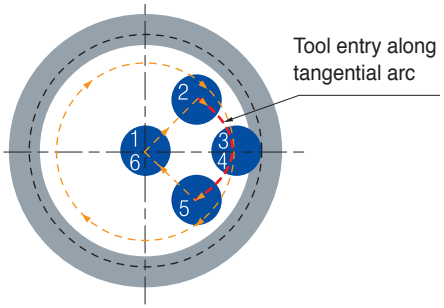
Problem		Possible	Solution
	**Increased insert flank wear**	Cutting speed too high Chip is too thin Insufficient coolant	Reduce cutting speed/use coated insert Increase feed rate Increase coolant flow rate
	**Chipping of cutting edge**	Chip is too thick Vibration	Reduce feed rate/Use the tangential arc method Increase RPM Check stability
	**Material built-up on the cutting edge**	Incorrect cutting speed Unsuitable carbide grade	Change cutting speed Use a coated carbide grade
	**Chatter/ vibration**	Feed rate is too high Profile is too deep Thread length is too long	Reduce the feed. Execute two passes, each with increased cutting depth/ Execute two passes, each cutting only half the thread length Execute two passes, each cutting only half the thread length
	**Insufficient thread accuracy**	Tool deflection	Reduce feed rate/Execute a “zero” cut

Recommended cutting condition

Workpiece			Hardness brinell HB	vc (m/min) Grade PC9570T	vc (m/min) Grade PC9070M	Feed fz (mm/t) Indexable insert	Feed fz (mm/t) Solid endmill
P	Unalloyed steel	Low carbon (C+0.1-0.25%)	125	100~210	80~250	0.05~0.3	0.03~0.15
		Medium carbon (C = 0.25-0.55%)	150	100~180	80~230	0.05~0.25	0.03~0.1
		High carbon (C = 0.55-0.85%)	170	100~170	80~200	0.05~0.2	0.03~0.08
	Low alloy steel (alloying elements≤5%)	Non-hardened	180	90~160	60~180	0.05~0.25	0.03~0.1
		Hardened	275	80~150	60~170	0.05~0.2	0.03~0.07
		Hardened	350	70~140	60~160	0.05~0.15	0.01~0.03
	High alloy steel	Annealed	200	60~130	40~100	0.05~0.2	0.03~0.05
		Hardened	325	70~110	30~80	0.05~0.1	0.01~0.03
	Cast steel	Low alloy (alloying elements<5%)	200	100~170	80~250	0.05~0.15	0.03~0.1
		High alloy (alloying elements>5%)	225	70~120	60~170	0.05~0.1	0.01~0.03
M	Stainless steel ferritic	Non-hardened	200	100~170	60~150	0.05~0.15	0.04~0.1
		Hardened	330	100~170	60~120	0.05~0.1	0.01~0.05
	Stainless steel Austenitic	Austenitic	180	70~140	60~140	0.05~0.15	0.04~0.1
		Super austenitic	200	70~140	60~130	0.05~0.1	0.04 ~0.1
	Stainless steel cast ferritic	Non-hardened	200	70~140	60~160	0.05~0.15	0.04~0.1
		Hardened	330	70~140	60~110	0.05~0.1	0.03~0.05
	Stainless steel cast austenitic	Austenitic	200	70~120	60~150	0.05~0.15	0.04~0.1
		Hardened	330	70~120	60~100	0.05~0.1	0.03~0.05
	High temperature alloys	Annealed (Iron based)	200	20~45	30~60	0.05~0.1	0.04~0.1
		Aged (Iron based)	280	20~30	20~50	0.02~0.05	0.01~0.03
		Annealed (Nickel or Cobalt based)	250	15~20	15~35	0.02~0.05	0.01~0.03
		Aged (Nickel or Cobalt based)	350	10~15	15~30	0.02~0.05	0.01~0.03
	Titanium alloys	Pure 99.5 Ti	400Rm	70~140	40~80	0.02~0.05	0.03~0.05
		α+β alloys	1050Rm	20~50	20~50	0.02~0.05	0.03~0.05
K	Extra hard steel	Hardened & tempered	55HRC	20~45	15~45	0.01~0.03	0.005~0.01
	Malleable cast iron	Ferritic (short chips)	130	60~130	70~160	0.02~0.08	0.01~0.03
		Pearlitic (long chips)	230	60~120	60~150	0.02~0.05	0.03~0.05
	Grey cast iron	Low tensile strength	180	60~130	70~160	0.05~0.15	0.05~0.1
		High tensile strength	260	60~100	40~120	0.05~0.1	0.03~0.05
	Nodular SG iron	Ferritic	160	60~125	40~110	0.05~0.15	0.05~0.1
		Pearlitic	260	50~ 90	40~100	0.05 ~0.1	0.03~0.05
	Aluminum alloys Wrought	Non-aging	60	100~250	200~300	0.1~0.4	0.1~0.25
		Aged	100	100~180	150~250	0.1~0.3	0.1~0.2
	Aluminum alloys	Cast	75	150~400	100~200	0.1~0.3	0.1~0.2
		Cast & aged	90	150~280	120~220	0.05~0.25	0.1~0.15
		Cast Si 13-22%	130	80~150	200~300	0.1~0.3	0.1~0.2
	Copper and copper alloys	Brass	90	120~210	200~300	0.1~0.3	0.1~0.25
		Bronze and non-leaded copper	100	120~210	150~250	0.05~0.25	0.1~0.2

Example

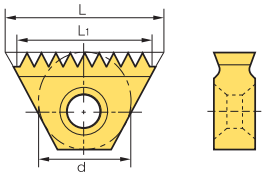
- At tool entry, set the Feed fz [mm/tooth] to 70% lower than the threading Feed
- Threading Feed: 0.3 [mm/t]
- Tool entry Feed: 0.09 [mm/t]

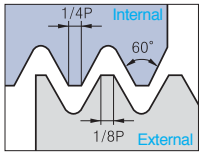


ISO Metric

External/Internal







Defined by: R262 (DIN 13)
Tolerance class: 6g/6H

(mm)

Insert size		Pitch (mm)	Designation						L1	Tooth	Tool holder
d	L		External		PC9570T	Internal		PC9570T			
6.0	10.4	0.5		-		TMI	10-0.5ISO	●	10.0	20	TMSR-10
		0.75		-			10-0.75ISO		9.75	13	
		1.0		-			10-1.0ISO	●	9.0	9	
		1.25		-			10-1.25ISO		8.75	7	
		1.5		-			10-1.5ISO		9.0	6	
6.35	11	0.5		-		TM2I	11-0.5ISO		10.0	20	TMSR-11
		0.75	TM2E	11-0.75ISO			11-0.75ISO	●	10.5	14	
		1.0		11-1.0ISO			11-1.0ISO	●	10.0	10	
		1.25		11-1.25ISO			-		10.0	8	
		1.25		-			11-1.25ISO		8.75	7	
		1.5		11-1.5ISO			-		9.0	6	
		1.5		-			11-1.5ISO	●	10.5	7	
9.525	16	0.5		-		TM2I	16-0.5ISO		15.0	30	TMSR-16
		0.75	TM2E	16-0.75ISO			16-0.75ISO		15.0	20	
		0.8		-			16-0.8ISO		14.4	18	
		1.0		16-1.0ISO			-		14.0	14	
		1.0		-			16-1.0ISO		15.0	15	
		1.25		16-1.25ISO			16-1.25ISO		15.0	12	
		1.5		16-1.5ISO			16-1.5ISO	●	15.0	10	
		1.75		16-1.75ISO			16-1.75ISO		14.0	8	
		2.0		16-2.0ISO			16-2.0ISO	●	14.0	7	
9.525B	22	1.0	TM2E	22-1.0ISO		TM2I	22-1.0ISO		22.0	22	TMSR-22
		1.25		22-1.25ISO			22-1.25ISO		21.25	17	
		1.5		22-1.5ISO			22-1.5ISO	●	21.0	14	
		1.75		22-1.75ISO			22-1.75ISO		21.0	12	
		2.0		22-2.0ISO	●		22-2.0ISO	●	22.0	11	
15.875	27	1.0	TM2E	27-1.0ISO		TM2I	27-1.0ISO		26.0	26	TMSR-27
		1.25		27-1.25ISO			27-1.25ISO		25.0	20	
		1.5		27-1.5ISO			27-1.5ISO	●	25.5	17	
		1.75		27-1.75ISO			27-1.75ISO		24.5	14	
		2.0		27-2.0ISO			27-2.0ISO	●	24.0	12	
		2.5		27-2.5ISO			27-2.5ISO		25.0	10	
		3.0		27-3.0ISO			27-3.0ISO	●	24.0	8	
		3.5		27-3.5ISO			27-3.5ISO		24.5	7	
		4.0		27-4.0ISO			27-4.0ISO	●	24.0	6	
		4.5		27-4.5ISO			27-4.5ISO		22.5	5	
19.05B	38.5	1.5	TM2E	38-1.5ISO		TM2I	38-1.5ISO		36.0	24	TMSR-38
		2.0		38-2.0ISO			38-2.0ISO		36.0	18	
		3.0		38-3.0ISO			38-3.0ISO		36.0	12	
		4.0		38-4.0ISO			38-4.0ISO		32.0	8	
		4.5		38-4.5ISO			38-4.5ISO		31.5	7	
		5.0		38-5.0ISO			38-5.0ISO		30.0	6	
		5.5		38-5.5ISO			38-5.5ISO		33.0	6	
		6.0		38-6.0ISO			38-6.0ISO		30.0	5	

Applicable holders D49

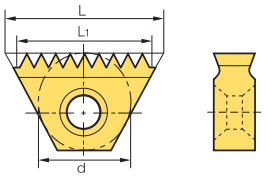
All inserts except TMI10 code have 2 cutting edges

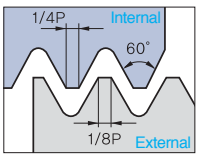
●: Stock item

American UN

External/Internal







Defined by: ANSI B1.1.74
Tolerance class: Class 2A/2B

(mm)

Insert size d	Insert size L	Pitch (mm)	Designation External		PC9570T	Designation Internal		PC9570T	L1	Tooth	Tool holder
6.0	10.4	32		-		TMI	10-32UN		9.53	12	TMSR-10
		28		-			10-28UN		9.07	10	
		24		-			10-24UN		9.53	9	
		20		-			10-20UN		8.89	7	
		18		-			10-18UN		8.47	6	
		16		-			10-16UN		7.94	5	
6.35	11	48		-		TM2I	11-48UN		10.05	19	TMSR-11
		40		-			11-40UN		10.16	16	
		32		-			11-32UN		10.32	13	
		28	TM2E	11-28UN			11-28UN		9.98	11	
		27		11-27UN			11-27UN		10.35	11	
		24		11-24UN			11-24UN		9.53	9	
		20		11-20UN			11-20UN		10.16	8	
		18		11-18UN			11-18UN		9.88	7	
		16		11-16UN			11-16UN		9.53	6	
		14		11-14UN			11-14UN		9.07	5	
9.525	16	40		-		TM2I	16-40UN		14.61	40	TMSR-16
		32		-			16-32UN		15.08	32	
		28	TM2E	16-28UN			16-28UN		14.51	28	
		27		16-27UN			16-27UN		14.11	27	
		24		16-24UN			16-24UN		14.82	24	
		20		16-20UN			16-20UN		13.97	20	
		18		16-18UN			16-18UN		14.11	18	
		16		16-16UN			16-16UN	●	14.29	16	
		14		16-14UN			16-14UN		14.51	14	
		13		16-13UN			16-13UN		13.68	13	
		12		16-12UN			16-12UN	●	14.82	12	
		11.5		16-11.5UN			16-11.5UN		13.25	11.5	
9.525B	22	24	TM2E	22-24UN		TM2I	22-24UN		21.16	20	TMSR-22
		20		22-20UN			22-20UN		21.59	17	
		18		22-18UN			22-18UN		21.17	15	
		16		22-16UN			22-16UN		20.64	13	
		14		22-14UN			22-14UN		21.77	12	
		13		22-13UN			22-13UN		21.49	11	
		12		22-12UN			22-12UN		21.17	10	
15.875	27	24	TM2E	27-24UN		TM2I	27-24UN		25.40	24	TMSR-27
		20		27-20UN			27-20UN		25.40	20	
		18		27-18UN			27-18UN		25.40	18	
		16		27-16UN			27-16UN		25.40	16	
		14		27-14UN			27-14UN		25.40	14	
		13		27-13UN			27-13UN		25.40	13	
		12		27-12UN			27-12UN		25.40	12	
		11.5		27-11.5UN			27-11.5UN		24.30	11	
		11		27-11UN			27-11UN		25.40	11	
		10		27-10UN			-		22.86	9	
		10		-			27-10UN		25.40	10	
		9		27-9UN			27-9UN		22.58	8	
		8		27-8UN			27-8UN		22.23	7	
		7		27-7UN			-		21.77	6	
		7		-			27-7UN		25.40	7	
		6		27-6UN			-		21.17	5	
		6		-			27-6UN		25.40	6	
19.05	38.5	6	TM2E	38-6UN		TM2I	38-6UN		38.87	8	TMSR-38
		5		38-5UN			38-5UN		30.48	6	
		4.5		38-4.5UN			38-4.5UN		33.87	6	
		4		38-4UN			38-4UN		31.75	5	

Applicable holders D49

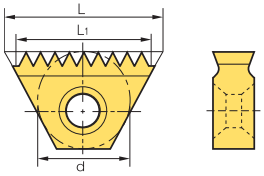
All inserts except TMI10 code have 2 cutting edges

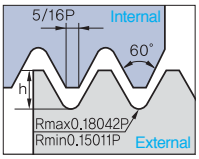
●: Stock item

UNJ (Unified constant thread)

External/Internal







Defined by: MIL-S-8879C
Tolerance class: 3A/3B

(mm)

Insert size		Pitch (tpi)	Designation						L_1	Tooth	Tool holder
d	L		External		PC9570T	Internal		PC9570T			
6.0	10.4	24		-		TMI	10-24UNJ		9.53	9	TMSR-10
		20		-			10-20UNJ		8.89	7	
		18		-			10-18UNJ		8.47	6	
		16		-			10-16UNJ		9.53	8	
6.35	11	24	TM2E	11-24UNJ		TM2I	11-24UNJ		9.53	9	TMSR-11
		20		11-20UNJ			11-20UNJ		10.16	8	
		18		-			11-18UNJ		9.88	7	
		16		11-16UNJ			11-16UNJ		9.53	6	
		14		11-14UNJ			11-14UNJ		9.07	5	
9.525	16	24	TM2E	16-24UNJ		TM2I	16-24UNJ		14.82	14	TMSR-16
		20		16-20UNJ			16-20UNJ		13.97	11	
		18		16-18UNJ			16-18UNJ		14.11	10	
		16		16-16UNJ			16-16UNJ		14.29	9	
		14		16-14UNJ			16-14UNJ		14.51	8	
		13		16-13UNJ			-		13.68	7	
		12		16-12UNJ			16-12UNJ		14.82	7	
15.875	27	16	TM2E	27-16UNJ		TM2I	27-16UNJ		25.40	16	TMSR-27
		12		27-12UNJ			27-12UNJ		25.40	12	
		11		27-11UNJ			27-11UNJ		25.40	11	

Applicable holders **D49**

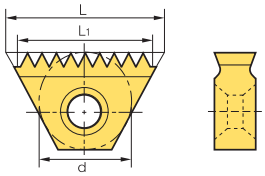
All inserts except TMI10 code have 2 cutting edges

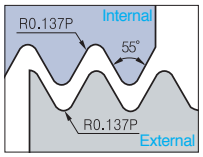
●: Stock item

Whitworth (BSW, BSF, BSP, BSB)

External/Internal







BSW Defined by: B.S.84:1956, DIN 259, ISO228/1: 1982
BSP Defind by: B.S.2779: 1956
Tolerance class: BSW-Medium class A, BSP-Medium class

(mm)

Insert size		Pitch (tpi)	Designation			L_1	Tooth	Tool holder
d	L		External+Internal		PC9570T			
6.0	10.4	28	TMEI	10-28W		9.07	10	TMSR-10
		26		10-26W		8.79	9	
		24		10-24W		9.53	9	
		20		10-20W		8.89	7	
		19		10-19W		9.36	7	
6.35	11	28	TM2EI	11-28W		9.98	11	TMSR-11
		26		11-26W		9.77	10	
		24		11-24W		9.53	9	
		20		11-20W		10.16	8	
		19		11-19W		9.36	7	
		14		11-14W		9.07	5	
9.525	16	26	TM2EI	16-26W		14.65	15	TMSR-16
		24		16-24W		14.82	14	
		20		16-20W		13.97	11	
		19		16-19W		14.71	11	
		18		16-18W		14.11	10	
		16		16-16W		14.29	9	
		14		16-14W		14.51	8	
		12		16-12W		14.82	7	
		11		16-11W	●	13.85	6	
9.525B	22	24	TM2EI	22-24W		21.17	20	TMSR-22
		20		22-20W		21.59	17	
		19		22-19W		21.39	16	
		18		22-18W		21.17	15	
		16		22-16W		20.64	13	
		14		22-14W		21.77	12	
		12		22-12W		21.17	10	
		11		22-11W		20.78	9	
15.875	27	16	TM2EI	27-16W		25.4	16	TMSR-27
		14		27-14W		25.4	14	
		12		27-12W		23.28	11	
		11		27-11W		23.09	10	
		10		27-10W		25.40	10	
		9		27-9W		22.58	8	
		8		27-8W		22.23	7	
		7		27-7W		21.77	6	
		6		27-6W		21.17	5	
19.05B	38.5	11	TM2EI	38-11W		34.64	15	TMSR-38
		6		38-6W		33.87	8	
		5		38-5W		30.48	6	
		4.5		38-4.5W		33.87	6	
		-		38-15W		-	-	

Applicable holders D49

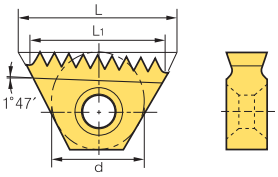
All inserts except TMI10 code have 2 cutting edges

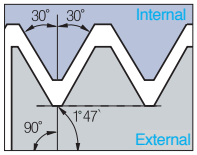
●: Stock item

NPT

External/Internal







Defined by: USAS B2.1: 1968
Tolerance class: Standard NPT

(mm)

Insert size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External+Internal		PC9570T			RH	LH
9.525	16	18	TM2E	16-18NPT *		14.11	10	TMSRT-16	TMSLT-16
		14	TM2EI	16-14NPT		14.51	8		
		11.5		16-11.5NPT		13.25	6		
9.525B	22	14	TM2EI	22-14NPT		21.77	12	TMSRT-22	TMSLT-22
15.875	27	11.5	TM2EI	27-11.5NPT	●	24.30	11	TMSR-27	TMSL-27
		8		27-8NPT	●	22.23	7		
19.05B	38.5	11.5	TM2EI	38-11.5NPT		35.34	16	TMSR-38	TMSL-38
		8		38-8NPT		31.75	10		

Applicable holders D49

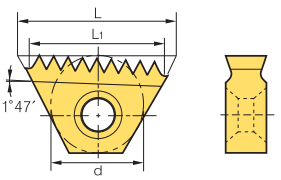
* TM2E16–18NPT is for external threading

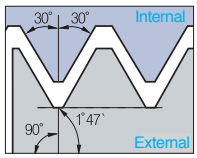
●: Stock item

NPTF

External/Internal







Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF

(mm)

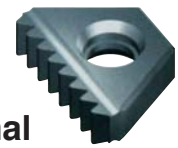
Insert size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External+Internal		PC9570T			RH	LH
9.525	16	14	TM2EI	16-14NPTF	●	14.51	8	TMSRT - 16	TMSLT - 16
		11.5		16-11.5NPTF		13.25	6		
9.525B	22	14	TM2EI	22-14NPTF		21.77	12	TMSRT - 22	TMSLT - 22
		11.5		22-11.5NPTF		19.88	9		
15.875	27	11.5	TM2EI	27-11.5NPTF		24.30	11	TMSR - 27	TMSL - 27
		8		27-8NPTF		22.23	7		
19.05B	38.5	11.5	TM2EI	38-11.5NPTF		35.34	16	TMSR - 38	TMSL - 38
		8		38-8NPTF		31.75	10		

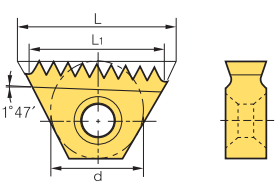
Applicable holders D49

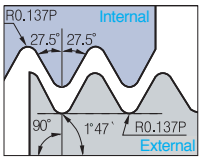
●: Stock item

BSPT

External/Internal







Defined by: B.S 21: 1985
Tolerance class: Standard BSPT

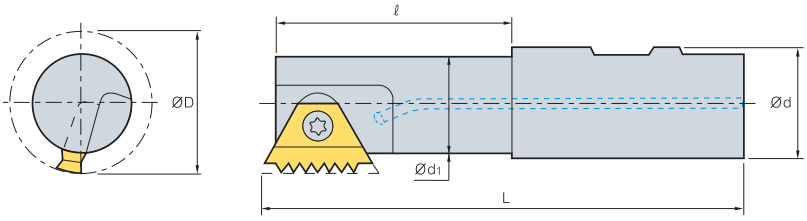
(mm)

Insert size		Pitch (tpi)	Designation			L1	Tooth	Tool holder	
d	L		External+Internal		PC9570T			RH	LH
6.35	11	19	TM2EI	11-19BSPT		9.36	7	TMSR - 10	TMSL - 10
9.525	16	14	TM2EI	16-14BSPT		14.51	8	TMSRT - 16	TMSLT - 16
		11		16-11BSPT		13.85	6		
15.875	27	11	TM2EI	27-11BSPT		23.09	10	TMSR - 27	TMSL - 27

Applicable holders D49

●: Stock item

Standard Type

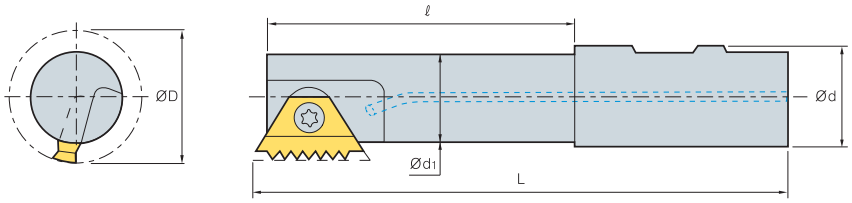


(mm)

Insert size d	Designation		ØD	Ød	Ød1	ℓ	L	Screw	Wrench
6.0	TMSR	12-10	9.0	12	6.8	12.0	69.0	STM10	TW07P
		20-10	9.0	20	6.8	17.0	84.0		
6.35	TMSR	12-11	11.5	12	8.9	12.0	70.0	STM11	TW08P
		20-11	11.5	20	8.9	20.0	85.0		
9.525	TMSR	16-16	17.0	16	13.6	22.0	90.0	STM1622	TW10P
		20-16	20.0	20	16.6	43.0	95.0		
9.525B	TMSR	16-22	17.0	16	13.5	29.0	79.5	STM1622	TW10P
		20-22	19.0	20	15.5	29.0	81.5		
		25-22	19.0	25	15.5	30.0	92.3		
	TMSRW	25-22	22.0	25	18.5	30.0	90.8		
15.875	TMSR	25-27	30.0	25	24.0	52.0	110.0	STM27	TW25L
	TMSL	25-27	30.0	25	24.0	52.0	110.0		
	TMSR	32-27	37.0	32	31.0	58.0	120.0		
19.05	TMSR	32-38	35.0	32	27.0	53.0	115.0	STM38	TW30L
		40-38	46.0	40	38.0	63.0	135.0		

Applicable inserts **D44~48**

Long Type

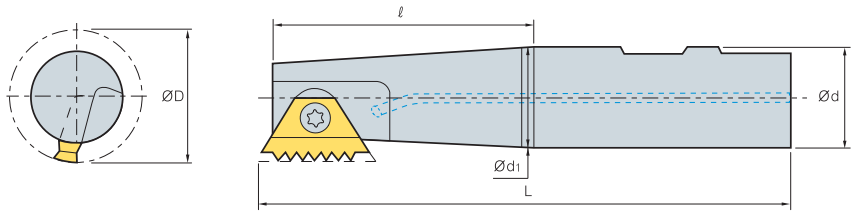


(mm)

Insert size d	Designation		ØD	Ød	Ød1	ℓ	L	Screw	Wrench
6.35	TMSRL	25-11	11.5	25	8.9	17.0	125.0	STM11	TW08P
9.525B	TMSRL	25-16	22.0	25	18.6	25.0	125.0	STM1622	TW10P
9.525B	TMSRL	20-22	19.0	20	15.5	44.0	96.5	STM1622	TW10P
		25-22	22.0	25	18.6	63.5	125.0		
15.875	TMSRL	25-27	30.0	25	24.0	92.0	150.0	STM27	TW25L
		32-27	37.0	32	31.0	98.0	160.0		
19.05B	TMSRL	40-38	46.0	40	38.0	93.0	168.0	STM38	TW30L

Applicable inserts **D44~48**

Tapered Type



(mm)

Insert size d	Designation		ØD	Ød	Ød1	ℓ	L	Screw	Wrench
9.525	TMSRT	16-16	15.5	16	12.5	22.0	90.0	STM1622	TW10P
		20-16	19.0	20	15.0	23.0	85.0	STMT16	
9.525B	TMSRT	16-22	17.0	16	13.5	29.0	79.5	STM1622	TW10P
		20-22	19.0	20	15.5	29.0	81.5		
15.875	TMSRT	32-27	37.0	32	31.0	58.0	120.0	STM27	TW25L

Applicable inserts **D44~48**

Solid threading endmills code system

STM D 3T 03 012 L034 - I 0.35 ISO

1	2	3	4	5	6	7	8	9
Type	Flute style	No. of flutes	Shank dia.	Cutting dia.	Cutting edge length	Type of tool	Pitch	Type

1 Type

STM D 3T 03 012 L034 - I 0.35 ISO

Solid Threading Endmill

2 Flute style

STM D 3T 03 012 L034 - I 0.35 ISO

HC: Heli Cool
HCR: Heli Radial Cooling
HCC: Heli Cool Chamfering
HCD: Heli Cool C/F & Drilling
D: Deep Threading

3 No. of flutes

STM D 3T 03 012 L034 - I 0.35 ISO

3T: 3 Flutes 2L: 4 Flutes, Left Flutes

4 Shank dia.

STM D 3T 03 012 L034 - I 0.35 ISO

03: 3.0

5 Cutting dia.

STM D 3T 03 012 L034 - I 0.35 ISO

012: 1.20

6 Cutting edge length

STM D 3T 03 012 L034 - I 0.35 ISO

L034: 3.4

7 Type of tool

STM D 3T 03 012 L034 - I 0.35 ISO

I: Internal

8 Pitch

STM D 3T 03 012 L034 - I 0.35 ISO

mm: 0.35~3.0 tpi: 72~12

9 Type

STM D 3T 03 012 L034 - I 0.35 ISO

ISO Metric
American UN
Cutting edge Length UNJ
Whit Worth (BSW, BSF, BSP, BSB)
National Pipe Thread (NPT)
National Pipe Thread (NPTF)
British Standard Pipe Thread (BSPT)

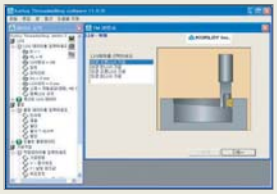
TM-INFO User guide



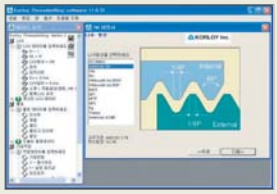
CNC Program composition
TM-INFO composes CNC program for thread milling process in a short time

- ▶Multilingual
- ▶Window operation

1 Select thread type



2 Select thread standard



3 Select thread type



4 Input thread parameter



5 Select working way



6 Select tool



7 Confirm the working data & controler

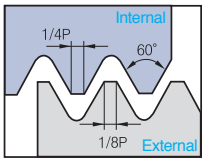


download
Pls. visit our web-site to download.
http://www.korloy.com

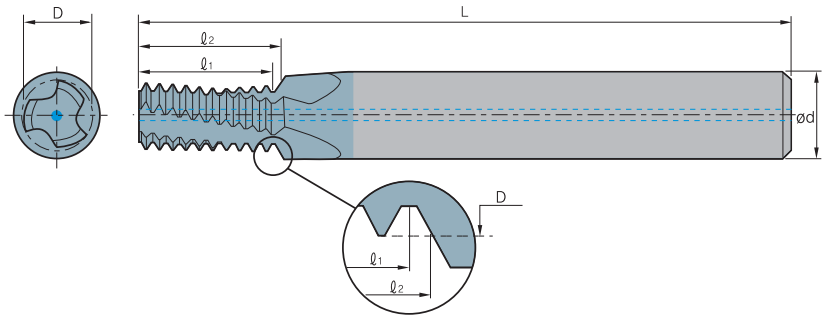
ISO Metric

Helical flutes with thru-hole coolant

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



(ℓ2≤1.5×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
M3×0.5	M3.5~M16×0.5	0.5	STMHC	04024L04-I0.50ISO		4	2.40	45	4.5	4.7	3	9	2.5
M4×0.7		0.7		04031L06-I0.70ISO		4	3.15	45	6.3	6.6	3	9	3.3
M5×0.8		0.8		04039L07-I0.80ISO		4	3.90	45	7.2	7.6	3	9	4.2
M6×1.0	M8~M40×1.0	1.0		06048L09-I1.00ISO		6	4.80	57	9.0	9.5	3	9	5.0
M8×1.25		1.25		08065L13-I1.25ISO		8	6.50	61	12.5	13.1	3	10	6.8
M10×1.5	M12~M48×1.5	1.5		10082L15-I1.50ISO		10	8.20	73	15.0	15.7	3	10	8.5
M12×1.75		1.75		10099L18-I1.75ISO		10	9.90	73	17.5	18.4	4	10	10.2
M14×2.0	M17~M80×2.0	2.0		12116L21-I2.00ISO		12	11.60	73	20.0	21.0	4	10	12.0
M16×2.0	M17~M80×2.0	2.0		14136L25-I2.00ISO		14	13.60	92	24.0	25.0	4	12	14.0

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
M3×0.5	M3.5~M16×0.5	0.5	STMHC	04024L06-I0.50ISO		4	2.40	45	6.0	6.2	3	12	2.5
	M4×0.5	0.5		04032L08-I0.50ISO		4	3.20	45	8.0	8.2	3	16	3.5
	M5×0.5	0.5		06042L10-I0.50ISO		6	4.20	57	10.0	10.2	3	20	4.5
M4×0.7		0.7		04031L08-I0.70ISO		4	3.15	45	8.4	8.7	3	12	3.3
	M6×0.75	0.75		06050L12-I0.75ISO		6	5.00	57	12.0	12.4	3	16	5.3
M5×0.8		0.8		04039L10-I0.80ISO		4	3.90	45	10.4	10.8	3	13	4.2
M6×1.0	M8~M40×1.0	1.0		06048L12-I1.00ISO	●	6	4.80	57	12.0	12.5	3	12	5.0
	M8×1.0	1.0		08067L16-I1.00ISO		8	6.70	61	16.0	16.5	3	16	7.0
	M10×1.0	1.0		10087L20-I1.00ISO		10	8.70	73	20.0	20.5	3	20	9.0
	M12×1.0	1.0		12107L24-I1.00ISO	●	12	10.70	73	24.0	24.5	4	24	11.0
M8×1.25		1.25		08065L16-I1.25ISO	●	8	6.50	61	16.2	16.9	3	13	6.8
	M10×1.25	1.25		10085L20-I1.25ISO	●	10	8.50	73	20.0	20.6	3	16	8.8
M10×1.5	M12~M48×1.5	1.5		10082L20-I1.50ISO	●	10	8.20	73	19.5	20.2	3	13	8.5
	M12×1.5	1.5		10099L24-I1.50ISO	●	10	9.90	73	24.0	24.7	4	16	10.5
	M14×1.5	1.5		12119L29-I1.50ISO		12	11.90	80	28.5	29.2	4	19	12.5
	M16×1.5	1.5		14139L32-I1.50ISO		14	13.90	92	31.5	32.2	4	21	14.5
M12×1.75		1.75		10099L25-I1.75ISO		10	9.90	73	24.5	25.4	4	14	10.2
M14×2.0	M17~M80×2.0	2.0		12116L29-I2.00ISO		12	11.60	80	28.0	29.0	4	14	12.0
M16×2.0	M17~M80×2.0	2.0		14136L33-I2.00ISO		14	13.60	92	32.0	33.0	4	16	14.0
M18×2.5		2.5		16148L36-I2.50ISO		16	14.80	92	35.0	36.2	4	14	15.5
M 20×2.5		2.5		18171L41-I2.50ISO		18	17.10	102	40.0	41.2	4	16	17.5
M 24×3.0		3.0		20199L49-I3.00ISO		20	19.90	102	48.0	49.5	4	16	21.0

* Bore Diameter applies to smallest thread Dia

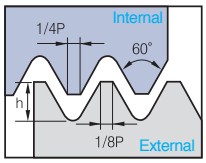
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

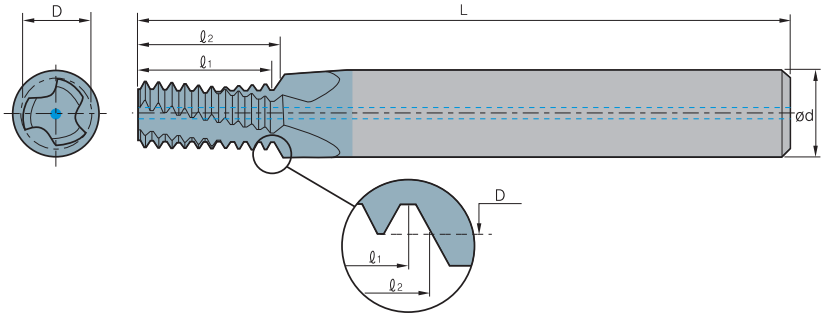
American UN

Helical flutes with thru-hole coolant

Internal



Defined by: ANSI B1.1.74
Tolerance class: 2B



(ℓ2≤1.5×Thread Diameter)

Thread			Pitch (tpi)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
No.10~24	5/16″ ,3/8″x24	9/16″~11/16″x24	24	STMHC	04035L07-I24UNC		4	3.58	45	7.4	7.9	3	7	3.8
No.10~24	5/16″ ,3/8″x24	9/16″~11/16″x24	24		06041L08-I24UNC		6	4.15	57	8.5	9.0	3	8	4.5
1/4″x20	7/16″ ,1/2″x20	3/4″~1″x20	20		06048L09-I20UNC		6	4.88	57	8.9	9.5	3	7	5.2
5/16″x18	9/16″ ,5/8″x18	11/16″~1 11/16″x18	18		08061L11-I18UNC		8	6.15	61	11.3	12.0	3	8	6.5
3/8″x16	3/4″x16		16		08076L15-I16UNC		8	7.65	61	14.3	15.1	3	9	8.0
7/16″x14	7/8″x14		14		10090L17-I14UNC		10	9.00	73	16.3	17.2	3	9	9.3
1/2″x13			13		12104L20-I13UNC		12	10.35	73	19.5	20.5	4	10	10.8
9/16″x12	1″~1 1/2″x12		12		12118L22-I12UNC		12	11.80	73	21.2	22.2	4	10	12.3

(ℓ2≤2×Thread Diameter)

Thread			Pitch (tpi)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
UNC	UNF	UNEF			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
	No.10~32	No. 12~3/8″x32	32	STMHC	04038L09-I32UNF		4	3.80	45	9.5	9.9	3	12	4.0
		No. 12~3/8″x32	32		06044L11-I32UNEF		6	4.40	57	11.1	11.5	3	14	4.7
	No.12, 1/4″x28	7/16″; 1/2″x28	28		06043L11-I28UNF		6	4.30	57	10.9	11.3	3	12	4.6
	1/4″x28	7/16″; 1/2″x28	28		06052L13-I28UNF		6	5.15	57	12.7	13.1	3	14	5.5
		7/16″; 1/2″x28	28		10099L22-I28UNEF		10	9.90	73	21.8	22.2	3	24	10.2
No.10~24	5/16″, 3/8″x24	9/16″~11/16″x24	24		04035L10-I24UNC		4	3.58	45	9.5	10.0	3	9	3.8
No.12~24	5/16″, 3/8″x24	9/16″~11/16″x24	24		06041L11-I24UNC		6	4.15	57	10.6	11.1	3	10	4.5
	5/16″, 3/8″x24	9/16″~11/16″x24	24		08066L16-I24UNF		8	6.68	61	15.9	16.4	3	15	6.8
	3/8″x24	9/16″~11/16″x24	24		10082L19-I24UNF		10	8.20	73	19.0	19.6	3	18	8.5
		9/16″~11/16″x24	24		14129L29-I24UNEF		14	12.90	92	28.6	29.1	4	27	13.2
1/4″x20	7/16″, 1/2″x20	3/4″~1″x20	20		06048L13-I20UNC		6	4.88	57	12.7	13.3	3	10	5.2
	7/16″, 1/2″x20	3/4″~1″x20	20		10096L22-I20UNF		10	9.60	73	21.6	22.2	3	17	9.8
	1/2″x20	3/4″~1″x20	20		12111L26-I20UNF		12	11.10	80	25.4	26.0	3	20	11.5
		3/4″~1″x20	20		18174L38-I20UNEF		18	17.40	102	38.1	38.7	4	30	17.8
5/16″x18	9/16″, 5/8″x18	11/16″~1 11/16″x18	18		08061L16-I18UNC		8	6.15	61	15.5	16.2	3	11	6.5
	9/16″, 5/8″x18	11/16″~1 11/16″x18	18		14125L28-I18UNF		14	12.50	92	28.2	28.9	4	20	12.8
	5/8″x18	11/16″~1 11/16″x18	18		16141L31-I18UNF		16	14.10	92	31.0	31.7	4	22	14.5
3/8″x16	3/4″x16		16		08076L19-I16UNC		8	7.65	61	19.0	19.8	3	12	8.0
	3/4″x16		16		18170L38-I16UNF		18	17.00	102	38.1	38.8	4	24	17.5
7/16″x14	7/8″x14		14		10090L22-I14UNC		10	9.00	73	21.8	22.7	3	12	9.3
	7/8″x14		14		20199L44-I14UNF		20	19.90	102	43.5	44.4	4	24	20.5
1/2″x13			13		12104L26-I13UNC		12	10.35	80	25.4	26.4	4	13	10.8
9/16″x12	1″~1 1/2″x12		12		12118L28-I12UNC		12	11.80	80	27.5	28.6	4	13	12.3
	1″~1 1/2″x12		12		20199L51-I12UNF		20	19.90	102	50.8	51.9	4	24	23.5
5/8″x11			11		14131L33-I11UNC		14	13.10	92	32.3	33.5	4	14	13.5
3/4″x10			10		16159L39-I10UNC		16	15.90	92	38.1	39.4	4	15	16.5
7/8″x9			9		20190L46-I9UNC		20	19.00	102	45.2	46.6	4	16	19.5
1″x8			8		20199L52-I8UNC		20	19.90	102	50.8	52.4	4	16	22.0

* Bore Diameter applies to smallest thread Dia

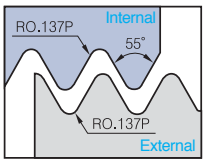
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

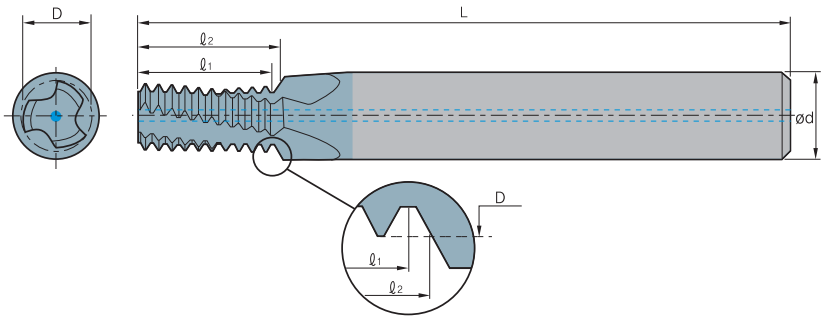
Whitworth

Helical flutes with thru-hole coolant

External/Internal



Defined by: B.S.84: 1956,
DIN 259, ISO228/1: 1982
Tolerance class: Medium class A



(ℓ2≤2×Thread Diameter)

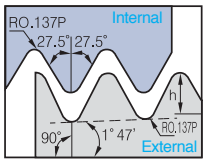
Thread		Pitch (tpi)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
BSW	BSF		External/Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
	1/4″×26	26	STMHC	06050L13-EI26BSF		6	5.00	57	12.7	13.2	3	13	5.3
	5/16″×22	22		08063L16-EI22BSF		8	6.35	61	16.2	16.7	3	14	6.7
1/4″×20	3/8″×20	20		06044L13-EI20BSW		6	4.45	57	12.7	13.3	3	10	5.0
	3/8″×20	20		08076L19-EI20BSF		8	7.65	61	19.0	197	3	15	8.2
5/16″×18	7/16″×18	18		06058L16-EI18BSW		6	5.85	57	15.5	16.2	3	11	6.5
	7/16″×18	18		10092L23-EI18BSF		10	9.20	73	22.6	23.3	3	16	9.7
3/8″×16	1/2″, 9/16″×16	16		08072L19-EI16BSW		8	7.20	61	19.0	19.8	3	12	7.9
	1/2″, 9/16″×16	16		12105L26-EI16BSF		12	10.50	80	25.4	26.2	4	16	11.1
	9/16″×16	16		14122L29-EI16BSF		14	12.15	92	28.6	29.4	4	18	12.6
7/16″×14	5/8″, 11/16″×14	14		10085L22-EI14BSW		10	8.50	73	21.8	22.7	3	12	9.2
	5/8″, 11/16″×14	14		14134L31-EI14BSF		14	13.40	92	30.8	31.7	4	17	14.0
	11/16″×14	14		16150L35-EI14BSF		16	15.00	92	34.5	35.4	4	19	15.6
1/2″×12	3/4″×12	12		10096L26-EI12BSW		10	9.65	73	25.4	26.5	3	12	10.5
9/16″×12	3/4″×12	12		12113L28-EI12BSW		12	11.25	80	27.5	28.6	4	13	12.1
	3/4″×12	12		18162L39-EI12BSF		18	16.20	102	38.1	39.2	4	18	16.8
5/8″×11	7/8″×11	11		14126L33-EI11BSW		14	12.60	92	32.3	33.5	4	14	13.4
11/16″×11		11		16142L35-EI11BSW		16	14.20	92	34.6	35.8	4	15	15.0

●: Stock item

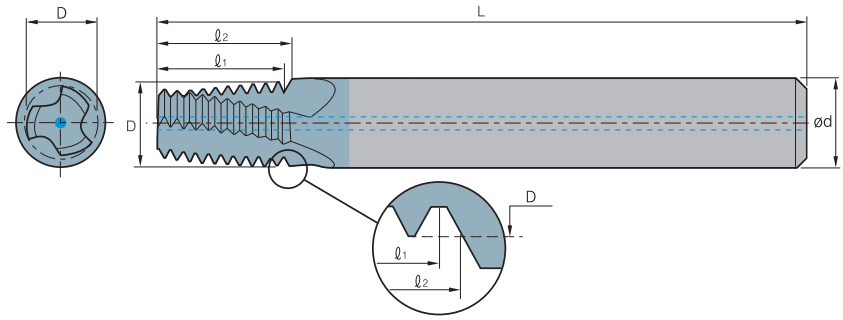
BSPT

Helical flutes with thru-hole coolant

External/Internal



Defined by: B.S.21 : 1985
Tolerance class: Standard BSPT



Thread	Pitch (tpi)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
Standard		Internal		PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
1/16″×28	28	STMHC	06059L10-EI28BSPT		6	5.90	57	10.0	10.2	3	11	6.7
1/8″×28	28		08076L10-EI28BSPT		8	7.65	61	10.0	10.2	3	11	8.7
1/4″×19	19		10099L15-EI19BSPT		10	9.90	73	14.7	15.4	3	11	11.8
3/8″×19	19		12111L15-EI19BSPT		12	11.15	73	14.7	15.4	4	11	15.2
1/2″, 3/4″×14	14		16142L22-EI14BSPT		16	14.25	92	21.8	22.7	4	12	19.0
1″, 1 1/2″, 2″, 2 1/2″×11	11		20196L28-EI11BSPT		20	19.60	102	27.7	28.9	4	12	30.7

* Bore Diameter applies to smallest thread Dia

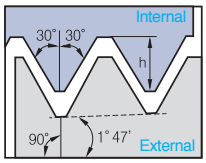
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

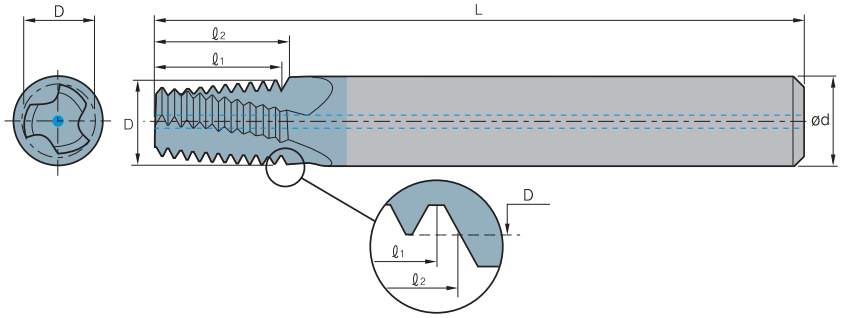
NPT

Helical flutes with thru-hole coolant

External/Internal



Defined by: USAS B2.1: 1968
Tolerance class: Standard NPT

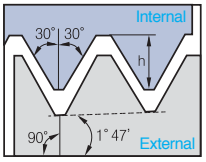


Thread Standard	Pitch (tpi)	Designation Internal		PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
1/16″×27	27	STMHC	06059L09-EI27NPT		6	5.90	57	9.4	9.9	3	10	6.3
1/8″×27	27		08076L09-EI27NPT		8	7.65	61	9.4	9.9	3	10	8.5
1/4″×18	18		10099L14-EI18NPT	●	10	9.90	73	14.1	14.8	3	10	11.1
3/8″×18	18		12111L14-EI18NPT		12	11.15	73	14.1	14.8	4	10	14.5
1/2″, 3/4″×14	14		16142L19-EI14NPT		16	14.25	92	18.1	19.0	4	10	17.7, 23.0
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPT		20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 44.0, 56.0
2 1/2″×8 ; 3″×8	8		20196L33-EI8NPT		20	19.60	102	31.7	33.3	4	10	66.5, 82.1

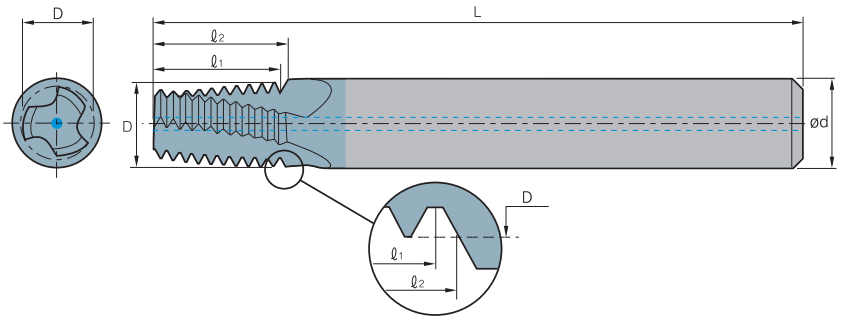
NPTF

Helical flutes with thru-hole coolant

External/Internal



Defined by: ANSI 1.20.3-1976
Tolerance class: Standard NPTF



Thread Standard	Pitch (tpi)	Designation Internal		PC9070M	Dimensions (mm) Ød	D	L	ℓ1	ℓ2	No.of flute z	Tooth zt	*Bore dia. mm
1/16″×27	27	STMHC	06059L09-EI27NPTF	●	6	5.90	57	9.4	9.9	3	10	6.3
1/8″×27	27		08076L09-EI27NPTF		8	7.65	61	9.4	9.9	3	10	8.5
1/4″×18	18		10099L14-EI18NPTF		10	9.90	73	14.1	14.8	3	10	11.1
3/8″×18	18		12111L14-EI18NPTF		12	11.15	73	14.1	14.8	4	10	14.5
1/2″, 3/4″×14	14		16142L19-EI14NPTF		16	14.25	92	18.1	19.0	4	10	17.7, 23.4
1″, 1 1/14, 1 1/2″, 2″×11.5	11.5		20196L23-EI11.5NPTF		20	19.60	102	22.1	23.2	4	10	29.0, 37.7, 43.7, 55.6
2 1/2″×8 ; 3″×8	8		20196L33-EI8NPTF		20	19.60	102	31.7	33.3	4	10	66.3, 82.1

* Bore Diameter applies to smallest thread Dia

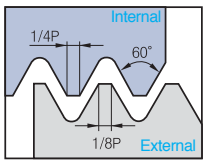
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

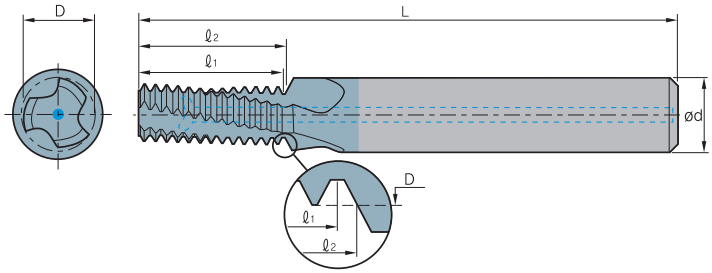
ISO Metric

Helical flutes with radial cooling

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



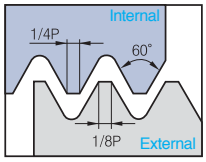
(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)					No.of flute	Tooth	*Bore dia.
M Coarse	M Fine			Internal	PC9070M	Ød	D	L	ℓ1	ℓ2	z	zt	mm
M6×1.0	M8~M40×1.0	1.0	STMHCR	06048L12-I1.00ISO		6	4.8	57	12.0	12.5	3	12	5.0
	M10×1.0	1.0		10087L20-I1.00ISO		10	8.7	73	20.0	20.5	3	20	9.0
	M12×1.0	1.0		12107L24-I1.00ISO		12	10.7	73	24.0	24.5	4	24	11.0
M8×1.25		1.25		08065L16-I1.25ISO		8	6.5	64	16.3	16.9	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		10082L20-I1.50ISO		10	8.2	73	19.5	20.3	3	13	8.5
	M12×1.5	1.5		10099L24-I1.50ISO		10	9.9	73	24.0	24.8	4	16	10.5
	M14×1.5	1.5		12119L29-I1.50ISO		12	11.9	84	28.5	29.3	4	19	12.5
	M16×1.5	1.5		14139L32-I1.50ISO		14	13.9	84	31.5	32.3	4	21	14.5
M12×1.75		1.75		10099L25-I1.75ISO		10	9.9	73	24.5	25.4	4	14	10.2

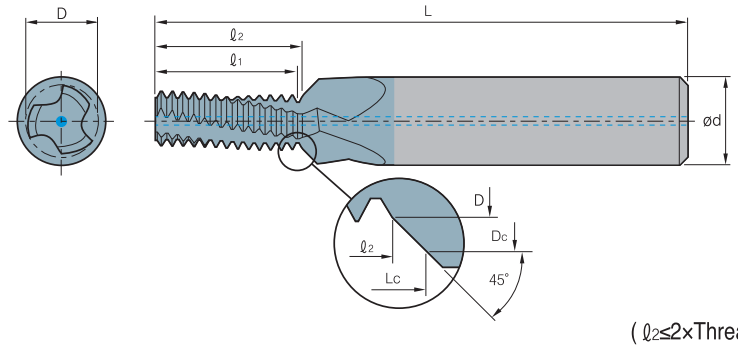
ISO Metric

Helical flutes with thru-hole coolant -thru & Chamfer

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)							No.of flute	Tooth	*Bore dia.
M Coarse	M Fine			Internal	PC9070M	Ød	D	Dc	L	ℓ1	ℓ2	Lc	z	zt	mm
M6×1.0	M8~M40×1.0	1.0	STMHCC	08048L12-I1.00ISO		8	4.8	6.3	61	12.0	12.5	13.3	3	12	5.0
	M10×1.0	1.0		12087L20-I1.00ISO		12	8.7	10.3	73	20.0	20.5	21.3	3	20	9.0
	M12×1.0	1.0		14107L24-I1.00ISO		14	10.7	12.3	80	24.0	24.5	25.3	4	24	11.0
M8×1.25		1.25		10065L16-I1.25ISO		10	6.5	8.3	73	16.3	16.9	17.8	3	13	6.8
M10×1.5	M12~M48×1.5	1.5		12082L20-I1.50ISO		12	8.2	10.3	80	19.5	20.3	21.3	3	13	8.5
	M12×1.5	1.5		14099L24-I1.50ISO		14	9.9	12.3	80	24.0	24.8	26.0	4	16	10.5
	M14×1.5	1.5		16119L29-I1.50ISO		16	11.9	14.3	92	28.5	29.3	30.5	4	19	12.5
	M16×1.5	1.5		18139L32-I1.50ISO		18	13.9	16.3	92	31.5	32.3	33.5	4	21	14.5
M12×1.75		1.75		14099L25-I1.75ISO		14	9.9	12.3	80	24.5	25.4	26.6	4	14	10.2

* Bore Diameter applies to smallest thread Dia

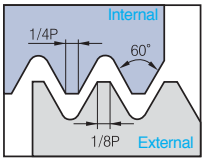
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

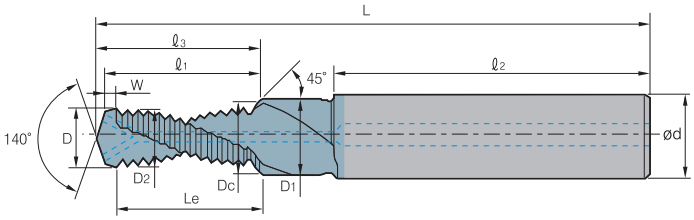
ISO Metric

Drill, Chamfer & Thread with thru-hole coolant

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



Thread	Pitch	Designation			Dimensions (mm)											No.of flute	Tooth
ISO 2D M Coarse	(mm)		Internal	PC9070M	L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD-	IM6×1.0ISO-2D		62.0	14.5	13.7	36	1.0	12.7	5.0	8	6.6	6.3	4.85	2	11
M8×1.25	1.25		IM8×1.25ISO-2D		74.0	18.2	17.1	40	1.3	15.8	6.8	10	9.0	8.3	6.45	2	11
M10×1.5	1.5		IM10×1.5ISO-2D		79.0	23.4	22.1	45	1.5	20.6	8.5	12	11.0	10.3	8.08	2	12
M12×1.75	1.75		IM12×1.75ISO-2D		89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12

Thread	Pitch	Designation			Dimensions (mm)											No.of flute	Tooth
ISO 2.5D M Coarse	(mm)		Internal	PC9070M	L	ℓ3	ℓ1	ℓ2	W	Le	D	Ød	D1	Dc	D2	z	zt
M6×1.0	1.0	STMHCD-	IM6×1.0ISO-2.5D		62.0	16.5	15.7	36	1.0	14.7	5.0	8	6.6	6.3	4.85	2	13
M8×1.25	1.25		IM8×1.25ISO-2.5D		74.0	23.2	22.1	40	1.3	20.8	6.8	10	9.0	8.3	6.45	2	15
M10×1.5	1.5		IM10×1.5ISO-2.5D		79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

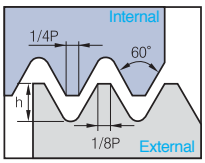
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

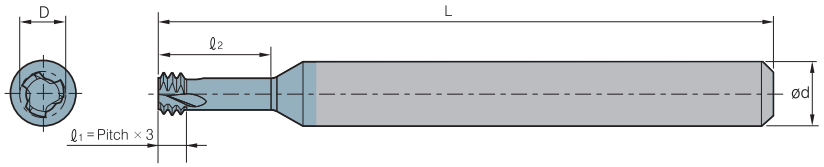
●: Stock item

ISO Metric

Deep threading

Internal





Defined by: R262 (DIN 13)
Tolerance class: 6H

(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
M1.6×0.35		0.35	STMD3T	03012L034-I0.35ISO		3	1.20	30	3.4	3	3	1.25
M2×0.4		0.4		06015L042-I0.4ISO		6	1.55	57	4.2	3	3	1.6
M2.2×0.45		0.45		06016L046-I0.45ISO		6	1.65	57	4.6	3	3	1.75
M2.5×0.45		0.45		06019L052-I0.45ISO		6	1.95	57	5.2	3	3	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L062-I0.5ISO		6	2.40	57	6.2	3	3	2.5
M3.5×0.6		0.6		06027L073-I0.6ISO		6	2.75	57	7.3	3	3	2.9
M4×0.7		0.7		06031L083-I0.7ISO		6	3.15	57	8.3	3	3	3.3
M5×0.8		0.8		06040L104-I0.8ISO		6	4.05	57	10.4	3	3	4.2
M6×1.0	M8~M40×1.0	1.0		06048L125-I1.0ISO		6	4.80	57	12.5	3	3	5.0
M8×1.25		1.25		08065L166-I1.25ISO		8	6.50	63	16.6	3	3	6.8
M10×1.5	M12~M48×1.50	1.5		10082L208-I1.50ISO		10	8.20	73	20.8	3	3	8.5
M12×1.75		1.75		10099L250-I1.75ISO		10	9.90	73	25.0	3	3	10.3

3d (ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
M1.6×0.35		0.35	STMD3T	03012L050-I0.35ISO		3	1.20	30	5.0	3	3	1.25
M2×0.4		0.4		06015L062-I0.4ISO		6	1.55	57	6.2	3	3	1.6
M2.5×0.45		0.45		06019L077-I0.45ISO		6	1.95	57	7.0	3	3	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L092-I0.5ISO		6	2.40	57	9.2	3	3	2.5
M4×0.7		0.7		06031L123-I0.7ISO		6	3.15	57	12.3	3	3	3.3
M5×0.8		0.8		06040L154-I0.8ISO		6	4.05	57	15.4	3	3	4.2
M6×1.0	M8~M40×1.0	1.0		06048L185-I1.0ISO		6	4.80	57	18.5	3	3	5.0
M8×1.25		1.25		08065L246-I1.25ISO		8	6.50	63	24.6	3	3	6.8

* Bore Diameter applies to smallest thread Dia

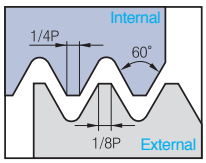
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

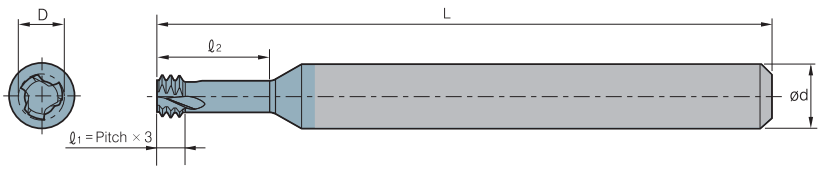
●: Stock item

American UN

Deep threading

Internal





Defined by: ANSI B1.1.74
Tolerance class: 2B

(ℓ2≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
	No.1~72	72	STMD3T	06014L039-I72UN		6	1.45	57	3.9	3	3	1.6
No.1~64	No.2~64	64		06014L042-I64UN		6	1.40	57	4.2	3	3	1.5
No.2~56	No.3~56	56		06016L050-I56UN		6	1.65	57	5.0	3	3	1.8
No.3~48	No.4~48	48		06019L060-I48UN		6	1.90	57	6.0	3	3	2.1
No.4, No.5~40	No.6~40	40		06021L060-I40UN		6	2.10	57	6.0	3	3	2.3
No.5~40	No.6~40	40		06024L072-I40UN		6	2.45	57	7.2	3	3	2.6
	No.8~36	36		06033L087-I36UN		6	3.30	57	8.7	3	3	3.5
No.6, No.8~32	No.10~32	32		06025L074-I32UN		6	2.55	57	7.4	3	3	2.8
No.8~32	No.10~32	32		06032L100-I32UN		6	3.20	57	10.0	3	3	3.5
	1/4″x28	28		06052L132-I28UN		6	5.25	57	13.2	3	3	5.5
No.10~24	5/16″x24	24		06035L102-I24UN		6	3.58	57	10.2	3	3	3.9
	5/16″x24	24		08066L165-I24UN		8	6.68	63	16.5	3	3	6.9
1/4″x20	7/16″x20	20		06048L134-I20UN		6	4.88	57	13.4	3	3	5.2
	7/16″x20	20		010095L230-I20UN		10	9.55	73	23.0	3	3	9.9
3/8″x16		16		08067L191-I16UN		8	6.70	63	19.1	3	3	8.0
7/16″x14		14		10090L233-I14UN		10	9.00	73	23.3	3	3	9.4

(ℓ2≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
	No.1~72	72	STMD3T	06014L057-I72UN		6	1.45	57	5.75	3	3	1.6
No.4, No.5~40	No.6~40	40		06021L090-I40UN		6	2.10	57	9.0	3	3	2.3
No.5~40	No.6~40	40		06024L100-I40UN		6	2.45	57	10.0	3	3	2.6
No.6, No.8~32	No.10~32	32		06025L110-I32UN		6	2.55	57	11.0	3	3	2.8
No.8~32	No.10~32	32		06032L130-I32UN		6	3.20	57	13.0	3	3	3.4
	1/4″ 28	28		06052L196-I28UN		6	5.25	57	19.6	3	3	5.5
	5/16″x24	24		08066L245-I24UN		8	6.68	63	24.5	3	3	6.9
1/4″x20	7/16″x20	20		06048L198-I20UN		6	4.88	57	19.8	3	3	5.1

* Bore Diameter applies to smallest thread Dia

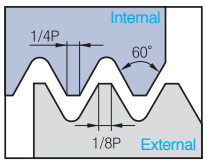
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

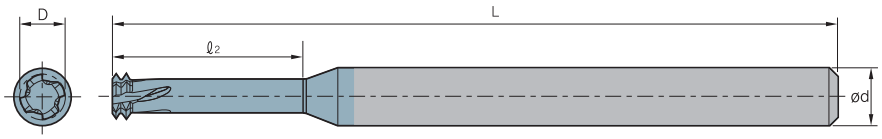
ISO Metric

Deep threading for hard materials (~HRC62)

Internal



Defined by: R262 (DIN 13)
Tolerance class: 6H



(ℓ2≤2×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
M2×0.4		0.4	STMD2L	06015L042-I0.4ISO		6	1.55	76	4.60	4	2	1.6
M2.2×0.45		0.45		06016L046-I0.45ISO		6	1.65	76	5.05	4	2	1.8
M2.5×0.45		0.45		06019L052-I0.45ISO		6	1.95	76	5.65	4	2	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L062-I0.5ISO		6	2.40	76	6.75	4	2	2.55
M3.5×0.6		0.6		06027L073-I0.6ISO		6	2.75	76	7.90	4	2	2.95
M4×0.7		0.7		06031L083-I0.7ISO		6	3.15	76	9.05	4	2	3.35
M5×0.8		0.8		06040L104-I0.8ISO		6	4.05	76	11.20	4	2	4.3
M6×1.0	M8~M40×1.0	1.0		06048L125-I1.0ISO		6	4.80	76	13.50	4	2	5.1
M8×1.25		1.25		08065L166-I1.25ISO		8	6.50	80	17.85	4	2	6.8
M10×1.5	M12~M48×1.50	1.5		08079L208-I1.50ISO		8	7.90	80	22.30	4	2	8.6
M12×1.75		1.75		10099L250-I1.75ISO		10	9.90	101	26.75	4	2	10.4

(ℓ2≤3×Thread Diameter)

Thread		Pitch (mm)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
M Coarse	M Fine		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
M2×0.4		0.4	STMD2L	06015L062-I0.4ISO		6	1.55	76	6.60	4	2	1.6
M2.2×0.45		0.45		06019L077-I0.45ISO		6	1.95	76	8.15	4	2	2.05
M3×0.5	M3.5~M16×0.5	0.5		06024L092-I0.5ISO		6	2.40	76	9.75	4	2	2.55
M4×0.7		0.7		06031L123-I0.7ISO		6	3.15	76	13.05	4	2	3.35
M5×0.8		0.8		06040L154-I0.8ISO		6	4.05	76	16.20	4	2	4.3
M6×1.0	M8~M40×1.0	1.0		06048L185-I1.0ISO		6	4.80	76	19.50	4	2	5.1
M8×1.25		1.25		08065L246-I1.25ISO		8	6.50	80	25.85	4	2	6.8

* Bore Diameter applies to smallest thread Dia

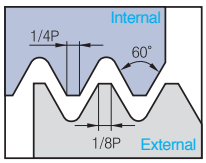
Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

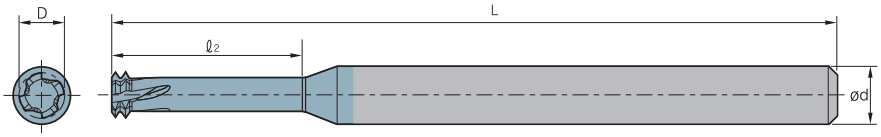
●: Stock item

American UN

Deep threading for hard materials (~HRC62)

Internal





Defined by: ANSI B1.1.74
Tolerance class: 2B

(ℓ2≤2×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
No.2~56	No.3~56	56	STMD2L	06016L050-I56UN		6	1.65	76	5.45	4	2	1.80
No.3~48	No.4~48	48		06019L060-I48UN		6	1.90	76	6.53	4	2	2.10
No.4~40 ; No.5-40	No.6~40	40		06021L060-I40UN		6	2.10	76	6.64	4	2	2.35
No.5~40	No.6~40	40		06024L072-I40UN		6	2.45	76	7.84	4	2	2.65
	No.8~36	36		06033L087-I36UN		6	3.30	76	9.41	4	2	3.55
No.6~32 ; No.8~32	No.10~32	32		06025L074-I32UN		6	2.55	76	8.20	4	2	2.85
No.8~32	No.10~32	32		06032L100-I32UN		6	3.20	76	10.79	4	2	3.50
	1/4″×28	28		06052L132-I28UN		6	5.25	76	14.11	4	2	5.55
No.10~24	5/16″×24	24		06035L102-I24UN		6	3.58	76	11.26	4	2	3.90
	5/16″×24	24		08066L165-I24UN		8	6.68	76	17.56	4	2	7.00
1/4″×20	7/16″×20	20		06048L134-I20UN		6	4.88	76	14.67	4	2	5.20
	7/16″×20	20		10095L230-I20UN		10	9.55	101	24.27	4	2	9.90
3/8″×16		16		08076L197-I16UN		8	7.65	80	21.29	4	2	8.00
7/16″×14		14		10090L233-I14UN		10	9.00	101	25.11	4	2	9.50
1/2″×13		13		10099L256-I13UN		10	9.90	101	27.55	4	2	10.90

(ℓ2≤3×Thread Diameter)

Thread		Pitch (tpi)	Designation			Dimensions (mm)				No.of flute	Tooth	*Bore dia.
UNC	UNF		Internal		PC9070M	Ød	D	L	ℓ2	z	zt	mm
No.4~40, No.5~40	No.6~40	40	STMD2L	06021L090-I40UN		6	2.10	76	9.64	4	2	2.35
No.5~40	No.6~40	40		06024L100-I40UN		6	2.45	76	10.64	4	2	2.65
No.6~32, No.8~32	No.10~32	32		06025L110-I32UN		6	2.55	76	11.79	4	2	2.85
No.8~32	No.10~32	32		06032L130-I32UN		6	3.20	76	13.79	4	2	3.50
	1/4″×28	28		06052L196-I28UN		6	5.25	76	20.51	4	2	5.55
	5/16″×24	24		08066L245-I24UN		8	6.68	80	25.56	4	2	7.00
1/4″~20	7/16″×20	20		06048L198-I20UN		6	4.88	76	21.07	4	2	5.20
7/16″×14		14		10090L335-I14UN		10	9.00	101	35.31	4	2	9.50

* Bore Diameter applies to smallest thread Dia

Maximum thread length = $\ell_2 - \frac{\text{Pitch}}{4}$

●: Stock item

High performance carbide tap and HSS tap

TAP

- Highly durable carbide tap and HSS tap
- A variety of taps including point taps, spiral taps, straight taps, roll taps, and more to meet a wide range of requirements, available for JIS and DIN standards in metric threads
- Custom orders can be made for powder HSS and taps under M3

Features



- Carbide type and HSS type
  - Carbide Taps: High toughness substrate
  - HSS: High vanadium substrate
- Applicable to various workpiece forms
  - A wide selection composed of point taps, spiral taps, straight taps, roll taps and more
- Metric threads standardized
  - JIS, DIN standard and special tools
- Broad line-ups per type and size
  - A wide choice with various types and sizes

Code system

M3 x 0.5 - ST 25 (S) - (120)

Metric coarse screw threads and thread size

Appearance
- ST: Straight Tap
- PT: Point Tap
- SP: Spiral Tap
- RT: Roll Tap
- SR: Spiral roll Tap
- STD: Straight Tap(DIN)
- PTD: Point Tap(DIN)
- SPD: Spiral Tap(DIN)
- RTD: Roll Tap(DIN)

Incomplete thread length

Roll Tap
- S: Single
- M: Multi

Overall length
- Special type

Grade system

Carbide Tap		HSS Tap	
FN30T	Carbide, Uncoated	HN30T	HSS, Uncoated
PC20T	Carbide, TiN coating	HC20T	HSS, TiN coating
PC10T	Carbide, TiCN coating	HC10T	HSS, TiCN coating
-	-	HH30T	HSS, Steam Oxide



Carbide tap

Tap type		Picture	Features	Grade	Size
ST	Straight tap		• For through holes and mass production • For cast iron, medium carbon steel and non-ferrous metal	FN30T	M3~M12
				PC10T	M3~M12
				PC20T	M3~M12
SP	Spiral tap		• For blind holes • Better chip evacuation through flutes	FN30T	M3~M12
				PC10T	M3~M12
RT	Roll tap		• For non-ferrous metal • For through holes and blind holes	FN30T	M3~M12
				PC10T	M3~M12
SR	Spiral roll tap		• For non-ferrous metal, Al and magnesium	FN30T	M3~M6
				PC10T	M3~M6

HSS tap

Tap type		Picture	Features	Grade	Size
ST	Straight tap		• For through holes and mass production • For cast iron, medium carbon steel and non-ferrous metal	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M20
PT	Point tap		• For through holes and mass production • Similar shape to the straight type but specialized with easier chip evacuation	HN030T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M20
SP	Spiral tap		• For blind holes • Chip evacuation through flutes	HN30T	M3~M20
				HC20T	M3~M20
				HC10T	M3~M20
				HH30T	M3~M24
RT	Roll tap		• For non-ferrous metal • For through holes and blind holes	HN30T	M3~M12
				HC20T	M3~M12
				HC10T	M3~M12
SR	Spiral roll tap		• For non-ferrous metal, Al and magnesium	HN30T	M3~M6
				HC20T	M3~M6
				HC10T	M3~M6

Recommended cutting speeds and cutting fluid

- For machining cold/hot forging steel and sintered ferrous alloy in high feed, high depth of cut and highly interrupted conditions
- Excellent resistance to chipping, fracture and thermal cracks
- Improved surface finish due to optimized cutting edges

ISO	Workpiece		Cutting speed, vc (m/min)					Cutting fluid			
			Straight tap	Spiral tap	Point tap	Carbide tap	Roll tap	Insoluble	Water soluble emulsion	Semi dry	Dry
P	Low carbon steel	≥ 0.25 %C	8~13	8~13	15~25	-	8~13	◎	○	△	△
	Medium carbon steel	≥ 0.25~0.45 %C	7~12	7~12	10~15	-	7~10	◎	○	△	△
	High carbon steel	≥ 0.45 %C	6~9	6~9	8~13	-	5~8	◎	○	△	△
	Alloy steel	SCM	7~12	7~12	10~15	-	5~8	◎	△	△	△
	Quenched and tempered steel	25~45HRC	3~5	3~5	4~6	-	-	◎	△	-	-
	Tool steel	SKD	6~9	6~9	7~10	-	-	◎	-	-	-
	Cast steel	SCM	6~11	6~11	10~15	-	-	◎	○	-	-
M	Stainless steel	SUS	4~7	5~8	8~13	-	5~10	◎	○	-	-
	Precipitation hardened stainless steel	SUS630 SUS631	3~5	3~5	4~6	-	-	◎	-	-	-
K	Cast iron	GC	10~15	-	-	10~20	-	◎	○	○	○
	Ductile cast iron	GCD	7~12	7~12	10~20	10~20	-	◎	○	○	-
N	Copper	Cu	6~9	6~11	7~12	10~20	7~12	○	○	-	-
	Brass, brass-cast	Bs Bsc	10~15	10~20	15~25	15~25	7~12	○	○	○	○
	Bronze, bronze-cast	PB PBC	6~11	6~11	10~20	10~20	7~12	○	○	-	-
	Rolled aluminum	Al	10~20	10~20	15~25	-	10~20	◎	○	△	-
	Aluminum-cast, alloyed	AC ACD	10~15	10~15	15~20	10~20	10~25	◎	○	△	-
	Magnesium-cast, alloyed	MC	7~12	7~12	10~15	10~20	-	◎	○	○	-
	Zinc-cast, alloyed	ZDC	1~12	7~12	10~15	10~20	7~12	◎	○	△	-
	Thermosetting plastics	Bakelite phenol epoxy	10~20	-	-	15~25	-	-	○	○	○
	Thermoplastics	Nylon vinyl chloride	10~20	10~15	10~20	10~20	-	-	○	○	○

◎ Recommended ○ Applicable △ Usable - unusable

Recommended drill diameter [On 2nd class thread basis]

[Straight tap & Spiral tap]

Thread size	Drill diameter		
	Min	Recommended	Max
M3X0.5	2.459	2.5	2.599
M4X0.7	3.242	3.3	3.422
M5X0.8	4.134	4.2	4.334
M6X1.0	4.917	5.0	5.153
M8X1.25	6.647	6.8	6.912
M10X1.25	8.647	8.8	8.912
M10X1.5	8.376	8.5	8.676
M12X1.0	10.917	11.0	11.153
M12X1.25	10.647	10.8	10.912
M12X1.5	10.376	10.5	10.676

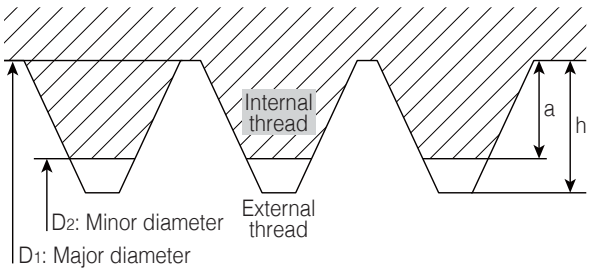
Thread size	Drill diameter		
	Min	Recommended	Max
M12X1.75	10.106	10.3	10.441
M14X1.5	12.376	12.5	12.676
M14X2.0	11.835	12.0	12.21
M16X1.5	14.376	14.5	14.676
M16X2.0	13.835	14.0	14.21
M18X1.5	16.376	16.5	16.676
M18X2.5	15.294	15.5	15.744
M20X1.5	18.376	18.5	18.676
M20X2.5	17.294	17.5	17.744
-	-	-	-

[Roll tap]

Thread size	Drill diameter		
	Min	Recommended	Max
M3X0.5	2.76	2.8	2.81
M4X0.7	3.65	3.7	3.7
M5X0.8	4.59	4.6	4.66
M6X1.0	5.48	5.5	5.57
M8X1.25	7.34	7.4	7.41
M10X1.25	9.34	9.4	9.41

Thread size	Drill diameter		
	Min	Recommended	Max
M10X1.5	9.18	9.2	9.28
M12X1.0	11.48	11.5	11.57
M12X1.25	11.34	11.4	11.41
M12X1.5	11.18	11.2	11.28
M12X1.75	11.05	11.1	11.15
-	-	-	-

[Fig] In case that a external thread has a standard shape



- Pre-hole diameter = D1: Major diameter
  D2: Minor diameter
- a = 1/2 x (D1 - D2)
- h = Height of fundamental triangle
- Rate of threading engagement = a/h x 100 (%)

$$* \text{ Rate of threading engagement} = \frac{\text{Major diameter} - \text{Pre-hole diameter}}{2 \times (\text{Height of fundamental triangle})}$$

$$* \text{ Pre-hole diameter} = d - 2 \times H \times \frac{\text{rate of threading engagement}}{100}$$

- d: Major diameter
- H (Rate of threading engagement's Height): 0.541266P
- P: Pitch (mm)

* Recommended bottom hole diameters follow the JIS2 standard for a nut. (Nuts outside the JIS standard are excluded)

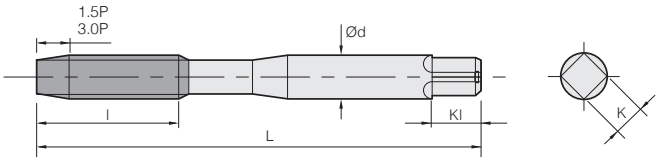
$$* \text{ Drill diameter} = D - 0.0068 \times P \times 65$$

- D: Nominal diameter
- P: Pitch (mm)
- 65 = 65% of the thread height

* Nut's bottom hole diameters outside the JIS standard are only for reference.

ST Straight Tap





3 | 4 | H·A 0° | Carbide | Uncoated FN30T | TiCN PC10T | TiN PC20T

(mm)

Flutes	Designation 1.5P	Designation 3P	Thread size	L	l	d	K	Kl	Limits
3	M3X0.5-ST15	M3X0.5-ST30	M3X0.5	46	11	4.0	3.2	6	KH3
	M4X0.7-ST15	M4X0.7-ST30	M4X0.7	52	13	5.0	4.0	7	KH3
	M5X0.8-ST15	M5X0.8-ST30	M5X0.8	60	16	5.5	4.5	7	KH3
	M6X1.0-ST15	M6X1.0-ST30	M6X1.0	62	19	6.0	4.5	7	KH3
4	M8X1.0-ST15	M8X1.0-ST30	M8X1.0	70	22	6.2	5.0	8	KH3
	M8X1.25-ST15	M8X1.25-ST30	M8X1.25	70	22	6.2	5.0	8	KH4
	M10X1.0-ST15	M10X1.0-ST30	M10X1.0	75	24	7.0	5.5	8	KH3
	M10X1.25-ST15	M10X1.25-ST30	M10X1.25	75	24	7.0	5.5	8	KH4
	M10X1.5-ST15	M10X1.5-ST30	M10X1.5	75	24	7.0	5.5	8	KH4
	M12X1.0-ST15	M12X1.0-ST30	M12X1.0	82	29	8.5	6.5	9	KH3
	M12X1.25-ST15	M12X1.25-ST30	M12X1.25	82	29	8.5	6.5	9	KH4
	M12X1.5-ST15	M12X1.5-ST30	M12X1.5	82	29	8.5	6.5	9	KH4
	M12X1.75-ST15	M12X1.75-ST30	M12X1.75	82	29	8.5	6.5	9	KH5

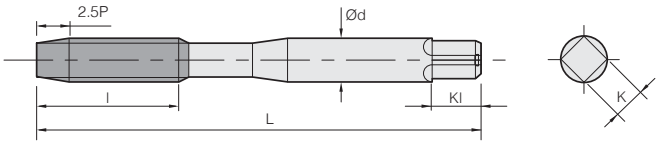
※ Ideal for mass tapping operations of general cast iron, ductile cast iron, brass-cast, thermosetting plastics, etc
※ Wear resistance highly improved by the use of TiCN, TiN coating for high efficiency tapping operations

Applicable workpiece range

Division	Carbon steel C ~0.25%	Carbon steel C0.25% ~0.45%	Carbon steel C 0.45%~	Alloy steel SCM	Quenched and tempered steel 25~45 HRC	Quenched and tempered steel 45~55 HRC	Quenched and tempered steel 50~60 HRC	Stain-less steel SUS	Tool steel SKD	Cast steel SC	Cast iron GC	Ductile cast iron GCD	Copper Cu	Brass Bs	Brass-cast BsC	Bronze PB	Rolled aluminum Al	Aluminum-cast, alloyed AC ADC	Magnesium-cast, alloyed MC	Zinc-cast, alloyed ZDC	Titanium alloy Ti	Titanium alloy Ni	Thermo-setting plastics -	Thermo-plastics -
FN30T											◎	○		○	○	◎		○	○	○			◎	
PC10T											◎	○		○	○	◎		○	○	○			◎	
PC20T											◎	○		○	○	◎		○	○	○			◎	

SP Spiral Tap







(mm)

Flutes	Designation 2.5P	Thread size	L	l	d	K	Kl	Limits
3	**M3X0.5-SP25**	M3X0.5	46	11	4.0	3.2	6	KH3
	M4X0.7-SP25	M4X0.7	52	13	5.0	4.0	7	KH3
	M5X0.8-SP25	M5X0.8	60	16	5.5	4.5	7	KH3
	M6X1.0-SP25	M6X1.0	62	19	6.0	4.5	7	KH3
	M8X1.0-SP25	M8X1.0	70	22	6.2	5.0	8	KH3
	M8X1.25-SP25	M8X1.25	70	22	6.2	5.0	8	KH4
	M10X1.0-SP25	M10X1.0	75	24	7.0	5.5	8	KH3
	M10X1.25-SP25	M10X1.25	75	24	7.0	5.5	8	KH4
	M10X1.5-SP25	M10X1.5	75	24	7.0	5.5	8	KH4
	M12X1.0-SP25	M12X1.0	82	29	8.5	6.5	9	KH3
	M12X1.25-SP25	M12X1.25	82	29	8.5	6.5	9	KH4
	M12X1.5-SP25	M12X1.5	82	29	8.5	6.5	9	KH4
	M12X1.75-SP25	M12X1.75	82	29	8.5	6.5	9	KH5

※ Ideal for making blind holes in quantity on general cast iron, ductile cast iron, brass-cast, thermosetting plastics, etc

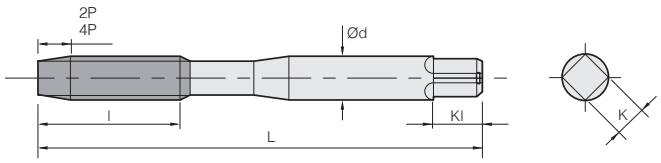
※ Wear resistance highly improved by the use of TiCN coating for high efficiency tapping operations

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T											○	◎	◎	◎	◎	○	○	○	○	○				◎
PC10T											○	◎	◎	◎	◎	○	○	◎	◎	◎			○	◎

RT Roll Tap





Carbide | Uncoated FN30T | TiCN PC10T

(mm)

Flutes	Designation		Thread size	L	l	d	K	Kl	Limits
	2P	4P							
1	M3X0.5-RT20(S)	-	M3X0.5	46	11	4.0	3.2	6	GH5
4	M3X0.5-RT20(M)	M3X0.5-RT40(M)	M3X0.5	46	11	4.0	3.2	6	GH5
1	M4X0.7-RT20(S)	-	M4X0.7	52	13	5.0	4.0	7	GH6
4	M4X0.7-RT20(M)	M4X0.7-RT40(M)	M4X0.7	52	13	5.0	4.0	7	GH6
1	M5X0.8-RT20(S)	-	M5X0.8	60	16	5.5	4.5	7	GH6
4	M5X0.8-RT20(M)	M5X0.8-RT40(M)	M5X0.8	60	16	5.5	4.5	7	GH6
1	M6X1.0-RT20(S)	-	M6X1.0	62	19	6.0	4.5	7	GH7
4	M6X1.0-RT20(M)	M6X1.0-RT40(M)	M6X1.0	62	19	6.0	4.5	7	GH7
1	M8X1.25-RT20(S)	-	M8X1.25	70	22	6.2	5.0	8	GH7
4	M8X1.25-RT20(M)	M8X1.25-RT40(M)	M8X1.25	70	22	6.2	5.0	8	GH7
1	M10X1.25-RT20(S)	-	M10X1.25	75	24	7.0	5.5	8	GH7
4	M10X1.25-RT20(M)	M10X1.25-RT40(M)	M10X1.25	75	24	7.0	5.5	8	GH7
1	M12X1.0-RT20(S)	-	M12X1.0	82	29	8.5	6.5	9	GH7
4	M12X1.0-RT20(M)	M12X1.0-RT40(M)	M12X1.0	82	29	8.5	6.5	9	GH7
1	M12X1.25-RT20(S)	-	M12X1.25	82	29	8.5	6.5	9	GH7
4	M12X1.25-RT20(M)	M12X1.25-RT40(M)	M12X1.25	82	29	8.5	6.5	9	GH7
1	M12X1.5-RT20(S)	-	M12X1.5	82	29	8.5	6.5	9	GH7
4	M12X1.5-RT20(M)	M12X1.5-RT40(M)	M12X1.5	82	29	8.5	6.5	9	GH7
1	M12X1.75-RT20(S)	-	M12X1.75	82	29	8.5	6.5	9	GH8
4	M12X1.75-RT20(M)	M12X1.75-RT40(M)	M12X1.75	82	29	8.5	6.5	9	GH8

※ For general use on both steels and non-ferrous metal

※ Wear resistance highly improved by the use of TiCN coating for high efficiency tapping operations

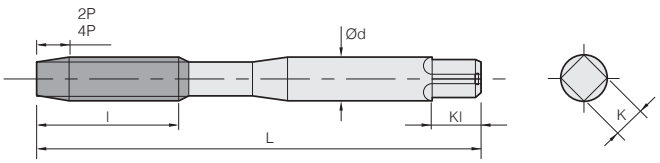
※ Ideal for making both through holes and blind holes on non-ferrous metals

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													◎	◎	◎		◎	◎		◎				
PC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

SR Spiral Roll Tap





Carbide | Uncoated FN30T | TiCN PC10T

(mm)

Designation		Thread size	L	l	d	K	Kl	Limits
2P	4P							
M3X0.5-SR20	**M3X0.5-SR40**	M3X0.5	46	18	4.0	3.2	6	GH6
M3.5X0.6-SR20	**M3.5X0.6-SR40**	M3.5X0.6	46	18	4.0	3.2	6	GH6
M4X0.7-SR20	**M4X0.7-SR40**	M4X0.7	52	20	5.0	4.0	7	GH7
M5X0.8-SR20	**M5X0.8-SR40**	M5X0.8	60	22	5.5	4.5	7	GH7
M6X1.0-SR20	**M6X1.0-SR40**	M6X1.0	62	24	6.0	4.5	7	GH7

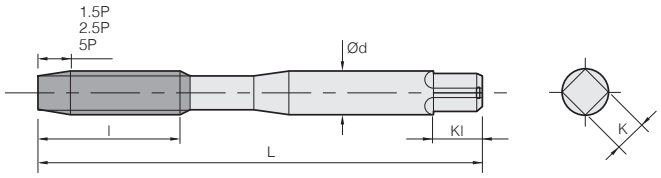
※ For general use for tapping aluminum, magnesium and zinc as well as non-ferrous metal
※ Ideal for tapping steel, non-ferrous materials and stainless steel
※ Wear resistance highly improved by the use of TiCN coating for high efficiency tapping operations

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
FN30T													◎	◎	◎		◎	◎		◎				
PC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

ST Straight Tap





3 | 4 | H·A 0° | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T

(mm)

Flutes	Designation 1.5P	Designation 2.5P	Designation 5P	Thread size	L	l	d	K	Kl	Limits
3	M3X0.5-ST15	M3X0.5-ST25	M3X0.5-ST50	M3X0.5	46	11	4.0	3.2	6	KH2
	M4X0.7-ST15	M4X0.7-ST25	M4X0.7-ST50	M4X0.7	52	13	5.0	4.0	7	KH2
	M5X0.8-ST15	M5X0.8-ST25	M5X0.8-ST50	M5X0.8	60	16	5.5	4.5	7	KH2
	M6X1.0-ST15	M6X1.0-ST25	M6X1.0-ST50	M6X1.0	62	19	6.0	4.5	7	KH2
4	M8X1.25-ST15	M8X1.25-ST25	M8X1.25-ST50	M8X1.25	70	22	6.2	5.0	8	KH2
	M10X1.25-ST15	M10X1.25-ST25	M10X1.25-ST50	M10X1.25	75	24	7.0	5.5	8	KH2
	M10X1.5-ST15	M10X1.5-ST25	M10X1.5-ST50	M10X1.5	75	24	7.0	5.5	8	KH3
	M12X1.0-ST15	M12X1.0-ST25	M12X1.0-ST50	M12X1.0	82	29	8.5	6.5	9	KH2
	M12X1.25-ST15	M12X1.25-ST25	M12X1.25-ST50	M12X1.25	82	29	8.5	6.5	9	KH2
	M12X1.5-ST15	M12X1.5-ST25	M12X1.5-ST50	M12X1.5	82	29	8.5	6.5	9	KH3
	M12X1.75-ST15	M12X1.75-ST25	M12X1.75-ST50	M12X1.75	82	29	8.5	6.5	9	KH3
	M14X1.5-ST15	M14X1.5-ST25	M14X1.5-ST50	M14X1.5	88	30	10.5	8.0	11	KH3
	M14X2.0-ST15	M14X2.0-ST25	M14X2.0-ST50	M14X2.0	88	30	10.5	8.0	11	KH3
	M16X1.5-ST15	M16X1.5-ST25	M16X1.5-ST50	M16X1.5	95	32	12.5	10.0	13	KH3
	M16X2.0-ST15	M16X2.0-ST25	M16X2.0-ST50	M16X2.0	95	32	12.5	10.0	13	KH3
	M18X1.5-ST15	M18X1.5-ST25	M18X1.5-ST50	M18X1.5	100	37	14.0	11.0	14	KH3
	M18X2.5-ST15	M18X2.5-ST25	M18X2.5-ST50	M18X2.5	100	37	14.0	11.0	14	KH3
	M20X1.5-ST15	M20X1.5-ST25	M20X1.5-ST50	M20X1.5	105	37	15.0	12.0	15	KH3
	M20X2.5-ST15	M20X2.5-ST25	M20X2.5-ST50	M20X2.5	105	37	15.0	12.0	15	KH3

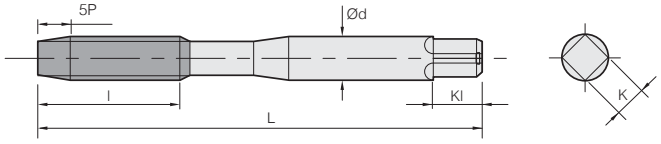
※ Ideal for making both through holes and blind holes on carbon steel, alloy steel and non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN, Steam oxide coating for high efficiency tapping operations
※ Built-up edges are prevented thanks to a reduced coefficient of friction gained by using porous cutting fluid of Fe^3O^4
※ Ideal for tapping stainless steel, cast steel, carbon steel for machine structures, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○										○		○	○	○	○	○	○	○				
HC20T	○	○	○	○	○									○	○	○	○	○	○	○				
HC10T	○	○	○	○	○									○	○	○	○	○	○	○				
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

PT Point Tap





3 | H·A 0° | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T

(mm)

Flutes	Designation 5P	Thread size	L	l	d	K	Kl	Limits
3	M3X0.5-PT50	M3X0.5	46	11	4.0	3.2	6	KH2
	M4X0.7-PT50	M4X0.7	52	13	5.0	4.0	7	KH2
	M5X0.8-PT50	M5X0.8	60	16	5.5	4.5	7	KH2
	M6X1.0-PT50	M6X1.0	62	19	6.0	4.5	7	KH2
	M8X1.25-PT50	M8X1.25	70	22	6.2	5.0	8	KH3
	M10X1.25-PT50	M10X1.25	75	24	7.0	5.5	8	KH3
	M10X1.5-PT50	M10X1.5	75	24	7.0	5.5	8	KH3
	M12X1.0-PT50	M12X1.0	82	29	8.5	6.5	9	KH3
	M12X1.25-PT50	M12X1.25	82	29	8.5	6.5	9	KH3
	M12X1.5-PT50	M12X1.5	82	29	8.5	6.5	9	KH3
	M12X1.75-PT50	M12X1.75	82	29	8.5	6.5	9	KH4
	M14X1.5-PT50	M14X1.5	88	30	10.5	8.0	11	KH3
	M14X2.0-PT50	M14X2.0	88	30	10.5	8.0	11	KH4
	M16X1.5-PT50	M16X1.5	95	32	12.5	10.0	13	KH3
	M16X2.0-PT50	M16X2.0	95	32	12.5	10.0	13	KH4
	M18X1.5-PT50	M18X1.5	100	37	14.0	11.0	14	KH4
	M18X2.5-PT50	M18X2.5	100	37	14.0	11.0	14	KH4
	M20X1.5-PT50	M20X1.5	105	37	15.0	12.0	15	KH4
	M20X2.5-PT50	M20X2.5	105	37	15.0	12.0	15	KH4

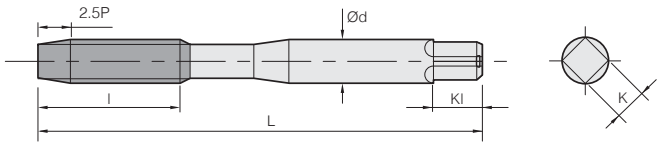
※ Ideal for making through holes on carbon steel, alloy steel and non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN, Steam oxide coating for high efficiency tapping operations
※ Built-up edges are prevented thanks to a reduced coefficient of friction gained by using porous cutting fluid of Fe^3O^4
※ Ideal for tapping stainless steel, cast steel, carbon steel for machine structures, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○	○	◎							○	○	○	○	○	○	◎	○	○	○				○
HC20T	○	○	○	○				◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○
HC10T	◎	◎	◎	○				○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

SP Spiral Tap





3 | 4 | H·A 35° | HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T | Steam Oxide HH30T

(mm)

Flutes	Designation 2.5P	Thread size	L	l	d	K	Kl	Limits
3	M3X0.5-SP25	M3X0.5	46	11	4.0	3.2	6	KH2
	M4X0.7-SP25	M4X0.7	52	13	5.0	4.0	7	KH2
	M5X0.8-SP25	M5X0.8	60	16	5.5	4.5	7	KH2
	M6X1.0-SP25	M6X1.0	62	19	6.0	4.5	7	KH2
	M8X1.25-SP25	M8X1.25	70	22	6.2	5.0	8	KH2
	M10X1.25-SP25	M10X1.25	75	24	7.0	5.5	8	KH2
	M10X1.5-SP25	M10X1.5	75	24	7.0	5.5	8	KH2
	M12X1.0-SP25	M12X1.0	82	29	8.5	6.5	9	KH2
	M12X1.25-SP25	M12X1.25	82	29	8.5	6.5	9	KH2
	M12X1.5-SP25	M12X1.5	82	29	8.5	6.5	9	KH2
	M12X1.75-SP25	M12X1.75	82	29	8.5	6.5	9	KH2
	M14X1.5-SP25	M14X1.5	88	30	10.5	8.0	11	KH2
	M14X2.0-SP25	M14X2.0	88	30	10.5	8.0	11	KH2
	M16X1.5-SP25	M16X1.5	95	32	12.5	10.0	13	KH2
	M16X2.0-SP25	M16X2.0	95	32	12.5	10.0	13	KH2
4	M18X1.5-SP25	M18X1.5	100	37	14.0	11.0	14	KH2
	M18X2.5-SP25	M18X2.5	100	37	14.0	11.0	14	KH3
	M20X1.5-SP25	M20X1.5	105	37	15.0	12.0	15	KH3
	M20X2.5-SP25	M20X2.5	105	37	15.0	12.0	15	KH3

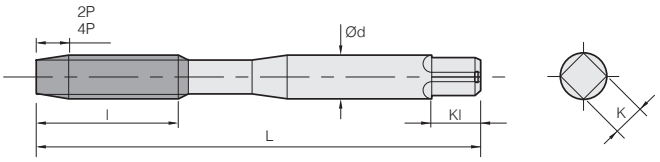
※ Ideal for making blind holes. Its flutes provide excellent chip evacuation in tapping carbon steel, alloy steel and non-ferrous materials
※ Wear resistance highly improved by the use of TiN, TiCN, Steam oxide coating for high efficiency tapping operations
※ Built-up edges are prevented thanks to a reduced coefficient of friction gained by using porous cutting fluid of Fe^3O^4
※ Ideal for tapping stainless steel, cast steel, carbon steel for machine structures, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T		○		◎								○	○	○	○	○	○	○	○	○				○
HC20T	○	○	○	○				○	○	○		○	○	○	○	○	○	○	○	○	○			○
HC10T	○	◎	◎	○				○	○	○		○	○	○	○	○	○	◎	○	○	○	○		○
HH30T	◎	◎	◎	◎	◎	◎	◎	○	○	○	○	○												

RT Roll Tap





HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T

(mm)

Flutes	Designation		Thread size	L	l	d	K	Kl	Limits
	2P	4P							
1	**M3X0.5-RT20(S)**	-	M3X0.5	46	11	4.0	3.2	6	GH5
4	**M3X0.5-RT20(M)**	**M3X0.5-RT40(M)**	M3X0.5	46	11	4.0	3.2	6	GH5
1	**M4X0.7-RT20(S)**	-	M4X0.7	52	13	5.0	4.0	7	GH6
4	**M4X0.7-RT20(M)**	**M4X0.7-RT40(M)**	M4X0.7	52	13	5.0	4.0	7	GH6
1	**M5X0.8-RT20(S)**	-	M5X0.8	60	16	5.5	4.5	7	GH6
4	**M5X0.8-RT20(M)**	**M5X0.8-RT40(M)**	M5X0.8	60	16	5.5	4.5	7	GH6
1	**M6X1.0-RT20(S)**	-	M6X1.0	62	19	6.0	4.5	7	GH7
4	**M6X1.0-RT20(M)**	**M6X1.0-RT40(M)**	M6X1.0	62	19	6.0	4.5	7	GH7
1	**M8X1.25-RT20(S)**	-	M8X1.25	70	22	6.2	5.0	8	GH7
4	**M8X1.25-RT20(M)**	**M8X1.25-RT40(M)**	M8X1.25	70	22	6.2	5.0	8	GH7
1	**M10X1.25-RT20(S)**	-	M10X1.25	75	24	7.0	5.5	8	GH7
4	**M10X1.25-RT20(M)**	**M10X1.25-RT40(M)**	M10X1.25	75	24	7.0	5.5	8	GH7
1	**M10X1.5-RT20(S)**	-	M10X1.5	75	24	7.0	5.5	8	GH7
4	**M10X1.5-RT20(M)**	**M10X1.5-RT40(M)**	M10X1.5	75	24	7.0	5.5	8	GH7
1	**M12X1.0-RT20(S)**	-	M12X1.0	82	29	8.5	6.5	9	GH7
4	**M12X1.0-RT20(M)**	**M12X1.0-RT40(M)**	M12X1.0	82	29	8.5	6.5	9	GH7
1	**M12X1.25-RT20(S)**	-	M12X1.25	82	29	8.5	6.5	9	GH7
4	**M12X1.25-RT20(M)**	**M12X1.25-RT40(M)**	M12X1.25	82	29	8.5	6.5	9	GH7
1	**M12X1.5-RT20(S)**	-	M12X1.5	82	29	8.5	6.5	9	GH7
4	**M12X1.5-RT20(M)**	**M12X1.5-RT40(M)**	M12X1.5	82	29	8.5	6.5	9	GH7
1	**M12X1.75-RT20(S)**	-	M12X1.75	82	29	8.5	6.5	9	GH8
4	**M12X1.75-RT20(M)**	**M12X1.75-RT40(M)**	M12X1.75	82	29	8.5	6.5	9	GH8

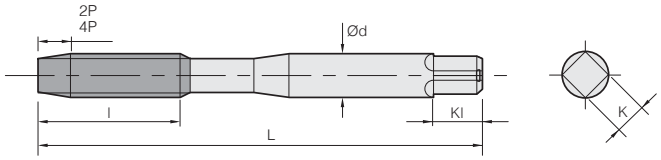
※ For general use for both steels and non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN coating for high efficiency tapping operations
※ Ideal for tapping non-ferrous alloys such as aluminum, zinc, copper, etc

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium -cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T													○	○	○	○	○	○		◎				
HC20T	○	○	○	○				◎	○	○		○	○	○	○									
HC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

SR Spiral Roll Tap





HSSE | Uncoated HN30T | TiN HC20T | TiCN HC10T

(mm)

Designation		Thread size	L	l	d	K	Kl	Limits
2P	4P							
M3X0.5-SR20	M3X0.5-SR40	M3X0.5	46	18	4.0	3.2	6	GH6
M3.5X0.6-SR20	M3.5X0.6-SR40	M3.5X0.6	48	18	4.0	3.2	6	GH6
M4X0.7-SR20	M4X0.7-SR40	M4X0.7	52	20	5.0	4.0	7	GH7
M5X0.8-SR20	M5X0.8-SR40	M5X0.8	60	22	5.5	4.5	7	GH7
M6X1.0-SR20	M6X1.0-SR40	M6X1.0	62	24	6.0	4.5	7	GH7

※ For general use for tapping aluminum, magnesium and zinc as well as non-ferrous metal
※ Wear resistance highly improved by the use of TiN, TiCN coating for high efficiency tapping operations
※ Ideal for tapping steel, non-ferrous materials and stainless steel

Applicable workpiece range

Division	Carbon steel			Alloy steel	Quenched and tempered steel			Stain-less steel	Tool steel	Cast steel	Cast iron	Ductile cast iron	Copper	Brass	Brass-cast	Bronze	Rolled aluminum	Aluminum-cast, alloyed	Magnesium-cast, alloyed	Zinc-cast, alloyed	Titanium alloy		Thermo-setting plastics	Thermo-plastics
	C ~0.25%	C0.25% ~0.45%	C 0.45%~	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	GC	GCD	Cu	Bs	BsC	PB	Al	AC ADC	MC	ZDC	Ti	Ni	-	-
HN30T													○	○	○	○	○	○		◎				
HC20T	○	○	○	○				◎	○	○		○	○	○	○									
HC10T	◎	◎	○	○				◎					◎	◎	◎		◎	◎		◎				

Milling Insert

E02 Milling Insert Code System (ISO)
E04 Milling Inserts
E32 KORLOY Cutters
E38 KORLOY Shanks
E41 KORLOY Modular Adaptors

Face Milling Cutters

E42 Mill-max/Mill-max Plus (E43, E49)
E52 Technical Information for Mill-max Heavy
E53 Mill-max Heavy
E54 Turbo Mill
E57 Double Mill
E59 Technical Information for Power Buster
E63 Power Buster
E66 Technical Information for Rich Mill
E86 Rich Mill
E128 Technical Information for Aero Mill/ Aero Mill-Plus/Aero Mill-Mini
E132 Aero Mill
E133 Aero Mill-Plus
E135 Aero Mill-Mini
E137 PCD Face Cutter

Cutters for Molds

E138 Technical Information for Alpha Mill
E143 Alpha Mill
E172 Technical Information for BT/HSK Tooling System
E173 BT Tooling System (Single-edge)
E178 HSK Tooling System (Single-edge)
E183 BT Tooling System (Multi-edge)
E189 HSK Tooling System (Multi-edge)
E194 BT Tooling System (Modular)
E195 HSK Tooling System (Modular)
E196 Technical Information for Future Mill/FMR P-Positive
E211 Future Mill
E237 FMR P-Positive
E249 Technical Information for HFM
E254 HFM
E257 Technical Information for HRMDouble
E262 HRMDouble
E273 HRM
E280 Tank Mill
E281 Technical Information for TP2P
E284 TP2P
E286 Technical Information for Laser Mill/GBE/BRE
E295 Laser Mill



Cutters for Molds

E300 BFE
E301 GBE
E304 BRE
E306 Technical Information for HAVE
E308 HAVE (Single-edge/Multi-edge)
E310 O-ring Cutter
E312 Chamfer Tool (Multi-functional, Solid)
E320 T-Cutter (TFE)

Milling Cutters for Aluminum

E321 Technical Information for Pro-A Mill/ Pro-X Mill/Pro-L Mill/Pro-XL Mill
E328 Pro-A Mill
E331 Pro-X Mill
E337 Pro-L Mill
E341 Pro-XL Mill
E342 Modular Adaptor (MAT)

Side Milling Cutters

E344 Technical Information for Side Milling Cutters
E346 Side Milling Cutter
E350 Side Cutter
E353 Wind Mill

Milling Cutter for Cast iron at high feed

E357 Technical Information for High feed Cutter
E359 Technical Information for Cube Mill
E360 Technical Information for Couple Mill
E362 Technical Information for Storm Mill
E363 Technical Information for Shave Mill
E365 Technical Information for Shave Mill-Ultra
E366 High feed Cutter
E368 Shave Mill
E369 Shave Mill-Ultra

Detail Information of Milling Cutter and Arbor

E371 Actual Designations of Milling Cutter and Arbor

Gear Tools

E374 Technical Information for Gear Cutter Tools
E375 Gear Cutter Table
E376 Gear Cutter
E384 Gear Cutter Order Form
E385 Indexable HOB
E386 Indexable HOB Order Form
E387 Special Boring Tool Order Form

MILLING

Milling tools that provide the best quality and improve productivity for every customer needs.

E

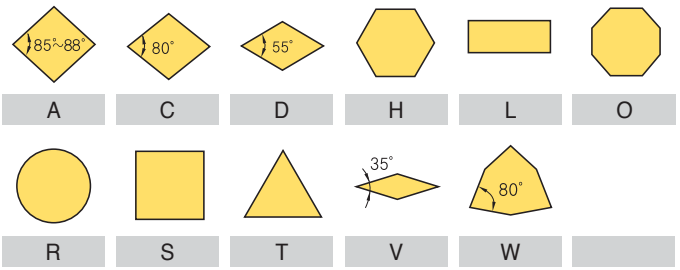


S P K R 12

1 Insert shape | 2 Relief angle | 3 Tolerance | 4 Cross section type | 5 Cutting-edge length, diameter of inscribed circle

1 Insert shape

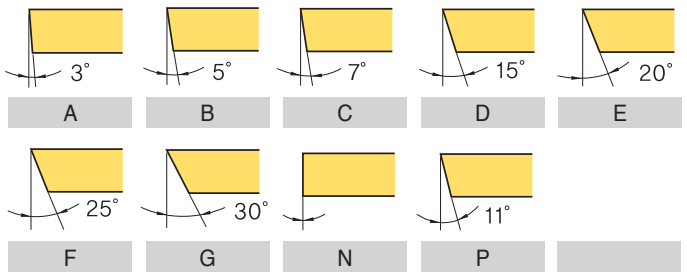
S P K R 12 03 ED 08 S R - MX



A	C	D	H	L	O
R	S	T	V	W	

2 Relief angle

S P K R 12 03 ED 08 S R - MX

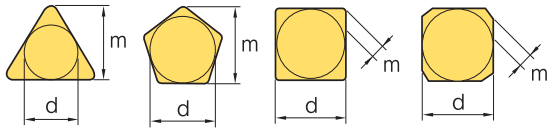


A	B	C	D	E
F	G	N	P	

3 Tolerance

S P K R 12 03 ED 08 S R - MX

d: Inscribed circle
t: Thickness
m: Refer to figure



(mm)

Class	d	m	t
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J	±0.05~±0.15	±0.005	±0.025
K	±0.05~±0.15	±0.013	±0.025
L	±0.05~±0.15	±0.025	±0.025
M	±0.05~±0.15	±0.08~±0.20	±0.13
U	±0.08~±0.25	±0.13~±0.38	±0.13

■ Tolerance on C,E,H,M,O,P,R,S,T,W Insert Shape (exceptional case)

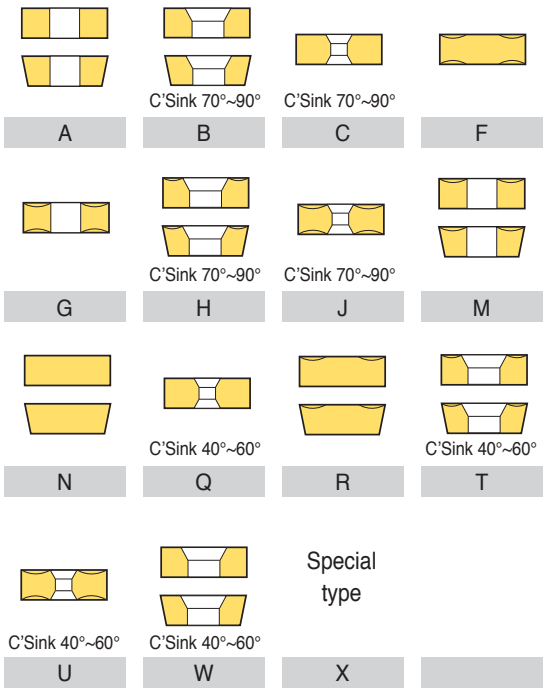
d	Tolerance on d		Tolerance on m	
	J,K,L,M,N	U	M,N	U
6.35	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

Tolerance on D Insert Shape (exceptional case)

d	Tolerance on d	Tolerance on m
6.35	±0.05	±0.11
9.525	±0.05	±0.11
12.7	±0.08	±0.15
15.875	±0.10	±0.18
19.05	±0.10	±0.18

4 Cross section type

S P K R 12 03 ED 08 S R - MX

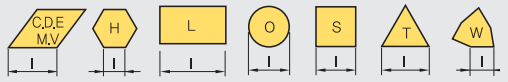


A	B	C	F
G	H	J	M
N	Q	R	T
U	W	X	

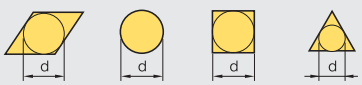
5 Cutting-edge length, diameter of inscribed circle

S P K R 12 03 ED 08 S R - MX

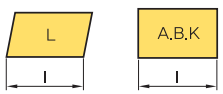
■ Metric system ※Decimal integer constant



■ Inch system



· Use 1/32″ unit for a insert having smaller I.C under 1/4″
· Use 1/8″ unit for a insert having larger I.C over 1/4″



※ In case of rectangular and rhombic insert indicate cutting-edge length instead of inscribed circle.

■ **Cross over chart for "Metric" and "Inch" system**

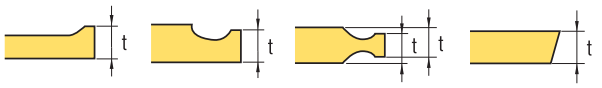
	06	09	11	16	22	27	33	44
	03	05	06	09	12	15	19	25
55°	04	06	07	11	15	19	23	31
80°	03	05	06	09	12	16	19	25
Inscribed circle	5/32″	7/32″	1/4″	3/8″	1/2″	5/8″	3/4″	1″
Inch system	5	7	2 (8)	3	4	5	6	8

03 ED 08 S R - MX

6	7	8	9	10
Height of cutting-edge	Nose radius (Nose R)	Edge preparation	Hand	Chip breaker for milling

6 Height of cutting-edge

S P K R 12 **03** ED 08 S R - MX

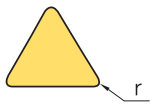


Symbol		Height of cutting-edge (t)	
Metric	Inch	mm	Inch
01	1 (2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5 (3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8 (16)	12.70	1/2

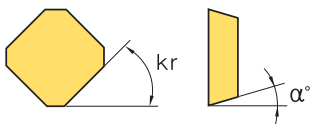
( ) Symbol for small size insert

7 Nose radius (Nose R)

S P K R 12 03 **ED 08** S R - MX



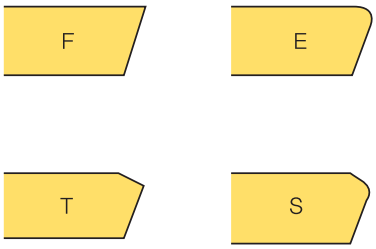
r		Symbol		r		Symbol	
mm	Inch	mm	Inch	mm	Inch	mm	Inch
00	0	0.0		12	3	1.2	3/64
02		0.2		15		1.5	
04	1	0.4	1/64	16	4	1.6	4/64
05		0.5		24	6	2.4	6/64
08	2	0.8	2/64	32	8	3.2	8/64
10		1.0		40		4.0	



Parallel land	Relief angle	
kr	α°	
A - 45°	A - 3°	F - 25°
D - 60°	B - 5°	G - 30°
E - 75°	C - 7°	N - 0°
F - 85°	D - 15°	P - 11°
P - 90°	E - 20°	
Z - Special		

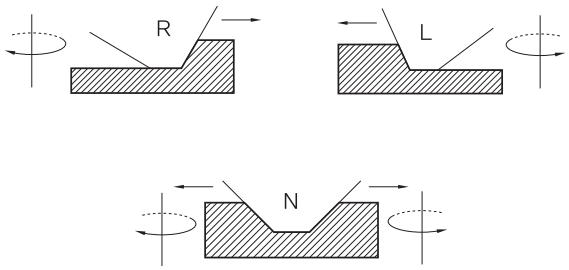
8 Edge preparation

S P K R 12 03 ED 08 **S** R - MX



9 Hand

S P K R 12 03 ED 08 S **R** - MX

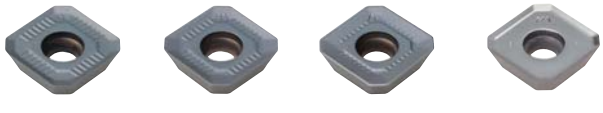


10 Chip breaker for milling

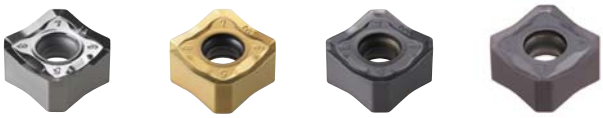
S P K R 12 03 ED 08 S R - **MX**



MA MF MM MX



MF MM MR MA



MA MF MM ML

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

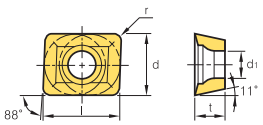
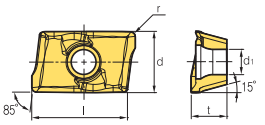
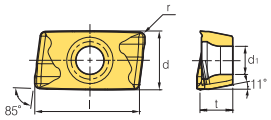
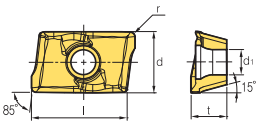
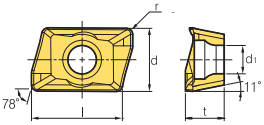
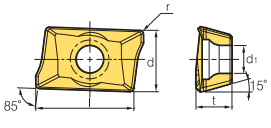
Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	G10	H01	l	d	t	r	d_1		
ADKA	150308R																	15.0	9.525	3.18	0.8	4.5		-
	150308SR																	15.0	9.525	3.18	0.8	4.5		
	150308TR		●															15.0	9.525	3.18	0.8	4.5		
ADLT	150308R			●									●					15.0	9.525	3.18	0.8	4.5		E280
	150308SR								●									15.0	9.525	3.18	0.8	4.5		
	150308TR																	15.0	9.525	3.18	0.8	4.5		
APKT	1604PDSR			●					●			●						16.4	9.525	4.76	0.8	4.4		E147 E159
APKT-MA	1604PDFR-MA														●		●	16.4	9.525	4.76	0.2	4.4		E147 E159
	160416FR-MA																●	16.4	9.525	4.76	1.6	4.4		
APKT-MA2	1604PDFR-MA2																●	16.5	9.56	5.76	0.8	4.5		E147 E159
	160416FR-MA2																	16.5	9.56	5.76	1.6	4.5		
	160432FR-MA2																	16.5	9.56	5.76	3.2	4.5		
APKT-MA3	1604PDFR-MA3															●	●	16.4	9.525	5.0	0.8	4.4		E147 E159
	160420FR-MA3																	16.0	9.525	5.0	2.0	4.4		
APKT-MF	1604PDSR-MF			●									●					16.4	9.525	5.0	0.8	4.4		E147 E159 E168
APKT-MM	1604PDSR-MM			●	●				●			●	●	●				16.4	9.525	5.2	0.8	4.4		E147 E159 E168
APKT-MM1	160432R-MM1																	16.4	9.525	4.76	3.2	4.4		E147 E159

●: Stock item

Workpiece			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01
	Steel	P	●	⬬	⬬	●	✱	✱	●	⬬	⬬	⬬			✱	✱		
	Stainless steel	M			⬬								✱		✱	✱		
	Cast iron	K				⬬			⬬	⬬				●	✱	✱	⬬	●
	Non-ferrous metal	N																⬬
	Heat resistant alloy, Titanium alloy	S													✱	✱		
	Hardened steel	H							●	⬬					⬬	✱		

Machining types

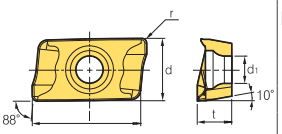
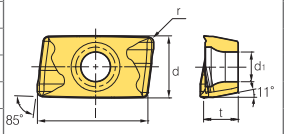
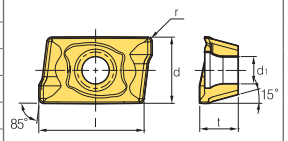
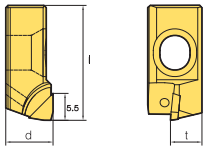
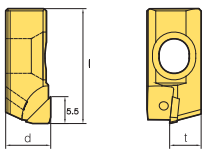
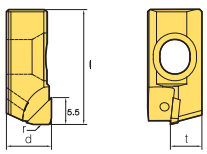
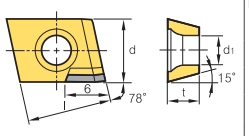
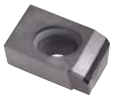
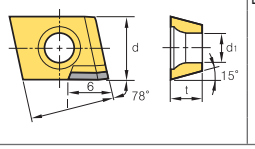
● Continuous cutting
⬬ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	l	d	t	r	d_1		
APLT 	070304R													●				7.5	6.35	3.18	0.4	2.8		E280
APMT-MA 	0602PDFR-MA																●	6	4.24	2.6	0.4	2.0		E143~E146
	060208PDFR-MA																	6	4.24	2.6	0.8	2.0		E148
	0903PDFR-MA																●	9.4	6.21	3.6	0.4	2.8		E151~E158
	090308PDFR-MA																	9.4	6.21	3.6	0.8	2.8		E160~E161
	11T3PDFR-MA																●	11.2	6.467	3.6	0.5	2.9		E164~E171
	11T308PDFR-MA																	11.2	6.467	3.6	0.8	2.9		E173~E187
	160404PDFR-MA																	16.4	9.41	5.76	0.4	4.5		E189~E193
	1604PDFR-MA																●	16.4	9.41	5.76	0.8	4.5		
	180604PDFR-MA																●	17.4	10.98	6.35	0.4	4.5		
	1806PDFR-MA																●	17.4	10.98	6.35	0.8	4.5		
	180612PDFR-MA																●	17.4	10.98	6.35	1.2	4.5		
	180616PDFR-MA																●	17.4	10.98	6.35	1.6	4.5		
	180620PDFR-MA																●	17.4	10.98	6.35	2.0	4.5		
	180624PDFR-MA																●	17.4	10.98	6.35	2.4	4.5		
	180630R-MA																●	17.4	10.98	6.35	3.0	4.5		
APMT-MF 	11T3PDSR-MF				●					●	●		●	●	●			11.2	6.467	3.6	0.5	2.9		E145~E146
	1604PDSR-MF				●					●	●		●	●	●			16.4	9.41	5.76	0.8	4.5		E148~E153
	1806PDSR-MF				●						●		●	●	●			17.4	10.98	6.35	0.8	4.5		E157~E158
	180612PDSR-MF																	17.4	10.98	6.35	1.2	4.5		E160~E163
																								E165~E166
																								E168
																								E171
																								E175~E177
																								E180~E182
																								E185
																								E187
																								E191~E193
APMT-ML 	0903PDER-ML													●	●			9.4	6.21	3.6	0.4	2.8		E144~E146
	090308PDER-ML													●	●			9.4	6.21	3.6	0.8	2.8		E148
	11T3PDER-ML													●	●			11.2	6.467	3.6	0.5	2.9		E151~E153
	11T308PDER-ML													●	●			11.2	6.467	3.6	0.8	2.9		E155~E158
	160404PDER-ML													●	●			16.4	9.41	5.76	0.4	4.5		E160~E161
	1604PDER-ML													●	●			16.4	9.41	5.76	0.8	4.5		E164~E168
	180604PDER-ML													●	●			17.4	10.98	6.35	0.4	4.5		E170~E171
	1806PDER-ML													●	●			17.4	10.98	6.35	0.8	4.5		E174~E177
	180612PDER-ML													●	●			17.4	10.98	6.35	1.2	4.5		E179~E182
	180616PDER-ML													●	●			17.4	10.98	6.35	1.6	4.5		E184~E187
	180620PDER-ML													●	●			17.4	10.98	6.35	2.0	4.5		E190~E193
	180624PDER-ML													●	●			17.4	10.98	6.35	2.4	4.5		
	180630R-ML													●	●			17.4	10.98	6.35	3.0	4.5		
APMT-MM 	060202PDSR-MM				●					●				●	●			6	4.24	2.6	0.2	2.0		E143~E146
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			6	4.24	2.6	0.4	2.0		E148~E158
	060208PDSR-MM				●					●	●			●	●			6	4.24	2.6	0.8	2.0		E160~E171
	060212R-MM *				●						●			●	●			6	4.24	2.6	1.2	2.0		E173~E188
	060216R-MM										●			●	●			6	4.24	2.6	1.6	2.0		E189~E193
	0903PDSR-MM				●			●	●	●	●		●	●	●			9.4	6.21	3.6	0.4	2.8		
	090308PDSR-MM				●					●	●			●	●			9.4	6.21	3.6	0.8	2.8		
	090312R-MM										●			●	●			9.4	6.21	3.6	1.2	2.8		
	090316R-MM				●					●	●			●	●			9.4	6.21	3.6	1.6	2.8		
	090320R-MM									●	●			●	●			9.2	6.21	3.6	2.0	2.8		
	090331R-MM *																	9.2	6.21	3.6	3.1	2.8		
	090332R-MM *										●			●	●			9.2	6.21	3.6	3.2	2.8		

●: Stock item

Inserts marked with an asterisk (*) require a custom-made order for special holders.

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated											PCD		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	DP150	DP200	l	d	t	r	d_1	
APMT-MM 	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			11.2	6.467	3.6	0.5	2.85		E143~E171 E173~E193
	11T308PDSR-MM				●					●	●	●		●	●			11.2	6.467	3.6	0.8	2.85		
	11T312PDSR-MM				●					●	●	●		●	●			11.2	6.467	3.6	1.2	2.85		
	11T316R-MM				●					●	●			●	●			11.0	6.467	3.6	1.6	2.85		
	11T318R-MM																	11.0	6.467	3.6	1.8	2.85		
	11T324R-MM				●					●	●			●	●			11.0	6.467	3.6	2.4	2.85		
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			16.4	9.41	5.76	0.8	4.5		
	160410PDSR-MM										●			●	●			16.4	9.41	5.76	1.0	4.5		
	160416PDSR-MM				●					●	●			●	●			16.4	9.41	5.76	1.6	4.5		
	160424R-MM				●					●	●			●	●			16	9.41	5.76	2.4	4.5		
	160430R-MM										●			●	●			16	9.41	5.76	3.0	4.5		
	160432R-MM				●					●	●			●	●			16	9.41	5.76	3.2	4.5		
	160450R-MM *										●			●	●			16	9.41	5.76	5.0	4.5		
	160464R-MM *										●			●	●			16	9.41	5.76	6.4	4.5		
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			17.4	10.98	6.35	0.8	4.5		
	180612PDSR-MM				●					●	●			●	●			17.4	10.98	6.35	1.2	4.5		
	180616PDSR-MM				●						●			●	●			17.4	10.98	6.35	1.6	4.5		
	180620PDSR-MM																	17.4	10.98	6.35	2.0	4.5		
	180624PDSR-MM				●						●			●	●			17.4	10.98	6.35	2.4	4.5		
	180630R-MM										●			●	●			16.7	10.98	6.35	3.0	4.5		
	180632R-MM *				●						●			●	●			16.7	10.98	6.35	3.2	4.5		
	180640R-MM *										●			●	●			16.7	10.98	6.35	4.0	4.5		
	180648R-MM *										●			●	●			16.7	10.98	6.35	4.8	4.5		
	180650R-MM *										●			●	●			16.7	10.98	6.35	5.0	4.5		
	180660R-MM *																	16.7	10.98	6.35	6.0	4.5		
	180664R-MM										●			●	●			16.7	10.98	6.35	6.4	4.5		
BAMPR-XAF 	BAMPR-XAF															●		25.5	10.5	7	-	-		E133~E134
BAMPR-XAW 	BAMPR-XAW															●		25.5	10	7	-	-		E133~E134
BAMPR-XAWR 	BAMPR-XAWR																	25.5	10	7	-	-		E133~E134
CDEW-NAF  strengthened Edge	1204R-NAF															●		12.7	9.525	4.76	-	4.4		E132
	1204L-NAF																	12.7	9.525	4.76	-	4.4		
CDEW-NAW  strengthened Edge Wiper Insert	1204R-NAW															●		12.7	9.525	4.76	-	4.4		E132
	1204L-NAW																	12.7	9.525	4.76	-	4.4		

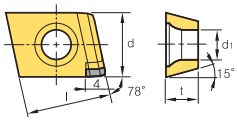
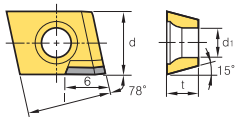
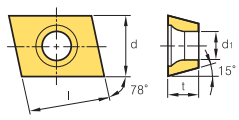
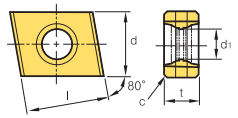
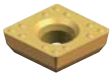
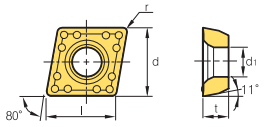
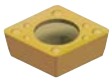
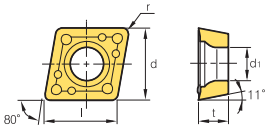
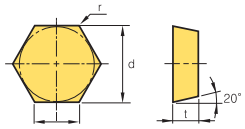
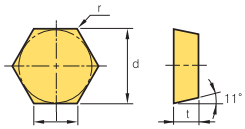
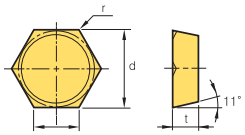
Inserts marked with an asterisk (*) require a custom-made order for special holders.

●: Stock item

Workpiece																				
	Steel	P	●	⬬	●	✱	✱	●	⬬	⬬	⬬			✱	✱					
	Stainless steel	M										✱		✱	✱					
	Cast iron	K		⬬				⬬	⬬				●	✱	✱	●				
	Non-ferrous metal	N														⬬	●	●		
	Heat resistant alloy, Titanium alloy	S												✱	✱					
	Hardened steel	H						●	⬬					✱	✱					

Machining types

● Continuous cutting
⬬ General cutting
✱ Interrupted cutting

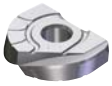
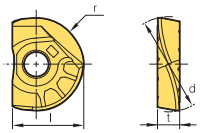
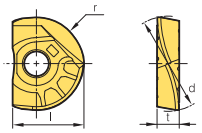
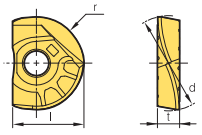
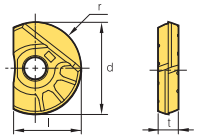
Inserts	Designation	Cermet		Coated											Uncoated	PCD		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200	l	d	t	r	d_1		
CDEW-XAW  Sharp Edge Wiper Insert	1204R-XAW																●	12.7	9.525	4.76	-	4.4		E132
	1204L-XAW																	12.7	9.525	4.76	-	4.4		
CDEW-XAF  Sharp Edge	1204R-XAF																●	12.7	9.525	4.76	-	4.4		E132
	1204L-XAF																	12.7	9.525	4.76	-	4.4		
CDEW-XCF  Sharp Edge	1204R-XCF														●			12.7	9.525	4.76	-	4.4		E132
	1204L-XCF																	12.7	9.525	4.76	-	4.4		
CNHQ 	1005-C0.5																	10	10	5.4	-	4.7		E346 E347
	1305-C0.5																	12.7	10	5.4	-	4.7		
	1606-C0.5																	16	12	6.4	-	5.9		
CPMH 	120408-MM							●										12.9	12.7	4.76	0.8	5.5		E320
CPMT 	060204-MM							●										6.4	6.35	2.38	0.4	2.75		E320
	080308-MM							●										8.1	7.938	3.40	0.8	3.18		
	09T308-MM							●										9.7	9.525	3.97	0.8	4.4		
HECN 	090408FN																	9.0	15.875	4.76	0.8	-		E358
	090408SN																	9.0	15.875	4.76	0.8	-		
	090408TN																	9.0	15.875	4.76	0.8	-		
	110412FN																	11.0	19.05	4.76	1.2	-		
	110412TN																	11.0	19.05	4.76	1.2	-		
HPEN 	090408FN																	9.0	15.875	4.76	0.8	-		E358
	090408SN																	9.0	15.875	4.76	0.8	-		
	090408EN																	9.0	15.875	4.76	0.8	-		
	110412FN																	11.0	19.05	4.76	1.2	-		
HPEN-WC 	090408-WC																	9.0	15.875	4.76	0.8	-		E358
	110412-WC																	11.0	19.05	4.76	1.2	-		

●: Stock item

Workpiece			CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01
	Steel	P	●	⬬	●	⬬	✱	✱	●	⬬	⬬	⬬			✱	✱		
	Stainless steel	M				●	⬬	⬬					✱		✱	✱		
	Cast iron	K			●	⬬	✱	✱	⬬	⬬				●	✱	✱	⬬	●
	Non-ferrous metal	N					●	●										⬬
	Heat resistant alloy, Titanium alloy	S					●	●							✱	✱		
	Hardened steel	H			●	⬬	✱	✱	●	⬬					✱	✱		

Machining types

● Continuous cutting
⬬ General cutting
✱ Interrupted cutting

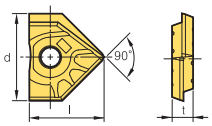
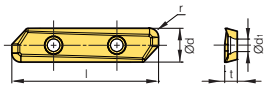
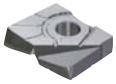
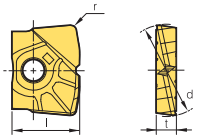
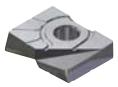
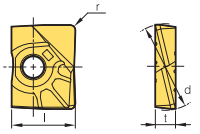
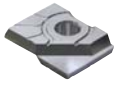
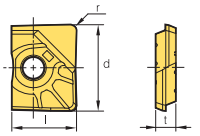
Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	l	d	t	r	d_1		
LBH 	080						●											7.0	8	2.4	4	-		E296~ E299
	100						●											8.5	10	2.6	5	-		
	120						●											10.0	12	3	6	-		
	160						●											12.0	16	4	8	-		
	200						●											15.0	20	5	10	-		
	250						●											18.5	25	6	12.5	-		
	300						●											22.5	30	7	15	-		
	320						●											23.5	32	7	16	-		
LBH-KF new 	080-KF																	7.0	8	2.4	4			E295 E296
	100-KF					●												8.5	10	2.6	5			
	120-KF					●												10.0	12	3	6			
	130-KF					●												20.5	13	3	6.5			
	160-KF					●												12.0	16	4	8			
	170-KF					●												12.5	17	4	8.5			
	200-KF					●												15.0	20	5	10			
	210-KF					●												15.5	21	5	10.5			
	250-KF					●												18.5	25	6	12.5			
	300-KF					●												22.5	30	7	15			
	320-KF																	23.5	32	7	16			
LBH-KH new 	080-KH				●													7.0	8	2.4	4			E295 E296
	100-KH			●	●													8.5	10	2.6	5			
	120-KH			●	●													10.0	12	3	6			
	130-KH				●													20.5	13	3	6.5			
	160-KH			●	●													12.0	16	4	8			
	170-KH			●	●													12.5	17	4	8.5			
	200-KH			●	●													15.0	20	5	10			
	210-KH				●													15.5	21	5	10.5			
	250-KH			●	●													18.5	25	6	12.5			
	260-KH				●													19.0	26	6	13			
	300-KH			●	●													22.5	30	7	15			
	320-KH				●													23.5	32	7	16			
LBS 	080																	18.5	25	6	12.5	-		E296~ E299
	090																	19.0	26	6	13	-		
	100																	22.5	30	7	15	-		
	110																	23.0	31	7	15.5	-		
	120																	23.5	32	7	16	-		
	130																	7.0	8	2.4	4	-		
	160																	7.5	9	2.4	4.5	-		
	170																	8.5	10	2.6	5	-		
	200																	9.0	11	2.6	5.5	-		
	210																	10.0	12	3	6	-		
	250																	10.5	13	3	6.5	-		
	260																	12.0	16	4	8	-		
	300																	12.5	17	4	8.5	-		
	310																	15.0	20	5	10	-		
	320																	15.5	21	5	10.5	-		

●: Stock item

Workpiece			CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01
	Steel	P	●	⬬	●	⬬	✱	✱	●	⬬	⬬	⬬			✱	✱		
	Stainless steel	M				●	⬬	⬬					✱		✱	✱		
	Cast iron	K			●	⬬	✱	✱	⬬	⬬				●	✱	✱	⬬	●
	Non-ferrous metal	N					●	●										⬬
	Heat resistant alloy, Titanium alloy	S					●	●							✱	✱		
	Hardened steel	H			●	⬬	✱	✱	●	⬬					⬬	✱		

Machining types

● Continuous cutting
⬬ General cutting
✱ Interrupted cutting

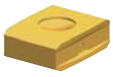
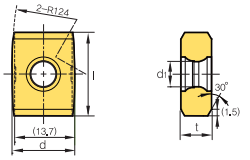
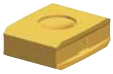
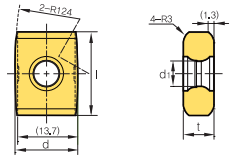
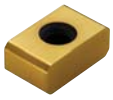
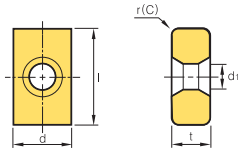
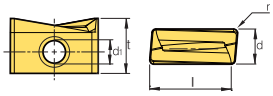
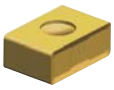
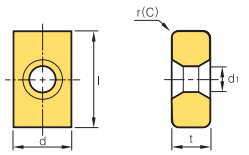
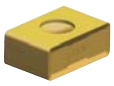
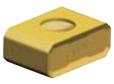
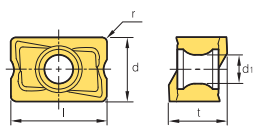
Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	PC2005	PC2010	PC2015	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	l	d	t	r	d_1		
LCF 	160-D90						●											13.7	16	4	-	-		E296~ E299
	200-D90						●											17.0	20	5	-	-		
	250-D90																	21.5	25	6	-	-		
LDET 	650540PPFR-MA																	65	15	5.625	4.0	5.56		E341
	650550PPFR-MA																	65	15	5.625	5.0	5.56		
LFH 	100																	8.5	10	2.6	1.0	-		E296~ E299
	120						●											10.0	12	3	1.0	-		
	160						●											12.0	16	4	1.5	-		
	200																	15.0	20	5	1.5	-		
	250																	18.5	25	6	2.0	-		
	300																	22.5	30	7	2.0	-		
	320																	23.5	32	7	2.0	-		
LRH 	100-R05						●											8.5	10	2.6	0.5	-	 LRH type	E296~ E299
	100-R10						●											8.5	10	2.6	1.0	-		
	100-R20																	8.5	10	2.6	2.0	-		
	110-R05																	9.0	11	2.6	0.5	-		
	120-R05						●											10.0	12	3	0.5	-		
	120-R10						●											10.0	12	3	1.0	-		
	120-R20																	10.0	12	3	2.0	-		
	130-R05																	10.5	13	3	0.5	-		
	160-R05						●											12.0	16	4	0.5	-		
	160-R10						●											12.0	16	4	1.0	-		
	160-R20																	12.0	16	4	2.0	-		
	160-R30						●											12.0	16	4	3.0	-		
	170-R05																	12.5	17	4	0.5	-		
	200-R05						●											15.0	20	5	0.5	-		
	200-R10						●											15.0	20	5	1.0	-		
	200-R20						●											15.0	20	5	2.0	-		
	200-R30						●											15.0	20	5	3.0	-		
LR  (Special type)	210-R05																	15.5	21	5	0.5	-	 LR type	
	250-R05																	18.5	25	6	0.5	-		
	250-R10						●											18.5	25	6	1.0	-		
	250-R20																	18.5	25	6	2.0	-		
	250-R30																	18.5	25	6	3.0	-		
	260-R05																	19.0	26	6	0.5	-		
	300-R10																	22.5	30	7	1.0	-		
	300-R20																	22.5	30	7	2.0	-		
	300-R30																	22.5	30	7	3.0	-		
	310-R05																	23.0	31	7	0.5	-		
	320-R10						●											23.5	32	7	1.0	-		
	320-R20						●											23.5	32	7	2.0	-		
	320-R30						●											23.5	32	7	3.0	-		

●: Stock item

Workpiece		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
Steel	P	●	⬍	●	✖	✖	●	⬍	⬍	⬍			✖	✖	⬍		
Stainless steel	M										✖		✖	✖			
Cast iron	K			⬍			⬍	⬍				●	✖	✖		⬍	●
Non-ferrous metal	N																⬍
Heat resistant alloy, Titanium alloy	S												✖	✖			
Hardened steel	H						●	⬍					⬍	✖			

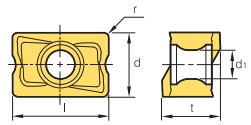
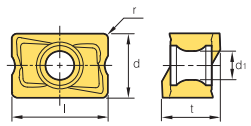
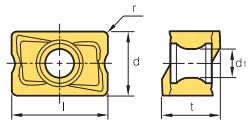
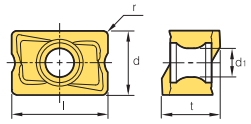
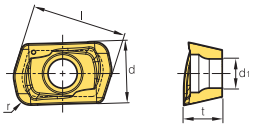
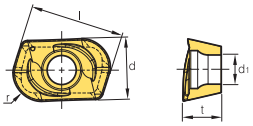
Machining types

● Continuous cutting
⬍ General cutting
✖ Interrupted cutting

Inserts	Designation	Cermet CN2000	Cermet CN30	Coated NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	Uncoated ST30A	G10	H01	Dimensions (mm) l	d	t	r	d1	Geometries	Available tools
LNCS 	1907-C1.5-WC																	19.05	14.3	7	-	5.8		E369 E370
LNCS 	1907-R3.0-WC																	19.05	14.3	7	-	5.8		E369 E370
LNE 	324-R0.8																	15.9	9.525	6.35	0.8	4.4		E376~ E380
	324-C1.0																	15.9	9.525	6.35	1.0	4.4		
LNKT  new	170708PNR-MM												●	●				16.5	7.0	11.0	0.8	4.5		E284 E285
	170708PNR-ML											●	●	●				16.5	7.0	11.0	0.8	4.5		
KEL-MF 	150608-MF																	15.88	15.23	6.35	0.8	-		E379
	150608-ML																	15.88	15.23	6.35	0.8	-		
KEL-QNN 	1506QNN-MF																	15.88	15.23	6.35	0.8	-		E362
	1506QNN-ML																	15.88	15.23	6.35	0.8	-		
KEL-ANN 	1506ANN-MF																	15.88	15.23	6.35	0.8	-		E362
	1506ANN-ML																	15.88	15.23	6.35	0.8	-		
LNM(E)X-MF 	LNMX 100605PNR-MF									●		●	●	●				10.0	6.5	6.5	0.5	3.5		E92 E93 E96 E97 E100~ E104
	100608PNR-MF									●		●	●	●				10.0	6.5	6.5	0.8	3.5		
	LNEX 100605PNR-MF											●	●	●				10.0	6.5	6.5	0.5	3.5		
	100608PNR-MF								●			●	●	●				10.0	6.5	6.5	0.8	3.5		

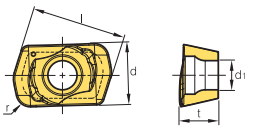
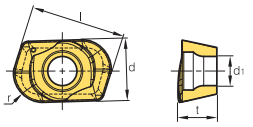
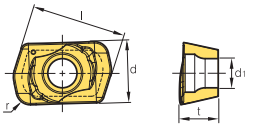
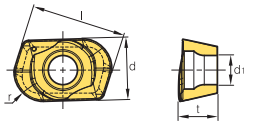
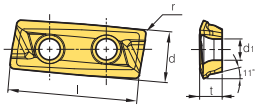
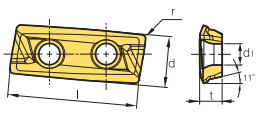
●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬬ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation		Cermet		Coated										Uncoated			Dimensions (mm)					Geometries	Available tools
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
LNM(E)X-MF	LNMX	151004PNR-MF									●		●	●	●				15.0	10.0	10.0	0.4	4.5		E92
		151008PNR-MF								●	●		●	●	●				15.0	10.0	10.0	0.8	4.5		E93
		151016PNR-MF									●		●	●	●				15.0	10.0	10.0	1.6	4.5		E96
	LNEX	151004PNR-MF											●	●	●				15.0	10.0	10.0	0.4	4.5		E97
		151008PNR-MF											●	●	●				15.0	10.0	10.0	0.8	4.5		E100~
		151016PNR-MF											●	●	●				15.0	10.0	10.0	1.6	4.5		E104
LNM(E)X-MM	LNMX	100605PNR-MM								●	●	●	●	●	●				10.0	6.5	6.5	0.5	3.5		E92~
		100608PNR-MM								●	●			●	●				10.0	6.5	6.5	0.8	3.5		E106
		100605PNL-MM								●	●		●	●	●				10.0	6.5	6.5	0.5	3.5		
	LNEX	100605PNR-MM								●			●	●	●				10.0	6.5	6.5	0.5	3.5		
		100608PNR-MM											●	●	●				10.0	6.5	6.5	0.8	3.5		
		100605PNL-MM											●	●	●				10.0	6.5	6.5	0.5	3.5		
LNM(E)X-MM	LNMX	151004PNR-MM									●		●		●				15.0	10.0	10.0	0.4	4.5		E92~
		151008PNR-MM								●	●	●	●	●	●				15.0	10.0	10.0	0.8	4.5		E106
		151016PNR-MM								●	●		●		●				15.0	10.0	10.0	1.6	4.5		
		151008PNL-MM									●			●	●				15.0	10.0	10.0	0.8	4.5		
	LNEX	151004PNR-MM											●	●	●				15.0	10.0	10.0	0.4	4.5		
		151008PNR-MM								●			●	●	●				15.0	10.0	10.0	0.8	4.5		
		151016PNR-MM											●	●	●				15.0	10.0	10.0	1.6	4.5		
		151008PNL-MM											●	●	●				15.0	10.0	10.0	0.8	4.5		
LNEX-MA	LNEX	100605PNR-MA																●	10.0	6.5	6.5	0.5	3.5		E92~E93
		151004PNR-MA																●	15.0	10.0	10.0	0.4	4.5		E96~E97
		151008PNR-MA																●	15.0	10.0	10.0	0.8	4.5		E100~
																									E104
LPMT-MF	LPMT	040210R-MF							●					●	●				6.4	4.2	2.6	1.0	2.0		E254~
																									E256
	LPMT	040220R-MF							●					●	●				6.4	4.2	2.6	2.0	2.0		E254~
																									E256

●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
LPMW	LPMW 040210R						●	●					●					6.4	4.2	2.6	1.0	2.0		E254~ E256
	LPMW 040220R						●	●					●					6.4	4.2	2.6	2.0	2.0		E254~ E256
LPEW	LPEW 040210R						●	●					●					6.4	4.2	2.6	1.0	2.0		E254~ E256
	LPEW 040220R						●	●					●					6.4	4.2	2.6	2.0	2.0		E254~ E256
LXET-MA	250404PEFR-32-MA																	25	10.775	4.76	0.4	4.5		E337~ E340
	2504PEFR-32-MA																●	25	10.775	4.76	0.8	4.5		
	250412PEFR-32-MA																	25	10.775	4.76	1.2	4.5		
	250416PEFR-32-MA																	25	10.775	4.76	1.6	4.5		
	250404PEFR-40-MA																	25	10.618	4.76	0.4	4.5		
	2504PEFR-40-MA																	25	10.618	4.76	0.8	4.5		
	250412PEFR-40-MA																	25	10.618	4.76	1.2	4.5		
	250416PEFR-40-MA																	25	10.618	4.76	1.6	4.5		
	340504PEFR-50-MA																	34	13.765	5.56	0.4	5.56		
	3405PEFR-50-MA																●	34	13.765	5.56	0.8	5.56		
	340512PEFR-50-MA																	34	13.765	5.56	1.2	5.56		
	340516PEFR-50-MA																	34	13.765	5.56	1.6	5.56		
	340504PEFR-63-MA																●	34	13.803	5.56	0.4	5.56		
	3405PEFR-63-MA																●	34	13.803	5.56	0.8	5.56		
	340512PEFR-63-MA																	34	13.803	5.56	1.2	5.56		
	340516PEFR-63-MA																	34	13.803	5.56	1.6	5.56		
LXET-ML	250404PEER-32-ML																	25	10.775	4.76	0.4	4.5		E337~ E340
	2504PEER-32-ML																	25	10.775	4.76	0.8	4.5		
	250412PEER-32-ML																	25	10.775	4.76	1.2	4.5		
	250416PEER-32-ML																	25	10.775	4.76	1.6	4.5		
	250404PEER-40-ML																	25	10.618	4.76	0.4	4.5		
	2504PEER-40-ML																	25	10.618	4.76	0.8	4.5		
	250412PEER-40-ML																	25	10.618	4.76	1.2	4.5		
	250416PEER-40-ML																	25	10.618	4.76	1.6	4.5		
	340504PEER-50-ML																	34	13.765	5.56	0.4	5.56		
	3405PEER-50-ML																	34	13.765	5.56	0.8	5.56		
	340512PEER-50-ML																	34	13.765	5.56	1.2	5.56		
	340516PEER-50-ML																	34	13.765	5.56	1.6	5.56		
	340504PEER-63-ML																	34	13.803	5.56	0.4	5.56		
	3405PEER-63-ML																	34	13.803	5.56	0.8	5.56		
	340512PEER-63-ML																	34	13.803	5.56	1.2	5.56		
	340516PEER-63-ML																	34	13.803	5.56	1.6	5.56		

●: Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5400	ST30A	H01
	Steel	P	●	⇄	⇄	✱	●	✱	✱	●	⇄	⇄	⇄	⇄		✱	⇄	
	Stainless steel	M			⇄	✱								✱		✱		
	Cast iron	K					⇄			⇄	⇄				●	✱		●
	Non-ferrous metal	N																⇄
	Heat resistant alloy, Titanium alloy	S														✱		
	Hardened steel	H								●	⇄					✱		

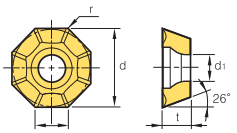
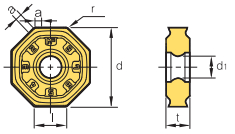
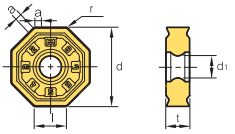
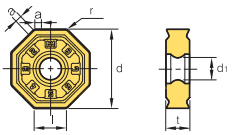
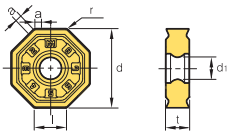
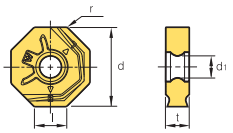
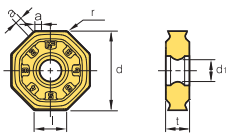
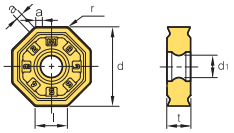
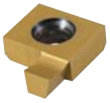
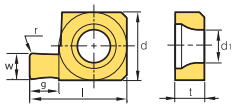
Machining types

● Continuous cutting
⇄ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5400	ST30A	H01	l	d	t	r	d_1		
MPMT	090308																	9.5	9.525	3.18	0.8	4.5		-
	120408										●							12.7	12.7	4.76	0.8	5.5		
OFCN	0704SN													●				7.4	18	4.86	0.5	-		E58
	0704FN																	7.4	18	4.86	0.5	-		
	070408SN																	7.4	18	4.86	0.8	-		
	070408FN																	7.4	18	4.86	0.8	-		
	070408TN																	7.4	18	4.86	0.8	-		
OFCW	05T3SN																	5.2	12.7	3.85	0.5	4.4		E57
	05T3FN																	5.2	12.7	3.85	0.5	4.4		
	05T308FN																	5.2	12.7	3.85	0.8	4.4		
OFKR-MA	0704FN-MA																●	7.4	18	4.76	0.5	-		E58
	0704EN-MA																	7.4	18	4.76	0.5	-		
OFKR-MF	0704SN-MF			●	●													7.4	18	4.76	0.5	-		E58
	070408SN-MF																	7.4	18	4.76	0.8	-		
OFKR-MM	0704SN-MM			●	●						●		●	●				7.4	18	4.76	0.5	-		E58
	070408SN-MM			●														7.4	18	4.76	0.8	-		
OFKT-MA	05T3FN-MA																●	5.2	12.7	3.97	0.5	4.4		E57
	05T3EN-MA																	5.2	12.7	3.97	0.5	4.4		E58
	0704FN-MA																●	7.4	18	4.76	0.5	5.8		
	0704EN-MA																	7.4	18	4.76	0.5	5.8		
OFKT-MF	05T3SN-MF													●				5.2	12.7	3.97	0.5	4.4		E57
	05T308SN-MF																	5.2	12.7	3.97	0.8	5.8		

●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (mm)								Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	l	d	t	r	d_1	a	W	g		
OFKT-MM 	05T3SN-MM			●						●		●						5.2	12.7	3.97	0.5	4.4	-	-	-		E57
	05T308SN-MM																	5.2	12.7	3.97	0.8	4.4	-	-	-		E58
	0704SN-MM																	7.4	18	4.76	0.5	5.5	-	-	-		
ONHX-MF 	060608-MF												●	●	●			6.6	16.0	6.0	0.8	5.6	-	-	-		E126
	080608-MF												●	●	●			8.4	20.2	6.0	0.8	5.6	-	-	-		E127
	0606ANN-MF												●	●	●			6.6	16.0	6.0	0.8	5.6	1.03	-	-		
	0806ANN-MF												●	●	●			8.4	20.2	6.0	0.8	5.6	1.53	-	-		
ONHX-ML 	060608-ML													●	●			6.6	16.0	6.0	0.8	5.6	-	-	-		E126
	080608-ML													●	●			8.4	20.2	6.0	0.8	5.6	-	-	-		E127
ONHX-MM 	060608-MM												●	●	●			6.6	16.0	6.0	0.8	5.6	-	-	-		E126
	080608-MM												●	●	●			8.4	20.2	6.0	0.8	5.6	-	-	-		E127
	0606ANN-MM												●	●	●			6.6	16.0	6.0	0.8	5.6	1.03	-	-		
	0806ANN-MM												●	●	●			8.4	20.2	6.0	0.8	5.6	1.53	-	-		
ONHX-MA 	060608-MA																●	6.6	16.0	6.0	0.8	5.6	-	-	-		E126
	080608-MA																●	8.4	20.2	6.0	0.8	5.6	-	-	-		E127
ONHX-W 	060608-W											●	●	●				6.5	16.0	6.0	0.8	5.6	-	-	-		E126
	080608-W												●	●				8.2	20.2	6.0	0.8	5.6	-	-	-		E127
ONMX-MF 	060608-MF										●		●	●	●			6.6	16.0	6.0	0.8	5.6	-	-	-		E126
	080608-MF										●		●	●	●			8.4	20.2	6.0	0.8	5.6	-	-	-		E127
	0606ANN-MF										●	●	●	●	●			6.6	16.0	6.0	0.8	5.6	1.03	-	-		
	0806ANN-MF										●		●	●	●			8.4	20.2	6.0	0.8	5.6	1.53	-	-		
ONMX-MM 	060608-MM									●	●		●	●	●			6.6	16.0	6.0	0.8	5.6	-	-	-		E126
	080608-MM									●	●	●	●	●	●			8.4	20.2	6.0	0.8	5.6	-	-	-		E127
	0606ANN-MM									●	●		●	●	●			6.6	16.0	6.0	0.8	5.6	1.03	-	-		
	0806ANN-MM									●	●	●	●	●	●			8.4	20.2	6.0	0.8	5.6	1.53	-	-		
ORG 	265																	10	7	3.0	0.3	3.5	-	2.65	2.8		E311
	325									●								10	7	3.0	0.3	3.5	-	3.25	2.8		
	405																	15	12	4.5	0.5	4.5	-	4.05	4.5		
	470									●								15	12	4.5	0.5	4.5	-	4.70	4.5		

●: Stock item

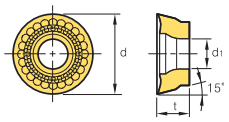
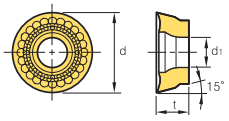
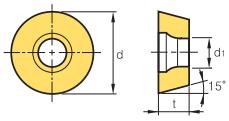
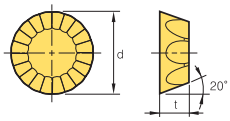
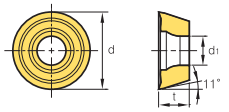
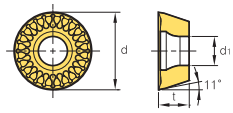
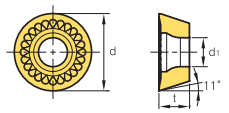
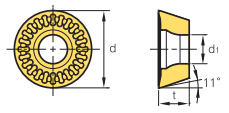
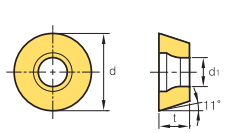
Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (mm)						Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC210F	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	l	d	t	r	d_1	Cutter width		
PNEJ	1223N									●								-	12.7	2.3	-	5.0	4.0		E350
	1225N																	-	12.7	2.5	-	5.0	4.5		E351
	1230N																	-	12.7	3.0	-	5.0	5.0		
	1235N									●				●				-	12.7	3.5	-	5.0	6.0		
	1240N									●				●				-	12.7	4.0	-	5.0	7.0		
	1245N									●				●				-	12.7	4.5	-	5.0	8.0		
	1250N																	-	12.7	5.0	-	5.0	9.0		
	1255N									●								-	12.7	5.5	-	5.0	10.0		
	1260N																	-	12.7	6.0	-	5.0	11.0		
	1265N													●				-	12.7	6.5	-	5.0	12.0		
	1270N																	-	12.7	7.0	-	5.0	13.0		
	1275N													●				-	12.7	7.5	-	5.0	14.0		
	1285N																	-	12.7	8.5	-	5.0	16.0		
PNEJ-C	1223N-C03																	-	12.7	2.3	-	5.0	4.0		E350
	1230N-C03																	-	12.7	3.0	-	5.0	5.0		E351
	1235N-C03																	-	12.7	3.5	-	5.0	6.0		
	1240N-C05																	-	12.7	4.0	-	5.0	7.0		
	1245N-C05																	-	12.7	4.5	-	5.0	8.0		
	1250N-C05																	-	12.7	5.0	-	5.0	9.0		
	1255N-C05																	-	12.7	5.5	-	5.0	10.0		
	1260N-C05																	-	12.7	6.0	-	5.0	11.0		
	1265N-C05																	-	12.7	6.5	-	5.0	12.0		
	1270N-C05																	-	12.7	7.0	-	5.0	13.0		
	1275N-C05																	-	12.7	7.5	-	5.0	14.0		
RC	16						●											15.8	16	3.5	8	-	-		E300
	20						●											17.8	20	4	10	-	-		
	25						●											22.0	25	5	12.5	-	-		
	30																	26.8	30	6	15	-	-		
	32						●											27.8	32	6	16	-	-		
RDCT-MA	10T3M0-MA															●		-	10	3.97	-	3.85	-		E223
	1204M0-MA															●		-	12	4.76	-	4.5	-		E224
																									E229
																									E230
																									E235
RDHW	0501M0F																	-	5	1.59	-	2.3	-		E227
	0501M0E											●						-	5	1.59	-	2.3	-		E228
	0501M0S																	-	5	1.59	-	2.3	-		E233
	06T1M0F																	-	6	1.98	-	2.5	-		E234
	06T1M0E											●						-	6	1.98	-	2.5	-		
	06T1M0S																	-	6	1.98	-	2.5	-		
	0702M0F																	-	7	2.38	-	2.8	-		
	0702M0E											●						-	7	2.38	-	2.8	-		
	0702M0S																	-	7	2.38	-	2.8	-		
	0803M0F																	-	8	3.18	-	3.4	-		
	0803M0E											●						-	8	3.18	-	3.4	-		
	0803M0S																	-	8	3.18	-	3.4	-		
RDHW	1605M0F																	-	16	5.56	-	5.5	-		E225
	1605M0E																	-	16	5.56	-	5.5	-		E226
	1605M0S																	-	16	5.56	-	5.5	-		E231
	2006M0F																	-	20	6.35	-	5.5	-		E232
	2006M0E																	-	20	6.35	-	5.5	-		E235
	2006M0S																	-	20	6.35	-	5.5	-		
RDKT-MF	10T3M0-MF											●	●					-	10	3.97	-	3.85	-		E223
	1204M0-MF											●	●					-	12	4.76	-	4.5	-		E224
	1605M0-MF																	-	16	5.56	-	5.5	-		E229
																									E230
																									E235

※ C03: Chamfer 0.3 mm
C05: Chamfer 0.5 mm

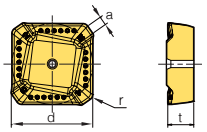
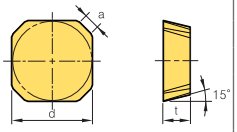
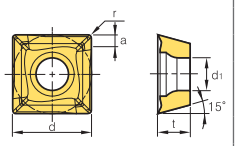
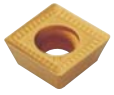
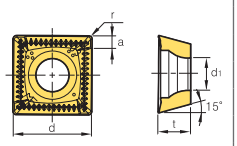
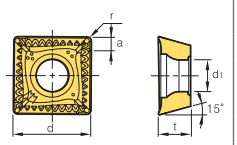
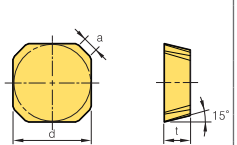
●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated										Uncoated		Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	l	d	t	r	d_1		
RDKT-ML 	1605M0-ML																	-	16	5.56	-	5.5		E225 E231 E235
RDKT-MM 	10T3M0-MM			●						●		●	●	●				-	10	3.97	-	3.85		E223~ E226 E229~ E235
	1204M0-MM			●						●		●	●	●				-	12	4.76	-	4.5		
	1605M0-MM									●								-	16	5.56	-	5.5		
	2006M0-MM									●								-	20	6.35	-	5.5		
RDKW 	0501M0E																	-	5	1.59	-	2.3		E227 E228 E233 E234
	06T1M0E																	-	6	1.98	-	2.5		
	0702M0E																	-	7	2.38	-	2.8		
	0803M0E																	-	8	3.18	-	3.4		
REKR-MM 	170400-MM																	-	17.8	4.76	-	-		E58
RPCT-MA new 	10T3M0-MA															●		-	10	3.97	-	4.0		E237~ E248
	1204M0-MA															●		-	12	4.76	-	4.5		
	1606M0-MA															●		-	16	6.35	-	5.5		
	2007M0-MA															●		-	20	7.00	-	7.0		
RPET-ML new 	0803M0E-ML													●	●			-	8	3.18	-	3.4		E237~ E248
	103TM0E-ML													●	●			-	10	3.97	-	4.0		
	1204M0E-ML													●	●			-	12	4.76	-	4.5		
	1606M0E-ML													●	●			-	16	6.35	-	5.5		
	2007M0E-ML													●	●			-	20	7.00	-	7.0		
RPMT-MF new 	0803M0E-MF										●			●	●			-	8	3.18	-	3.4		E237~ E248
	10T3M0E-MF										●			●	●			-	10	3.97	-	4.0		
	1204M0E-MF										●			●	●			-	12	4.76	-	4.5		
	1606M0E-MF										●			●	●			-	16	6.35	-	5.5		
	2007M0E-MF										●			●	●			-	20	7.00	-	7.0		
RPMT-MM new 	0803M0S-MM							●	●		●			●	●			-	8	3.18	-	3.4		E237~ E248
	10T3M0S-MM							●	●		●			●	●			-	10	3.97	-	4.0		
	1204M0S-MM							●	●		●			●	●			-	12	4.76	-	4.5		
	1606M0S-MM							●	●		●			●	●			-	16	6.35	-	5.5		
	2007M0S-MM							●	●		●			●	●			-	20	7.00	-	7.0		
RPMW new 	0803M0E1							●	●		●			●	●			-	8	3.18	-	3.4		E237~ E248
	10T3M0E1							●	●		●			●	●			-	10	3.97	-	4.0		
	1204M0S1							●	●		●			●	●			-	12	4.76	-	4.5		
	1204M0S2													●	●			-	12	4.76	-	4.5		
	1606M0S1							●	●		●			●	●			-	16	6.35	-	5.5		
	2007M0S1							●	●		●			●	●			-	20	7.00	-	7.0		

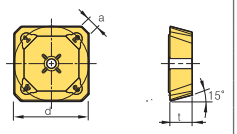
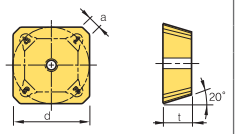
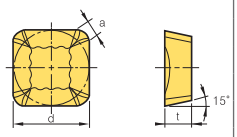
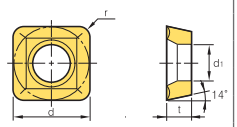
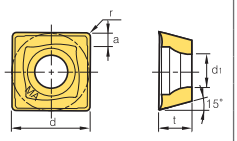
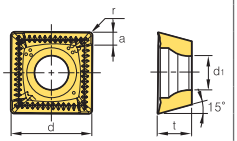
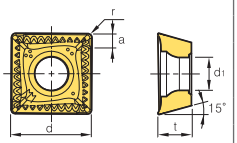
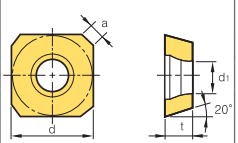
●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⬌ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (mm)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PD2000	ST30A	G10	H01	l	d	t	r	d_1	a		
SCKN 	220715DDSR-MM																	-	22.0	7.0	1.5	-	2.5		E53
	280920DDSR-MM																	-	28.0	9.0	2.0	-	3.0		
SDCN 	42M															●		-	12.7	3.18	-	-	1.5		E42
	42M-G																●	-	12.7	3.18	-	-	1.5		E46
	42MT	●	●		●										●			-	12.7	3.18	-	-	1.5		E54
	42MT-RH																	-	12.7	3.18	-	-	1.5		E55
	42MT-S20										●							-	12.7	3.18	-	-	1.5		
	53M															●		-	15.875	4.76	-	-	1.5		
	53M-G																●	-	15.875	4.76	-	-	1.5		
	53MT		●	●											●			-	15.875	4.76	-	-	1.5		
	53MT-RH								●									-	15.875	4.76	-	-	1.5		
	53MT-S20										●							-	15.875	4.76	-	-	1.5		
	1203AEEN																	-	12.7	3.18	-	-	1.5		
	1203AEEN-RH																	-	12.7	3.18	-	-	1.43		
	1203AESN																	-	12.7	3.18	-	-	1.5		
	1203AESN-RH																	-	12.7	3.18	-	-	1.43		
	1504AEEN																	-	15.875	4.76	-	-	1.5		
	1504AEEN-RH											●	●					-	15.875	4.76	-	-	1.43		
	1504AESN																	-	15.875	4.76	-	-	1.5		
	1504AESN-RH										●	●						-	15.875	4.76	-	-	1.43		
SDET-MA 	09M402R-MA													●			●	-	9.525	3.923	0.2	4.0	1.2		E217~ E222
	09M404R-MA																	-	9.525	3.923	0.4	4.0	1.2		
	09M405R-MA																	-	9.525	3.923	0.5	4.0	1.2		
	130504R-MA																●	-	13.5	5.56	0.4	5.56	2.2		
SDET-MF 	09M405R-MF																	-	9.525	4	0.5	4	1.2		E217~ E222
	130508R-MF																	-	13.5	5.56	0.8	5.56	2.2		
SDET-MM 	09M405R-MM																	-	9.525	4	0.5	4	1.2		E217~ E222
	130508R-MM																	-	13.5	5.56	0.8	5.56	2.2		
SDKN-CM 	42MT-CM		●															-	12.7	3.18	-	-	1.5		E42 E54

●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (mm)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a		
SDKN-MU	1203AESN-MU									●								-	12.7	3.18	-	-	2.08		E42 E46 E54 E55
	1504AESN-MU									●								-	15.875	4.76	-	-	2.10		
SDKN-SU	1203AESN-SU									●			●	●				-	12.7	3.18	-	-	2.08		E42 E46 E54 E55
	1504AESN-SU									●			●	●				-	15.875	4.76	-	-	2.10		
SDKR-MX	1203AESN-MX																	-	12.7	3.18	-	-	1.46		E42 E46 E54 E55
	1203AETN-MX																	-	12.7	3.18	-	-	1.46		
	1203AEN-MX			●														-	12.7	3.18	-	-	1.46		
	1504AESN-MX				●													-	15.875	4.76	-	-	1.45		
	1504AETN-MX																	-	15.875	4.76	-	-	1.45		
	1504AEN-MX			●														-	15.875	4.76	-	-	1.45		
SDMT-MM	090308-MM								●				●					-	9.525	3.18	0.8	4.4	-		E280 E303
SDXT-MA	09M405R-MA															●		-	9.525	4.0	0.5	4.0	1.2		E217~ E222
	130508R-MA															●		-	13.5	5.56	0.8	5.56	2.2		
SDXT-MF	09M403R-MF																	-	9.525	4.0	0.3	4.0	1.2		E217~ E222
	09M403L-MF																	-	9.525	4.0	0.3	4.0	1.2		
	09M404R-MF																	-	9.525	4.0	0.4	4.0	1.2		
	09M404L-MF																	-	9.525	4.0	0.4	4.0	1.2		
	09M405R-MF			●						●	●	●	●	●				-	9.525	4.0	0.5	4.0	1.2		
	09M405L-MF									●	●	●	●	●				-	9.525	4.0	0.5	4.0	1.2		
	130508R-MF			●						●	●	●	●	●				-	13.5	5.56	0.8	5.56	2.2		
SDXT-MM	09M405R-MM			●	●				●	●	●	●	●	●				-	9.525	4.0	0.5	4.0	1.2		E217~ E222
	09M405L-MM									●		●						-	9.525	4.0	0.5	4.0	1.2		
	130508R-MM			●	●				●	●	●	●	●	●				-	13.5	5.56	0.8	5.56	2.2		
	130508L-MM																	-	13.5	5.56	0.8	5.56	2.2		
	130538-MM																	-	13.5	5.56	3.8	5.56	2.2		
SECA	1204AFSN			●														-	12.7	4.76	-	5.56	2.66		-
	1204AFTN																	-	12.7	4.76	-	5.56	2.66		
	1204AFFN																	-	12.7	4.76	-	5.56	2.66		
	1204AFEN		●						●		●							-	12.7	4.76	-	5.56	2.66		
	1504AFSN																	-	15.875	4.76	-	5.5	2.8		
	1504AFTN																	-	15.875	4.76	-	5.5	2.8		
	1504AFFN																	-	15.875	4.76	-	5.5	2.8		

●: Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01
	Steel	P	●	⇔	⇔	✱	●	✱	✱	⇔			✱	✱		⇔		
	Stainless steel	M			⇔	✱					✱		✱	✱				
	Cast iron	K					⇔					●	✱	✱		⇔	●	●
	Non-ferrous metal	N													●			⇔
	Heat resistant alloy, Titanium alloy	S											✱	✱				
	Hardened steel	H											⇔	✱				

Machining types

● Continuous cutting
⇔ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated											Uncoated			Dimensions (mm)						Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	l	d	t	r	d_1	a		
SECN	1203AFFN															●	●	-	12.7	3.18	-	-	2.36	• Shape of Edge - S20: STS - RH: Strengthened edge, STS	E44 E45
	1203AFTN	●	●												●			-	12.7	3.18	-	-	2.36		
	1203AFEN																	-	12.7	3.18	-	-	2.36		
	1203AFSN			●	●													-	12.7	3.18	-	-	2.36		
	1203AFEN-RH										●	●						-	12.7	3.18	-	-	2.36		
	1203AFSN-RH																	-	12.7	3.18	-	-	2.36		
	1203AFTN-S20									●								-	12.7	3.18	-	-	2.36		
	1504AFFN															●		-	15.875	4.76	-	-	2.4		
	1504AFTN		●															-	15.875	4.76	-	-	2.4		
	1504AFEN																	-	15.875	4.76	-	-	2.4		
	1504AFSN																	-	15.875	4.76	-	-	2.4		
	1504AFEN-RH																	-	15.875	4.76	-	-	2.4		
	1504AFSN-RH										●							-	15.875	4.76	-	-	2.4		
	1504AFTN-S20																	-	15.875	4.76	-	-	2.4		
SEET-MA	0903AGFN-MA													●			●	-	9.525	3.18	-	3.4	2.11		E211~ E216
	14M4AGFN-MA																●	-	14.0	4.0	-	4.4	2.64		
SEET-MF	0903AGSN-MF									●	●	●	●					-	9.525	3.18	-	3.4	2.11		E211~ E216
	14M4AGSN-MF									●	●	●	●					-	14.0	4.0	-	4.4	2.64		
SEET-MM	0903AGSN-MM										●	●	●					-	9.525	3.18	-	3.4	2.11		E211~ E216
	14M4AGSN-MM								●	●	●	●	●					-	14.0	4.0	-	4.4	2.64		
SEEW	0903AGTN																	-	9.525	3.18	-	3.4	2.11		E211~ E216
	14M4AGTN		●															-	14.0	4.0	-	4.4	2.64		
SEEW-W	14M4AGFN-W																	-	14.0	4.0	-	4.4	8.5		E212 E214 E216
	14M4AGSN-W											●						-	14.0	4.0	-	4.4	8.5		
	14M4AGTN-W								●		●							-	14.0	4.0	-	4.4	8.5		
SEKN-SU	1203AFSN-SU								●									-	12.7	3.18	-	1.98	-		E44 E45
	1504AFSN-SU								●									-	15.875	4.76	-	2.04	-		
SEKR-MF1	1203AFSN-MF1																	-	12.7	3.18	-	2.3	-		E44 E45

●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

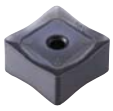
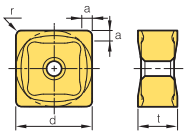
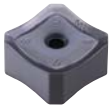
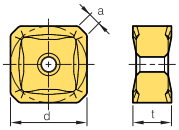
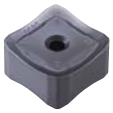
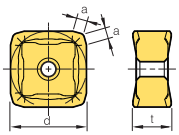
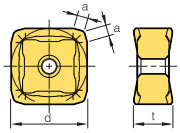
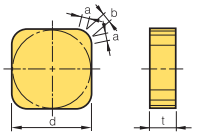
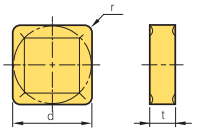
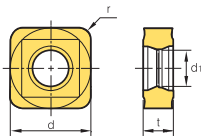
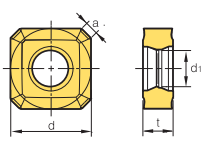
Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	d_1	a		
SEKR-MX	1203AFSN-MX			●	●						●							-	12.7	3.18	-	2.3		E44
	1204AFSN-MX			●														-	12.7	4.76	-	2.3		E45
	1504AFSN-MX			●							●							-	15.875	4.76	-	2.4		
SEMN	1204AZ																	-	12.7	4.76	-	2.0		-
SEXT-MF	0903AGSN-MF									●		●	●	●				-	9.525	3.18	3.4	2.11		E211~
	14M4AGSN-MF									●		●	●	●				-	14.0	4.0	4.4	2.64		E216
SEXT-MM	0903AGSN-MM								●	●		●	●	●				-	9.525	3.18	3.4	2.11		E211~
	14M4AGSN-MM			●	●				●	●	●	●	●	●				-	14.0	4.0	4.4	2.64		E216
SEXT-MR	0903AGSN-MR																	-	9.525	3.18	3.4	2.11		E211~
	14M4AGSN-MR										●		●					-	14.0	4.0	4.4	2.64		E216
SFCN	1203EFR																●	-	12.7	3.18	-	2.5		E46
SNC(M)F-MF	SNCF 1206ANN-MF																	-	12.7	6.6	-	2		E121
	1507ANN-MF											●						-	15.875	7.35	-	2.1		E122
	SNMF 1206ANN-MF																	-	12.7	6.6	-	2		
	1507ANN-MF																	-	15.875	7.35	-	2.1		
	SNCF 1206ENN-MF											●						-	12.7	6.6	-	1.8		E123
	1507ENN-MF											●						-	15.875	7.35	-	1.8		E124
	SNMF 1206ENN-MF								●									-	12.7	6.6	-	1.8		
	1507ENN-MF																	-	15.875	7.35	-	1.8		

●: Stock item

Workpiece			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01
	Steel	P	●	⬬	⬬	●	⬬	✱	✱	●	⬬	⬬	⬬			✱	✱	⬬	
	Stainless steel	M			⬬									✱		✱	✱		
	Cast iron	K				⬬			●	⬬				●	✱	✱			●
	Non-ferrous metal	N																	⬬
	Heat resistant alloy, Titanium alloy	S													✱	✱			
	Hardened steel	H							●	⬬					⬬	✱			

Machining types

● Continuous cutting
⬬ General cutting
✱ Interrupted cutting

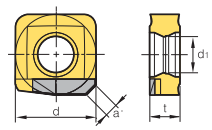
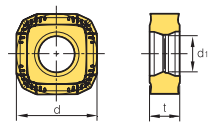
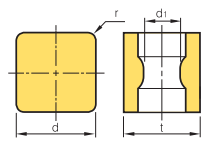
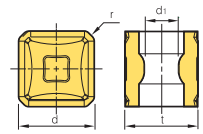
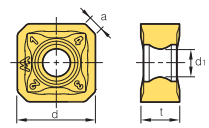
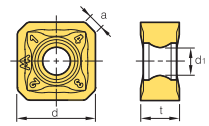
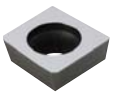
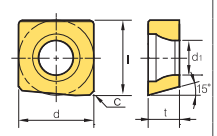
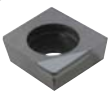
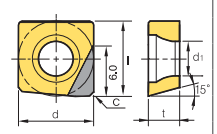
Inserts	Designation	Cermet		Coated													Uncoated		Dimensions (mm)							Geometries	Available tools
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400		ST30A	H01	l	d	t	r	d_1	a	b		
SNC(M)F-MF 	SNCF 1206QNN-MF												●						-	12.7	6.6	0.8	-	1	-		E125
	SNMF 1206QNN-MF																		-	12.7	6.6	0.8	-	1	-		
SNC(M)F-MM 	SNCF 1206ANN-MM																		-	12.7	6.6	-	-	2	-		E121 E122
	1507ANN-MM																		-	15.875	7.35	-	-	2.1	-		
	SNMF 1206ANN-MM																		-	12.7	6.6	-	-	2	-		
	1507ANN-MM																		-	15.875	7.35	-	-	2.1	-		
SNC(M)F-MM 	SNCF 1206ENN-MM																		-	12.7	6.6	-	-	1.8	-		E123 E124
	1507ENN-MM																		-	15.875	7.35	-	-	1.8	-		
	SNMF 1206ENN-MM										●								-	12.7	6.6	-	-	1.8	-		
	1507ENN-MM																		-	15.875	7.35	-	-	1.8	-		
SNC(M)F-MM 	SNCF 1206QNN-MM												●						-	12.7	6.6	0.8	-	1	-		E125
	SNMF 1206QNN-MM										●								-	12.7	6.6	0.8	-	1	-		
SNCN 	1204ENN			●													●		-	12.7	4.76	-	-	1.4	1.0		E47
	1504ENN																		-	15.875	4.76	-	-	1.4	1.0		
SNEF 	435												●						-	12.7	4.76	2.0	-	-	-		E366
	535																		-	15.875	4.76	2.0	-	-	-		
SNEU-MF 	120420-MF												●						-	12.7	4.76	2.0	5.7	(2.3)	-		E368
SNEU-MF 	1204ANN-MF																		-	12.7	4.76	-	5.7	(2.0)	-		E368

●: Stock item

Workpiece																		
Steel	P	●	⬍	●	⌘	⌘	●	⬍	⬍	⬍			⌘	⌘			
Stainless steel	M										⌘		⌘	⌘			
Cast iron	K			⬍			⬍	⬍				●	⌘	⌘	●		
Non-ferrous metal	N														⬍	●	●
Heat resistant alloy, Titanium alloy	S												⌘	⌘			
Hardened steel	H						●	⬍					⬍	⌘			

Machining types

● Continuous cutting
⬍ General cutting
⌘ Interrupted cutting

Inserts	Designation	Cermet CN2000	Cermet CN30	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated H01	PCD DP150	PCD DP200	Dimensions (mm) l	d	t	r	d1	a	Geometries	Available tools
SNEU-TBW 	1204-TBW																	-	12.7	4.76	-	5.7	(2.1)		E368
SNEU-WMF 	1204R-WMF																	-	12.7	4.76	-	5.7	-		E368
SNEX 	101010											●						-	10	10	1.0	4.6	-		-
	1010ZNN																	-	10	10	(1.0)	4.6	-		
SNEX-CU1 	101010-CU1											●						-	10	10	1.0	4.6	-		-
	1010ZNN-CU1											●						-	10	10	(1.0)	4.6	-		
	121212-CU1																	-	12.7	12.7	1.2	5.6	-		
	1212ZNN-CU1																	-	12.7	12.7	(1.2)	5.6	-		
SNEX-MA 	1206ANN-MA														●			-	12.7	6.35	-	4.5	2.36		E111~ E120
	1206ENN-MA											●			●			-	12.7	6.35	-	5.2	1.82		
	1206QNN-MA														●			-	12.7	6.35	-	5.2	1.39		
	120612-MA														●			-	12.7	6.35	1.2	5.2	-		
SNEX-ML  new	1206ANN-ML												●	●				-	12.7	6.35	-	4.5	-		E111~ E120
	1206ENN-ML												●	●				-	12.7	6.35	-	4.5	2.36		
	1206QNN-ML												●	●				-	12.7	6.35	-	4.5	1.82		
	120612-ML												●	●				-	12.7	6.35	1.2	4.5	1.39		
	1507ANN-ML												●	●				-	15.875	7.94	-	5.6	3.16		
	1507ENN-ML												●	●				-	15.875	7.94	-	5.6	2.66		
SNEW 	09T3ADFR														●			9.525	9.525	3.97	-	4.4	-		E135 E136
SNEW-NAF 	09T3ADTR-NAF																●	9.525	9.525	3.97	-	4.4	-		E135 E136
	09T3ADTR-NAW																●	9.525	9.525	3.97	-	4.4	-		
	NAW: Wiper insert																								

●: Stock item

Workpiece			NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200
	Steel	P	●	⧓	✱	●	⧓	⧓	⧓			✱	✱			
	Stainless steel	M								✱		✱	✱			
	Cast iron	K	⧓		⧓	⧓					●	✱	✱	●		
	Non-ferrous metal	N												⧓	●	●
	Heat resistant alloy, Titanium alloy	S										✱	✱			
	Hardened steel	H				●	⧓					✱	✱			

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

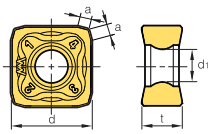
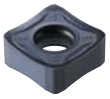
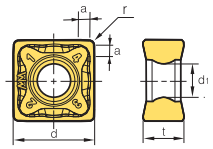
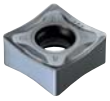
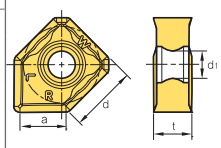
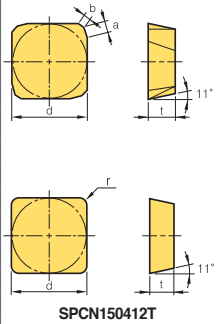
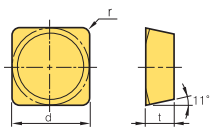
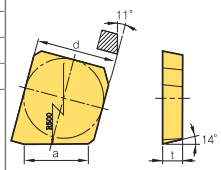
Inserts	Designation	Cermet		Coated											Uncoated	PCD		Dimensions (mm)							Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	DP150	DP200	l	d	t	r	d_1	a	b		
SNEW-XAF	09T3ADTR-XAF																●	9.525	9.525	3.97	-	4.4	-	-		E135
	09T3ADTR-XAW																●	9.525	9.525	3.97	-	4.4	-	-		E136
	XAW: Wiper insert																									
SNHT-WX	1102308R/L-WX												●					-	11	2.30	-	4	-	-		E355
	110308R/L-WX												●					-	11	3.00	-	4	-	-		E356
	120308R/L-WX																	-	12.7	3.25	-	5	-	-		
	1203508R/L-WX												●					-	12.7	3.50	-	5	-	-		
	120408R/L-WX																	-	12.7	4.00	-	5	-	-		
	1204508R/L-WX												●					-	12.7	4.54	-	5	-	-		
	120508R/L-WX												●					-	12.7	5.00	-	5	-	-		
	1205408R/L-WX												●					-	12.7	5.47	-	5	-	-		
	120608R/L-WX																	-	12.7	6.00	-	5	-	-		
	1206508R/L-WX																	-	12.7	6.50	-	5	-	-		
	120708R/L-WX																	-	12.7	7.00	-	5	-	-		
	1207508R/L-WX																	-	12.7	7.5	-	5	-	-		
SNKN	1204ENN												●					-	12.7	4.76	-	-	1.4	1.0		E47
	1504ENN																	-	15.875	4.76	-	-	1.4	1.0		
SNM(E)X-MF	SNMX 1206ANN-MF								●	●		●	●	●				-	12.7	6.35	-	4.5	2.36	-		E111
	1507ANN-MF									●		●	●	●				-	15.875	7.94	-	5.6	3.15	-		E112
	SNEX 1206ANN-MF								●	●		●	●	●				-	12.7	6.35	-	4.5	2.36	-		E116
	1507ANN-MF											●	●	●				-	15.875	7.94	-	5.6	3.15	-		
SNM(E)X-MF	SNMX 1206ENN-MF								●	●		●	●	●				-	12.7	6.35	-	4.5	1.82	-		E111~
	1507ENN-MF									●		●	●	●				-	15.875	7.94	-	5.6	2.66	-		E114
	SNEX 1206ENN-MF											●	●	●				-	12.7	6.35	-	4.5	1.82	-		
	1507ENN-MF											●	●	●				-	15.875	7.94	-	5.6	2.66	-		
SNM(E)X-MF	SNMX 1206QNN-MF								●	●		●	●	●				-	12.7	6.35	-	5.2	2.36	-		E119
	120612-MF									●		●	●	●				-	12.7	6.35	1.2	5.2	-	-		E120
	SNEX 1206QNN-MF								●			●	●	●				-	12.7	6.35	-	5.2	2.36	-		
	120612-MF											●	●	●				-	12.7	6.35	1.2	5.2	-	-		
SNM(E)X-MM	SNMX 1206ANN-MM			●					●	●	●	●	●	●				-	12.7	6.35	-	4.5	2.36	-		E111~
	1507ANN-MM								●	●		●	●	●				-	15.875	7.94	-	5.6	3.15	-		E114
	SNEX 1206ANN-MM								●	●	●	●	●	●				-	12.7	6.35	-	4.5	2.36	-		
	1507ANN-MM											●	●	●				-	15.875	7.94	-	5.6	3.15	-		

●: Stock item

Workpiece			P			M			K			N			S			H		
	Steel	P	●	◓		◓	✱								✱	✱				
	Stainless steel	M				◓	✱					✱			✱	✱				
	Cast iron	K							◓				●		✱	✱	●			
	Non-ferrous metal	N															◓	●	●	
	Heat resistant alloy, Titanium alloy	S														✱	✱			
	Hardened steel	H														◓	✱			

Machining types

● Continuous cutting
◓ General cutting
✱ Interrupted cutting

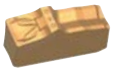
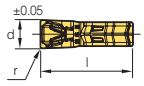
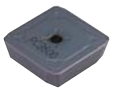
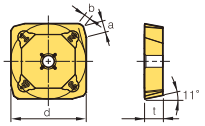
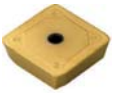
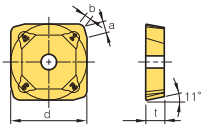
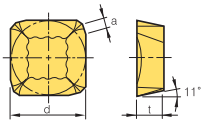
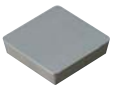
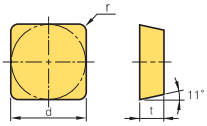
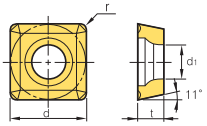
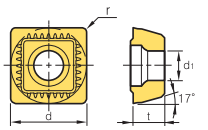
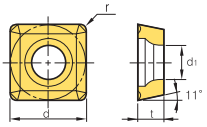
Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (mm)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a	b		
SNM(E)X-MM	SNMX 1206ENN-MM								●	●		●	●	●				-	12.7	6.35	-	5.2	1.82	-		E115~ E118
	1507ENN-MM									●		●	●	●				-	15.875	7.94	-	5.6	2.66	-		
	SNEX 1206ENN-MM									●		●	●	●				-	12.7	6.35	-	5.2	1.82	-		
	1507ENN-MM											●	●	●				-	15.875	7.94	-	5.6	2.66	-		
SNM(E)X-MM	SNMX 1206QNN-MM								●	●		●	●	●				-	12.7	6.35	-	4.5	2.36	-		E119 E120
	120612-MM								●	●		●	●	●				-	12.7	6.35	1.2	4.5	-	-		
	SNEX 1206QNN-MM											●	●	●				-	12.7	6.35	-	4.5	2.36	-		
	120612-MM											●						-	12.7	6.35	1.2	4.5	-	-		
SNEX-W	1206ANN-W								●			●	●					-	12.7	6.35	-	4.5	7.6	-		E111 E112
																										
SPCN	1203EDR		●	●	●										●	●	●	-	12.7	3.18	-	-	1.4	1.0		E48 E49
	1203EDR-RH																	-	12.7	3.18	-	-	1.4	1.0		
	1203EDL														●			-	12.7	3.18	-	-	1.4	1.0		
	1203EDR-G																●	-	12.7	3.18	-	-	1.4	1.0		
	1203EDR-RN																	-	12.7	3.18			1.4	1.0		
	1203EDER-RH											●	●					-	12.7	3.18	-	-	1.63	0.8		
	1203EDSR-RH											●						-	12.7	3.18	-	-	1.63	0.8		
	1203EDTR-RH								●									-	12.7	3.18	-	-	1.63	0.8		
	1203EDR-S20										●							-	12.7	3.18	-	-	1.4	1.0		
	1204EDR																	-	12.7	4.76	-	-	1.4	1.0		
	150412T																	-	15.875	4.76	1.2	-	-	-		
	1504EDR		●	●											●	●		-	15.875	4.76	-	-	1.4	1.0		
	1504EDR-RH																		15.875	4.76	-	-	1.4	1.0		
	1504EDSR																	-	15.875	4.76	-	-	1.4	1.0		
	1504EDL											●						-	15.875	4.76	-	-	1.4	1.0		
	1504EDR-G																●	-	15.875	4.76	-	-	1.4	1.0		
	1504EDR-RN	●																-	15.875	4.76	-	-	1.4	1.0		
	1504EDER-RH											●	●					-	15.875	4.76	-	-	1.64	0.8		
	1504EDSR-RH											●						-	15.875	4.76	-	-	1.64	0.8		
	1504EDTR-RH								●									-	15.875	4.76	-	-	1.64	0.8		
	1504EDR-S20										●							-	15.875	4.76	-	-	1.4	1.0		
																									SPCN150412T	
SPEN-WC	120416-WC																	-	12.7	4.76	1.6	-	-	-		E367
	150412-WC																	-	15.875	4.76	1.2	-	-	-		
	150416-WC																	-	15.875	4.76	1.6	-	-	-		
	150420-WC																	-	15.875	4.76	2.0	-	-	-		
	190424-WC																	-	19.05	4.76	2.4	-	-	-		
SPEX	1203EDR-1																	-	12.7	3.18	-	-	10.2	-		E48 E49
	1203EDL-1																	-	12.7	3.18	-	-	10.2	-		
	1504EDR-1																	-	15.875	4.76	-	-	10.2	-		
	1504EDL-1																	-	15.875	4.76	-	-	10.2	-		

●: Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	ST30A	G10
	Steel	P	●	⧓	⧓	✱	●	✱	✱	●	⧓	⧓	⧓		✱	✱	⧓	
	Stainless steel	M			⧓	✱								✱	✱	✱		
	Cast iron	K					⧓			⧓	⧓				✱	✱		⧓
	Non-ferrous metal	N																
	Heat resistant alloy, Titanium alloy	S													✱	✱		
	Hardened steel	H								●	⧓				✱	✱		

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

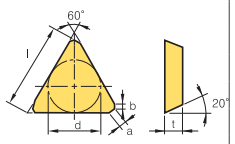
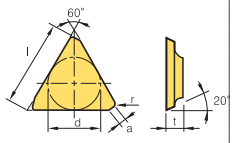
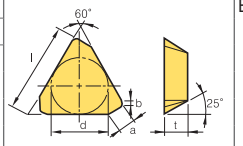
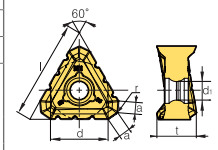
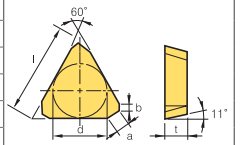
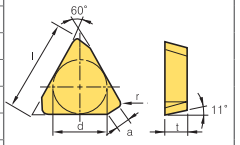
Inserts	Designation	Cermet		Coated													Uncoated		Dimensions (mm)							Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400		ST30A	G10	l	d	t	r	d_1	a	b		
SPFN 	200-N																		8.8	2.2	-	0.2	-	-	-		E352
	300-N																		9.8	3.0	-	0.2	-	-	-		
	400-N																		9.8	4.0	-	0.25	-	-	-		
SPKN-MU 	1203EDSR-MU											●							-	12.7	3.18	-	-	0.86	1.87		E48
	1504EDSR-MU											●							-	15.875	4.76	-	-	0.84	1.92		E49
SPKN-SU 	1203EDSR-SU											●		●	●				-	12.7	3.18	-	-	1.66	0.92		E48
	1203EDSL-SU											●							-	12.7	3.18	-	-	1.66	0.92		E49
	1504EDSR-SU											●		●	●				-	15.875	4.76	-	-	1.62	0.93		
	1504EDSL-SU											●							-	15.875	4.76	-	-	1.62	0.93		
SPKR-MX 	1203EDSR-MX			●	●						●								-	12.7	3.18	-	-	1.4	-		E48
	1203EDSL-MX																		-	12.7	3.18	-	-	1.4	-		E49
	1504EDR-MX			●															-	15.875	4.76	-	-	1.45	-		
	1504EDSR-MX										●								-	15.875	4.76	-	-	1.45	-		
SPMN 	120308																●		-	12.7	3.18	0.8	-	-	-		E315
SPMT 	060304			●															-	6.35	3.18	0.4	2.8	-	-		E280 E303 E304
SPMT-KC 	110408-KC										●						●	●	-	11.5	4.8	0.8	4.5	-	-		E315
SPMT-MM 	120408-MM											●		●					-	12.7	4.76	0.8	5.6	-	-		E188
	120508-MMN																		-	12.7	5.56	0.8	5.6	-	-		E280 E303 E304

●: Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	⧓	⧓	✱	●	✱	✱	⧓	⧓			✱	✱	⧓		
	Stainless steel	M			⧓	✱						✱		✱	✱			
	Cast iron	K					⧓						●	✱	✱		●	●
	Non-ferrous metal	N																⧓
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H												⧓	✱			

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

Inserts	Designation		Cermet		Coated											Uncoated			Dimensions (mm)							Geometries	Available tools
			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a	b		
TEC(E)N	TECN	22R																	11.0	6.35	3.18	-	-	1.0	0.5		E56
		22TR		●												●			11.0	6.35	3.18	0.8	-	0.5	-		
		32R															●		16.5	9.525	3.18	-	-	1.0	0.5		
		32R-G																	16.5	9.525	3.18	-	-	1.0	0.5		
		32TR		●			●									●			16.5	9.525	3.18	0.8	-	0.5	-		
		32TR-S20										●							16.5	9.525	3.18	0.8	-	0.5	-		
		43R-G																	22.0	12.7	4.76	-	-	2.0	0.5		
		43TR-Z																	22.0	12.7	4.76	0.8	-	1.5	-		
		43TR																	22.0	12.7	4.76	0.8	-	1.5	-		
	TEEN	32TR																	16.5	9.525	3.18	0.8	-	0.5	-		
TEEN	43R-Z																		22.0	12.7	4.76	-	-	2.0	0.5		
	43TR-Z															●			22.0	12.7	4.76	0.8	-	1.5	-		
	43TR-ZH									●		●							22.0	12.7	4.76	0.8	-	1.5	-		
	43R																●		22.0	12.7	4.76	-	-	2.0	0.5		
	43R-G																	●	22.0	12.7	4.76	-	-	2.0	0.5		
	43TR		●	●	●	●							●			●			22.0	12.7	4.76	0.8	-	1.5	-		
	43TR-S20											●							22.0	12.7	4.76	0.8	-	1.5	-		
TFCN	2203PFR																	●	22.0	12.7	3.18	-	-	2.42	0.71		E50
	2203PFL																		22.0	12.7	3.18	-	-	2.42	0.71		
TNMX	2710AZNR-NM						●			●		●		●					27	15.875	10	0.8	5.6	2.63	-		E63
	2710AZNL-NM																		27	15.875	10	0.8	5.6	2.63	-		E64
	3012PNR-NM																		30	17.462	11.970	0.8	5.6	3.5	-		
TPCN	1103PPN			●												●	●		11.0	6.35	3.18	-	-	0.7	0.7		E51
	1103PPTN																		11.0	6.35	3.18	-	-	0.7	0.7		
	1603PDR				●														16.5	9.525	3.18	-	-	1.2	0.7		
	1603PPN			●	●								●				●		16.5	9.525	3.18	-	-	1.2	1.2		
	1603PPR			●	●											●	●	●	16.5	9.525	3.18	-	-	1.2	1.0		
	1603PPR-RH																		16.5	9.525	3.18	-	-	1.2	1.0		
	1603PPR-G																	●	16.5	9.525	3.18	-	-	1.2	1.0		
	1603PPSR																	●	16.5	9.525	3.18	-	-	1.2	1.0		
	1603PPTN																		16.5	9.525	3.18	-	-	1.2	1.2		
	1603PPTR																		16.5	9.525	3.18	-	-	1.2	1.0		
	1603PPR-RH																		16.5	9.525	3.18	-	-	1.2	1.0		
	1603PDER-RH												●	●					16.5	9.525	3.18	0.8	-	1.5	-		
	1603PDSR-RH												●						16.5	9.525	3.18	0.8	-	1.5	-		
	1603PDR-S20											●							16.5	9.525	3.18	-	-	1.2	0.7		
	1603PDR-RN																		16.5	9.525	3.18	-	-	1.5	1.1		
	2204PDR			●	●											●	●		22.0	12.7	4.76	-	-	1.4	0.7		
	2204PDR-RH																		22.0	12.7	4.76	-	-	1.4	0.7		
	2204PDR-RN																		22.0	12.7	4.76	-	-	1.42	0.52		
	2204PDR-G																	●	22.0	12.7	4.76	-	-	1.4	0.7		
	2204PDL															●			22.0	12.7	4.76	-	-	1.4	0.7		
	2204PDSR					●													22.0	12.7	4.76	-	-	1.4	0.7		
	2204PDTR																		22.0	12.7	4.76	-	-	1.4	0.7		
	2204PPN																		22.0	12.7	4.76	-	-	1.2	1.2		
	2204PPTN																		22.0	12.7	4.76	-	-	1.2	1.2		
	2204PDR-RH																		22.0	12.7	4.76	0.8	-	1.8	-		
	2204PDER-RH												●	●					22.0	12.7	4.76	0.8	-	1.8	-		
	2204PDSR-RH												●						22.0	12.7	4.76	0.8	-	1.8	-		
	2204PDR-S20											●							22.0	12.7	4.76	-	-	1.4	0.7		

● Shape of Edge
- G: Light side, Sharp edge
- S20: STS
- ZH: Hole added

●: Stock item

Workpiece			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01
	Steel	P	●	⬌	⬌	✱	●	✱	✱	●	⬌	⬌	⬌			✱	✱	
	Stainless steel	M			⬌	✱								✱		✱	✱	
	Cast iron	K					⬌			⬌	⬌				●	✱	✱	●
	Non-ferrous metal	N																⬌
	Heat resistant alloy, Titanium alloy	S														✱	✱	
	Hardened steel	H								●	⬌					✱	✱	

Machining types

● Continuous cutting
⬌ General cutting
✱ Interrupted cutting

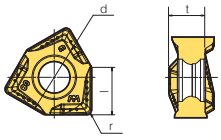
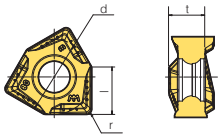
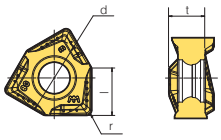
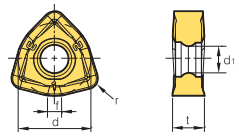
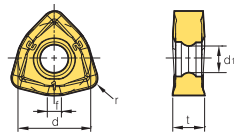
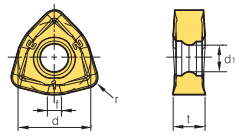
Inserts	Designation	Cermet		Coated													Uncoated	Dimensions (mm)								Geometries	Available tools
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01	l	d	t	r	d_1	a	b	f		
TPKN-MU	**2204PDSR-MU**											●						22.0	12.7	4.76	0.8	-	1.96	-			E51
TPKN-SU	**1603PDSL-SU**																	16.5	9.525	3.18	1.0	-	1.70	-			E51
	1603PDSR-SU											●						16.5	9.525	3.18	1.0	-	1.70	-			
	2204PDSL-SU											●						22.0	12.7	4.76	1.0	-	1.91	-			
	2204PDSR-SU											●			●	●		22.0	12.7	4.76	1.0	-	1.91	-			
TPKR-MX	**1603PDSN-MX**																	16.5	9.525	3.18	-	-	1.2	1.2			E51
	1603PDSR-MX												●					16.5	9.525	3.18	-	-	1.2	0.7			
	1603PPR-MX			●														16.5	9.525	3.18	-	-	1.2	1.0			
	1603PPSN-MX																	16.5	9.525	3.18	-	-	1.2	1.2			
	1603PPSR-MX				●													16.5	9.525	3.18	-	-	1.2	1.0			
	2204PDR-MX			●														22.0	12.7	4.76	1.0	-	1.4	-			
	2204PDSR-MX			●	●													22.0	12.7	4.76	1.0	-	1.4	-			
	2204PPR-MX																	22.0	12.7	4.76	1.0	-	1.4	-			
TWX-KC	**16R-KC**										●							16.5	9.52	3.97	0.8	4.45	-	-	-		E317
	22R-KC										●							22.0	12.7	4.76	0.8	4.45	-	-	-		
VCKT-MA	**220530N-MA**																●	15.6	12.7	5.56	3.0	5.6	-	-	-		E328 E329
VDKT-MA	**11T210N-MA**																●	8.8	6.35	2.87	1.0	2.8	-	-	-		E328
	11T220N-MA																	6.7	6.35	2.87	2.0	2.8	-	-	-		E329
WDKT-MH	**080316ZDSR-MH**								●	●	●	●	●	●	●	●		-	8.0	3.18	1.6	3.3	-	-	1.8		E273~
	10T320ZDSR-MH								●	●	●	●	●	●	●	●		-	10.0	3.97	2.0	4.3	-	-	2.3		E279
	130520ZDSR-MH								●	●	●	●	●	●	●	●		-	13.5	5.56	2.0	5.56	-	-	3.1		
	150625ZDSR-MH										●	●	●	●	●	●		-	15.0	6.35	2.5	5.56	-	-	3.4		

●: Stock item

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	H01
Workpiece	Steel	P	●	⧓	●	✱	✱	●	⧓	⧓	⧓			✱	✱		⧓	
	Stainless steel	M										✱		✱	✱			
	Cast iron	K			⧓			⧓	⧓				●	✱	✱			●
	Non-ferrous metal	N														●		⧓
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H						●	⧓					⧓	✱			

Machining types

● Continuous cutting
⧓ General cutting
✱ Interrupted cutting

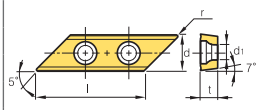
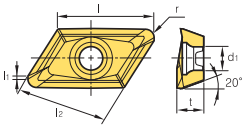
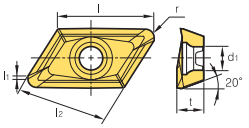
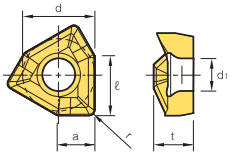
Inserts	Designation	Cermet		Coated												Uncoated		Dimensions (mm)						Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	H01	l	d	t	r	d_1	f		
WNGX-MA new	040304PNFR-MA																	4.3	7.0	3.46	0.4	-	-		E107~ E109
	040308PNFR-MA																	4.3	7.0	3.46	0.8	-	-		
	040312PNFR-MA																	4.3	7.0	3.46	1.2	-	-		
	040316PNFR-MA																	4.3	7.0	3.46	1.6	-	-		
	080604PNFR-MA																	8.2	13.0	6.4	0.4	-	-		
	080608PNFR-MA																●	8.2	13.0	6.4	0.8	-	-		
	080612PNFR-MA																	8.2	13.0	6.4	1.2	-	-		
	080616PNFR-MA																	8.2	13.0	6.4	1.6	-	-		
	080620PNFR-MA																	8.2	13.0	6.4	2.0	-	-		
WNGX-ML new	040304PNER-ML																	4.3	7.0	3.46	0.4	-	-		E107~ E109
	040308PNER-ML																	4.3	7.0	3.46	0.8	-	-		
	040312PNER-ML																	4.3	7.0	3.46	1.2	-	-		
	040316PNER-ML																	4.3	7.0	3.46	1.6	-	-		
	080604PNER-ML									●			●	●				8.2	13.0	6.4	0.4	-	-		
	080608PNER-ML									●			●	●				8.2	13.0	6.4	0.8	-	-		
	080612PNER-ML																	8.2	13.0	6.4	1.2	-	-		
	080616PNER-ML																	8.2	13.0	6.4	1.6	-	-		
	080620PNER-ML																	8.2	13.0	6.4	2.0	-	-		
WNGX-MM new	040304PNSR-MM																	4.3	7.0	3.46	0.4	-	-		E107~ E109
	040308PNSR-MM																	4.3	7.0	3.46	0.8	-	-		
	040312PNSR-MM																	4.3	7.0	3.46	1.2	-	-		
	040316PNSR-MM																	4.3	7.0	3.46	1.6	-	-		
	080604PNSR-MM																	8.2	13.0	6.4	0.4	-	-		
	080608PNSR-MM									●			●	●				8.2	13.0	6.4	0.8	-	-		
	080612PNSR-MM																	8.2	13.0	6.4	1.2	-	-		
	080616PNSR-MM																	8.2	13.0	6.4	1.6	-	-		
	080620PNSR-MM																	8.2	13.0	6.4	2.0	-	-		
WNMX-MF new	060312ZNN-MF									●			●	●				-	6.35	3.18	1.2	2.86	1.2		E262~ E272
	09T316ZNN-MF									●			●	●				-	9.525	3.97	1.6	3.6	1.7		
	130520ZNN-MF									●			●	●				-	12.7	5.56	2.0	4.7	2.5		
	160720ZNN-MF									●			●	●				-	16.0	7.0	2.0	5.8	3.0		
WNMX-ML new	060312ZNN-ML												●	●				-	6.35	3.18	1.2	2.86	1.2		E262~ E272
	09T316ZNN-ML												●	●				-	9.525	3.97	1.6	3.6	1.7		
	130520ZNN-ML												●	●				-	12.7	5.56	2.0	4.7	2.5		
	160720ZNN-ML												●					-	16.0	7.0	2.0	5.8	3.0		
WNMX-MM	060312ZNN-MM						●	●		●			●	●				-	6.35	3.18	1.2	2.86	1.2		E262~ E272
	09T316ZNN-MM						●	●	●	●	●		●	●				-	9.525	3.97	1.6	3.6	1.7		
	130520ZNN-MM						●	●	●	●	●		●	●				-	12.7	5.56	2.0	4.7	2.5		
	160720ZNN-MM									●			●	●				-	16.0	7.0	2.0	5.8	3.0		

●: Stock item

Workpiece			NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01
	Steel	P	●	⇔	✱	✱	●	⇔	⇔	⇔		✱	✱		⇔	
	Stainless steel	M									✱	✱	✱			
	Cast iron	K		⇔			⇔	⇔				✱	✱			⇔	●
	Non-ferrous metal	N											●			⇔
	Heat resistant alloy, Titanium alloy	S										✱	✱			
	Hardened steel	H					●	⇔				⇔	✱			

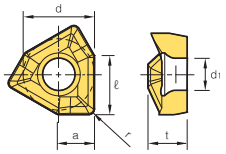
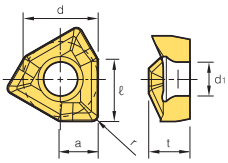
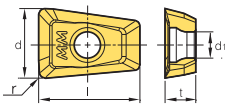
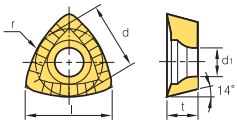
Machining types

● Continuous cutting
⇔ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (mm)									Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	l	l2	l1	d	t	r	d1	a	f		
XCET-KC 	310404ER-KC								●						●	●		30.9	-	-	9.525	4.5	0.4	4.4	-	-		E316
XEKT-MA 	19M504FR-MA													●		●		18	16.4	1.4	-	5	0.4	4.4	-	-		E331~ E336
	19M508FR-MA													●		●		18	16.4	1.0	-	5	0.8	4.4	-	-		
	19M512FR-MA													●		●		18	16.4	0.6	-	5	1.2	4.4	-	-		
	19M516FR-MA															●		17.5	16.4	0.5	-	5	1.6	4.4	-	-		
	19M518FR-MA																	17.5	16.4	0.5	-	5	1.8	4.4	-	-		
	19M520FR-MA													●		●		17.5	16.4	0.5	-	5	2.0	4.4	-	-		
	19M530FR-MA															●		17	16.4	0.7	-	5	3.0	4.4	-	-		
	19M532FR-MA													●		●		17	16.4	0.5	-	5	3.2	4.4	-	-		
	19M540FR-MA													●		●		16.5	16.4	0.5	-	5	4.0	4.4	-	-		
	19M550FR-MA													●		●		16	16.4	0.4	-	5	5.0	4.4	-	-		
	250604FR-MA															●		24.5	21.9	1.5	-	6.35	0.4	6.0	-	-		
	250608FR-MA															●		24.5	21.9	1.2	-	6.35	0.8	6.0	-	-		
	250612FR-MA															●		24.5	21.9	0.8	-	6.35	1.2	6.0	-	-		
	250616FR-MA																	24.5	21.9	0.4	-	6.35	1.6	6.0	-	-		
	250620FR-MA															●		24	21.9	0.5	-	6.35	2.0	6.0	-	-		
	250630FR-MA																	23.7	21.9	0.6	-	6.35	3.0	6.0	-	-		
	250632FR-MA															●		23.7	21.9	0.4	-	6.35	3.2	6.0	-	-		
	250640FR-MA																	22.8	21.9	1.2	-	6.35	4.0	6.0	-	-		
	250650FR-MA															●		22.7	21.9	0.4	-	6.35	5.0	6.0	-	-		
XEKT-ML new 	19M504ER-ML																	18	16.4	1.4	-	5	0.4	4.4	-	-		E331~ E336
	19M508ER-ML																	18	16.4	1.0	-	5	0.8	4.4	-	-		
	19M512ER-ML																	18	16.4	0.6	-	5	1.2	4.4	-	-		
	19M516ER-ML																	17.5	16.4	0.5	-	5	1.6	4.4	-	-		
	19M518ER-ML																	17.5	16.4	0.5	-	5	1.8	4.4	-	-		
	19M520ER-ML																	17.5	16.4	0.5	-	5	2.0	4.4	-	-		
	19M530ER-ML																	17	16.4	0.7	-	5	3.0	4.4	-	-		
	19M532ER-ML																	17	16.4	0.5	-	5	3.2	4.4	-	-		
	19M540ER-ML																	16.5	16.4	0.5	-	5	4.0	4.4	-	-		
	19M550ER-ML																	16	16.4	0.4	-	5	5.0	4.4	-	-		
	250604ER-ML																	24.5	21.9	1.5	-	6.35	0.4	6.0	-	-		
	250608ER-ML																	24.5	21.9	1.2	-	6.35	0.8	6.0	-	-		
	250612ER-ML																	24.5	21.9	0.8	-	6.35	1.2	6.0	-	-		
	250616ER-ML																	24.5	21.9	0.4	-	6.35	1.6	6.0	-	-		
	250620ER-ML																	24	21.9	0.5	-	6.35	2.0	6.0	-	-		
	250630ER-ML																	23.7	21.9	0.6	-	6.35	3.0	6.0	-	-		
	250632ER-ML																	23.7	21.9	0.4	-	6.35	3.2	6.0	-	-		
	250640ER-ML																	22.8	21.9	1.2	-	6.35	4.0	6.0	-	-		
	250650ER-ML																	22.7	21.9	0.4	-	6.35	5.0	6.0	-	-		
XNCT-MA new 	080504PNFR-MA															●		8.2	-	-	10.0	5.5	0.4	4.5	2.9	-		E87~ E90
	080508PNFR-MA															●		8.2	-	-	10.0	5.5	0.8	4.5	2.9	-		
	080512PNFR-MA															●		8.2	-	-	10.0	5.5	1.2	4.5	2.9	-		
	080520PNFR-MA															●		8.2	-	-	10.0	5.5	2.0	4.5	2.9	-		
	120608PNFR-MA															●		12.0	-	-	13.0	6.5	0.8	5.5	3.5	-		

●: Stock item

Workpiece			Machining types
	Steel	P	● Continuous cutting
	Stainless steel	M	⧓ General cutting
	Cast iron	K	✱ Interrupted cutting
	Non-ferrous metal	N	
	Heat resistant alloy, Titanium alloy	S	
	Hardened steel	H	

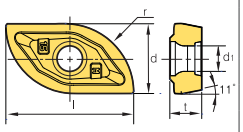
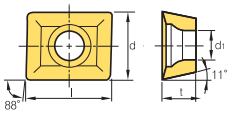
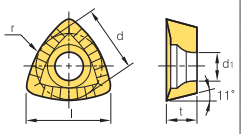
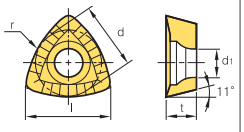
Inserts	Designation	Cermet		Coated										Uncoated			Dimensions (mm)						Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1	a		
XNKT-ML 	060405PNER-ML							●		●		●	●	●				5.7	6.5	4.0	0.5	3.4	1.8		E86~ E90
	060408PNER-ML									●		●	●	●				5.7	6.5	4.0	0.8	3.4	1.8		
	080504PNER-ML									●			●	●				8.2	10.0	5.5	0.4	4.5	2.9		
	080508PNER-ML							●		●		●	●	●				8.2	10.0	5.5	0.8	4.5	2.9		
	080512PNER-ML												●	●				8.2	10.0	5.5	1.2	4.5	2.9		
	080516PNER-ML												●	●				8.2	10.0	5.5	1.6	4.5	2.9		
	080520PNER-ML												●	●				8.2	10.0	5.5	2.0	4.5	2.9		
	120608PNER-ML									●		●	●	●				12.0	13.0	6.5	0.8	5.5	3.5		
	120612PNER-ML												●	●				12.0	13.0	6.5	1.2	5.5	3.5		
	120616PNER-ML												●	●				12.0	13.0	6.5	1.6	5.5	3.5		
	120620PNER-ML												●	●				12.0	13.0	6.5	2.0	5.5	3.5		
XNKT-MM 	060405PNSR-MM						●	●		●		●	●	●				5.7	6.5	4.0	0.5	3.4	1.8		E86~ E90
	060408PNSR-MM						●	●		●		●	●	●				5.7	6.5	4.0	0.8	3.4	1.8		
	080504PNSR-MM									●			●	●				8.2	10.0	5.5	0.4	4.5	2.9		
	080508PNSR-MM						●	●		●		●	●	●				8.2	10.0	5.5	0.8	4.5	2.9		
	080512PNSR-MM						●	●		●			●	●				8.2	10.0	5.5	1.2	4.5	2.9		
	080516PNSR-MM						●	●		●			●	●				8.2	10.0	5.5	1.6	4.5	2.9		
	080520PNSR-MM						●	●		●			●	●				8.2	10.0	5.5	2.0	4.5	2.9		
	120604PNSR-MM												●	●				12.0	13.0	6.5	0.4	5.5	3.5		
	120608PNSR-MM						●	●		●		●	●	●				12.0	13.0	6.5	0.8	5.5	3.5		
	120612PNSR-MM						●	●					●	●				12.0	13.0	6.5	1.2	5.5	3.5		
	120616PNSR-MM						●	●					●	●				12.0	13.0	6.5	1.6	5.5	3.5		
	120620PNSR-MM						●	●					●	●				12.0	13.0	6.5	2.0	5.5	3.5		
XPMT-MM 	0802ER-MM								●				●					8.5	5.9	2.38	0.8	-	-		E308 E309
	1003ER-MM								●				●					10.5	7.25	3.18	0.8	-	-		
	13T3ER-MM								●				●					13.1	9	3.97	0.8	-	-		
	1604ER-MM								●				●					16.5	11.5	4.76	0.8	-	-		
	1805ER-MM								●				●					18	12.4	5.56	0.8	-	-		
	2006ER-MM								●				●					20.5	14.1	6.35	0.8	-	-		
	2507ER-MM								●				●					25.5	17.6	7.94	0.8	-	-		
ZDMT-R-MM 	080310R-MM								●				●					8.4	6.73	3.2	10	2.8	-		E304
	110312.5R-MM								●				●					10.6	8.5	3.65	12.5	2.8	-		
	130416R-MM								●				●					13.2	10.5	4.76	16	4.4	-		

●: Stock item

Workpiece			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01
	Steel	P	●	◖◗	●	✱	✱	●	◖◗	◖◗	◖◗			✱	✱	◖◗		
	Stainless steel	M										✱		✱	✱			
	Cast iron	K			◖◗			◖◗	◖◗				●	✱	✱		◖◗	●
	Non-ferrous metal	N																◖◗
	Heat resistant alloy, Titanium alloy	S												✱	✱			
	Hardened steel	H						●	◖◗					✱	✱			

Machining types

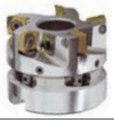
● Continuous cutting
◖◗ General cutting
✱ Interrupted cutting

Inserts	Designation	Cermet		Coated											Uncoated			Dimensions (mm)					Geometries	Available tools
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	l	d	t	r	d_1		
ZPET-MM Internal	080M-MM																	16	8.0	3.5	8	2.9		E302
	090M-MM																	17.7	7.2	4.3	9	3.4		E303
	100M-MM							●	●				●					19	10.4	4.5	10	3.4		
	110M-MM																	22.2	11.4	4.8	11	4.5		
	125M-MM							●	●				●					24	12.9	5.3	12.5	4.5		
	130M-MM																	25.7	13.4	5.3	13	4.5		
	140M-MM																	27.2	14.3	6.3	14	5.6		
	150M-MM												●					28	15.4	7	15	5.6		
	160M-MM							●	●				●					28.5	16.4	7	16	5.6		
	200M-MM								●									38	20.7	8	20	6.6		
	250M-MM																	48	25.9	9.5	25	8.6		
ZPET-MM External	080S-MM																	15	6.6	3.1	8	2.9		
	090S-MM																	15.5	7.4	3.7	9	3.4		
	100S-MM							●	●				●					15.5	8.4	3.8	10	3.4		
	110S-MM																	18.1	9	4.4	11	4.5		
	125S-MM							●	●				●					20.5	10.7	4.5	12.5	4.5		
	130S-MM																	22.2	11	4.4	13	4.5		
	140S-MM																	24.1	11.2	5.7	14	5.6		
	150S-MM								●				●					25	12.4	6.5	15	5.6		
	160S-MM							●	●				●					26	13.4	6.5	16	5.6		
	200S-MM								●									32	16.7	7	20	6.6		
	250S-MM																	40	20.7	8.5	25	8.6		
ZPMT-MM	1504PPSR-MM								●				●					15.9	12.7	4.76	-	5.6		E188
	1505PPSR-MMN																	15.9	12.7	5.76	-	5.6		E280
ZPMT-R-MM	160520R-MM								●				●					16.1	12.7	5.56	20	5.6		E304
	160525R-MM								●				●					16.9	12.7	5.56	25	5.6		
	160531.5R-MM												●					17.6	12.7	5.56	31.5	5.6		
ZPMT-R-MR	160525R-MR																	17.6	12.7	5.56	25	5.6		E304

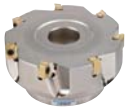
●: Stock item

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Mill-max	ADN(M) 4000/5000+		45°	Ø80~Ø315	Excellent cutting-edge strength and chip flow	●					E42 E43
		AE(M) 4000/5000		45°	Ø80~Ø315	Low cutting load and good machinability	●					E44 E45
		EF(M) 4000	Al 	75°	Ø80~Ø315	High rake angle to prevents welding	●					E46
		EN(M) 4000		75°	Ø80~Ø315	Economical because double sided inserts applied	●					E47
		EPN(M) 4000/5000+		75°	Ø80~Ø315	Double posi rake angle and low cutting force	●					E48 E49
		PF(M) 4000	Al 	90°	Ø80~Ø315	High rake angle and good machinability	●	●	●			E50
		PPN(M) 4000		90°	Ø80~Ø315	Double posi rake angle and low cutting force	●	●	●			E51
	Mill-max Heavy	HDDCM 7000/9000 new		55°	Ø125~Ø315	Deep roughing availability thanks to highly rigid inserts	●					E53
	Turbo Mill	ADS 4000/5000		45°	Ø50~Ø63	Anti-vibration	●					E54 E55
		PES 2000/3000/ 4000		90°	Ø20~Ø63	High rake angle, Cutting efficiency	●	●	●			E56
	Double Mill	AFO(M)4000		45°	Ø80~Ø125	High rake angle low cutting force Economical (8 corners available)	●					E57 E58
		AFO(M)5000			Ø80~Ø315							
	Power Buster	PBAC(M)5000		45°	Ø80~Ø315	Double-sided Insert High depth High Feed Roughing	●					E63
		PBZC(M)5000		90°	Ø80~Ø315		●					E64
		PBPCM6000 new			Ø80~Ø315		●	●				E65

Al Cutter for aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Aero Mill	APD(M) A type, B type	Al 	90°	Ø80~Ø315	Aluminum cutter body suitable for high speed machining, Both cemented carbides and PCD inserts are available, G2.5 balance possible	●					E132
	Aero Mill Plus	APD(M)-PB	Al 	90°	Ø80~Ø315	Prevent overload to the spindle bearings through weight reduction of the Al alloy body and enable high-speed processing	●					E133 E134
	Aero Mill-Mini	MAPDS	Al 	90°	Ø40~Ø63	Available with small Machining center-Carbide, PCD insert Application-Balancing class G2.5	●					E135
		MAPD	Al 	90°	Ø32~Ø40		●					E136
	Rich Mill	RM8AC(M)4000 RMH8AC(M)4000		45°	Ø50~Ø400	8 corners available Double-sided insert for steel, cast iron, stainless steel, aluminum	●					E111 E112 E113 E114
		RM8AC(M)5000 RMH8AC(M)5000			Ø80~Ø400		●					
		RM8EC(M)4000 RMH8EC(M)4000		75°	Ø50~Ø400	8 corners available Double-sided insert for steel, cast iron	●					E115 E116 E117 E118
		RM8EC(M)5000 RM8HEC(M)5000			Ø80~Ø400		●					
		RM8QC(M)4000 RMH8QC(M)4000		88°	Ø63~Ø200	8 corners available Reduced cutting interruption at cast Iron	●					E119 E120
		RMT8A(M) 4000/5000		45°	Ø80~Ø315	Easy insert change and good machinability due to latch clamping system 8 corners available Excellent surface finish	●					E121 E122
		RMT8E(M) 4000/5000		75°	Ø80~Ø315		●					E123 E124
		RMT8Q(M)		88°	Ø80~Ø315		●					E125
		RM16AC(M) 6000/8000		45°	Ø63~Ø400	16 corners available. Wiper inserts can be applied for good surface finish Strong insert and powerful clamping	●					E126 E127
Cutters for molds	Rich Mill	RM3PC(M)3000 new		90°	Ø40~Ø80	Perfect perpendicularity Strong clamping	●	●	●		●	E86 E87 E88
		RM3PC(M)4000 new			Ø40~Ø125							
		RM3PC(M)5000 new			Ø80~Ø125							

Al Cutter for aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Rich Mill	RM4PC(M)3000		90°	Ø40~Ø100	4corners available. High rake angle insert reduces cutting force. Excellent insert rigidity	●	●	●		●	E92 E93
		RM4PC(M)4000			Ø50~Ø160							
		RM4ZCM3000		90°	Ø40~Ø52	In vertical machining, the maximum cutting depth for RM4Z3000: 9.00 mm, RM4Z4000: 14.0 mm	●	●	●		●	E105
		RM4ZC(M)4000			Ø63~Ø100							
		RM6PC(M) new		90°	Ø40~Ø125	Improved productivity and high-quality shouldering through high speed and high feed machining	●	●	●		●	E107 ~E109
	Alpha Mill	AMC(M) 1000S/1500S/ 2000S		90°	Ø32~Ø100	3-dimensional shape and high rake angle lowers cutting load and ensures better chip evacuation Inner coolant system for better chip control increases tool life Wide size range of inserts enlarges application range. Various types of Alpha Mills available for high depth of cut and high feed machining	●	●	●	●	●	E143 ~E145
		AMC(M) 3000S/3000S-K /4000S		90°	Ø40~Ø200		●	●	●	●	●	E146 ~E148
		AMC(M) 1000SE 2000SE 3000SE		75°	Ø40~Ø100		●					E149 E150
		AMC(M) 2000M 3000M 4000M		90°	Ø50~Ø125		●	●	●	●	●	E151 E152 E153
	Future Mill	FMAC(M)3000		45°	Ø50~Ø125	Accurate inserts and cutter, Excellent chip flow	●					E211 E212
		FMAC(M)4000			Ø50~Ø200							
		FMAC(M)3000A		45°	Ø63~Ø125	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body	●					E213 E214
		FMAC(M)4000A			Ø63~Ø315							
		FMPC(M)3000		90°	Ø50~Ø100	4 corners available various inserts can be applied to machine for different types of workpiece	●	●	●			E217 E218
		FMPC(M)4000			Ø63~Ø125							
		FMPC(M)3000A		90°	Ø63~Ø100	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body	●	●	●			E219 E220
		FMPC(M)4000A			Ø63~Ø315							
		FMRC(M)3000		-	Ø40~Ø100	4~8 corners available Double contact faces between insert & seat part of cutter for stable clamping Excellent rotating-free machining	●				●	E223 E224
		FMRC(M)4000			Ø50~Ø125							
		FMRC(M)5000		-	Ø50~Ø125		●				●	E225 E226
		FMRC(M)6000			Ø63~Ø160							

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Future Mill P-positive	FMRC(M) new 3000 4000 5000 6000		-	Ø40~Ø250	Stable clamping system enables stable machining and productivity Varied product line-up ensures wide application range Optimal shape and grade with high hardness for hard-to-cut material machining.	●				●	E237 ~E240
	HRM	HRMC(M)13		15°	Ø50~Ø80	Powerful clamping by double clamping system 3 corners available high feed cutting with low cutting load	●	●	●	●	●	E273 E274
		HRMC(M)15			Ø63~Ø160							
	HRMD	HRMDC(M)09		14°	Ø40~Ø100	Double side insert with 6 corner High feed cutting with strong simple screw-on clamp	●	●	●	●	●	E262 ~E264
		HRMDC(M)13			Ø50~Ø125							
		HRMDC(M)16 new			Ø80~Ø315							
	Tangen-Pro	TP2PC(M) new		90°	Ø40~Ø125	High-quality results available even under harsh cutting conditions, thanks to the stable clamping force	●	●	●			E284
	BT/HSK Tooling System	BT30/40/50		90°	Ø10~Ø50	BT/HSK one solid type has been accepted to increase the precision Inner coolant system can also make it possible to evacuate the chip effectively High feed and high depth	●	●	●	●	●	E173 ~E177
		HSK63										E178 ~E182
		BT30/40/50		90°	Ø16~Ø100		●	●	●			E183 ~E188
		HSK63/100										E189 ~E193
		BT30/40/50-MAT		90°	Ø12~Ø40	Alpha Mill, Rich Mill, FMR, Laser Mill, HRM(D), Pro-A, Pro-X Modular head M06~M16 applicable	●	●	●	●	●	E194
		HSK63/100-MAT										E195
		BT50 HAT4000		90°	Ø50~Ø80	Head only replacement possible and higher efficiency by self assembly head	●	●	●			E188
Cutters for aluminum	Pro-A Mill	PAC(M) 2000/4000	Al 	90°	Ø40~Ø100	Buffed insert controls chip flow without built-up edge	●	●	●	●	●	E328
	Pro-X Mill	PAXC(M)5000	Al 	90°	Ø40~Ø125	Powerful clamping Excellent body rigidity for rectangular and curve machining	●	●	●	●	●	E331 E332
		PAXC(M)6000			Ø50~Ø125							
	Pro-L Mill	PALC(M)	Al 	90°	Ø63	High helix and high depth of cut High perpendicularity Low cutting load	●	●	●	●	●	E337

Al Cutter for aluminum

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
High feed cutter for cast iron	High feed cutter	PNH 4000/5000		90°	Ø125~Ø450	Wiper insert available Double negative rake angle Excellent surface finish	●					E366
		PPH 4000		90°	Ø125~Ø450	Square insert and wiper insert available Excellent surface finish	●					E367
	Shave Mill	SVM(M)4000		90°	Ø80~Ø315	Exclusive adjusting device of cutting-edge adjusts run-out easily.	●					E368
	Shave Mill-Ultra	SVUM6000		90°	Ø80~Ø315	Good rigidity and economical due to Screw on Simple type	●					E369
		SVUM6000-B		90°	Ø80~Ø315	Easy to handle the run-out due to Korloy exclusive high toughness cutting-edge special parts	●					E370
Indexable side cutter	Tangential type / Full-side cutter	TAFCP		-	Ø100~Ø315	Various cutting depth can be possible because of adjustable length control. Medium to Roughing based on strengthened edge		●	●			E346
		TAFCB		-	Ø100~Ø315		●	●	●			E346
	Tangential type / Half-side cutter	TAHCP		-	Ø100~Ø315			●	●			E347
		TAHCB		-	Ø100~Ø315		●	●	●			E347

Type	Cutter		Designation	Shape	A.A	Diameter range	Features	Application					Page
								Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Indexable side cutter	Radial type	Full-side cutter	RAFCP		-	Ø100~Ø315	Wide range of machining width with only one side cutter due to adjustable cutting-edge height Suitable for medium and finishing in narrow width side cutting due to good chip evacuation by 3-dimensional chip breaker		●	●			E348
			RAFCB		-	Ø100~Ø315		●	●	●			E348
		Half-side cutter	RAHCP		-	Ø100~Ø315			●	●			E349
			RAHCB		-	Ø100~Ø315		●	●	●			E349
Side cutter	-		SPP(M)		-	Ø80~Ø200	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E350
			SPB(M)		-	Ø80~Ø200	Economical by using pentagonal insert Suitable for narrow & deep grooving			●			E351
			SPS		-	Ø50~Ø200	For narrow and deep width grooving			●			E352
	Full-side cutter		RM4PFCB		-	Ø80~Ø160	4 corner usage with double-sided insert can be economical			●			E94 E95
			RM4PFCP		-	Ø80~Ø160				●			E98 E99
	Half-side cutter		RM4PHCB		-	Ø80~Ø160	4 corner usage with double-sided insert can be economical			●			E96 E97
			RM4PHCP		-	Ø80~Ø160				●			E100 E101
	Wind Mill		WFSB(M)		-	Ø100~Ø250	The nose R shape of insert ensures long tool life. Wide applications with various widths and corner R sizes.	●	●	●			E355
			WFSP(M)		-	Ø100~Ø250			●	●			E356

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Turbo Mill	ADS 4000/5000		45°	Ø50~Ø63	Uneven insert spacing prevents chattering	●					E54 E55
		PES 2000/3000/4000		90°	Ø20~Ø63	Good machinability due to the high rake angle	●	●	●			E56
Cutters for molds	Rich Mill	RM3PS3000 new		90°	Ø20~Ø40	Perfect perpendicularity Strong clamping	●	●	●		●	E89 E90
		RM3PS4000 new			Ø32~Ø63							
		RM4PS3000		90°	Ø14~Ø50	4 corners available High rake angle insert reduces cutting force Excellent insert rigidity	●	●	●		●	E102
		RM4PS4000			Ø32~Ø63		●	●	●		●	E103
		RM4ZS3000		90°	Ø25~Ø40	In vertical machining, the maximum cutting width: 9.0 mm	●	●	●		●	E106
		RM6PS new		90°	Ø20~Ø50	Improved productivity and high-quality shouldering through high speed and high feed machining	●	●	●		●	E109 E110
	Alpha Mill	AMS 1000S/1500S 2000S/3000S 3000S-K/4000S		90°	Ø10~Ø63	The combination of a 3-dimensional curve design & high rake angle helps chip-evacuation effectively with a low cutting forcel Inner coolant system The various range of inserts can provide the widened choice High depth and high feed can be available during operation	●	●	●	●	●	E154 ~E161
		AMS 1000SE/2000SE 3000SE		75°	Ø25~Ø63		●					E162 E163
		AMS 1000M/1500M 2000M/4000M		90°	Ø16~Ø50		●	●	●	●	●	E164 ~E166
		AMS 1000MH/1500MH 2000MH/3000MH		90°	Ø14~Ø40		●	●	●	●	●	E167 E168
	Future Mill	FMAS3000		45°	Ø25~Ø63	For precision machining Excellent chip evacuation	●					E215 E216
		FMAS4000			Ø50~Ø63							
		FMPS3000		90°	Ø25~Ø63	4 corners available Strong cutting-edge with low cutting load	●					E221 E222
		FMPS4000			Ø40~Ø63							
		FMRS 1000/1500/2000 2500/3000/4000 5000/6000		-	Ø8~Ø63	2 touch clamping system, convenient insert change	●	●	●	●	●	E227 ~232

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Future Mill P-positive	FMRS new 2500/3000 4000/5000 6000		-	Ø17~Ø50	P-positive relief angle ensures high rigidity and high machinability in die steel and high-resistant alloy machining Flat clearance face of insert prevents interference and revolution while machining	●	●	●	●	●	E241 ~E244
	HFM	HFMS new 1000		-	Ø8~Ø21	Apply helix cutting-edge on insert, low cutting load and reinforce toughness on corner Increased rigidity with double relief angle (11, 13), prevent interference with high feed To apply the negative axial rake angle when set up the holder, increased chipping resistance	●	●	●	●	●	E254 ~E255
	HRM	HRMS 08/10/13/15		15°	Ø20~Ø63	Powerful clamping by double clamping system 3 corners available High feed cutting with low cutting load	●	●	●	●	●	E275 ~E277
	HRMD	HRMDS 06 new 09/13		14°	Ø16~Ø63	6 corners available, High feed, multi-function, Only one screw application	●	●	●	●	●	E265 ~E268
	Tangen-Pro	TP2PS new		90°	Ø32~Ø50	High-quality results available even under harsh cutting conditions, thanks to the stable clamping force	●	●	●			E285
	Tank Mill	THE		90°	Ø25~Ø50	Right-hand helix angle employed for good chip evacuation. Special surface treatment prevents body breaking and improves rigidity. Strong cutting-edge	●	●				E280
	Laser Mill	LBE□□ LRE□□		-	Ø8~Ø32	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available	●	●	●	●		E295 ~E299
		LBE□□-C LRE□□-C		-	Ø8~Ø32	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available Carbide shank	●	●	●			E295 ~E299
	Mach Mill	BFE		-	Ø16~Ø32	Upgraded cutting performance with S type curve design V clamping application	●	●	●	●		E300
		GBE		-	Ø16~Ø50	Helical design of edge can reduce the force during operation. Safe application to prevent rotation guarantee the increased tool life	●	●	●	●		E301
		BRE		-	Ø20~Ø63	Flute type chip-pocket can make chip-evacuation Customized edge design can prevent the breakage of holder's body	●	●	●	●		E304
	HAVE	Multi-edge new		90°	Ø16~Ø50	Tools for Z-axis feed plunge machining to cut faster and more effectively in vertical machining Machining with whole diameter	●	●	●		●	E308
		Single-edge new										E309

Type	Cutter	Designation	Shape	A.A	Diameter range	Features	Application					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	O-ring Cutter	ORC		90°	Ø11~Ø46	For grooving the seat of an O-Ring in a plastic mold Superior surface roughness and cutting performance compared to HSS and brazed tool	-	-	-	-	-	E311
	Chamfer Tool	CE		75°	Ø25~Ø30	For Back & Front high quality chamfering and various Chamfering angle machining	●					E315
				60°	Ø25~Ø35							
				45°	Ø7~Ø39							
				30°	Ø25~Ø42							
				30°	Ø5~Ø35	Various chamfer Degrees available Effective long chamfer cutting available	●	●	●			E316
				45°	Ø5~Ø48							
				60°	Ø5~Ø57							
				45°	~Ø28	Center Ring, Grooving, Chamfer Ring	●	●	●		●	E317
		CCT		30°	Ø3~Ø16	Centering, Countersinking, Chamfering						E319
				45°								
				60°								
		CET		30°	Ø4~Ø16	Countersinking, Chamfering, Shouldering	●	●	●		●	E318
				45°								
				60°								
	T-Cutter	TFE		90°	Ø21~Ø50	For slotting	●	●	●	●	●	E320
Cutters for aluminum	Pro-A Mill	PAS 2000/4000		90°	Ø12~Ø42 Ø32~Ø40	Polished face increases chip flow and reduces built-up edge	●	●	●	●	●	E329
	Pro-X Mill	PAXS 5000/6000		90°	Ø20~Ø40 Ø25~Ø40	Square shoulder and corner machining	●	●	●	●	●	E333 E334
	Pro-L Mill	PALS-HR (Single-edge)		90°	Ø32~Ø63	High helix and high depth of cut High perpendicularity Low cutting load	●	●	●	●	●	E338 E339
		PALS-HM (Multi-edge)			Ø63		●	●	●	●	●	E340
	Pro-XL Mill	PXLS		90°	Ø40~Ø80	Improved surface finish and perpendicularity achieved by a single pass with the deep cutting-edges	●	●				E341
Thread milling	-	TM		-	Ø32~Ø50	For internal and external threading	●					D49

Al Cutter for aluminum

FMRM type
E233~236
E245~248



LBE-MHD type
E299



PAM type
E330



PAXM type
E335



AMM type
E169~171



RM3PM type
E91



RM4PM type
E104



RM4ZM type
E106



HFMM type
E256



HRMM type
E278, 279



HRMDM type
E270~272



GBEM type
E303





Steel Shank type
E342



Carbide Shank type
E343



BT Arbors type
E194



HSK Arbors type
E195

ADN(M)4000



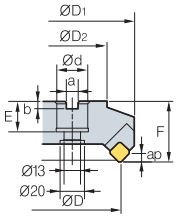


Fig. 1

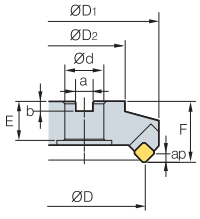


Fig. 2

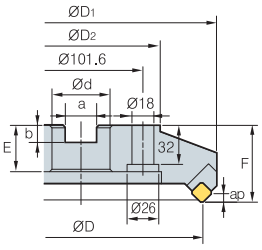


Fig. 3

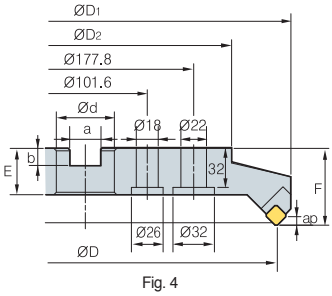


Fig. 4



AA
45°

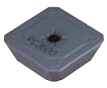
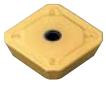
- AR: 15°
- RR: -4°

(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
ADN (ADNM)	4080R/L	4	80	57	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	6	1.9	1
	4100R/L	5	100	67	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	6	2.5	2
	4125R/L	6	125	87	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	6	4.3	2
	4160R/L	8	160	107	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	6	6.4	2
	4200R/L	10	200	130	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	8.7	3
	4250R/L	12	250	180	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	14.0	3
	4315R/L	14	315	240	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	21.0	4

( )Metric size

Available inserts

SDCN	SDKN-MU	SDKN-SU	SDKR-MX
			

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	42M														●			E17
	42M-G																●	
	42MT	●	●		●										●			
	42MT-RH																	
	42MT-S20										●							
	1203AEEN																	
	1203AEEN-RH																	
	1203AESN																	
	1203AESN-RH																	
SDKN	1203AESN-MU									●								E18
	1203AESN-SU									●			●	●				
SDKR	1203AESN-MX																	E18
	1203AETN-MX																	
	1203AEN-MX			●														

Available arbors

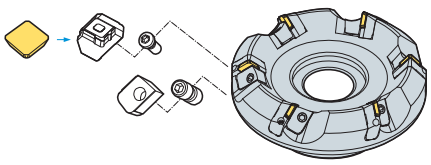
Designation		General arbor	NC arbors	
			ADN	ADNM
ADN(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	4160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	4200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LADN4R/L	WEPN4R/L	DHA0821F	LTX0514	HW40

Available inserts E17, E18 Available arbors and bolt E371~E373

ADN(M)5000+



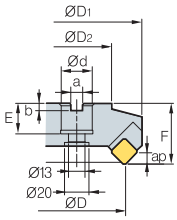


Fig. 1

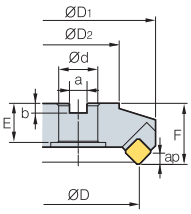


Fig. 2

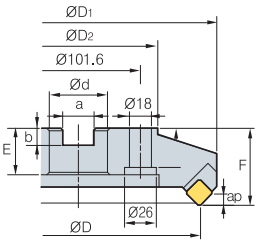


Fig. 3

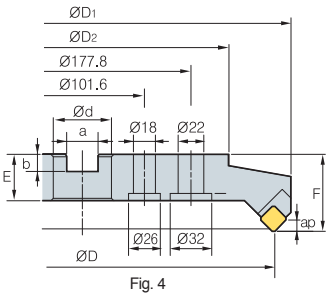


Fig. 4



AA
45°

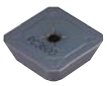
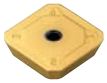
- AR: 15°
- RR: -4°

(mm)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
ADN (ADNM)	5080R/L+	4	80	107	65	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	63	8	2.4	1
	5100R/L+	5	100	126	75	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	63	8	3.0	2
	5125R/L+	6	125	150	100	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	8	4.7	2
	5160R/L+	8	160	185	120	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	8	6.5	2
	5200R/L+	10	200	225	140	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	8.7	3
	5250R/L+	12	250	275	220	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	15.5	3
	5315R/L+	14	315	340	280	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	23.7	4

( )Metric size

Available inserts

SDCN	SDKN-MU	SDKN-SU	SDKR-MX
			

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	53M														●			E17
	53M-G																●	
	53MT		●	●											●			
	53MT-RH								●									
	53MT-S20										●							
	1504AEEN																	
	1504AEEN-RH											●	●					
	1504AESN																	
	1504AESN-RH										●	●						
SDKN	1504AESN-MU									●								E18
	1504AESN-SU									●			●	●				
SDKR	1504AESN-MX			●														E18
	1504AETN-MX																	
	1504AEN-MX			●														

Available arbors

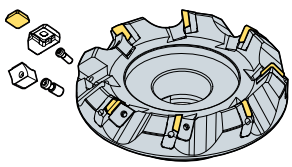
Designation		General arbor	NC arbors	
			ADN	ADNM
ADN(M)	5080R/L+	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	5100R/L+	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	5125R/L+	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	5160R/L+	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	5200R/L+	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5250R/L+	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5315R/L+	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LADN5R/L	WHPS5R/L	WHX0817 / WHX0813*	LTX0514	HW40

Available inserts E17, E18 Available arbors and bolt E371~E373

*: Ø80

AE(M)4000



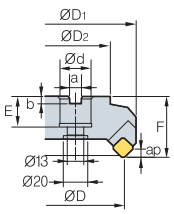


Fig. 1

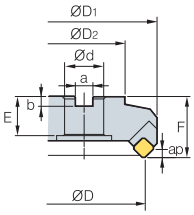


Fig. 2

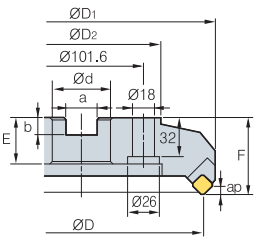


Fig. 3

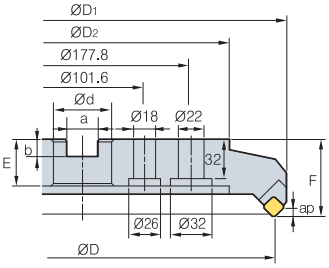


Fig. 4

AA
45°
• AR: 20°
• RR: -3°

(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
AE (AEM)	4080R/L	4	80	103	60	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	5.5	1.7	1
	4100R/L	5	100	122	80	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	5.5	2.9	2
	4125R/L	6	125	146	100	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	5.5	4.4	2
	4160R/L	8	160	181	120	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	5.5	6.1	2
	4200R/L	10	200	220	130	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	5.5	8.9	3
	4250R/L	12	250	270	180	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	5.5	15.7	3
	4315R/L	15	315	335	240	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	5.5	25.1	4

( )Metric size

Available inserts

SECN SEKN-SU SEKR-MF1 SEKR-MX



Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SECN	1203AFFN													●	●		
	1203AFTN	●	●											●			
	1203AFEN																
	1203AFSN			●	●												E19
	1203AFEN-RH										●	●					
	1203AFSN-RH																
	1203AFTN-S20									●							
SEKN	1203AFSN-SU								●								E19
SEKR	1203AFSN-MF1																E19
	1203AFSN-MX			●	●					●							E20

Available arbors

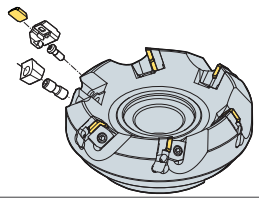
Designation		General arbor	NC arbors	
			ADN	ADNM
AE(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	4160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	4200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LAE4R/L	WAE4R/L	DHA0821F	LTX0512	HW40

Available inserts E19, E20 Available arbors and bolt E371~E373

AE(M)5000



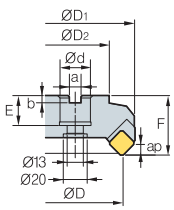


Fig. 1

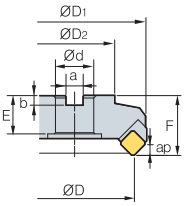


Fig. 2

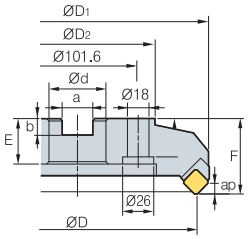


Fig. 3

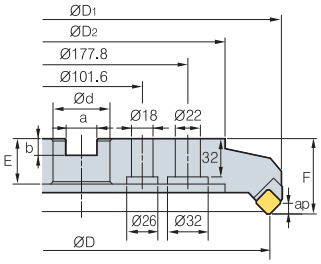


Fig. 4



AA
45°

- AR: 20°
- RR: -3°

(mm)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
AE (AEM)	5080R/L	4	80	103	60	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	7.5	1.7	1
	5100R/L	5	100	122	80	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	7.5	2.9	2
	5125R/L	6	125	146	100	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	7.5	4.4	2
	5160R/L	8	160	181	120	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	7.5	6.1	2
	5200R/L	10	200	220	130	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	7.5	8.9	3
	5250R/L	12	250	270	180	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	7.5	15.7	3
	5315R/L	15	315	335	240	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	7.5	25.1	4

( )Metric size

Available inserts

SECN SEKR-MX SEKN-SU



Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SECN	1504AFFN														●			E19
	1504AFTN		●															
	1504AFEN																	
	1504AFSN																	
	1504AFEN-RH																	
	1504AFSN-RH										●							
	1504AFTN-S20																	
SEKN	1504AFSN-SU									●								E19
	1504AFSN-MX			●								●						

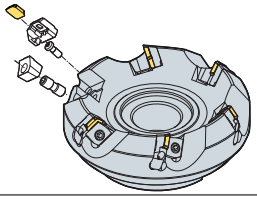
Available arbors

Designation		General arbor	NC arbors	
			AE	AEM
AE(M)	5080R/L	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	5100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	5125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	5160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	5200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling	

Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LAE5R/L	WAE5R/L	DHA0821F	LTX0512	HW40

Available inserts E19 Available arbors and bolt E371~E373

EF(M)4000



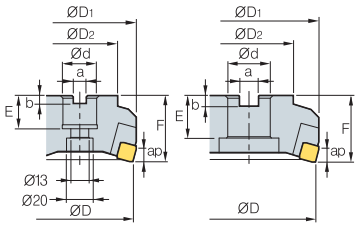


Fig. 1

Fig. 2

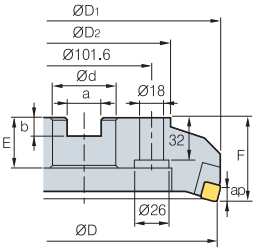


Fig. 3

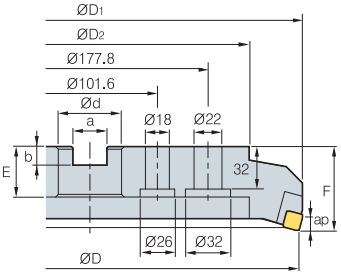


Fig. 4



AA
75°

- AR: 18°
- RR: 11°

(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EF (EFM)	4080R/L	4	80	89	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	8.0	1.5	1
	4100R/L	5	100	108	70	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	8.0	2.1	2
	4125R/L	6	125	133	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	8.0	3.8	2
	4160R/L	8	160	168	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	8.0	5.5	2
	4200R/L	10	200	208	130	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	8.0	8.2	3
	4250R/L	12	250	257	180	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	8.0	13.4	3
	4315R/L	16	315	322	240	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	8.0	21.2	4

( )Metric size

Available inserts

SFCN



Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SFCN	1203EFR																●	E20

Available arbors

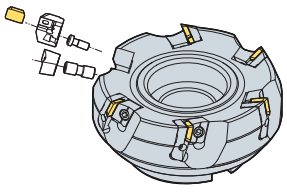
Designation		General arbor	NC arbors	
			EF	EFM
EF(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25-□□	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	4160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	4200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
K	75~125	0.05~0.30	H01

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LEF4R/L LEF4R1*/L1*	WEFR/L	DHA0821F	LTX0512	HW40

*: Ø80~Ø125

Available inserts E20 Available arbors and bolt E371~E373

EN(M)4000



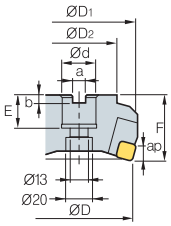


Fig. 1

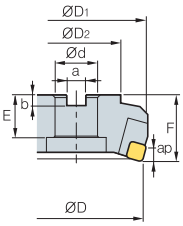


Fig. 2

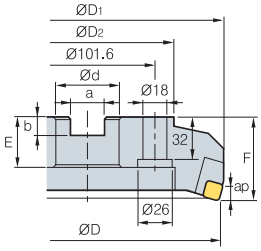


Fig. 3

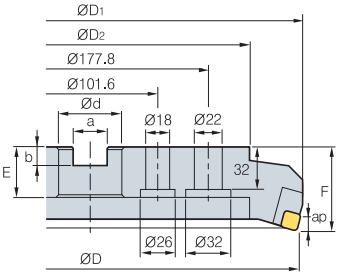


Fig. 4



AA
75°

- AR: -6°
- RR: -5°

(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EN (ENM)	4080R/L	5	80	87	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	8.5	1.4	1
	4100R/L	6	100	107	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	8.5	2.1	2
	4125R/L	8	125	132	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	8.5	3.8	2
	4160R/L	10	160	167	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	8.5	5.7	2
	4200R/L	12	200	207	130	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	8.5	8.4	3
	4250R/L	16	250	257	180	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	8.5	13.8	3
	4315R/L	20	315	322	240	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	8.5	21.6	4

( )Metric size

Available inserts

SNCN SNKN




Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCN	1204ENN			●											●			E21
SNKN	1204ENN											●						E23

Available arbors

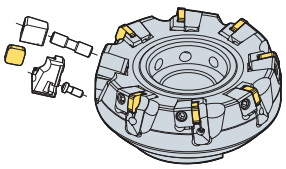
Designation		General arbor	NC arbors	
			EN	ENM
EN(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25-□□	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	4160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	4200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LEN4R/L	WENR/L WENR1*/L1*	DHA0830 DHA0825*	LTX0512	HW40

Available inserts E21, E23 Available arbors and bolt E371~E373

*: Ø80~Ø100

EPN(M)4000



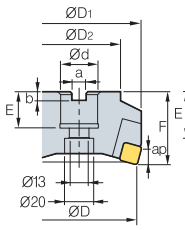


Fig. 1

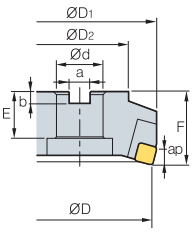


Fig. 2

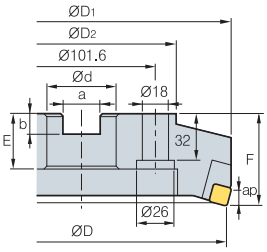


Fig. 3

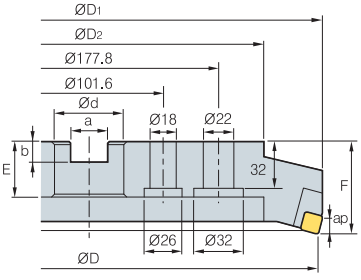


Fig. 4

AA
75°
• AR: 7°
• RR: 0°

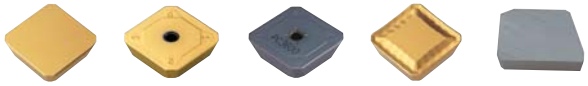
(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EPN (EPNM)	4080R/L	5	80	86	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	9	1.4	1
	4100R/L	6	100	107	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	9	2.1	2
	4125R/L	8	125	132	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	9	3.8	2
	4160R/L	10	160	166	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	9	5.7	2
	4200R/L	12	200	206	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	9	8.2	3
	4250R/L	16	250	256	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	9	13.5	3
	4315R/L	20	315	321	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	9	21.1	4

( )Metric size

Available inserts

SPCN SPKN-SU SPKN-MU SPKR-MX SPEX



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPCN	1203EDR		●	●	●										●	●	●	E24
	1203EDL														●			
	1203EDR-G																●	
	1203EDER-RH											●	●					
	1203EDSR-RH											●						
	1203EDTR-RH								●									
	1203EDR-S20										●							
SPKN	1203EDSR-MU									●								E25
	1203EDSR-SU									●			●	●				
	1203EDSL-SU									●								
SPKR	1203EDSR-MX			●	●				●									E25
	1203EDSL-MX																	
SPEX	1203EDR/L-1																	E24

Available arbors

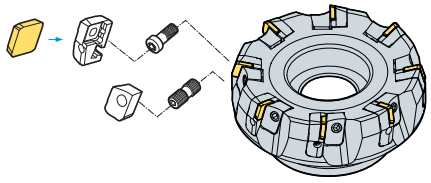
Designation		General arbor	NC arbors	
			EPN	EPNM
EPN(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	4160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	4200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LEPN4R/L LEPN4R1*/L1*	WEPN4R/L	DHA0821F DHA0817F*	LTX0514	HW40

*: Ø80~Ø100

Available inserts E24, E25 Available arbors and bolt E371~E373

EPN(M)5000+



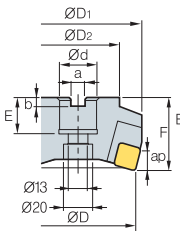


Fig. 1

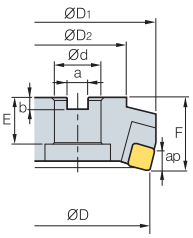


Fig. 2

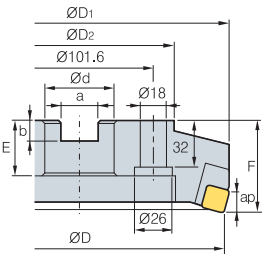


Fig. 3

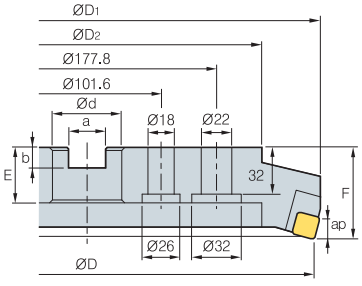


Fig. 4



AA
75°

- AR: 7°
- RR: 0°

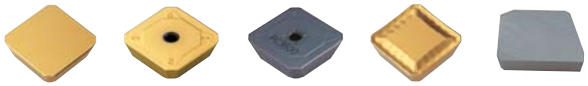
(mm)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EPN (EPNM)	5080R/L+	5	80	91	60	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	63	12	1.7	1
	5100R/L+	6	100	110	70	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	63	12	2.5	1
	5125R/L+	8	125	134	90	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	12	3.8	2
	5160R/L+	10	160	169	110	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	12	5.5	2
	5200R/L+	12	200	209	150	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	12	8.0	3
	5250R/L+	16	250	259	230	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	12	14.8	3
	5315R/L+	20	315	324	270	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	12	22.4	4

( )Metric size

Available inserts

SPCN SPKN-SU SPKN-MU SPKR-MX SPEX



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPCN	150412T																	E24
	1504EDR		●	●											●	●		
	1504EDSR																	
	1504EDL											●						
	1504EDR-G																●	
	1504EDER-RH											●	●					
	1504EDSR-RH											●						
	1504EDTR-RH								●									
	1504EDR-S20										●							
SPKN	1504EDSR-MU									●								E25
	1504EDSR-SU									●			●	●				
	1504EDSL-SU									●								
SPKR	1504EDR-MX			●														E25
	1504EDSR-MX								●									
SPEX	1504EDR/L-1																	E24

Available arbors

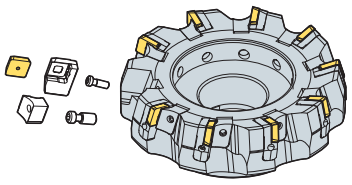
Designation		General arbor	NC arbors	
			EPN	EPNM
EPN(M)	5080R/L+	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	5100R/L+	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	5125R/L+	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	5160R/L+	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	5200R/L+	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5250R/L+	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5315R/L+	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LEPN5R/L LEPN5R1*/L1*	WHPS5R/L	WHX0817 WHX0813*	LTX0514	HW40

Available inserts E24, E25 Available arbors and bolt E371~E373

*: Ø80

PF(M)4000



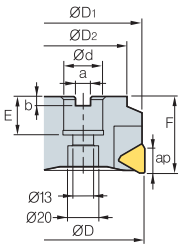


Fig. 1

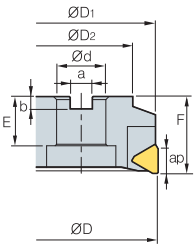


Fig. 2

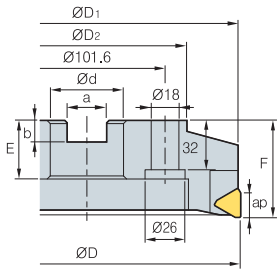


Fig. 3

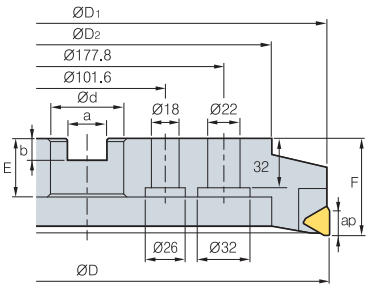


Fig. 4




AA
90°

- AR: 15°
- RR: 14°

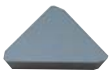
(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
PF (PFM)	4080R/L	4	80	79	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	16	1.2	1
	4100R/L	4	100	97	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	16	1.8	2
	4125R/L	7	125	122	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	16	3.1	2
	4160R/L	9	160	158	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	16	5.6	2
	4200R/L	11	200	197	130	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	16	8.8	3
	4250R/L	15	250	247	180	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	16	16	3
	4315R/L	19	315	311	240	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	16	22	4

( )Metric size

Available inserts

TFCN



Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TFCN	2203PFR															●		E26
	2203PFL																	

Available arbors

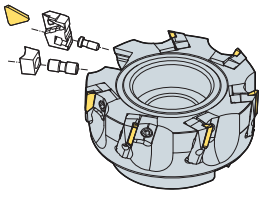
Designation		General arbor	NC arbors	
			PF	PFM
PF(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	4160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	4200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
	140~230	0.05~0.30	PC6510
K	50~90	0.05~0.30	G10

Assembling



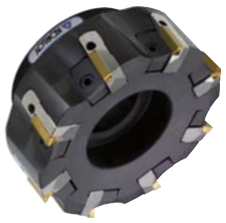
Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LPF4R/L LPF4R1**/L1**	WPFR/L	DHA0821F DHA0817F*	LTX0512	HW40

*: Ø80~Ø100/ **: Ø80~Ø125

Available inserts E26 Available arbors and bolt E371~E373

PPN(M)4000



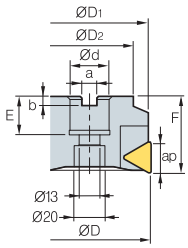


Fig. 1

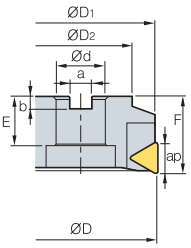


Fig. 2

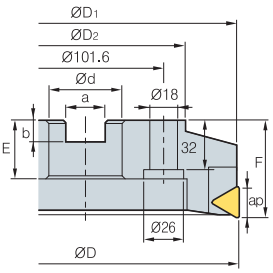


Fig. 3

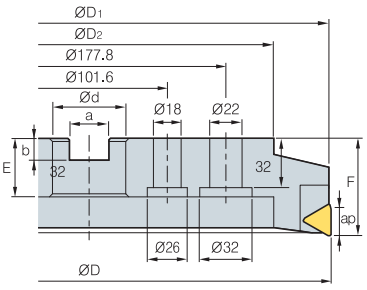


Fig. 4




AA 90°

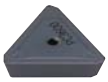
- AR: 7°
- RR: 0°

(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
PPN (PPNM)	4080R/L	5	80	79	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	18	1.3	1
	4100R/L	6	100	99	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	18	1.9	2
	4125R/L	8	125	124	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	18	3.5	2
	4160R/L	10	160	158	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	18	5.6	2
	4200R/L	12	200	198	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	18	8.1	3
	4250R/L	16	250	248	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	18	13.3	3
	4315R/L	20	315	313	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	18	21.4	4

( )Metric size

Available inserts

TPCN	TPKN-SU	TPKN-MU	TPKR-MX
			

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TPCN	2204PDR	●		●											●	●		E26
	2204PDR-G																●	
	2204PDL														●			
	2204PDSR			●														
	2204PDTR																	
	2204PDR-RH																	
	2204PDER-RH											●	●					
	2204PDSR-RH											●						
	2204PDR-S20										●							
TPKN	2204PDSR-MU									●								E27
	2204PDSR-SU									●				● ●				
	2204PDSL-SU									●								
TPKR	2204PDR-MX			●														E27
	2204PDSR-MX			● ●														
	2204PPR-MX																	

Available arbors

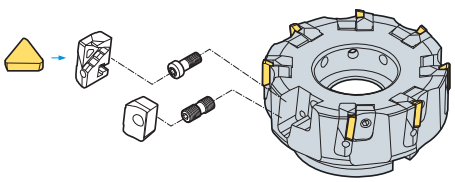
Designation		General arbor	NC arbors	
			PPN	PPNM
PPN(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	4160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	4200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	4315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LPPN4R/L LPPN4R1*/L1*	WPPN4R/L	DHA0821F DHA0817F*	LTX0514	HW40

Available inserts **E26, E27** Available arbors and bolt **E371~E373**

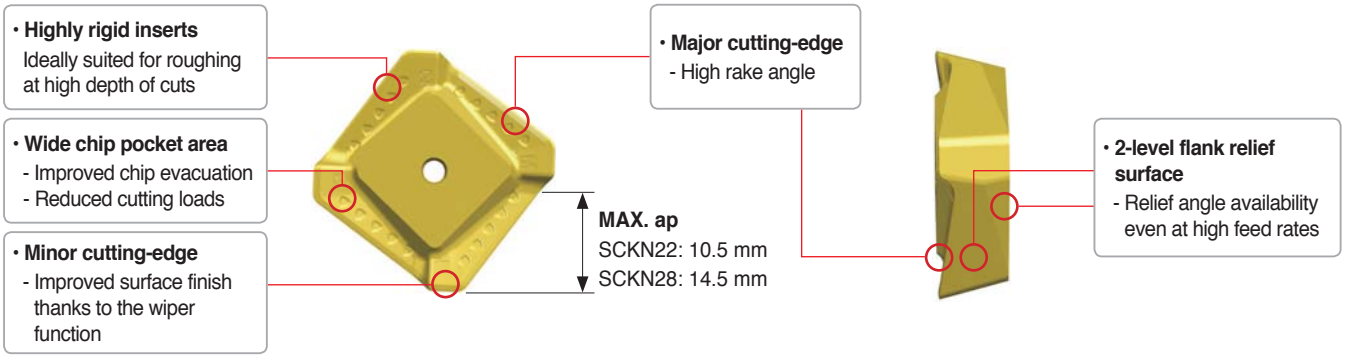
*: Ø80~Ø100

Highly rigid inserts for roughing

Mill-max Heavy new

- Productivity- Cutting time is reduced by the cutting-edge design specialized for rough facing at high depth of cuts
- High rigidity- The highly rigid inserts and cutter seams prevent tool breakage in rough facing
- Clamping stability- The wedge-type clamping system, which is easy-to-use and strong, reduces time for replacing inserts, and improves clamping stability

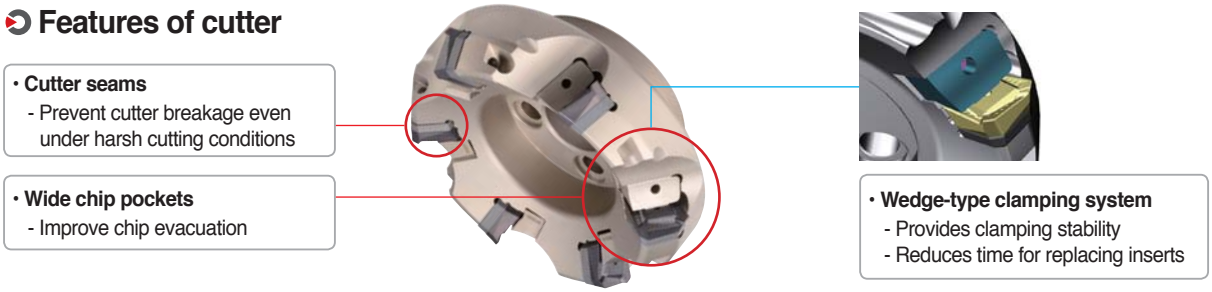
Features of insert



Features of chip breakers

Insert		Cutting-edge shape	Features
For roughing **MM**			• Highly rigid chip breaker ideally suited for roughing at high depth of cuts

Features of cutter



Recommended cutting condition

Workpiece		Grades	Cutting conditions		
			vc (m/min)	fz (mm/t)	ap (mm)
P	Low carbon steel/Mild steel	PC5300, NC5340	140~270	0.2~0.4	2.0~10.0 [SCKN22], 3.0~14.0 [SCKN28]
P	High carbon steel	PC5300, NC5340	100~220	0.2~0.4	2.0~10.0 [SCKN22], 3.0~14.0 [SCKN28]
P	Alloy steel	PC5300, NC5340	100~180	0.2~0.4	2.0~10.0 [SCKN22], 3.0~14.0 [SCKN28]
M	Stainless steel	PC5300, NC5340	90~180	0.2~0.4	2.0~10.0 [SCKN22], 3.0~14.0 [SCKN28]
K	Cast iron	PC5300, NC5340	100~180	0.2~0.4	2.0~10.0 [SCKN22], 3.0~14.0 [SCKN28]

HDDCM 7000/9000 new



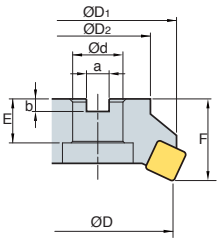


Fig. 1

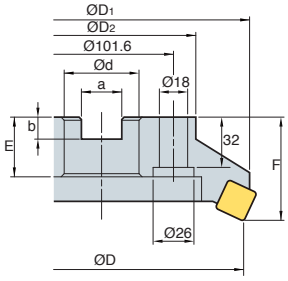


Fig. 2

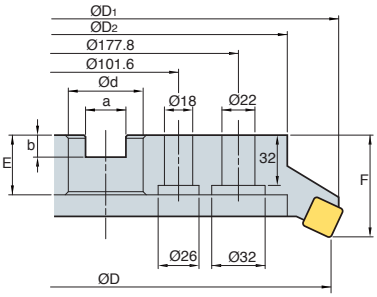


Fig. 3



AA
55°

- AR: 15°
- RR: 5°

(mm)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
HDDCM	7125R-5	5	125	135.6	90	40	16.4	9	32	63	10.5	3.43	1
	7160R-6	6	160	169.8	110	40	16.4	9	32	63	10.5	4.89	2
	7160R-8	8	160	169.8	110	40	16.4	9	32	63	10.5	4.62	2
	7200R-8	8	200	209.2	130	60	25.7	14	38	80	10.5	8.49	2
	7200R-10	10	200	209.2	130	60	25.7	14	38	80	10.5	8.74	2
	7250R-10	12	250	258.6	180	60	25.7	14	38	80	10.5	13.44	2
	7250R-12	10	250	258.6	180	60	25.7	14	38	80	10.5	13.41	2
	7315R-12	12	315	323.2	240	60	25.7	14	38	80	10.5	21.69	3
	7315R-14	14	315	323.2	240	60	25.7	14	38	80	10.5	21.41	3
HDDCM	9125R-5	5	125	140.4	90	40	16.4	9	32	63	14.5	3.4	1
	9160R-6	6	160	177.6	110	40	16.4	9	32	80	14.5	6.39	2
	9200R-8	8	200	213.6	130	60	25.7	14	38	80	14.5	8.76	2
	9250R-10	10	250	265	180	60	25.7	14	38	80	14.5	13.84	2
	9250R-12	12	250	265	180	60	25.7	14	38	80	14.5	13.41	2
	9315R-12	12	315	327.4	240	60	25.7	14	38	80	14.5	21.02	3

Available inserts

SCKN-MM



Type	Designation	Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
7000 type	SCKN 220715DDSR-MM																	E17
9000 type	SCKN 280920DDSR-MM																	

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	140~270 100~220 100~180	0.2~0.4	PC5300 NC5340
M	90~180		
K	100~180		

Available arbors

Designation		General arbor
HDDCM	7125R-5	NT*□□(M/U)-FMC40
	7160R-6	
	7160R-8	
	7200R-8	NT*□□(M/U)-FMC60
	7200R-10	
	7250R-10	
	7250R-12	
	7315R-12	
	7315R-14	
	9125R-5	NT*□□(M/U)-FMC40
	9160R-6	
	9200R-8	NT*□□(M/U)-FMC60
	9250R-10	
	9250R-12	
	9315R-12	

*□□-NT number **□□-BT number ***Over milling 5

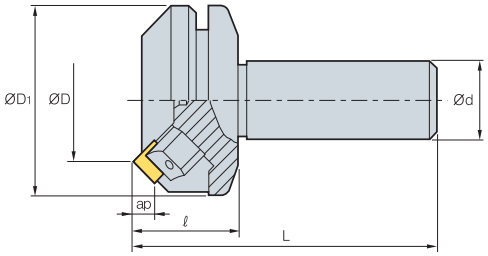
Parts

Specification	Wedge	Wedge screw	Shim	Wrench
Ø125~Ø315 (7000 type)	WHD7R	WHX0817	SS64DPR	HW40
Ø125~Ø315 (9000 type)	WHD9R	WHX0817	SS84DPR	HW40

Available inserts E17 Available arbors and bolt E371~E373

ADS4000







AA
45°

- AR: 15°
- RR: -3°

(mm)

Designation			ØD	ØD1	Ød	ℓ	L	ap	kg
ADS	4050R	3	50	75	32	40	120	6.5	1.8
	4050RS42	3	50	75	42	40	120	6.5	2.2
	4063R	4	63	87	32	40	120	6.5	2.3
	4063RS42	4	63	87	42	40	120	6.5	2.7

Available inserts

SDCN SDKN-MU SDKN-SU SDKR-MX

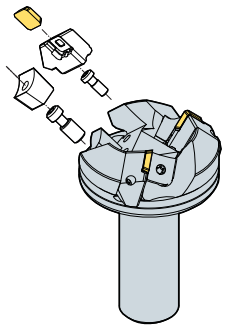


Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	42M														●			E17
	42M-G																●	
	42MT	●	●		●										●			
	42MT-RH																	
	42MT-S20										●							
	1203AEEN																	
	1203AEEN-RH																	
	1203AESN																	
	1203AESN-RH																	
SDKN	1203AESN-MU									●								E18
	1203AESN-SU									●			●	●				
SDKR	1203AESN-MX																	E18
	1203AETN-MX																	
	1203AEN-MX			●														

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



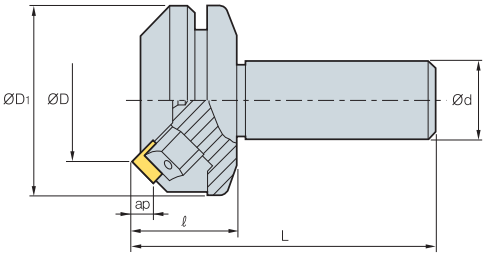
Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø50~Ø63	LASS4R/L	WASR/L	WTX0817	LTX0512	TW25

Available inserts E17, E18

ADS5000





AA
45°
• AR: 15°
• RR: -3°

(mm)

Designation			ØD	ØD1	Ød	ℓ	L	ap	kg
ADS	5050R	3	50	75	32	40	120	8.5	1.9
	5050R-S42	3	50	75	42	40	120	8.5	2.3
	5063R	4	63	87	32	40	120	8.5	2.4
	5063R-S42	4	63	87	42	40	120	8.5	2.8

Available inserts

SDCN SDKN-MU SDKN-SU SDKR-MX

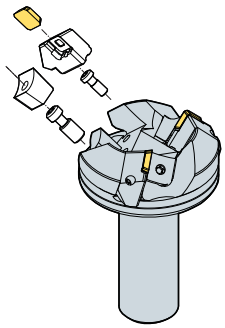


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SDCN	53M															●		E17
	53M-G																●	
	53MT		●	●											●			
	53MT-RH								●									
	53MT-S20										●							
	1504AEEN																	
	1504AEEN-RH											●	●					
	1504AESN																	
	1504AESN-RH										●	●						
SDKN	1504AESN-MU									●								E18
	1504AESN-SU									●			●	●				
SDKR	1504AESN-MX			●														E18
	1504AETN-MX																	
	1504AEN-MX			●														

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3600
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø50~Ø63	LASS5R/L	WASR/L	WTX0817	LTX0512	TW25

Available inserts **E17, E18**

PES2000/3000/4000



2000/3000 type 4000 type

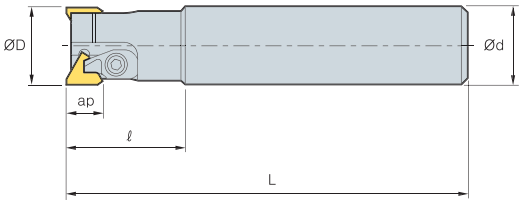


Fig. 1

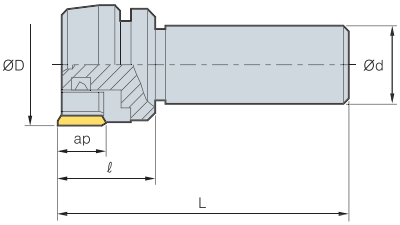


Fig. 2



AA 90°

- AR: 10°~15°
- RR: 2°~ -3°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
PES	2020R	2	20	20	30	110	8	0.3	1
	2025R	2	25	25	35	120	8	0.5	1
PES	3030R	2	30	32	45	160	13	0.9	1
	3032R	2	32	32	45	160	13	1.0	1
	3033R	2	33	32	45	160	13	1.1	1
	3035R	2	35	32	45	160	13	1.2	1
	3036R	2	36	32	45	160	13	1.3	1
	3040R	2	40	32	45	160	13	1.4	1
PES	4050R	3	50	32	40	120	16.5	1.2	2
	4050R-S42	3	50	42	40	120	16.5	1.5	2
	4063R	4	63	32	40	120	16.5	1.5	2
	4063R-S42	4	63	42	40	120	16.5	1.8	2

Available inserts

TECN TEEN

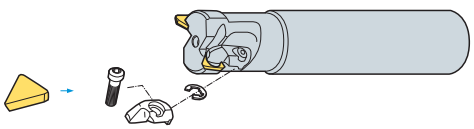


Designation			Cermet		Coated									Uncoated			page
			CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2000 type	TECN	22R																	E26
		22TR		●												●			
3000 type	TECN	32R															●		E26
		32TR		●		●										●			
		32TR-S20										●							
4000 type	TEEN	43R															●		E26
		43R-G																●	
		43TR	●	●	●	●							●			●			
		43TR-S20										●							
		43TR-Z														●			
		43TR-ZH								●		●							

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3500
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench	Wrench	Clamp	Ring
Ø20~Ø25 (2000 type)	-	-	-	CHX0407	HW25L	-	CH4R1	ER03
Ø30~Ø40 (3000 type)	-	-	-	CHX0510	HW30L	-	CH5R1	ER04
Ø50~Ø63 (4000 type)	LPTS4R/L	WPTSR	DHA0815	LTX0512	-	HW40	-	-

Available inserts E26

AFO(M)4000



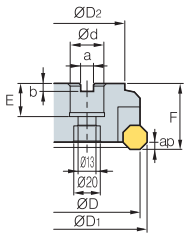


Fig. 1

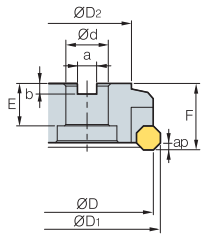


Fig. 2

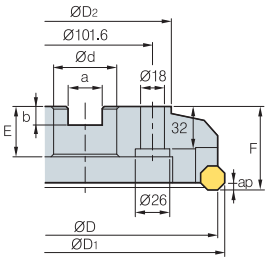


Fig. 3

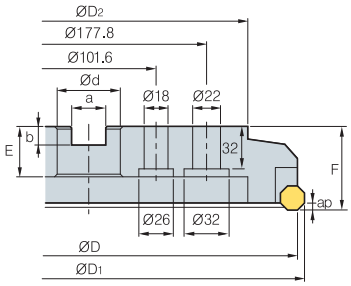


Fig. 4



AA
45°

- AR: 15°
- RR: 5°

(mm)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
AFO (AFOM)	4080R/L	5	80	88	60	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	3.3	1.4	1
	4100R/L	6	100	108	80	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	3.3	2.0	1
	4125R/L	8	125	133	100	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	3.3	3.1	1

( )Metric size

Available inserts

OFCW



OFKT-MF



OFKT-MM



OFKT-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
OFCW	05T3SN																	E13
	05T3FN																	
	05T308FN																	
OFKT	05T3SN-MF											●						
	05T308SN-MF																	
	05T3SN-MM			●					●		●							E13
	05T308SN-MM																	E14
	05T3FN-MA																●	
	05T3EN-MA																	

Available arbors

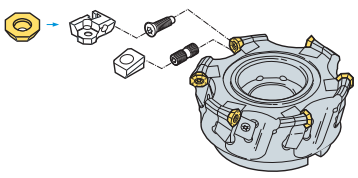
Designation		General arbor	NC arbors	
			AFO	AFOM
AFO(M)	4080R/L	NT*□□ (M/U)-FMA25.4-25	BT** □□-FMA25.4-□□	FMC27
	4100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	4125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3500
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Screw	Wrench
Ø80~Ø125	LAF04R/L	WAFO4R/L	DHA0815	FTKA0408	TW15S

Available inserts **E13, E14** Available arbors and bolt **E371~E373**

AFO(M)5000



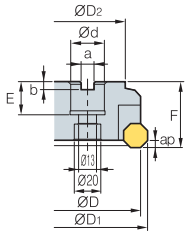


Fig. 1

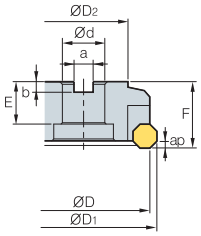


Fig. 2

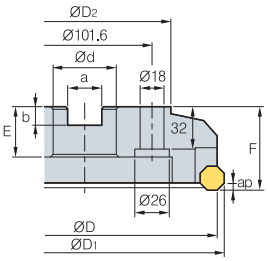


Fig. 3

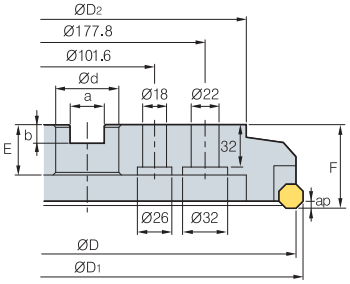


Fig. 4



AA
45°

- AR: 15°
- RR: 5°

(mm)

Designation		⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
AFO (AFOM)	5080R/L	5	80	91	60	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	4.8	1.4	1
	5100R/L	6	100	111	80	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	4.8	2.0	2
	5125R/L	8	125	136	100	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	4.8	3.1	2
	5160R/L	10	160	171	120	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	4.8	5.2	2
	5200R/L	12	200	211	130	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	4.8	7.5	3
	5250R/L	16	250	261	180	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	4.8	16.1	3
	5315R/L	20	315	326	240	47.625 (60)	25.4 (25.7)	13.5 (14)	38 (38)	63	4.8	22.8	4

( )Metric size

Available inserts

OFKT-MM



OFKT-MA



OFCN



OFKR-MF



OFKR-MM



OFKR-MA



REKR-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
OFCN	0704SN											●						E13
	0704FN																	
	070408SN																	
	070408FN																	
OFKR	0704SN-MF			●	●													E13
	070408SN-MF																	
	0704SN-MM			●	●				●		●	●						
	070408SN-MM			●														
	0704FN-MA																●	
	0704EN-MA																	
OFKT	0704SN-MM																	E13
	0704FN-MA																●	
	0704EN-MA																	
REKR	170400-MM																	E16

Available arbors

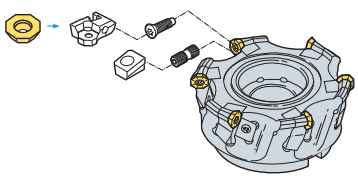
Designation		General arbor	NC arbors	
			AFO	AFOM
AFO(M)	5080R/L	NT*□□ (M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	5100R/L	NT*□□ (M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	5125R/L	NT*□□ (M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	5160R/L	NT*□□ (M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	FMB40
	5200R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5250R/L	NT*□□ (M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	5315R/L	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~320	0.05~0.20	NCM325
	161~270	0.05~0.20	PC3500
	80~140	0.05~0.20	ST30A
M	90~150	0.05~0.20	PC9530
K	140~230	0.05~0.30	PC6510
	50~90	0.05~0.30	G10

Assembling



Parts

Specification	Locator	Wedge	Wedge screw	Locator screw	Wrench
Ø80~Ø315	LAF05R/L LAF05R*/L-1*	WEFR/L	DHA0821F	LTX0512	HW40

*: Ø80~Ø100

Available inserts E13, E16 Available arbors and bolt E371~E373

New serrated edge design increases productivity by reducing insert cutting load

Power Buster

- New tooling utilizing a specially designed serrated edge to increase productivity by reducing the cutting load.
- Double-sided 6 corner insert geometry ensures high rigidity, long tool life and cost efficiency
- The serrated edge divides the chips into smaller pieces. This feature provides excellent chip control, reduces interference of the cutter and ensures good durability of the cutter body.
- Two types of inserts are available-TNMX27 for PBA (Approach angle: 45°) and PBZ (AA: 80°), and TNMX30 for PBP (AA: 90°)
- Application: High depth of cut and feed rate (Steel, Cast iron)

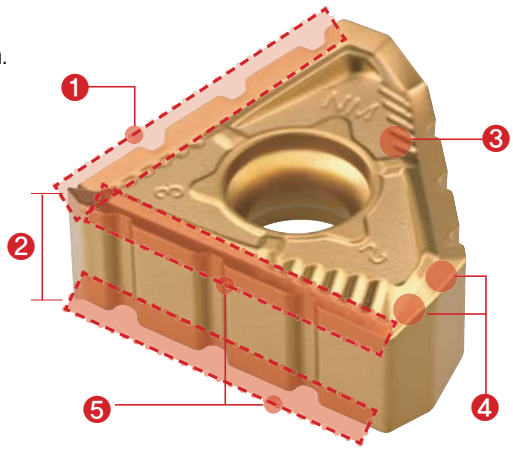
Code system

PB	A	C	M	5	250	R/L	–	M
Power Buster	AA	Cutter type	Arbor type	Inscribed circle of insert	Tool Dia.	Hand		No of tooth
Power buster	A: 45° Z: 80° P: 90°	C: Cutter	M: Metric No code: Inch	5: 15.875 6: 17.462	ØD: 250	R: Right L: Left		No code: Coarse pitch M: Close pitch 8: 8 teeth

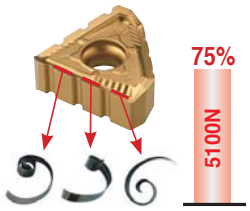
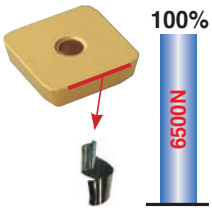
Features of insert

❶ Major cutting-edge (Serrated edge)

- Low cutting forces
- Ideal for chip control, divides chips into small pieces for proper chip evacuation. Double-sided 6 corner insert
- Ideal edge design for Steel and Cast iron rough milling



- **Comparison of chip control and cutting force**

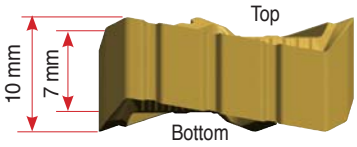
Power Buster	ISO milling insert
	

■ **Workpiece** SCM440

■ **Cutting condition** vc = 200 m/min, ap = 8 mm, ae = 90 mm, fz = 0.3 mm/t

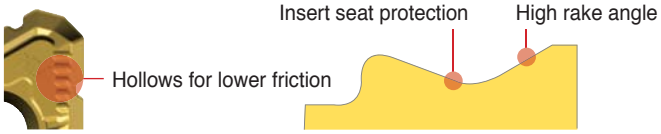
❷ Thicker insert

- Thick insert guarantees high rigidity
- Balanced insert design for stable mounting



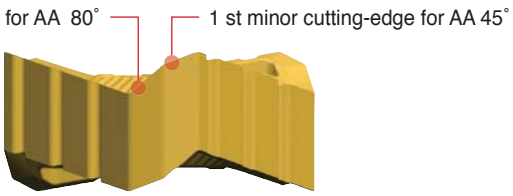
❸ NM Chip breaker

- High rake angle for low cutting force
- Good chip flow at various feed and depth of cut
- Inserts are protected with seats for a precise mounting
- Low friction and good heat evacuation at high depth cut



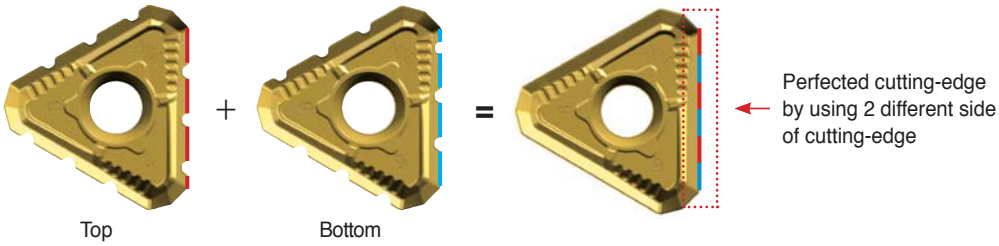
❹ Insert shape applied to PBA/Z cutters (AA: 45°/80°)

- High rake angle to avoid interference with chip
- Calculated minor cutting-edge angel for both AA 45° & 80° cutter



❺ Mirror system

- Cutting-edge on the both side of insert covers all overlapped cutting area



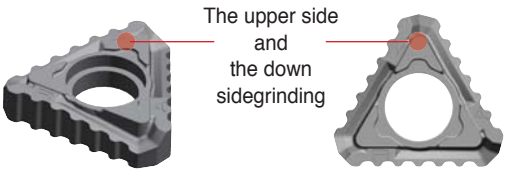
Features of cutter

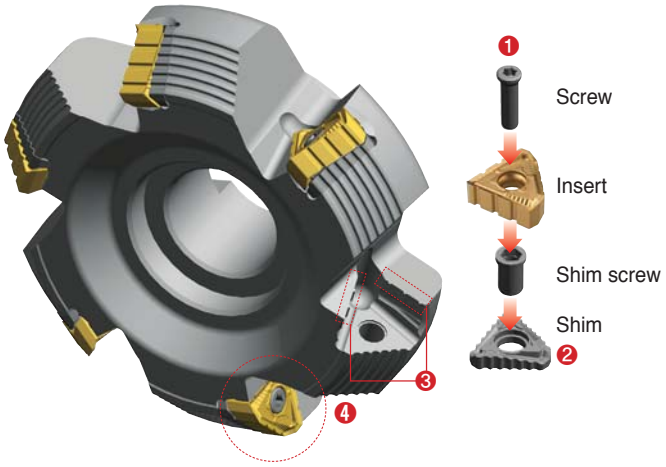
❶ Screw-on clamping system

- Simple and strong screw on clamping system

❷ Better rigidity & Stable Assembly system

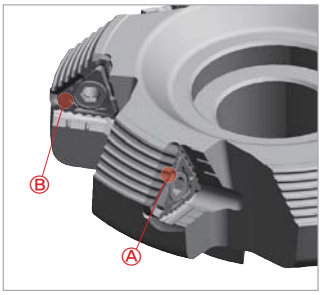
- The shim protects the cutter from insert damage
- High accuracy shim ensures tighter clamping

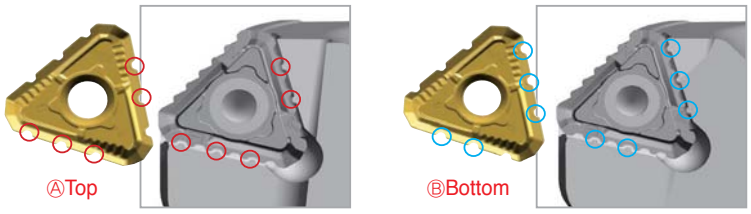




❸ Foolproof System

- Insert serrations match pocket design to prevent improper seating and alignment

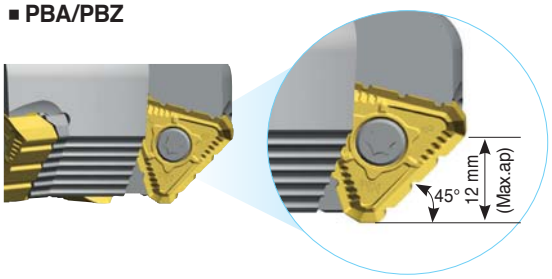


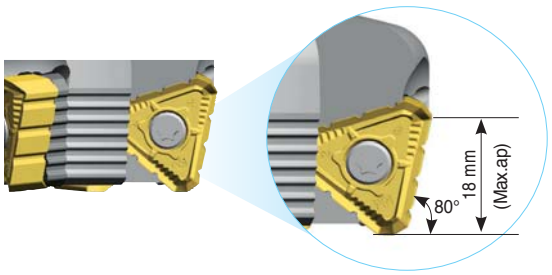


❹ Multi-application system

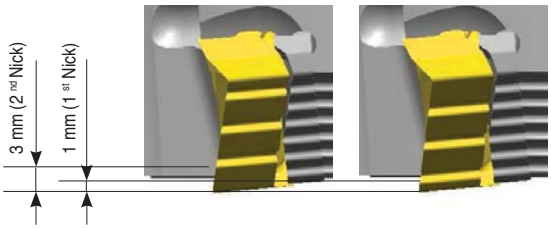
• Same insert for multi-use (45˚and 80˚)

■ PBA/PBZ

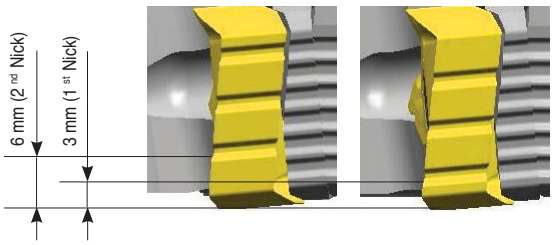




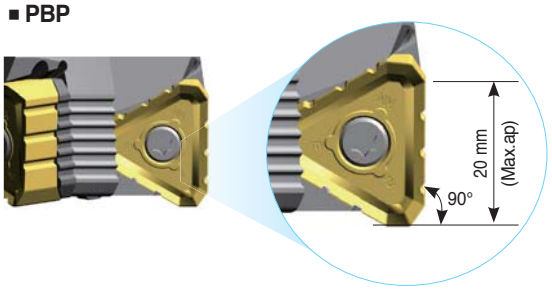
The serrations are effective with a depth of cut larger than 1 mm



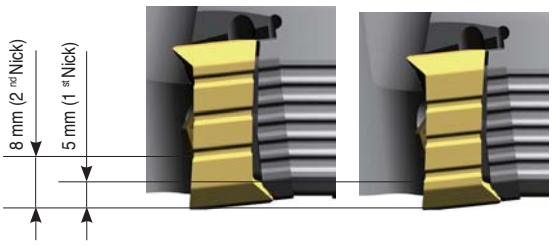
The serrations are effective with a depth of cut larger than 3 mm



■ PBP

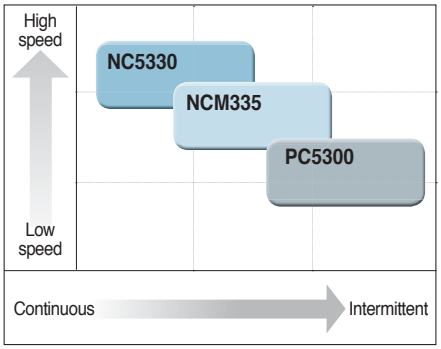


For the AA 90° cutter, nicks function properly at depth of cuts over 5 mm



Recommended cutting condition

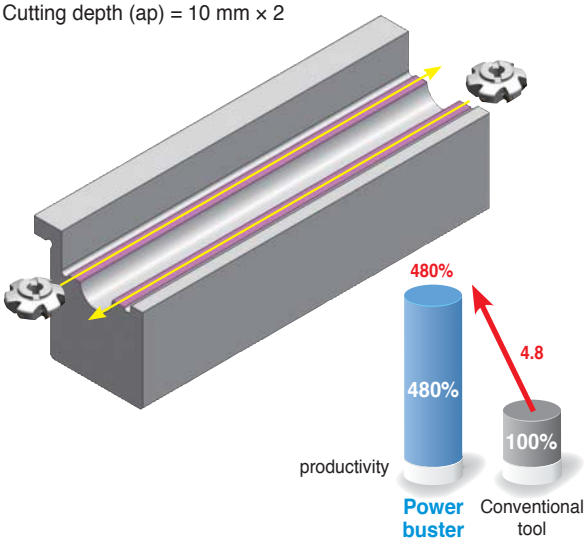
ISO	Workpiece		Material	NC5330	NCM335	PC5300
				fz (mm/t)		
				0.1-0.2-0.3	0.1-0.2-0.3	0.1-0.2-0.3
				vc (m/min)		
P	Carbon steel	-	SUM22, C = 0.1~25	400	335	280
		-	C = 0.30~55	365	305	255
		-	C = 0.55~80	340	285	240
	Low alloy steel (Alloy constituent < 5%)	-	SCM415(H), SCM420, SCM440	280	235	195
		Hardened		165	140	115
	High alloy steel (Alloy constituent > 5%)	Annealed	SKD61	210	180	150
		Hardened	SKH51, SKH55	175	145	120
K	Gray cast iron	Low tensile	FC200, FC250	125	-	145
		Hight tensile	FC300, FC350	105	-	120
		Ferric	FCD400, FCD500	80	-	95
		Pearlitic	FCD600, FCD700	75	-	85



Power Buster test

■ Cylinder block for ship engine (Cast iron)

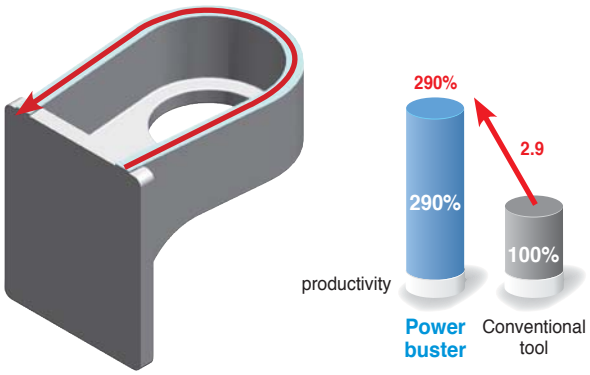
Cutting width (ae) = 160 mm x 2
Cutting depth (ap) = 10 mm x 2



Item	Power buster	Conventional tool
Diameter (ØD)	200 mm	200 mm
⦾	12 tooth	12 tooth
Grades	NC5330	PVD coating for Cast iron
vc	170 m/min	130 m/min
fz	0.24 mm/t	0.16 mm/t
ap	10 mm x 2 passes	4 mm x 5 passes
min	28.2 min/ea	137.5 min/ea
4.8 times productivity increased		• One-sided 4 corner insert (Without nick) • AA 45° cutter

■ Heavy machinery part (Alloy steel)

Cutting width (ae) = 160 mm x 2
Cutting depth (ap) = 10 mm x 2



Item	Power Buster	Conventional tool
Diameter (ØD)	125 mm	100 mm
⦾	8 tooth	8 tooth
Grades	NCM335	PVD coating for Cast iron
vc	180 m/min	150 m/min
fz	0.15 mm/t	0.10 mm/t
ap	5 mm x 2 passes	2.5 mm x 4 passes
min	5 min/ea	14.7 min/ea
2.9 times productivity increased		• Double-sided 8 corner insert (Without nick) • AA 45° cutter

PBAC(M)5000



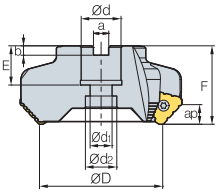


Fig. 1

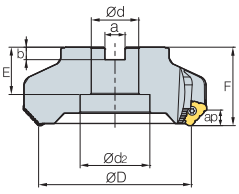


Fig. 2

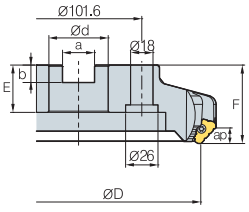


Fig. 3

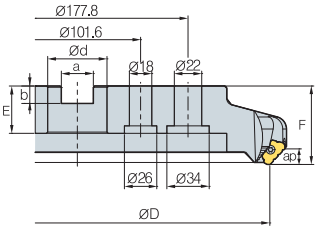


Fig. 4



AA
45°

- AR: -5°
- RR: -11°

(mm)

	Designation		⊚	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	Fig.
Coarse pitch	PBAC (PBACM)	5080R/L	4	80	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (22)	50	12	1
		5100R/L	4	100	31.75 (32)	-	45	12.7 (14.4)	8 (8)	32 (28)	50	12	2
		5125R/L	6	125	38.1 (40)	-	56	15.9 (16.4)	10 (9)	38 (32)	63	12	2
		5160R/L	8	160	50.8 (40)	-	100	19 (16.4)	11 (9)	38 (32)	63	12	2
		5200R/L	10	200	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	12	3
		5250R/L	12	250	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	12	3
		5315R/L	14	315	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	12	4
Close pitch	PBAC (PBACM)	5080R/L-M	6	80	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (22)	50	12	1
		5100R/L-M	6	100	31.75 (32)	-	45	12.7 (14.4)	8 (8)	32 (28)	50	12	2
		5125R/L-M	8	125	38.1 (40)	-	56	15.9 (16.4)	10 (9)	38 (32)	63	12	2
		5160R/L-M	10	160	50.8 (40)	-	100	19 (16.4)	11 (9)	38 (32)	63	12	2
		5200R/L-M	12	200	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	12	3
		5250R/L-M	14	250	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	12	3
		5315R/L-M	16	315	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	12	4

( )Metric size

Available inserts

TNMX-NM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	2710AZNR-NM					●			●		●		●					E26
	2710AZNL-NM																	

Available arbors

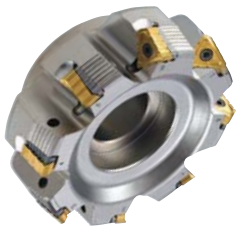
Designation		Available arbors	
		PBAC	PBACM
PBAC (PBACM)	5080R/L-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100R/L-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125R/L-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	5160R/L-□	BT□□-FMA50.8-□□	
	5200R/L-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	5250R/L-□		
	5315R/L-□		

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø315	FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available inserts E26 Available arbors and bolt E371~E373

PBZC(M)5000



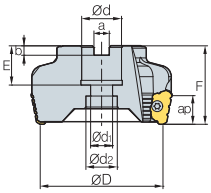


Fig. 1

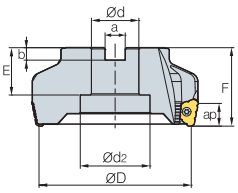


Fig. 2

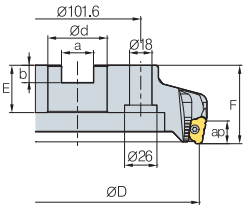


Fig. 3

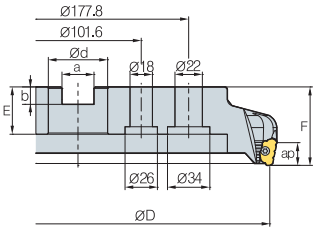


Fig. 4



AA
80°

- AR: -5°
- RR: -12°

(mm)

Designation			⊚	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	Fig.
Coarse pitch	PBZC (PBZCM)	5080R/L	4	80	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (22)	50	18	1
		5100R/L	4	100	31.75 (32)	-	45	12.7 (14.4)	8 (8)	32 (28)	50	18	2
		5125R/L	6	125	38.1 (40)	-	56	15.9 (16.4)	10 (9)	38 (32)	63	18	2
		5160R/L	8	160	50.8 (40)	-	100	19 (16.4)	11 (9)	38 (32)	63	18	2
		5200R/L	10	200	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	18	3
		5250R/L	12	250	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	18	3
		5315R/L	14	315	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	18	4
Close pitch	PBZC (PBZCM)	5080R/L-M	6	80	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (22)	50	18	1
		5100R/L-M	6	100	31.75 (32)	-	45	12.7 (14.4)	8 (8)	32 (28)	50	18	2
		5125R/L-M	8	125	38.1 (40)	-	56	15.9 (16.4)	10 (9)	38 (32)	63	18	2
		5160R/L-M	10	160	50.8 (40)	-	100	19 (16.4)	11 (9)	38 (32)	63	18	2
		5200R/L-M	12	200	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	18	3
		5250R/L-M	14	250	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	18	3
		5315R/L-M	16	315	47.625 (60)	-	-	25.4 (25.7)	14 (14)	38 (38)	63	18	4

( )Metric size

Available inserts

TNMX-NM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	2710AZNR-NM					●			●		●		●					E26
	2710AZNL-NM																	

Available arbors

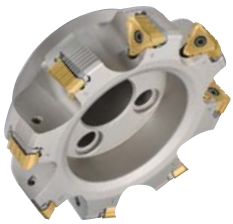
Designation		Available arbors	
		PBZC	PBZCM
PBZC (PBZCM)	5080R/L-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100R/L-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125R/L-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	5160R/L-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	5200R/L-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	5250R/L-□		
	5315R/L-□		

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø315	FTGA0518	ST53AZR	SHXN0712F	TW20-100

Available inserts E26 Available arbors and bolt E371~E373

PBPCM6000 new



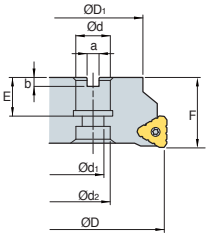


Fig. 1

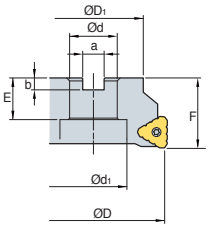


Fig. 2

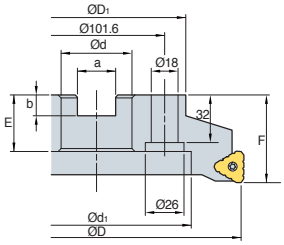


Fig. 3

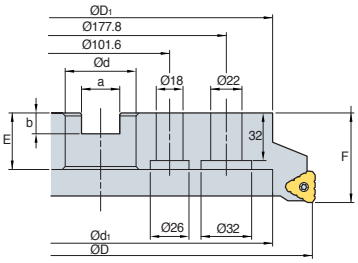


Fig. 4



AA
90°

- AR: -5°
- RR: -12°

(mm)

Designation		⊚	ØD	ØD1	Ød	Ød2	Ød2	a	b	E	F	ap	kg	Fig.
PBPCM	6080R-4	4	80	60	27	14	20	12.4	7	24	50	20	0.85	1
	6100R-6	6	100	70	32	-	54	14.4	8	30	50	20	1.16	2
	6125R-6	6	125	90	40	-	56	16.4	9	32	63	20	2.84	2
	6160R-8	8	160	107	40	-	90	16.4	9	32	63	20	3.58	3
	6200R-10	10	200	130	60	-	132	25.7	14	38	63	20	5.13	3
	6250R-12	12	250	180	60	-	180	25.7	14	38	63	20	9.6	3
	6315R-14	14	315	240	60	-	238	25.7	14	38	63	20	16.85	4

Available inserts

TNMX-NM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TNMX	3012PNR-NM																	E26

Available arbors

Designation		General arbor
PBPCM	6080R-4	BT□□-FMC27-□□
	6100R-6	BT□□-FMC32-□□
	6125R-6	BT□□-FMC40-□□
	6160R-8	
	6200R-10	BT□□-FMC60-□□
	6250R-12	
	6315R-14	

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø315	FTGA0518	ST53PNR	SHXN0712F	TW20-100

Available inserts E26 Available arbors and bolt E371~E373

Rich Mill series is one of innovations that provides more available cutting-edges by double-sided insert and longer tool life for our customers

Rich Mill Series

- Rich Mill series is one of the innovations that provides more available cutting-edges with double-sided inserts and longer tool life for our customers
- The unique geometry and special cutting-edge guarantees low cutting loads and long tool life
- Rich Mill series has a wide application range from steel and stainless steel to cast iron and aluminum
- Applying negative inserts makes it even stronger and provides longer tool life
- Rich Mill series has both screw-on clamping system and latch clamping system

Code system

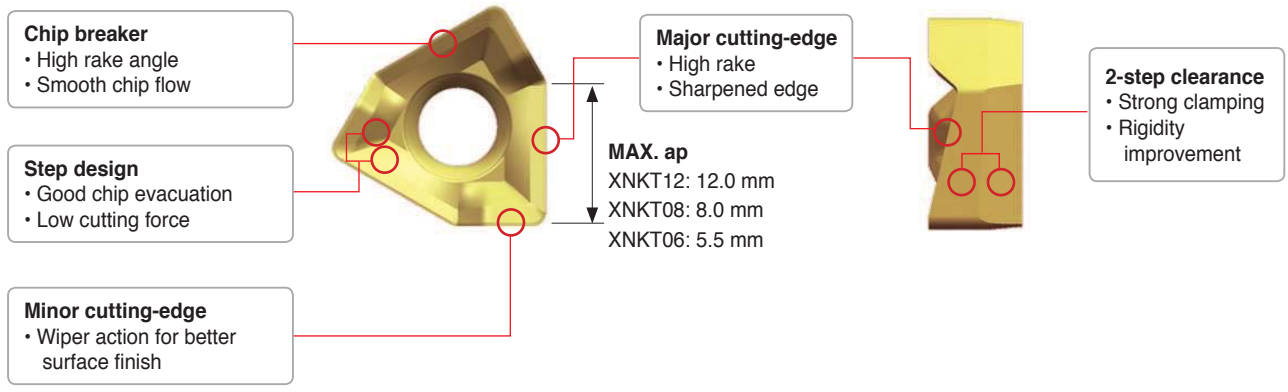
RM16	A	C	M	4	100	H	R – M
Number of edges	Approach angle	Tool type	Arbors type	Inscreibed circle of insert	Tool Dia.	Coolant type	Hand	Pitch type
RM3: Number of edges-3 RM4: Number of edges-4 RM8: Number of edges-8 RMH8: Number of edges-8 (Shim) RMT8: Number of edges-8 (Latch Clamp) RM16: Number of edges-16	A: 45° D: 30° E: 15° F: 5° P: 0° Q: 2° Z: Plunging	C: Cutter S: Shank	M: Metric A: Inch	3: 9.525 4: 12.7 5: 15.875	Ø100	H: Thru-Hole No code: None	R: Right L: Left	M: Close H: Extra Close

Rich Mill RM3

Features

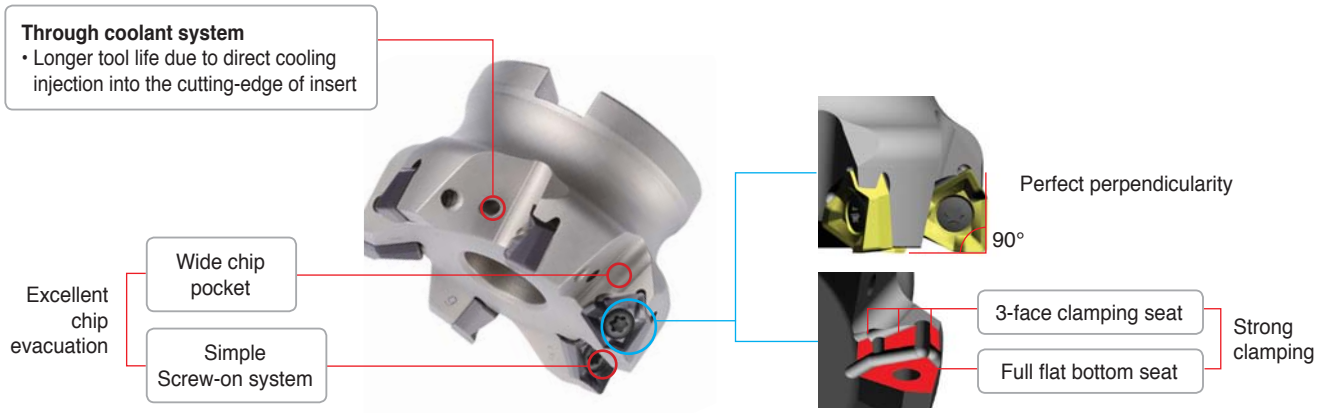
- High Quality - True 90° shouldering operation
- High Productivity - Strong thick insert and 3-face clamping ensure stable operation even tough condition.
- High Economics - Long tool life due to optimized manufacturing process

Features of insert



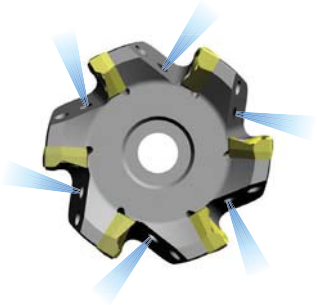
Rich Mill RM3

Features of cutter



Through coolant system

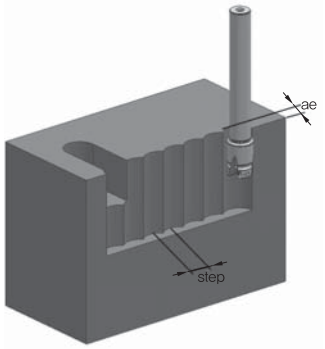
- Exclusive through coolant bolt required
- Effective coolant distribution directly to cutting-edge
- Coolant supporting arbor required



Features of chip breakers

Insert		Cutting-edge	Features
Aluminum **MA**			• Superior cutting quality for aluminum due to sharp cutting-edge and buffed surface
Light **ML**			• Superior cutting quality for light and light cutting, difficult-to-cut material machining through the low cutting load of chip breaker
General **MM**			• Suitable for various cutting due to special shape design for general cutting

Max Step in plunging



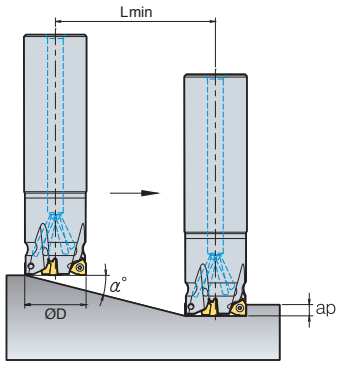
Type	max. ae
3000 type	2.5
4000 type	3.0
5000 type	3.5

ae	Cutter Diameter (mm)											
	20	21	25	26	32	33	40	50	63	80	100	125
	max step (mm)											
1	8.5	8.9	9.7	10	11.1	11.3	12.4	14	15.7	17.7	19.9	22.2
2	12	12.3	13.5	13.8	15.4	15.7	17.4	19.5	22	24.9	28	31.3
3	-	-	-	-	-	-	21	23.7	26.8	30.3	34.1	38.2

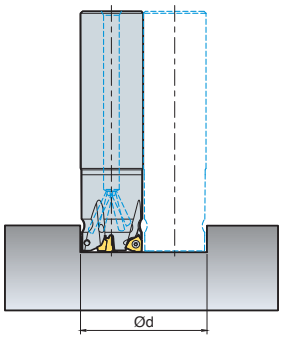
Rich Mill RM3

Ramping and helical cutting

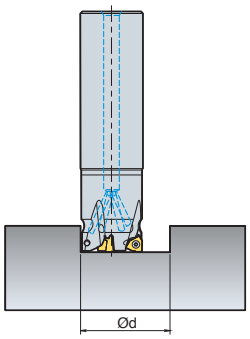
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



(mm)

Type	Tool Dia. ØD	1. Ramping		2. Helical cutting for blind hole				3.Helical cutting for through hole	
		α °	Lmin	Minimum Hole Diameter Ød	Maximum Pitch	Maximum Hole Diameter Ød	Maximum Pitch	Minimum Hole Diameter Ød	Maximum Pitch
3000 type	20	15.5	19.8	36.5	5.5	38.5	5.5	33.0	5.5
	21	14.0	22.1	38.5	5.5	40.5	5.5	35.0	5.5
	25	10.0	31.2	46.5	5.5	48.5	5.5	43.0	5.5
	26	9.5	32.9	48.34	5.5	51.0	5.5	45.0	5.5
	32	6.5	48.3	60.5	5.5	62.5	5.5	59.0	5.5
	33	6.0	52.3	62.5	5.5	64.5	5.5	59.0	5.5
	40	4.5	69.9	46.5	5.5	78.5	5.5	73.0	5.5
	50	3.5	89.9	96.5	5.5	98.5	5.5	93.0	5.5
	63	2.5	126.0	122.5	5.5	124.5	5.5	119.0	5.5
	80	2.0	157.5	156.5	5.5	158.5	5.5	153.0	5.5
	100	1.5	210.0	194.5	5.5	198.5	5.5	193.0	5.5
	125	1.0	315.1	246.5	5.5	248.5	5.5	243.0	5.5
4000 type	25	24.0	18.0	44.5	8.0	48.0	8.0	38.5	8.0
	32	13.0	34.7	58.5	8.0	62.0	8.0	52.5	8.0
	33	12.0	37.6	60.02	8.0	64.4	8.0	54.5	8.0
	40	8.5	53.5	74.5	8.0	78.0	8.0	68.5	8.0
	50	6.0	76.1	94.5	8.0	98.0	8.0	88.5	8.0
	63	4.0	114.4	12.5	8.0	124.0	8.0	114.5	8.0
	80	3.0	152.6	154.5	8.0	158.0	8.0	148.5	8.0
	100	2.0	229.1	194.5	8.0	198.0	8.0	188.5	8.0
	125	1.5	305.5	244.5	7.7	248.0	7.8	238.5	7.7
5000 type	80	5.5	124.6	153.5	12.0	158.0	12.0	146.5	12.0
	100	4.5	152.5	193.5	12.0	198.0	12.0	159.5	12.0
	125	3.5	196.2	242.5	12.0	248.0	12.0	236.5	12.0

* Please be sure to use cutting oil or air for ramping and helical machining
Lmin = ap/tan (α°)

3000 type: Available ap = 5.5 mm
4000 type: Available ap = 8.0 mm
5000 type: Available ap = 12.0 mm

Rich Mill RM3

Application guideline for grade

Workpiece		P		M	K	N
		Carbon steel	Alloy steel	Stainless steel	Cast iron	Aluminum
Chip breaker	First choice	MM	MM	ML	ML	MA
	Second choice	ML	ML	-	MM	-
Grades	High speed machining	PC3600	PC3600	PC5300	PC6510	H01
	General machining	PC5400	PC5300	PC5400	PC5300	
	Interrupted machining	PC5400	PC5400	PC5400	PC5400	

Recommended cutting condition

• RM3 3000 type

Workpiece		Grades	Cutting conditions				Cutting conditions			
			vc (m/min)	fz (mm/t)	max ap (mm)	Available inserts	vc (m/min)	fz (mm/t)	max ap (mm)	Available inserts
P	steel	PC3600	160~270	0.25~0.05	5.5	XNKT0604□□ PN□R-MM	160~270	0.2~0.05	5.5	XNKT0604□□ PN□R-ML
		PC5300	150~240	0.25~0.05			150~240	0.25~0.05		
		PC5400	130~210	0.25~0.05			130~210	0.25~0.05		
M	Stainless steel	PC5300	90~150	0.2~0.05			90~150	0.1~0.05		
		PC5400	70~120	0.2~0.05			70~120	0.1~0.05		
K	Cast iron	PC6510	140~230	0.3~0.08			140~230	0.25~0.08		
		PC5300	120~200	0.3~0.08			120~200	0.25~0.08		

※ Maximum cutting condition: vc = 350 m/min, fz = 0.5 mm/t according to cutting environment

• RM3 4000 type

Workpiece		Grades	Cutting conditions				Cutting conditions			
			vc (m/min)	fz (mm/t)	max ap (mm)	Available inserts	vc (m/min)	fz (mm/t)	max ap (mm)	Available inserts
P	steel	PC3600	160~270	0.3~0.05	8.0	XNKT0805□□ PN□R-MM	160~270	0.25~0.05	8.0	XNKT0805□□ PN□R-ML
		PC5300	150~240	0.3~0.05			150~240	0.25~0.05		
		PC5400	130~210	0.3~0.05			130~210	0.25~0.05		
M	Stainless steel	PC5300	90~150	0.25~0.05			90~150	0.2~0.05		
		PC5400	70~120	0.25~0.05			70~120	0.2~0.05		
K	Cast iron	PC6510	140~230	0.35~0.08			140~230	0.3~0.08		
		PC5300	120~200	0.35~0.08			120~200	0.3~0.08		
N	Aluminum	H01	400~1200	0.4~0.1		XNCT0805□□PNFR-MA				

※ Maximum cutting condition: vc = 350 m/min, fz = 0.7 mm/t according to cutting environment

• RM3 5000 type

Workpiece		Grades	Cutting conditions				Cutting conditions			
			vc (m/min)	fz (mm/t)	max ap (mm)	Available inserts	vc (m/min)	fz (mm/t)	max ap (mm)	Available inserts
P	steel	PC3600	160~270	0.3~0.05	12.0	XNKT1206□□ PN□R-MM	160~270	0.25~0.05	12.0	XNKT1206□□ PN□R-ML
		PC5300	150~240	0.3~0.05			150~240	0.25~0.05		
		PC5400	130~210	0.3~0.05			130~210	0.25~0.05		
M	Stainless steel	PC5300	90~150	0.25~0.05			90~150	0.2~0.05		
		PC5400	70~120	0.25~0.05			70~120	0.2~0.05		
K	Cast iron	PC6510	140~230	0.35~0.08			140~230	0.3~0.08		
		PC5300	120~200	0.35~0.08			120~200	0.3~0.08		
N	Aluminum	H01	400~1200	0.4~0.1		XNCT1206□□PN□R-MA				

※ Maximum cutting condition: vc = 350 m/min, fz = 0.7 mm/t according to cutting environment

Rich Mill RM4

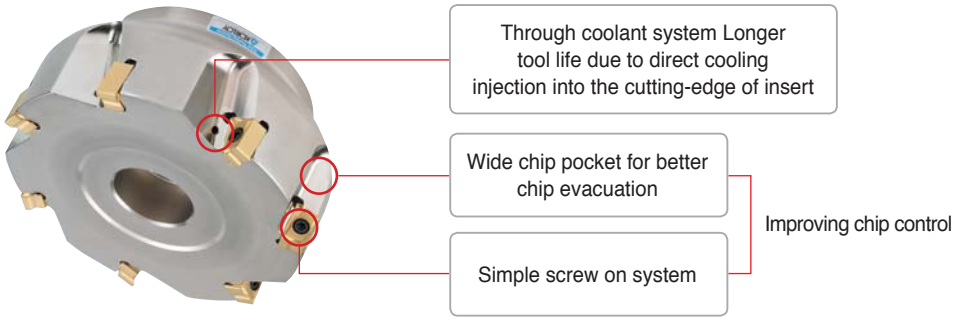


Features

- Economical 4 cutting-edges by using double-sided insert
- RM4, as a multi-functional milling tool, offers economical 4 cutting-edges by using an innovative double-sided insert
- Special designed chip breaker consists of high rake angle and strong cutting-edge to decrease the cutting load
- RM4 is multi-functional tool that can cover facing, side cutting, shouldering, slotting, ramping & helical cutting
- Optimal matching of the special cutting-edge geometry with variety of new grades provides consistence & long tool life of insert

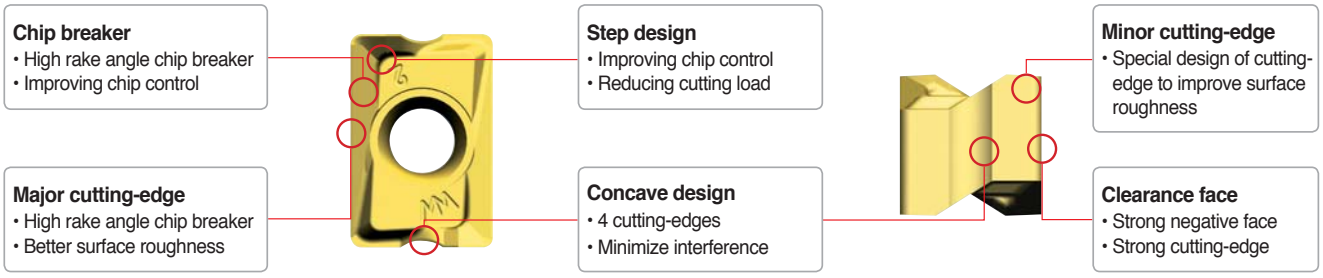
Features of cutter

- 4 cutting-edges can be used by using double-sided insert
- High rake angle chip breaker and cutting-edge can make smooth cutting with low cutting load
- Strong negative insert
- High efficiency, economical, multi-functional tool

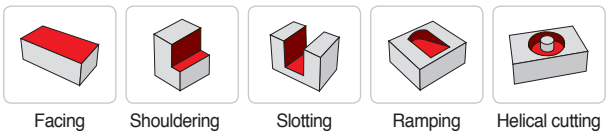


Features of insert

- Double-sided insert using 4 cutting-edges
- High rake angle chip breaker, cutting-edge
- Flexibility of product
- High efficiency, economical, multi-functional tool
- Negative insert has strong cutting-edge



Uses

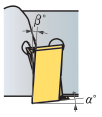
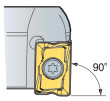


Rich Mill RM4

Features of chip breakers

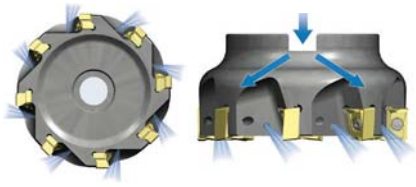
Insert		Cutting-edge	Features
Aluminum, Light machining **MA**			• With sharp edge application the better productivity has been accomplished, especially for Aluminum or low force cut
Light cutting **MF**			• Due to low cutting load, it is good for light cutting and difficult-to-cut material
General cutting **MM**			• It is suitable design for general milling

Setting configuration

Shape	Setting angle of insert	Features
		High rake chip breaker & positive setting angle for low cutting load → Improving machinability
		Multi applications for facing, shouldering, slotting, ramping, helical cutting, etc

Through coolant system

- By using on exclusive coolant bolt (hexagonal socket bolt) powerful cooling & better chip evacuation can be acquired
- To get optimal chip control, the direction of coolant injection has been designed to reach to each cutting-edge directly (through coolant arbor is required)

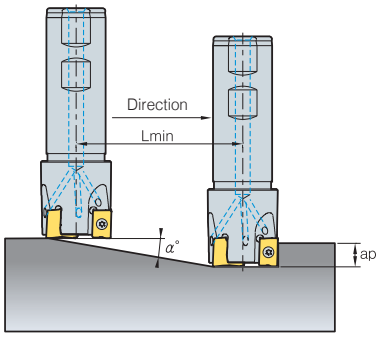


Through coolant system for decreasing cutting heat and good chip evacuation

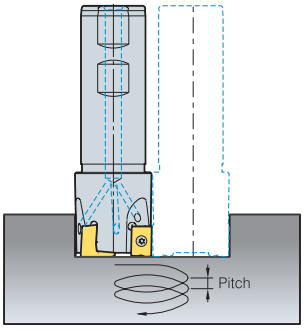
Rich Mill RM4

Ramping and helical cutting

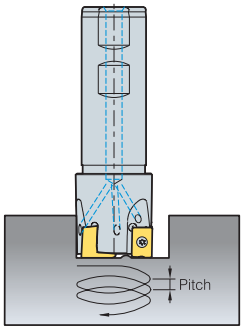
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



(mm)

Designation	1. Ramping			2. Helical cutting for blind hole				3.Helical cutting for through hole	
	D	α °	Lmin	Maximum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch
RM4PS3014HR	14	4.5	125	27	3.1	25	2.7	19	1.3
RM4PS3016HR	16	3.5	160	31	2.7	29	2.5	23	1.4
RM4PS3018HR	18	3.0	185	35	2.7	33	2.4	27	1.5
RM4PS3020HR	20	2.7	204	39	2.7	37	2.5	31	1.6
RM4PS3025HR	25	1.8	301	49	2.3	47	2.1	41	1.6
RM4PS3032HR	32	1.2	451	63	2.0	61	1.9	55	1.5
RM4PS3040HR	40	0.9	616	79	1.8	77	1.8	71	1.5
RM4PS3050HR	50	0.6	843	99	1.5	97	1.5	91	1.3
RM4PC(M)3040HR	40	0.9	616	79	1.8	77	1.8	71	1.5
RM4PC(M)3050HR	50	0.6	843	99	1.5	97	1.5	91	1.3
RM4PC(M)3063HR	63	0.5	1123	125	1.6	123	1.6	117	1.4
RM4PC(M)3080HR	80	0.3	1508	159	1.2	157	1.2	151	1.1
RM4PC(M)3100HR	100	0.2	1910	199	1.0	197	1.0	191	0.9
RM4PS4032HR	32	2.5	229	62	4	59.5	3.0	49	2.0
RM4PS4040HR	40	2.0	286	78	4	75.5	3.0	65	2.0
RM4PS4050HR	50	2.0	286	98	5	95.5	4.0	85	3.5
RM4PS4063HR	63	2.0	286	124	5	121.5	5.0	111	5.0
RM4PC(M)4050HR	50	2.0	286	98	5	95.5	4.0	85	3.5
RM4PC(M)4063HR	63	2.0	286	124	5	121.5	5.0	111	5.0
RM4PC(M)4080HR	80	1.5	382	158	5	155.5	5.0	145	5.0
RM4PC(M)4100HR	100	1.0	573	198	5	195.5	4.5	185	4.0
RM4PC(M)4125HR	125	1.0	573	248	5	245.5	5.0	235	5.0
RM4PC(M)4160R	160	0.5	1146	318	4	315.5	3.5	305	3.5

* Please be sure to use cutting oil or air for ramping and helical machining
  Lmin = ap/tan (α°)

  3000 type: Available ap = 5.5 mm
  4000 type: Available ap = 8.0 mm

Recommended cutting condition

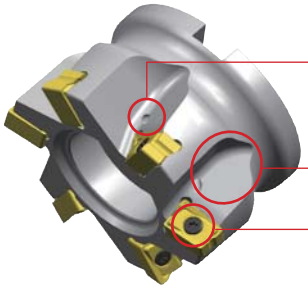
(mm)

ISO	Grades	LNM(E)X100605PNR-MF		LNM(E)X100605PNR-MM		LNEX100605PNR-MA		Max-ap	LNM(E)X151008PNR-MF		LNM(E)X151008PNR-MM		LNEX151008PNR-MA		Max-ap
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	
P	NCM325	-	-	-	-	-	-	9.0	150~300	0.05~0.30	120~300	0.05~0.35	150~300	0.03~0.20	14.0
P	PC3500	150~300	0.05~0.25	120~300	0.05~0.30	150~300	0.03~0.20		150~300	0.05~0.30	120~300	0.05~0.35	150~300	0.03~0.20	
M	PC5300	120~180	0.05~0.25	100~180	0.05~0.30	120~200	0.03~0.20		120~180	0.05~0.30	100~180	0.05~0.3	120~200	0.03~0.20	
K	PC6510	150~300	0.08~0.30	120~300	0.08~0.35	-	-		150~300	0.08~0.35	120~300	0.08~0.35	-	-	

Rich Mill RM4Z

Features

- Rich mill series RM4Z is a plunge mill for high efficiency vertical machining such as slotting and pocketing in roughing applications
- Rich mill series RM4Z is a highly efficient milling tool for plunging, shouldering and facing. It makes operations more economical with the use of its double-sided 4-corner insert
- Plunge machining reduces lead time for high productivity and precision machining.
- In plunging the max depth of RM4Z 3000 type is 9.0 mm and that of RM4Z 4000 type is 14.0 mm

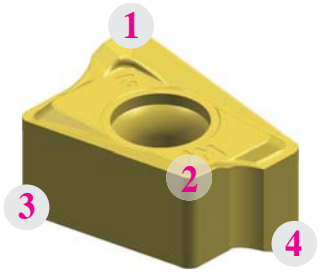


Through coolant system
- Improving chip control
  Cooling inserts increases tool life

Wide chip pocket

Screw on system

Improving chip evacuation

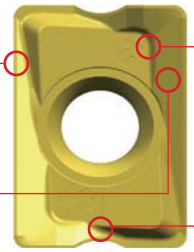


- Double-sided insert ···› 4 corner available
- High rake angle chip breaker and cutting-edge
- Various available machining types
- High efficiency and economical insert
- Negative type insert - Strong cutting-edge

Features of insert

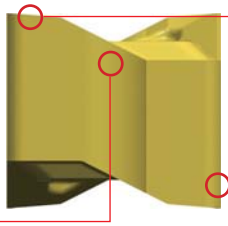
Major cutting-edge
- High rake cutting-edge
- Sharp cutting-edge

Chip breaker
- High rake angle
- Control chip flow



Step design
- Improving chip control
- Reducing cutting load

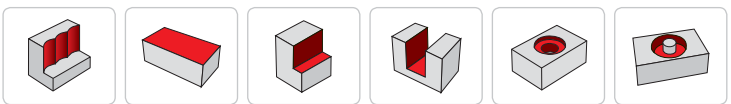
Concave design
- 4 corner available
- Avoiding interference of cutting-edges



Minor cutting-edge
- Special design for plunge machining

Sides
- Negative type
- Strong cutting-edge

Uses

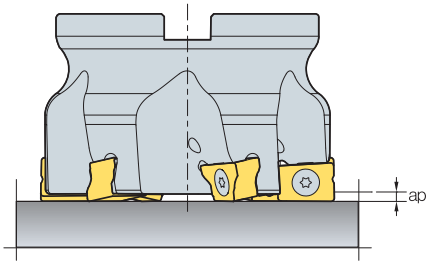


Plunging | Facing | Shouldering | Slotting | Counter Boring | Helical cutting

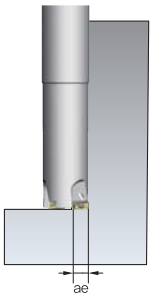
Rich Mill RM4Z

The depth of cut by machining type

• In horizontal machining, Depth of cut = ap (mm)

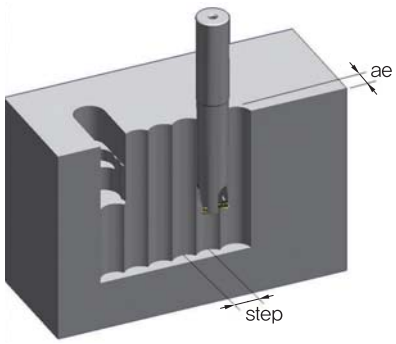


• In plunging, Depth of cut = ae (mm)



RM4Z	Horizontality	Verticality	
	max ap (mm)	max ae (mm)	step
RM4Z 3000	1.5	9	< 0.7D
RM4Z 4000	2.5	14	< 0.7D

Max step in plunging



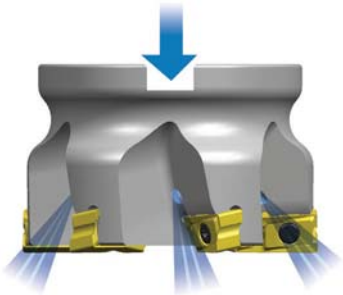
ae	Cutter Diameter (mm)								
	25	32	40	50	52	63	66	80	100
	Max step (mm)								
1	9.7	11.1	12.4	14	14.2	15.7	16.1	17.7	19.9
2	13.5	15.4	17.4	19.5	20	22	22.6	24.9	28
3	16.2	18.6	21	23.7	24.2	26.8	27.4	30.3	34.1
4	18.3	21.1	24	27.1	27.7	30.7	31.4	34.8	39.1
5	20	23.2	26.4	30	30.6	34	34.9	38.7	43.5
6	21.3	24.9	28.5	32.4	33.2	36.9	37.9	42.1	47.4
7	22.4	26.4	30.3	34.6	35.4	39.5	40.6	45.2	51
8	23.3	27.7	32	36.6	37.5	41.9	43	48	54.2
9	24	28.7	33.4	38.4	39.3	44	45.2	50.5	57.2
10	-	-	-	-	-	46	47.3	52.9	60
11	-	-	-	-	-	47.8	49.1	55.1	62.5
12	-	-	-	-	-	49.4	50.9	57.1	64.9
13	-	-	-	-	-	50.9	52.4	59	67.2
14	-	-	-	-	-	52.3	53.9	60.7	69.3

Through coolant system

- Exclusive hexagonal coolant socket bolt provides excellent cooling and chip evacuation
- Direct coolant injection to cutting-edge improves cooling effectiveness
- Coolant type arbor should be used

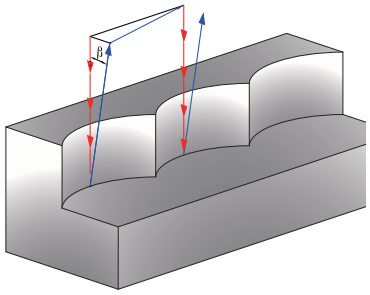
∗Coolant bolt is not included, it is for sale





Rich Mill RM4Z

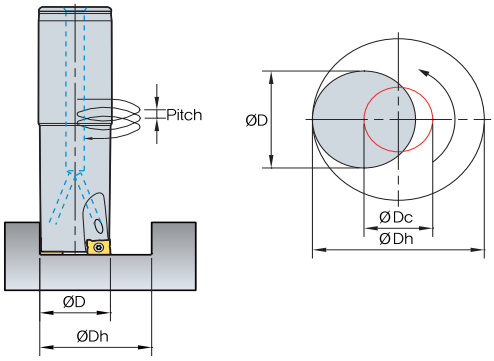
Programming tip



Plunging feed direction
Tool escape
β Escape angle (β ≥ 1°)

• When your tool steps back after plunging, please get over 1° more escape angle

Helical machining



ØDc = ØDh-ØD

ØDc = Tool center path
ØDh = Desired hole diameter
ØD = Tool Dia.

Designation		Diameter ØD (mm)	Helical data			
			ØDh max (mm)	Max. Pitch (mm)	ØDh min (mm)	Max. Pitch (mm)
RM4ZS	3025HR-L25	25	48	1.8	30	0.4
	3032HR-L32	32	62	0.9	43	0.3
	3040HR-L32	40	78	0.6	59	0.3
RM4ZC	M3040HR	40	78	0.6	59	0.3
	M3050HR	50	98	0.5	79	0.3
	M3052HR	52	102	0.5	83	0.3
RM4ZM	3025HR-M12	25	48	1.8	30	0.4
	3032HR-M16	32	62	0.9	43	0.3
	3040HR-M16	40	78	0.6	59	0.3
RM4ZC	M4063HR	63	124	1.0	95	0.5
	M4066HR	66	130	1.0	101	0.5
	M4080HR	80	158	0.8	129	0.5
	M4100HR	100	198	0.5	169	0.3

Recommended cutting condition

(mm)

ISO	Grades	LNM(E)X100605PNL-MM				LNM(E)X151008PNL-MM			
		vc (m/min)	fz (mm/t)	* max ae (mm)	** max ap (mm)	vc (m/min)	fz (mm/t)	* max ae (mm)	** max ap (mm)
P	PC3500	100~250	0.05~0.25	9	1.5	120~250	0.05~0.25	14	2.5
M	PC5300	100~250	0.08~0.30			120~250	0.08~0.30		
K	PC6510	80~180	0.05~0.20			100~180	0.05~0.20		

* max ae (mm): (Plunging) max. radial depth of cut
** max ap (mm): (Shouldering/Facing) max depth of cut

Rich Mill RM6

Features

- Stable clamping- 3 clamping surfaces on the side and strong clamping screws
  → Improves cutting stability
- High quality results- High precision, excellent perpendicularity, outstanding surface finish on the flank, accurate tolerance
- High productivity- High rake angle and sharp cutting-edges for lower cutting resistance
  → Ideal for high speed and high feed machining

Features of insert

Higher clamping stability
- Wide clamping areas and strong clamping screws for rigid clamping

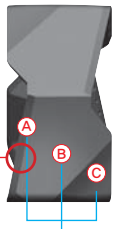
High rake angle chip breaker
- Maintains stable clamping
- Induces smooth chip flow
  → Increases insert life

Wide minor cutting-edges
- Improved surface finish
- Enable multi-purpose machining incl. plunging



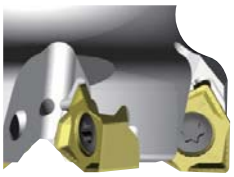
MAX. ap
WNGX08: 8.2 mm
WNGX04: 4.3 mm

High rake cutting-edges
- Improved machinability and reduces cutting resistance

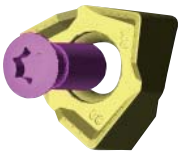


3-level flank relief surface
- Enhances rigidity and enables stable clamping
  → Improves cutting stability

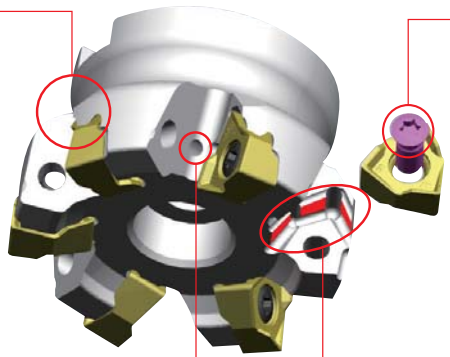
Features of cutter

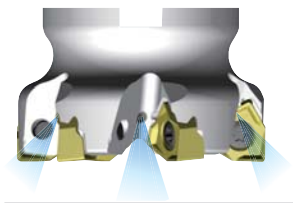


Streamlined holder design
- Improved chip evacuation in deep shouldering and slotting



Strong clamping screws
- Strong clamping screws enable rigid clamping





Through coolant system
- Improved chip flow and tool life thanks to insert cooling



3-side supporting system
- Stable tool life

Rich Mill RM6

Features of chip breakers

Insert		Cutting-edge	Features
For aluminum **MA**			• Sharp cutting-edges for excellent cutting performance in aluminum machining • Buffed surface for excellent chip flow and welding resistance
For light cutting **ML**			• Chip breaker design of low cutting resistance, ideal for light cutting and machining hard-to-cut materials • Excellent tool life and quality results
For general cutting **MM**			• Chip breaker design ideal for general shoulder milling and most applications

Application guideline for grade

Workpiece		P		M	K	N
		Carbon steel	Alloy steel	Stainless steel	Cast iron	Non-ferrous metal
Shape	1st recommended	MM	MM	ML	ML	MA
	2nd recommended	ML	ML	-	MM	MA
Grades	High speed milling	PC3600	PC3600	PC5300	PC6510	H01
	General milling	PC5400	PC5300	PC5400	PC5300	H01
	Interrupted milling	PC5400	PC5400	PC5400	PC5400	H01

Recommended cutting condition

• WNGX04

Workpiece		Grades	WNGX040304PNSR-MM			WNGX040304PNER-ML			WNGX040304PNFR-MA		
			vc (m/min)	fz (mm/t)	max. ap(mm)	vc (m/min)	fz (mm/t)	max. ap (mm)	vc (m/min)	fz (mm/t)	max. ap (mm)
P	Steel	PC3600	160~270	0.25~0.05	4.3	160~270	0.20~0.05	4.3	-	-	4.3
		PC5300	150~240	0.25~0.05	4.3	150~240	0.25~0.05	4.3	-	-	4.3
		PC5400	130~210	0.25~0.05	4.3	130~210	0.25~0.05	4.3	-	-	4.3
M	Stainless steel	PC5300	90~150	0.20~0.05	4.3	90~150	0.10~0.05	4.3	-	-	4.3
		PC5400	70~120	0.20~0.05	4.3	70~120	0.10~0.05	4.3	-	-	4.3
K	Cast iron	PC6510	140~230	0.30~0.08	4.3	140~230	0.25~0.08	4.3	-	-	4.3
		PC5300	120~200	0.30~0.08	4.3	120~200	0.25~0.08	4.3	-	-	4.3
N	Non-ferrous metal	H01	-	-	4.3	-	-	4.3	500~1000	0.2~0.05	4.3

※ The above data refer to general cutting conditions and can be adjustable up to 300 m/min and 0.4 mm/t depending on user environment.

• WNGX08

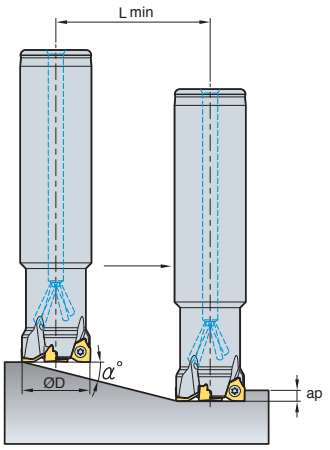
Workpiece		Grades	WNGX080608PNSR-MM			WNGX080608PNER-ML			WNGX080608PNFR-MA		
			vc (m/min)	fz (mm/t)	max. ap (mm)	vc (m/min)	fz (mm/t)	max. ap (mm)	vc (m/min)	fz (mm/t)	max. ap (mm)
P	Steel	PC3600	160~270	0.25~0.05	8.2	160~270	0.20~0.05	8.2	-	-	8.2
		PC5300	150~240	0.25~0.05	8.2	150~240	0.25~0.05	8.2	-	-	8.2
		PC5400	130~210	0.25~0.05	8.2	130~210	0.25~0.05	8.2	-	-	8.2
M	Stainless steel	PC5300	90~150	0.20~0.05	8.2	90~150	0.10~0.05	8.2	-	-	8.2
		PC5400	70~120	0.20~0.05	8.2	70~120	0.10~0.05	8.2	-	-	8.2
K	Cast iron	PC6510	140~230	0.30~0.08	8.2	140~230	0.25~0.08	8.2	-	-	8.2
		PC5300	120~200	0.30~0.08	8.2	120~200	0.25~0.08	8.2	-	-	8.2
N	Non-ferrous metal	H01	-	-	8.2	-	-	8.2	500~1000	0.2~0.05	8.2

※ The above data refer to general cutting conditions and can be adjustable up to 300 m/min and 0.4 mm/t depending on user environment.

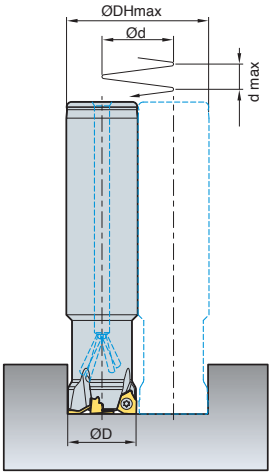
Rich Mill RM6

Ramping

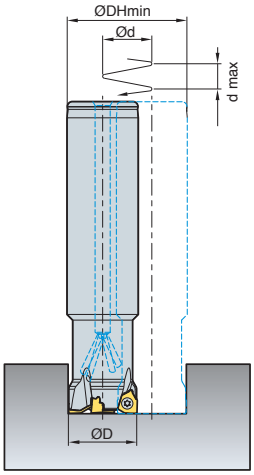
1. Ramping



2. Helical cutting for blind holes



3. Helical cutting for through holes



(mm)

Designation		Tool Dia. ØD	Depth of cut ap	1. Ramping		2. Helical cutting for blind holes				3. Helical cutting for through holes	
				Max. rake angle α°	Lmin	Min. machining Dia. Ø DHmin	Max. pitch dmax	Max. machining Dia. Ø DHmax	Max. pitch dmax	Min. machining Dia. Ø DHmin	Max. pitch dmax
RM6PS	**032R-2W32-120-WN08**	32	8	0.8	572.9	534	0.96	62	1.3	38 .5	0.5
	040R-3W32-120-WN08	40	8	0.5	916.7	70	0.82	78	1.0	54 .5	0.4
	050R-4W32-120-WN08	50	8	0.3	1527.9	90	0.66	98	0.8	74.5	0.3
RM6PCM	**063R-22-6-WN08**	63	8	0.2	2291.3	116	0.58	124	0.6	100.5	0.3
	080R-27-7-WN08	80	8	0.1	4583.7	150	0.38	158	0.4	134.5	0.2
	100R-32-8-WN08	100	8	0.1	4583.7	190	0.49	198	0.5	174.5	0.3
	125R-40-11-WN08	125	8	0.1	4583.7	240	0.63	248	0.6	224.5	0.3

Lmin = ap/tan (α°)

Lmin: Cutting length at min. rake angle
ap: Axial depth of cut
α°: Available rake angle for ramping

Rich Mill RM8

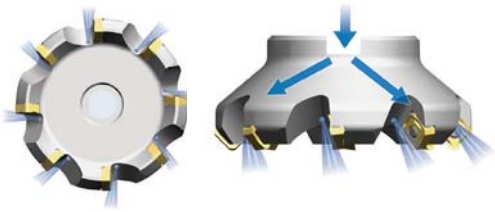
Features

- Double-sided insert to use 8 cutting-edges
- Innovative double-sided insert makes it possible to use 8 cutting-edges
  It is more economical than conventional single sided insert
- The unique geometry and high rake angle of cutting-edge guarantees excellent surface finish
  Applicable for various workpieces like steel, stainless steel, cast iron, aluminum
- Combined with the innovative geometry and various grades
  provided the tool offers durability and excellent tool life
- Various pitches and chip breakers can be applicable for diverse machining
- Light Rich mill cutter can be useful for high speed machining and low power machine



Through coolant system

- Exclusive coolant bolt is adapted to get better chip evacuation and more powerful cooling. To get optimal chip evacuation, the direction of coolant injection has been designed to reach to each cutting-edge directly. Through coolant arbor is required



Through coolant system for decreasing cutting heat and good chip evacuation

Features of chip breaker

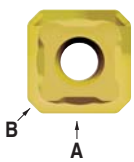
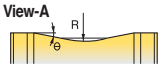
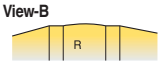
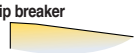
Insert		Cutting-edge	Features
For aluminum **MA**			• Due to sharp cutting-edge and buffed surface, it has good chip flow and welding resistance
For hard-to-cut material **ML**			• Chip breaker with low cutting load is optimal for machining hard-to-cut materials
For light cutting **MF**			• Due to low cutting load, it is good for light cutting and difficult-to-cut material
For general cutting **MM**			• It is suitable design for general milling
For wiper **W**			• Specialized edge design can be suitable for excellent surface roughness operation

Uses



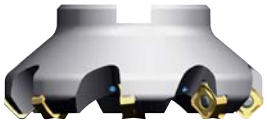
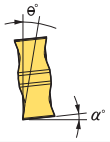
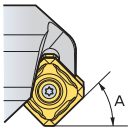
Facing

Features of insert

Insert	Cutting-edge	Features
	View-A 	High rake chip breaker & positive setting angle for low cutting load
	View-B 	Designed wiper technology in minor cutting-edge for improved surface roughness
	Chip breaker 	Low cutting load due to the positive setting and high rake angle chip breaker

Rich Mill RM8

Setting configuration

Shape	Setting angle of insert	Features
		High rake angle makes positive setting angle for low cutting load
		Suitable for facing and chamfering • RM8A A = 45° • RM8E A = 75° • RM8Q A = 88°

Recommended cutting condition

(mm)

ISO	Grades	SNM(E)X1206A(E)NN-MF		SNM(E)X1206A(E)NN-MM		SNEX1206A(E)NN-MA		Max-ap	SNM(E)X1507A(E)NN-MF		SNM(E)X1507A(E)NN-MM		Max-ap
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	
P	NC5330	-	-	150~300	0.10~0.35	150~300	0.10~0.35	RM8A 6.0 mm RM8E 9.0 mm RM8Q 11.5 mm	-	-	150~300	0.10~0.35	RM8A 7.5 mm RM8E 11 mm
P	NCM325	200~300	0.05~0.30	150~300	0.10~0.35	150~300	0.10~0.35		200~300	0.05~0.30	150~300	0.10~0.35	
P	PC3500	200~300	0.05~0.30	150~300	0.10~0.35	150~300	0.10~0.35		200~300	0.05~0.30	150~300	0.10~0.35	
M	PC9530	90~150	0.05~0.25	90~150	0.10~0.35	-	-		90~150	0.10~0.30	90~150	0.10~0.35	
M	PC5300	90~150	0.05~0.25	90~150	0.10~0.35	-	-		90~150	0.10~0.30	90~150	0.10~0.35	
K	PC6510	150~300	0.08~0.35	150~300	0.10~0.40	150~300	0.10~0.40		150~300	0.08~0.35	150~300	0.10~0.40	
K	PC5300	150~300	0.08~0.35	150~300	0.10~0.40	150~300	0.10~0.40		150~300	0.08~0.35	150~300	0.10~0.40	

Rich Mill RMH8

Screw on clamping system

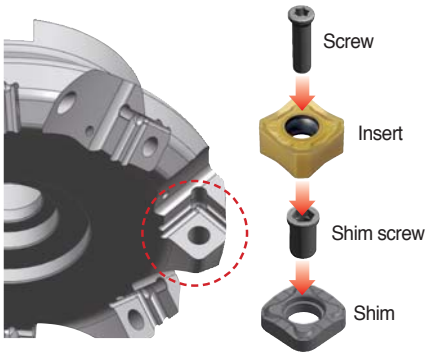
• Adaptable and Stable clamping system

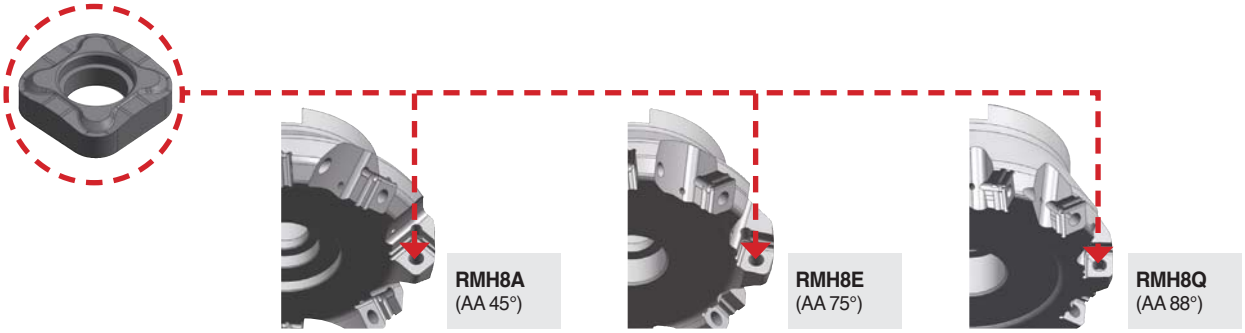
Reinforced rigidity and enhanced clamping power

• Appling shim system, prevent cutter damage when insert breaks

Adapting/exchangeable shim

• Using various kinds of cutter (Approach angle 45°, 75°, 88°)
• Stable clamping power with insert



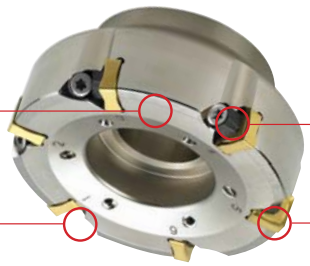


Rich Mill RMT8

Features

- New latch clamping system provides a powerful cutting force and an easy insert change
- New grades with chipping resistance provides good surface roughness and better tool life
- Due to the specially designed chip breaker, all operations are possible
- RMT with various pitches can replace conventional ISO milling tool

Features of cutter



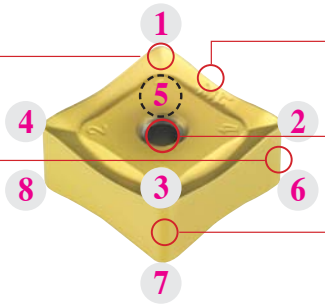
High rigid cutter body to improve durability

The 3-dimensional chip pocket design for smooth chip control

New latch clamping system ensures the powerful cutting force and easy to insert change

Economical 8 corners with a double-sided insert

Features of insert (Using R/L)



Economical 8 corners

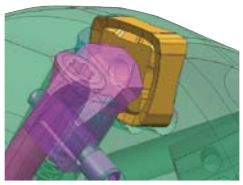
Coated grades with improved chipping resistance

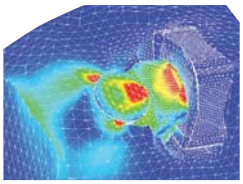
Low cutting load due to high rake angle chip breaker

The chamber shape for stable clamping

Optimal design of minor cutting-edge to use in R/L cutting type good surface roughness

Clamping force analysis





Features of chip breakers

Insert		Cutting-edge	Features
For fine finishing **MF**			• Our specialized insert design creates low cutting forces suitable for light cutting, HRSA
For strengthen **MM**			• Suitable geometry design for general milling has wider ranges of machining

Recommended grades and chip breakers

ISO	Grades	MM	MF
P	NCM325	◎	○
	PC5300	◎	○
M	PC9530	○	◎
K	PC6510	○	◎

◎: Optimum ○: Proper

Recommended cutting condition

ISO	Grades	MM		MF	
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
P	NC5330	190~310	0.10~0.35	190~310	0.05~0.30
	NCM325	160~270	0.10~0.35	160~270	0.05~0.30
	PC3500	130~210	0.10~0.35	130~210	0.05~0.30
M	PC9530	90~150	0.05~0.30	90~150	0.05~0.30
K	PC6510	140~230	0.10~0.40	140~230	0.08~0.35

Rich Mill RM16

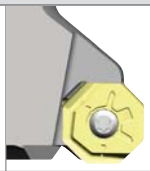
Features

- Economical 16 cutting-edges
- Reduces cost in medium cutting
- Wiper insert can be used for good surface roughness
- Optimal matching of the special cutting-edge geometry with variety of new grades provides consistence & long tool
- When it is used 16 corners, maximum cutting depth is 5.5 mm, but it is used 8 corners, maximum cutting depth is 13 mm
- Wiper insert is placed 0.05 mm lower than facing insert in cutter
- When feed is bigger than wiper cutting-edge length (7 mm), 2 wiper inserts are placed in symmetrical position

Features of chip breakers

Insert		Cutting-edge	Features
For aluminum cutting light **MA**			• With sharp edge application, the better productivity has been accomplished, especially for Aluminum cutting
For hard-to-cut material **ML**			• Chip breaker with low cutting load is optimal for machining hard-to-cut materials
For light cutting **MF**			• Due to low cutting load, it is good for light cutting and difficult-to-cut material
For general cutting **MM**			• It is suitable design for general milling
For wiper **W**			• It has better surface roughness than MM and MF chip breakers

Instruction for wiper insert

Hand	Correct setting	Incorrect setting			
Right hand					
Decision	O	×	×	×	×
Left hand					
Decision	O	×	×	×	×

Through coolant system

- Well designed chip pocket for better chip flow
- Through coolant system reduces cutting heat and improves chip evacuation



Recommended cutting condition

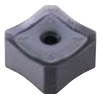
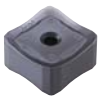
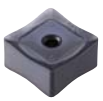
(mm)

ISO	Grades	ONM(H)X060608-MM		ONM(H)X060608-MF		ONHX060608-W		ONM(H)X080608-MM		ONM(H)X080608-MF		ONHX080608-W	
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
P	NCM325	150~300	0.10~0.35	200~300	0.05~0.30	200~300	0.05~0.20	150~300	0.10~0.40	200~300	0.05~0.35	200~300	0.05~0.25
P	PC3500	150~300	0.10~0.35	200~300	0.05~0.30	200~300	0.05~0.20	150~300	0.10~0.40	200~300	0.05~0.35	200~300	0.05~0.25
M	PC6510	120~180	0.10~0.35	100~180	0.05~0.30	100~180	0.05~0.20	120~180	0.10~0.40	100~180	0.05~0.35	100~180	0.05~0.25
K	PC9530	150~300	0.10~0.40	150~300	0.08~0.35	150~300	0.05~0.25	150~300	0.10~0.45	150~300	0.08~0.40	150~300	0.05~0.30

Cutters

Type	A.A	Designation	Shape	Cutter Diameter	Application		Features	Page
RM3	90°	RM3PC(M)3000 new		Ø40~Ø80	XNKT060405PNER-ML	XNKT060405PNSR-MM	• Economical 3 corners. • Perfect perpendicularity • Longer tool life due to direct injection into the cutting-edge of insert	E86
		RM3PC(M)4000 new		Ø40~Ø125	XNCT080508PNFR-MA XNKT080508PNER-ML XNKT080508PNSR-MM	XNKT080512PNSR-MM XNKT080516PNSR-MM XNKT080520PNSR-MM		E87
		RM3PC(M)5000 new		Ø80~Ø125	XNCT120608PNER-MA XNKT120608PNER-ML XNKT120612PNER-ML XNKT120616PNER-ML XNKT120620PNER-ML	XNKT120608PNSR-MM XNKT120612PNSR-MM XNKT120616PNSR-MM XNKT120620PNSR-MM		E88
RM4	90°	RM4PC(M)3000		Ø40~Ø100	LNEX100605PNR-MF LNMX100605aPNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM	• Economical 4 corners. • Screw on type for slotting, facing.	E92
		RM4PC(M)4000		Ø50~Ø160	LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM		E93
		RM4ZCM3000		Ø40~Ø52	LNEX100605PNL-MM	LNMX100605PNL-MM	• Economical 4 corners. • Optimal insert application for vertical machining	E105
		RM4ZC(M)4000		Ø63~Ø100	LNEX151008PNL-MM	LNMX151008PNL-MM		
RM6	90°	RM6PCM-WN04 new		Ø40~Ø63	WNGX040304PNFR-MA WNGX040308PNFR-MA WNGX040312PNFR-MA WNGX040316PNFR-MA WNGX040304PNER-ML WNGX040308PNER-ML	WNGX040312PNER-ML WNGX040316PNER-ML WNGX040304PNSR-MM WNGX040308PNSR-MM WNGX040312PNSR-MM WNGX040316PNSR-MM	• Improved productivity and high-quality shouldering through high speed and high feed machining	E107
		RM6PC(M)-WN08 new		Ø50~Ø125	WNGX080604PNFR-MA WNGX080608PNFR-MA WNGX080612PNFR-MA WNGX080616PNFR-MA WNGX080620PNFR-MA WNGX080604PNER-ML WNGX080608PNER-ML WNGX080612PNER-ML	WNGX080616PNER-ML WNGX080620PNER-ML WNGX080604PNSR-MM WNGX080608PNSR-MM WNGX080612PNSR-MM WNGX080616PNSR-MM WNGX080620PNSR-MM		E108
RM8	45°	RM8AC(M)4000		Ø50~Ø400	SNEX1206ANN-MA SNEX1206ANN-MF SNMX1206ANN-MF SNEX1206ANN-ML	SNEX1206ANN-MM SNMX1206ANN-MM SNEX1206ANN-W	• Economical 8 corners. • Low cutting load and excellent smooth cutting.	E111
		RM8AC(M)5000		Ø80~Ø400	SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-ML	SNEX1507ANN-MM SNMX1507ANN-MM		E113

Cutters

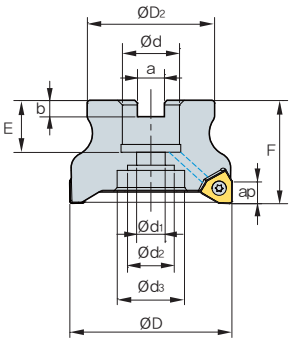
Type	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM8	75°	**RM8EC(M)4000**		Ø50~Ø400	SNEX1206ENN-MA SNEX1206ENN-MF SNMX1206ENN-MF	SNEX1206ENN-ML SNEX1206ENN-MM SNMX1206ENN-MM		• Economical 8 corners. • Low cutting load and excellent smooth cutting.	E115
		RM8EC(M)5000		Ø80~Ø400	SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-ML	SNEX1507ENN-MM SNMX1507ENN-MM			E117
	88°	**RM8QC(M)4000**		Ø63~Ø200	SNEX1206QNN-MA SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-ML SNEX1206QNN-MM SNMX1206QNN-MM	SNEX120612-MA SNEX120612-MF SNMX120612-MF SNEX120612-ML SNEX120612-MM SNMX120612-MM			E119
	45°	**RMH8AC(M)4000**		Ø50~Ø400	SNEX1206ANN-MA SNEX1206ANN-MF SNMX1206ANN-MF	SNEX1206ANN-ML SNEX1206ANN-MM SNMX1206ANN-MM SNEX1206ANN-W			E112
		RMH8AC(M)5000		Ø80~Ø400	SNEX1507ANN-MF SNMX1507ANN-MF SNEX1507ANN-ML	SNEX1507ANN-MM SNMX1507ANN-MM			E114
	75°	**RMH8EC(M)4000**		Ø50~Ø400	SNEX1206ENN-MA SNEX1206ENN-MF SNMX1206ENN-MF	SNEX1206ENN-ML SNEX1206ENN-MM SNMX1206ENN-MM			E116
		RMH8EC(M)5000		Ø80~Ø400	SNEX1507ENN-MF SNMX1507ENN-MF SNEX1507ENN-ML	SNEX1507ENN-MM SNMX1507ENN-MM			E118
	88°	**RMH8QC(M)4000**		Ø63~Ø200	SNEX1206QNN-MA SNEX1206QNN-MF SNMX1206QNN-MF SNEX1206QNN-ML SNEX1206QNN-MM SNMX1206QNN-MM	SNEX120612-MA SNEX120612-MF SNMX120612-MF SNEX120612-ML SNEX120612-MM SNMX120612-MM			E120
	45°	**RMT8A(M) 4000/5000**		Ø80~Ø315	SNCF1206ANN-MF SNCF1507ANN-MF SNMF1206ANN-MF SNMF1507ANN-MF	SNCF1206ANN-MM SNCF1507ANN-MM SNMF1206ANN-MM SNMF1507ANN-MM		• Economical 8 corners. • Excellent tool life and surface toughness due to low cutting resistance and high rake edge geometry. • Good performance with increased chipping resistance and grade	E121 E122
	75°	**RMT8E(M) 4000/5000**		Ø80~Ø315	SNCF1206ENN-MF SNCF1507ENN-MF SNMF1206ENN-MF SNMF1507ENN-MF	SNCF1206ENN-MM SNCF1507ENN-MM SNMF1206ENN-MM SNMF1507ENN-MM			E123 E124
	88°	**RMT8Q(M)4000**		Ø80~Ø315	SNCF1206QNN-MF	SNMF1206QNN-MF			E125
RM16	45°	**RM16AC(M) 6000/8000**		Ø63~Ø400	ONHX060608-MF ONMX060608-MF ONHX0606ANN-MF ONMX0606ANN-MF ONHX080608-MF ONMX080608-MF ONHX0806ANN-MF ONMX0806ANN-MF ONHX060608-ML ONHX080608-ML ONHX060608-MM	ONMX060608-MM ONHX0606ANN-MM ONMX0606ANN-MM ONHX080608-MM ONMX080608-MM ONHX0806ANN-MM ONMX0806ANN-MM ONHX060608-MA ONHX060608-W ONHX080608-MA ONHX080608-W		• Economical 16 corners. • Wiper insert for surface roughness.	E126 E127

Shanks/Modulars

Type	A.A	Designation	Shape	Cutter Diameter	Application			Features	Page
RM3	90°	RM3PS3000 new		Ø20~Ø40	XNKT060405PNER-ML	XNKT060405PNSR-MM		• Economical 3 corners. • Perfect perpendicular shouldering operation multi milling tool	E89
		RM3PS4000 new		Ø32~Ø63	XNKT080508PNER-ML XNKT080508PNSR-MM XNKT080512PNSR-MM	XNKT080516PNSR-MM XNKT080520PNSR-MM			E90
		RM3PM 3000/4000 new		Ø20~Ø50	XNKT060405PNER-ML XNKT060405PNSR-MM XNKT060408PNER-ML XNKT060408PNSR-MM XNCT080504PNFR-MA XNCT080508PNFR-MA XNCT080512PNFR-MA XNCT080520PNFR-MA	XNKT080508PNER-ML XNKT080508PNSR-MM XNKT080512PNER-ML XNKT080512PNSR-MM XNKT080516PNER-ML XNKT080516PNSR-MM XNKT080520PNER-ML XNKT080520PNSR-MM			E91
RM4	90°	RM4PS3000		Ø14~Ø50	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		• Economical 4 corners. • Screw on type for slotting, facing.	E102
		RM4PS4000		Ø32~Ø63	LNEX151004PNR-MF LNMX151004PNR-MF LNEX151004PNR-MM LNMX151004PNR-MM LNEX151008PNR-MF LNMX151008PNR-MF LNEX151008PNR-MM LNMX151008PNR-MM	LNEX151016PNR-MF LNMX151016PNR-MF LNEX151016PNR-MM LNMX151016PNR-MM LNEX151004PNR-MA LNEX151008PNR-MA LNEX151008PNL-MM LNMX151008PNL-MM			E103
		RM4ZS3000		Ø25~Ø40	LNEX100605PNL-MM	LNMX100605PNL-MM		• Economical 4 corners. • Optimal insert application for vertical machining	E106
		RM4PM3000		Ø14~Ø50	LNEX100605PNR-MF LNMX100605PNR-MF LNEX100605PNR-MM LNMX100605PNR-MM LNEX100608PNR-MF LNMX100608PNR-MF	LNEX100608PNR-MM LNMX100608PNR-MM LNEX100605PNR-MA LNEX100605PNL-MM LNMX100605PNL-MM		• Economical 4 corners. • Screw on type for slotting, facing.	E104
		RM4ZM3000		Ø25~Ø40	LNEX100605PNL-MM	LNMX100605PNL-MM		• Economical 4 corners. • Optimal insert application for vertical machining	E106
RM6	90°	RM6PS-WN04 new		Ø20~Ø32	WNGX040304PNFR-MA WNGX040308PNFR-MA WNGX040312PNFR-MA WNGX040316PNFR-MA WNGX040304PNER-ML WNGX040308PNER-ML	WNGX040312PNER-ML WNGX040316PNER-ML WNGX040304PNSR-MM WNGX040308PNSR-MM WNGX040312PNSR-MM WNGX040316PNSR-MM		• Improved productivity and high-quality shouldering through high speed and high feed machining	E109
		RM6PS-WN08 new		Ø32~Ø50	WNGX080604PNFR-MA WNGX080608PNFR-MA WNGX080612PNFR-MA WNGX080616PNFR-MA WNGX080620PNFR-MA WNGX080604PNER-ML WNGX080608PNER-ML WNGX080612PNER-ML	WNGX080616PNER-ML WNGX080620PNER-ML WNGX080604PNSR-MM WNGX080608PNSR-MM WNGX080612PNSR-MM WNGX080616PNSR-MM WNGX080620PNSR-MM	 		E110

RM3PC(M)3000 new





AA 90°

- AR: -5°
- RR: -9°~ -6°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
RM3PCM	3040HR	5	40	35	16	9	14	-	8.4	5.6	16	40	5.5	0.2
	3040HR-M	6	40	35	16	9	14	-	8.4	5.6	16	40	5.5	0.2
	3050HR	6	50	41	22	11	18	-	10.4	6.3	20	40	5.5	0.3
	3050HR-M	7	50	41	22	11	18	-	10.4	6.3	20	40	5.5	0.3
	3063HR	7	63	49	22	11	18	-	10.4	6.3	20	40	5.5	0.49
	3063HR-M	8	63	49	22	11	18	-	10.4	6.3	20	40	5.5	0.49
RM3PC (RM3PCM)	3080HR	8	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	25 (23)	50	5.5	0.87
	3080HR-M	10	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	25 (23)	50	5.5	0.88

( )Metric size

Available inserts

XNKT-ML



XNKT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNKT	060405PNER-ML							●		●		●	●	●				E30
	060405PNSR-MM						●	●		●		●	●	●				
	060408PNER-ML									●		●	●	●				
	060408PNSR-MM						●	●		●		●	●	●				

Available arbors

Designation		Available arbors	
		RM3PC	RM3PCM
RM3PC(M)	3040HR	-	BT□□-FMC16-□□
	3040HR-M		
	3050HR	-	BT□□-FMC22-□□
	3050HR-M		
	3063HR		
	3063HR-M		
	3080HR	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	3080HR-M		

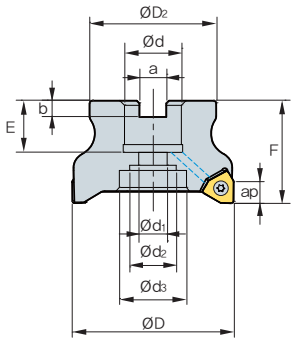
Parts

Specification	Screw	Wrench
Ø40~Ø80	FTNA0306	TW09S

Available inserts E30 Available arbors and bolt E371~E373

RM3PC(M)4000 new





AA 90°

- AR: -5°
- RR: -8°~ -6°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
RM3PCM	4040HR	3	40	35	16	9	14	-	8.4	5.6	19	40	8.0	0.19
	4040HR-M	4	40	35	16	9	14	-	8.4	5.6	19	40	8.0	0.19
	4050HR	4	50	42	22	11	18	-	10.4	6.3	20	40	8.0	0.28
	4050HR-M	5	50	42	22	11	18	-	10.4	6.3	20	40	8.0	0.29
	4063HR	5	63	49	22	11	18	-	10.4	6.3	20	40	8.0	0.54
	4063HR-M	6	63	49	22	11	18	-	10.4	6.3	20	40	8.0	0.53
RM3PC (RM3PCM)	4080HR	5	80	57	25.4 (27)	14	20	35	9.5 (12.4)	6 (7)	25 (23)	50	8.0	1.08
	4080HR-M	7	80	57	25.4 (27)	14	20	35	9.5 (12.4)	6 (7)	25 (23)	50	8.0	1.06
	4100HR	7	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	33 (25)	63 (50)	8.0	1.68
	4100HR-M	8	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	33 (25)	63 (50)	8.0	1.67
	4125HR	8	125	90	38.1 (40)	22	32	52	15.9 (16.4)	9 (10)	38 (29)	63	8.0	3.45
	4125HR-M	10	125	90	38.1 (40)	22	32	52	15.9 (16.4)	9 (10)	38 (29)	63	8.0	3.45

( )Metric size

Available inserts

XNCT-MA new　XNKT-ML new　XNKT-MM new





Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	080504PNFR-MA																●	E29 E30
	080508PNFR-MA																●	
	080512PNFR-MA																●	
	080520PNFR-MA																●	
XNKT	080508PNER-ML							●		●		●	●	●				
	080508PNSR-MM						●	●		●		●	●	●				
	080512PNER-ML												●	●				
	080512PNSR-MM						●	●		●			●	●				
	080516PNER-ML												●	●				
	080516PNSR-MM						●	●		●			●	●				
	080520PNER-ML												●	●				
	080520PNSR-MM						●	●		●			●	●				

Available arbors

Designation		Available arbors	
		RM3PC	RM3PCM
RM3PC(M)	4040HR	-	BT□□-FMC16-□□
	4050HR	-	BT□□-FMC22-□□
	4063HR		
	4080HR	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR	BT□□-FMA38.1-□□	BT□□-FMC40-□□

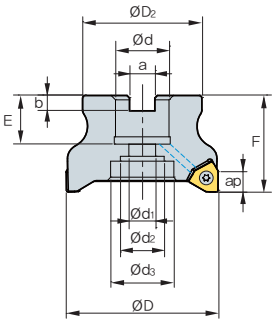
Parts

Specification	Screw	Wrench
Ø40~Ø125	FTNA0408	TW15S

Available inserts E29, E30　Available arbors and bolt E371~E373

RM3PC(M)5000 new





AA 90°
- AR: -5°
- RR: -7°

(mm)

Designation		⚙	ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
RM3PC (RM3PCM)	5080HR	5	80	57	25.4 (27)	14	20	35	9.5 (12.4)	6 (7)	24 (23)	50	12.0	0.84
	5080HR-M	7	80	57	25.4 (27)	14	20	35	9.5 (12.4)	6 (7)	24 (23)	50	12.0	0.84
	5100HR	7	100	67	31.75 (32)	18	28	45	12.7 (14.4)	8 (8)	32 (25)	63	12.0	1.76
	5100HR-M	8	100	67	31.75 (32)	18	28	45	12.7 (14.4)	8 (8)	32 (25)	63	12.0	1.76
	5125HR	8	125	90	38.1 (40)	22	32	52	15.9 (16.4)	9 (10)	38 (30)	63	12.0	2.70
	5125HR-M	10	125	90	38.1 (40)	22	32	52	15.9 (16.4)	9 (10)	38 (30)	63	12.0	2.70

( )Metric size

Available inserts

XNCT-MA new | XNKT-ML new | XNKT-MM new

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	120608PNFR-MA																	E29 E30
XNKT	120608PNER-ML									●		●	●	●				
	120608PNSR-MM						●	●		●		●	●	●				
	120612PNER-ML												●	●				
	120612PNSR-MM						●	●					●	●				
	120616PNER-ML												●	●				
	120616PNSR-MM						●	●					●	●				
	120620PNER-ML												●	●				
	120620PNSR-MM						●	●					●	●				

Available arbors

Designation		Available arbors	
		RM3PC	RM3PCM
RM3PC(M)	5080HR	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100HR	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125HR	BT□□-FMA38.1-□□	BT□□-FMC40-□□

Parts

Specification	Screw	Wrench
Ø80~Ø125	FTNA0511	TW20-100

Available inserts E29, E30 Available arbors and bolt E371~E373

RM3PS3000 new



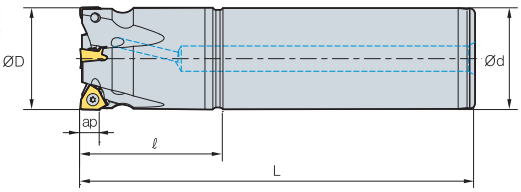


Fig. 1

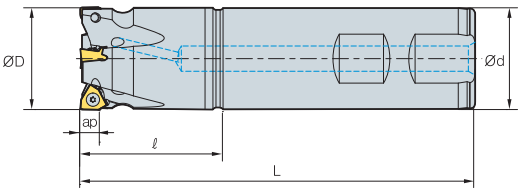
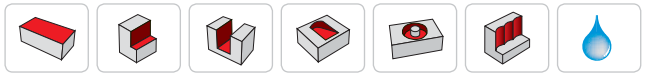


Fig. 2



AA 90°

- AR: -5°
- RR: -16°~ -9°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
RM3PS	3020HR-2S20	2	20	20	35	100	5.5	0.21	2
	3020HR-2L20	2	20	20	35	200	5.5	0.43	1
	3021HR-2S20	2	21	20	30	100	5.5	0.21	2
	3021HR-2L20	2	21	20	30	200	5.5	0.43	1
	3025HR-3S20	3	25	20	35	115	5.5	0.27	2
	3025HR-3L20	3	25	20	35	200	5.5	0.46	1
	3025HR-3S25	3	25	25	40	115	5.5	0.36	2
	3025HR-3L25	3	25	25	40	200	5.5	0.66	1
	3026HR-2S20	2	26	20	35	115	5.5	0.29	2
	3026HR-2L20	2	26	20	35	200	5.5	0.47	1
	3026HR-3S20	3	26	20	35	115	5.5	0.28	2
	3026HR-3L20	3	26	20	35	200	5.5	0.47	1
	3026HR-2S25	2	26	25	35	115	5.5	0.37	2
	3026HR-2L25	2	26	25	35	200	5.5	0.68	1
	3026HR-3S25	3	26	25	35	115	5.5	0.37	2
	3026HR-3L25	3	26	25	35	200	5.5	0.68	1
	3032HR-3S25	3	32	25	42	125	5.5	0.48	2
	3032HR-3L25	3	32	25	42	200	5.5	0.74	1
	3032HR-4S25	4	32	25	42	125	5.5	0.48	2
	3032HR-4L25	4	32	25	42	200	5.5	0.74	1
	3032HR-4S32	4	32	32	42	125	5.5	0.68	2
	3032HR-4L32	4	32	32	42	200	5.5	1.13	1
	3033HR-3S25	3	33	25	42	125	5.5	0.49	2
	3033HR-3L25	3	33	25	42	200	5.5	0.75	1
	3033HR-4S25	4	33	25	42	125	5.5	0.49	2
	3033HR-4L25	4	33	25	42	200	5.5	0.75	1
	3033HR-4S32	4	33	32	42	125	5.5	0.70	2
	3033HR-4L32	4	33	32	42	200	5.5	1.14	1
	3040HR-4S32	4	40	32	45	130	5.5	0.83	2
	3040HR-4L32	4	40	32	45	200	5.5	1.24	1
	3040HR-5S32	5	40	32	45	130	5.5	0.83	2
	3040HR-5L32	5	40	32	45	200	5.5	1.24	1

( )Metric size

Available inserts

XNKT-ML



XNKT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNKT	060405PNER-ML							●		●		●	●	●				E30
	060405PNSR-MM						●	●		●		●	●	●				
	060408PNER-ML									●		●	●	●				
	060408PNSR-MM						●	●		●		●	●	●				

Parts

Specification	Screw	Wrench
Ø20~Ø40	FTNA0306	TW09S

Available inserts E30

RM3PS4000 new



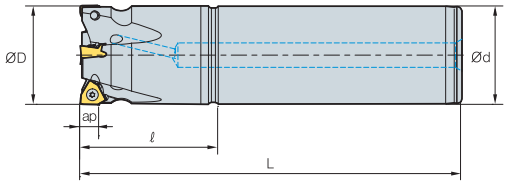


Fig. 1

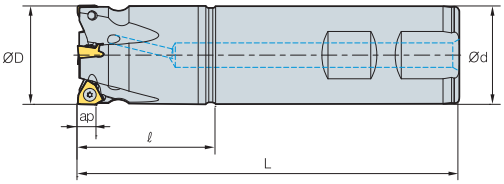
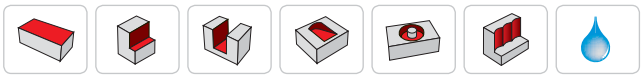


Fig. 2



AA 90°

- AR: -5°
- RR: -11°~ -7°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
RM3PS	4032HR-3S32	3	32	32	42	125	8	0.67	2
	4032HR-3L32	3	32	32	42	200	8	1.11	1
	4033HR-3S32	3	33	32	42	125	8	0.68	2
	4033HR-3L32	3	33	32	42	200	8	1.13	1
	4040HR-3S32	3	40	32	42	130	8	0.8	2
	4040HR-3L32	3	40	32	42	200	8	1.21	1
	4040HR-4S32	4	40	32	42	130	8	0.81	2
	4040HR-4L32	4	40	32	42	200	8	1.22	1
	4050HR-4S32	4	50	32	42	135	8	0.99	2
	4050HR-4L32	4	50	32	42	200	8	1.38	1
	4050HR-4S40	4	50	40	42	135	8	1.32	2
	4050HR-4L40	4	50	40	42	200	8	1.94	1
	4050HR-5S32	5	50	32	42	135	8	1.02	2
	4050HR-5L32	5	50	32	42	200	8	1.4	1
	4050HR-5S40	5	50	40	42	135	8	1.35	2
	4050HR-5L40	5	50	40	42	200	8	1.96	1
	4063HR-5S32	5	63	32	42	135	8	1.31	2
	4063HR-5L32	5	63	32	42	200	8	1.7	1
	4063HR-5S40	5	63	40	42	135	8	1.64	2
	4063HR-5L40	5	63	40	42	200	8	2.25	1
	4063HR-6S32	6	63	32	42	135	8	1.31	2
	4063HR-6L32	6	63	32	42	200	8	1.7	1
	4063HR-6S40	6	63	40	42	135	8	1.64	2
	4063HR-6L40	6	63	40	42	200	8	2.26	1

Available inserts

XNCT-MA



XNKT-ML



XNKT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XNCT	080504PNFR-MA																●	E29 E30
	080508PNFR-MA																●	
	080512PNFR-MA																●	
	080520PNFR-MA																●	
XNKT	080508PNER-ML							●		●		●	●	●				
	080508PNSR-MM						●	●		●		●	●	●				
	080512PNER-ML												●	●				
	080512PNSR-MM						●	●		●			●	●				
	080516PNER-ML												●	●				
	080516PNSR-MM						●	●		●			●	●				
	080520PNER-ML												●	●				
	080520PNSR-MM						●	●		●			●	●				

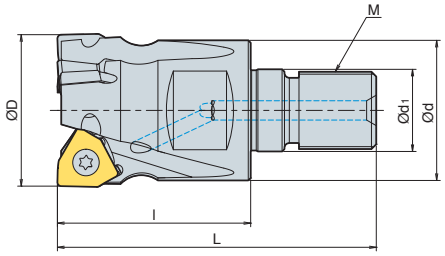
Parts

Specification	Screw	Wrench
Ø32~Ø63	FTNA0408	TW15S

Available inserts E29, E30

RM3PM3000/4000 new





AA 90°

- AR: -5°
- RR: -16°~ -7°

(mm)

Designation			ØD	Ød	Ød1	l	L	M	ap	kg
RM3PM	3020HR-2-M10	2	20	18	10.5	30	50	M10	5.5	0.06
	3025HR-3-M12	3	25	21	12.5	35	58	M12	5.5	0.1
	3032HR-4-M16	4	32	29	17	40	66	M16	5.5	0.21
	3040HR-5-M16	5	40	29	17	40	66	M16	5.5	0.26
RM3PM	4032HR-3-M16	3	32	29	17	40	66	M16	8	0.21
	4040HR-4-M16	4	40	29	17	50	76	M16	8	0.33
	4050HR-5-M16	5	50	29	17	55	81	M16	8	0.49

Available inserts

XNCT-MA new | XNKT-ML new | XNKT-MM new



Designation			Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
3000 type	XNKT	060405PNER-ML							●		●		●	●	●				E30
		060405PNSR-MM						●	●		●		●	●	●				
		060408PNER-ML									●		●	●	●				
		060408PNSR-MM						●	●		●		●	●	●				
4000 type	XNCT	080504PNFR-MA																●	
		080508PNFR-MA																●	
		080512PNFR-MA																●	
		080520PNFR-MA																●	
	XNKT	080508PNER-ML							●		●		●	●	●				E29 E30
		080508PNSR-MM						●	●		●		●	●	●				
		080512PNER-ML												●	●				
		080512PNSR-MM						●	●		●			●	●				
		080516PNER-ML												●	●				
		080516PNSR-MM						●	●		●			●	●				
		080520PNER-ML												●	●				
		080520PNSR-MM						●	●		●			●	●				

Available adaptor

Designation		Available adaptor
RM3PM	3020HR-2-M10	MAT-M10
	3025HR-3-M12	MAT-M12
	3032HR-4-M16	MAT-M16
	3040HR-5-M16	MAT-M16
RM3PM	4032HR-3-M16	MAT-M16
	4040HR-4-M16	MAT-M16
	4050HR-5-M16	MAT-M16

Designation: RM3PM4032HR-M16
Modular head threading measure size (M16)

=

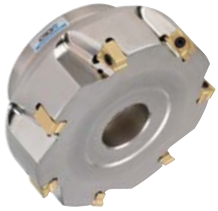
Adaptor spec.: MAT-M16-035-S32S
Adaptor threading measure (M16)

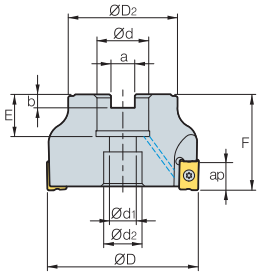
Parts

Specification	Screw	Wrench
Ø20~Ø40 (3000 type)	FTNA0306	TW09S
Ø32~Ø50 (4000 type)	FTNA0408	TW15S

Available inserts E29, E30 Available adaptor E342~E343

RM4PC(M)3000





AA
90°

- AR: -6°
- RR: -19°~ -13°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Bolt
RM4PCM	3040HR	4	40	35	16	9	14	8.4	5.6	19	40	9.0	0.24	SB0825
	3040HR-M	5	40	35	16	9	14	8.4	5.6	19	40	9.0	0.23	SB0825
	3050HR	5	50	42	22	11	18	10.4	6.3	20	40	9.0	0.36	SB1025
	3050HR-M	7	50	42	22	11	18	10.4	6.3	20	40	9.0	0.35	SB1025
	3063HR	7	63	49	22	11	18	10.4	6.3	20	40	9.0	0.61	SB1025
	3063HR-M	9	63	49	22	11	18	10.4	6.3	20	40	9.0	0.6	SB1025
RM4PC (RM4PCM)	3080HR	8	80	57	25.4 (27)	14	20	9.5 (12.4)	6.0 (7.0)	25 (23)	50	9.0	1.25 (1.24)	SB1230
	3080HR-M	10	80	57	25.4 (27)	14	20	9.5 (12.4)	6.0 (7.0)	25 (23)	50	9.0	1.24 (1.23)	SB1230
	3100HR	9	100	67	31.75(32)	18	26	12.7 (14.4)	8.0 (8.0)	33 (25)	63 (50)	9.0	2.46 (1.94)	SB1630
	3100HR-M	12	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0 (8.0)	33 (25)	63 (50)	9.0	2.44 (1.93)	SB1630

( )Metric size

Available inserts











Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100605PNL-MM											●	●	●				
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				
	100605PNL-MM								●	●		●	●	●				

Available arbors

Designation		Available arbors	
		RM4PC	RM4PCM
RM4PC(M)	3040HR	-	BT□□-FMC16-□□
	3040HR-M		
	3050HR	-	BT□□-FMC22-□□
	3050HR-M		
	3063HR		
	3063HR-M		

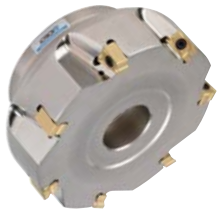
Designation		Available arbors	
		RM4PC	RM4PCM
RM4PC(M)	3080HR	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	3080HR-M		
	3100HR	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	3100HR-M		

Parts

Specification	Screw	Wrench
Ø40~Ø100	FTKA0307	TW09S

Available inserts E10, E11 Available arbors and bolt E371~E373

RM4PC(M)4000



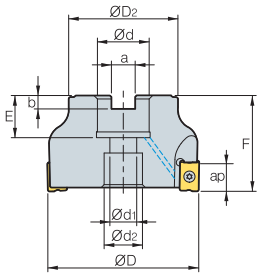


Fig. 1

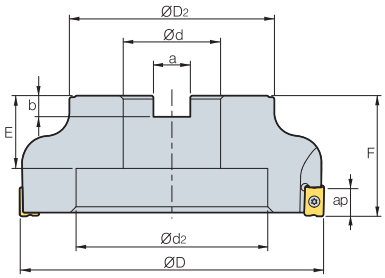
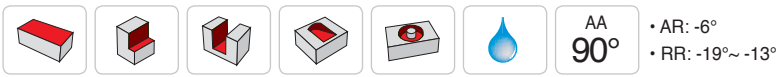


Fig. 2



AA 90°

- AR: -6°
- RR: -19°~ -13°

(mm)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Bolt	Fig.
RM4PCM	4040HR	3	40	36	16	11	18	8.4	5.6	19	40	14	0.23	SB0825	1
	4050HR	3	50	46	22	11	18	10.4	6.3	20	40	14	0.36	SB1025	1
	4050HR-M	4	50	46	22	11	18	10.4	6.3	20	40	14	0.35	SB1025	1
	4050HR-H	5	50	46	22	11	18	10.4	6.3	20	40	14	0.36	SB1025	1
	4063HR	4	63	49	22	11	18	10.4	6.3	20	40	14	0.56	SB1025	1
	4063HR-M	6	63	49	22	11	18	10.4	6.3	20	40	14	0.57	SB1025	1
RM4PC (RM4PCM)	4080HR	5	80	57	25.4 (27)	14	20	9.5 (12.4)	6.0 (7.0)	25 (23)	50	14	1.18 (1.16)	SB1230	1
	4080HR-M	7	80	57	25.4 (27)	14	20	9.5 (12.4)	6.0 (7.0)	25 (23)	50	14	1.17 (1.14)	SB1230	1
	4080HR-H	8	80	57	25.4 (27)	14	20	9.5 (12.4)	6.0 (7.0)	25 (23)	50	14	1.17 (1.14)	SB1230	1
	4100HR	5	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0 (8.0)	33 (25)	63 (50)	14	2.35 (1.84)	SB1630	1
	4100HR-M	8	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0 (8.0)	33 (25)	63 (50)	14	2.31 (1.82)	SB1630	1
	4100HR-H	9	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0 (8.0)	33 (25)	63 (50)	14	2.31 (1.82)	SB1630	1
	4125HR	7	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9.0)	35 (30)	63	14	3.87 (3.79)	SB2040	1
	4125HR-M	10	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9.0)	35 (30)	63	14	3.82 (3.70)	SB2040	1
	4160R	8	160	107	50.8 (40)	-	100	19 (16.4)	11 (9.0)	38 (32)	63	14	5.0 (4.75)	MBA	2
	4160R-M	12	160	107	50.8 (40)	-	100	19 (16.4)	11 (9.0)	38 (32)	63	14	4.97 (4.71)	MBA	2

( )Metric size

Available inserts

LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				E10 E11
	151004PNR-MM											●	●	●				
	151004PNR-MA																●	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																●	
	151008PNL-MM											●	●	●				
	151016PNR-MF											●	●	●				
	151016PNR-MM											●	●	●				

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNMX	151004PNR-MF									●		●	●	●				E10 E11
	151004PNR-MM											●	●	●				
	151008PNR-MF									●	●	●	●	●				
	151008PNR-MM									●	●	●	●	●				
	151008PNL-MM									●			●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM									●	●	●		●				

Available arbors

Designation		Available arbors	
		RM4PC	RM4PCM
RM4PC(M)	4050HR 4050HR-M 4063HR 4063HR-M	-	BT□□-FMC22-□□
	4080HR 4080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□

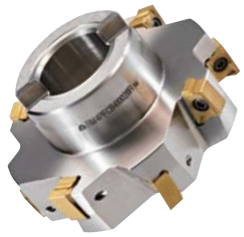
Designation		Available arbors	
		RM4PC	RM4PCM
RM4PC(M)	4100HR 4100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR 4125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	4160R 4160R-M	BT□□-FMA50.8-□□	

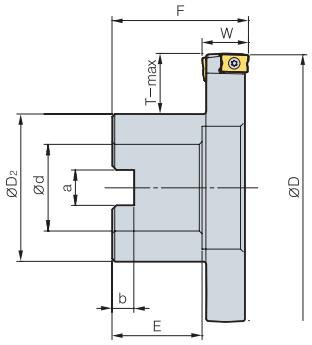
Parts

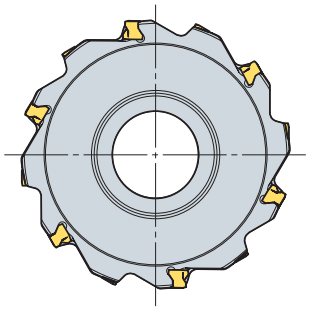
Specification	Screw	Wrench
Ø50~Ø160	FTKA0412B	TW15S

Available inserts **E10, E11** Available arbors and bolt **E371~E373**

RM4PFCB3000







(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PFCB	308015R	10	80	40	25.4	9.5	6	25	50	15	19
	308017R	10	80	40	25.4	9.5	6	25	50	17	19
	310015R	12	100	54	31.75	12.7	8	32	50	15	22
	310017R	12	100	54	31.75	12.7	8	32	50	17	22
	312515R	14	125	70	38.1	15.9	10	38	60	15	26
	312517R	14	125	70	38.1	15.9	10	38	60	17	26
	316015R	16	160	70	38.1	15.9	10	38	60	15	44
	316017R	16	160	70	38.1	15.9	10	38	60	17	44

Available inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MM								●			●	●	●				E11
	100605PNL-MM											●	●	●				
LNMX	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				

Available arbors

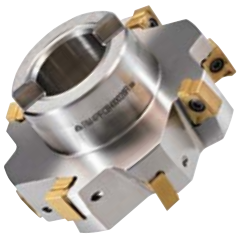
Designation		Available arbors
RM4PFCB	308015R	BT□□-FMA25.4-□□
	308017R	
	310015R	BT□□-FMA31.75-□□
	310017R	
	312515R	BT□□-FMA38.1-□□
	312517R	
	316015R	
	316017R	

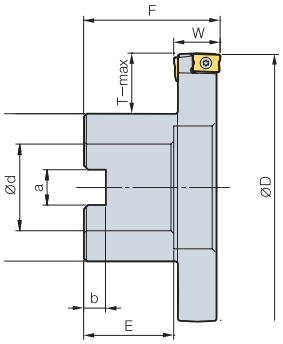
Parts

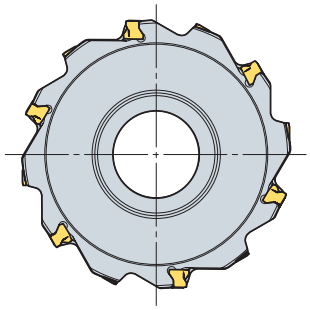
Specification	Screw	Wrench
Ø80~Ø160	FTKA0307	TW09S

Available inserts E11 Available arbors and bolt E371~E373

RM4PFCB4000







(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PFCB	408022R	6	80	40	25.4	9.5	6	25	50	22	19
	408024R	6	80	40	25.4	9.5	6	25	50	24	19
	408026R	6	80	40	25.4	9.5	6	25	50	26	19
	408028R	6	80	40	25.4	9.5	6	25	50	28	19
	410022R	8	100	54	31.75	12.7	8	32	50	22	22
	410024R	8	100	54	31.75	12.7	8	32	50	24	22
	410026R	8	100	54	31.75	12.7	8	32	50	26	22
	410028R	8	100	54	31.75	12.7	8	32	50	28	22
	412522R	10	125	70	38.1	15.9	10	38	60	22	26
	412524R	10	125	70	38.1	15.9	10	38	60	24	26
	412526R	10	125	70	38.1	15.9	10	38	60	26	26
	412528R	10	125	70	38.1	15.9	10	38	60	28	26
	416022R	12	160	70	38.1	15.9	10	38	60	22	44
	416024R	12	160	70	38.1	15.9	10	38	60	24	44
	416026R	12	160	70	38.1	15.9	10	38	60	26	44
	416028R	12	160	70	38.1	15.9	10	38	60	28	44

Available inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151008PNR-MM								●			●	●	●				E11
	151008PNL-MM											●	●	●				
LNMX	151008PNR-MM								●	●	●	●	●	●				
	151008PNL-MM									●			●	●				

Available arbors

Designation		Available arbors
RM4PFCB	408022R	BT□□-FMA25.4-□□
	408024R	
	408026R	
	408028R	
	410022R	BT□□-FMA31.75-□□
	410024R	
	410026R	
	410028R	

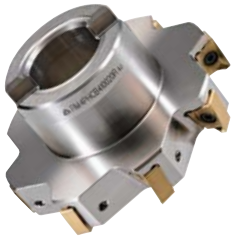
Designation		Available arbors
RM4PFCB	412522R	BT□□-FMA38.1-□□
	412524R	
	412526R	
	412528R	
	416022R	
	416024R	
	416026R	
	416028R	

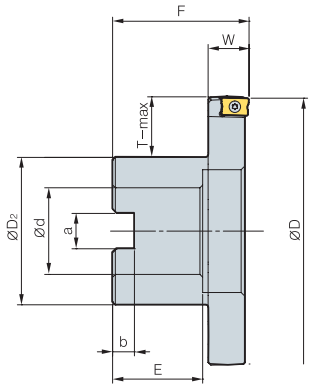
Parts

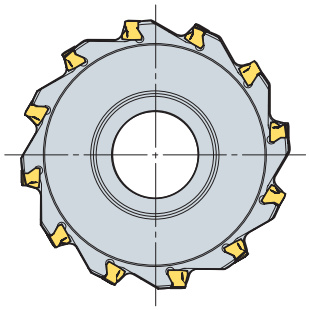
Specification	Screw	Wrench
Ø80~Ø160	FTKA0412B	TW15S

Available inserts E11 Available arbors and bolt E371~E373

RM4PHCB3000







(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PHCB	308015R	10	80	40	25.4	9.5	6	25	50	15	19
	310015R	12	100	54	31.75	12.7	8	32	50	15	22
	312515R	14	125	70	38.1	15.9	10	38	60	15	26
	316015R	16	160	70	38.1	15.9	10	38	60	15	44

Available inserts


LNEX-MF


LNEX-MM


LNEX-MA


LNMX-MF


LNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				

Available arbors

Designation		Available arbors
RM4PHCB	308015R	BT□□-FMA25.4-□□
	310015R	BT□□-FMA31.75-□□
	312515R	BT□□-FMA38.1-□□
	316015R	

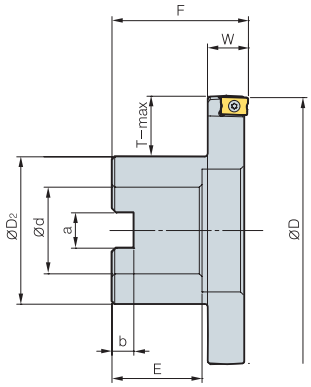
Parts

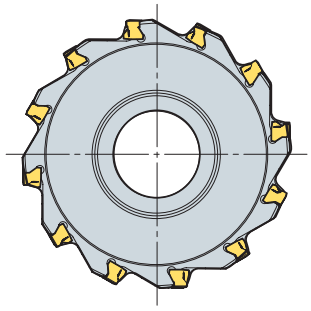
Specification	Screw	Wrench
Ø80~Ø160	FTKA0307	TW09S

Available inserts E10, E11 Available arbors and bolt E371~E373

RM4PHCB4000







(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	W	T-max
RM4PHCB	408020R	6	80	40	25.4	9.5	6	25	50	20	19
	410020R	8	100	54	31.75	12.7	8	32	50	20	22
	412520R	10	125	70	38.1	15.9	10	38	60	20	26
	416020R	12	160	70	38.1	15.9	10	38	60	20	44

Available inserts


LNEX-MF


LNEX-MM


LNEX-MA


LNMX-MF


LNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				E10 E11
	151004PNR-MM											●	●	●				
	151004PNR-MA																●	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																●	
	151016PNR-MF											●	●	●				
	151016PNR-MM											●	●	●				
LNMX	151004PNR-MF									●		●	●	●				
	151004PNR-MM											●	●	●				
	151008PNR-MF								●	●		●	●	●				
	151008PNR-MM								●	●	●	●	●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM								●	●		●		●				

Available arbors

Designation		Available arbors
RM4PHCB	408020R	BT□□-FMA25.4-□□
	410020R	BT□□-FMA31.75-□□
	412520R	BT□□-FMA38.1-□□
	416020R	

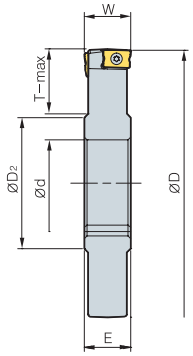
Parts

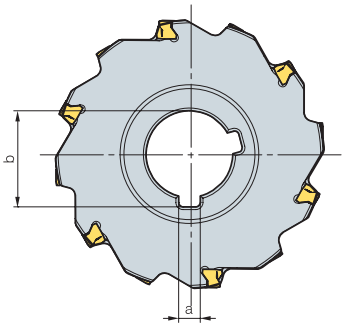
Specification	Screw	Wrench
Ø80~Ø160	FTKA0412B	TW15S

Available inserts **E10, E11** Available arbors and bolt **E371~E373**

RM4PFCP3000







(mm)

Designation		⊚	ØD	ØD2	Ød	a	b	E	W	T-max
RM4PFCP	308015R	10	80	41.5	25.4	6.35	28	15	15	17
	308017R	10	80	41.5	25.4	6.35	28	17	17	17
	310015R	12	100	48	31.75	7.94	35.2	15	15	24
	310017R	12	100	48	31.75	7.94	35.2	17	17	24
	312515R	14	125	58	38.1	9.53	42.3	15	15	32
	312517R	14	125	58	38.1	9.53	42.3	17	17	32
	316015R	16	160	58	38.1	9.53	42.3	15	15	49
	316017R	16	160	58	38.1	9.53	42.3	17	17	49

Available inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MM								●			●	●	●				E11
	100605PNL-MM											●	●	●				
LNMX	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				

Available arbors

Designation		Available arbors
RM4PFCP	308015R	BT□□-SCA25.4-□□
	308017R	
	310015R	BT□□-SCA31.75-□□
	310017R	
	312515R	BT□□-SCA38.1-□□
	312517R	
	316015R	
	316017R	

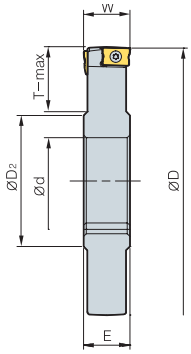
Parts

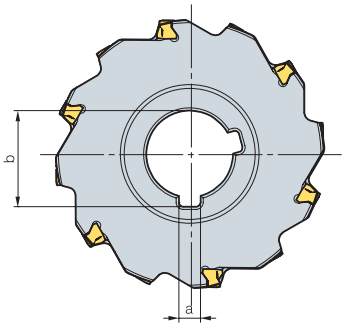
Specification	Screw	Wrench
Ø80~Ø160	FTKA0307	TW09S

Available inserts E11 Available arbors and bolt E371~E373

RM4PFCP4000







(mm)

Designation		⊙	ØD	ØD2	Ød	a	b	E	W	T-max
RM4PFCP	408022R	6	80	41.5	25.4	6.35	28	22	22	17
	408024R	6	80	41.5	25.4	6.35	28	24	24	17
	408026R	6	80	41.5	25.4	6.35	28	26	26	17
	408028R	6	80	41.5	25.4	6.35	28	28	28	17
	410022R	8	100	48	31.75	7.94	35.2	22	22	24
	410024R	8	100	48	31.75	7.94	35.2	24	24	24
	410026R	8	100	48	31.75	7.94	35.2	26	26	24
	410028R	8	100	48	31.75	7.94	35.2	28	28	24
	412522R	10	125	58	38.1	9.53	42.3	22	22	32
	412524R	10	125	58	38.1	9.53	42.3	24	24	32
	412526R	10	125	58	38.1	9.53	42.3	26	26	32
	412528R	10	125	58	38.1	9.53	42.3	28	28	32
	416022R	12	160	58	38.1	9.53	42.3	22	22	49
	416024R	12	160	58	38.1	9.53	42.3	24	24	49
	416026R	12	160	58	38.1	9.53	42.3	26	26	49
	416028R	12	160	58	38.1	9.53	42.3	28	28	49

Available inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151008PNR-MM								●			●	●	●				E11
	151008PNL-MM											●	●	●				
LNMX	151008PNR-MM								●	●	●	●	●	●				
	151008PNL-MM									●			●	●				

Available arbors

Designation		Available arbors
RM4PFCP	408022R	BT□□-SCA25.4-□□
	408024R	
	408026R	
	408028R	
	410022R	BT□□-SCA31.75-□□
	410024R	
	410026R	
	410028R	

Designation		Available arbors
RM4PFCP	412522R	BT□□-SCA38.1-□□
	412524R	
	412526R	
	412528R	
	416022R	
	416024R	
	416026R	
	416028R	

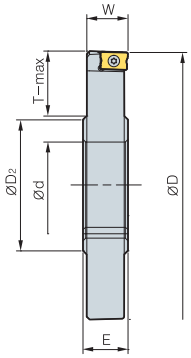
Parts

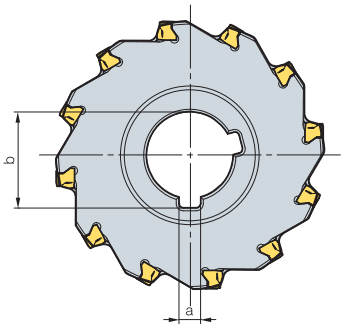
Specification	Screw	Wrench
Ø80~Ø160	FTKA0412B	TW15S

Available inserts E11 Available arbors and bolt E371~E373

RM4PHCP3000







(mm)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PHCP	308015R	10	80	41.5	25.4	6.35	28	16.5	15.1	17
	310015R	12	100	48	31.75	7.94	35.2	16.5	15.1	24
	312515R	14	125	58	38.1	9.52	42.3	16.5	15.1	32
	316015R	16	160	58	38.1	9.52	42.3	16.5	15.1	49

Available inserts


LNEX-MF


LNEX-MM


LNEX-MA


LNMX-MF


LNMX-MM

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●				●				

Available arbors

Designation		Available arbors
RM4PHCP	308015R	BT□□-SCA25.4-□□
	310015R	BT□□-SCA31.75-□□
	312515R	BT□□-SCA38.1-□□
	316015R	

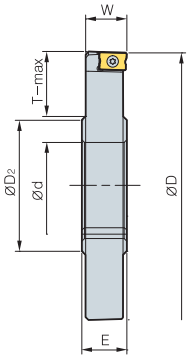
Parts

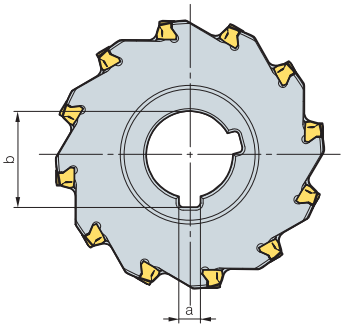
Specification	Screw	Wrench
Ø80~Ø160	FTKA0307	TW09S

Available inserts E10, E11 Available arbors and bolt E371~E373

RM4PHCP4000







(mm)

Designation			ØD	ØD2	Ød	a	b	E	W	T-max
RM4PHCP	408020R	6	80	41.5	25.4	6.35	28	22	19.8	17
	410020R	8	100	48	31.75	7.94	35.2	22	19.8	24
	412520R	10	125	58	38.1	9.53	42.3	22	19.8	32
	416020R	12	160	58	38.1	9.53	42.3	22	19.8	49

Available inserts


LNEX-MF


LNEX-MM


LNEX-MA


LNMX-MF


LNMX-MM

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				E10 E11
	151004PNR-MM											●	●	●				
	151004PNR-MA																	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																	
	151016PNR-MF											●	●	●				
	151016PNR-MM											●	●	●				
LNMX	151004PNR-MF									●		●	●	●				
	151004PNR-MM											●	●	●				
	151008PNR-MF								●	●		●	●	●				
	151008PNR-MM								●	●		●	●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM								●	●		●		●				

Available arbors

Designation		Available arbors
RM4PHCP	408020R	BT□□-SCA25.4-□□
	410020R	BT□□-SCA31.75-□□
	412520R	BT□□-SCA38.1-□□
	416020R	

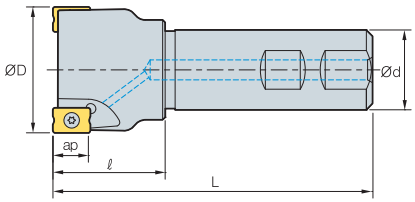
Parts

Specification	Screw	Wrench
Ø80~Ø160	FTKA0412B	TW15S

Available inserts E10, E11 Available arbors and bolt E371~E373

RM4PS3000





AA 90°

- AR: -6°
- RR: -39°~ -16°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
RM4PS	3014HR-S16	1	14	16	23	90	9.0	0.11
	3016HR-S16	1	16	16	25	90	9.0	0.11
	3018HR-S16	2	18	16	23	90	9.0	0.12
	3020HR-S20	2	20	20	30	100	9.0	0.21
	3020HR-S20M	3	20	20	30	100	9.0	0.21
	3025HR-S25	2	25	25	35	115	9.0	0.38
	3025HR-S25M	3	25	25	35	115	9.0	0.38
	3032HR-S32	3	32	32	40	125	9.0	0.69
	3032HR-S32M	4	32	32	40	125	9.0	0.7
	3040HR-S32	4	40	32	42	130	9.0	0.86
	3040HR-S32M	5	40	32	42	130	9.0	0.85
	3040HR-S40	4	40	40	42	130	9.0	1.17
	3040HR-S40M	5	40	40	42	130	9.0	1.17
	3040HR-S42	4	40	42	42	130	9.0	1.26
	3040HR-S42M	5	40	42	42	130	9.0	1.25
	3050HR-S32	5	50	32	45	135	9.0	1.06
	3050HR-S32M	7	50	32	45	135	9.0	1.05
	3050HR-S40	5	50	40	45	135	9.0	1.38
	3050HR-S40M	7	50	40	45	135	9.0	1.37
	3050HR-S42	5	50	42	45	135	9.0	1.48
	3050HR-S42M	7	50	42	45	135	9.0	1.48

Available inserts

LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100605PNL-MM											●	●	●				
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				

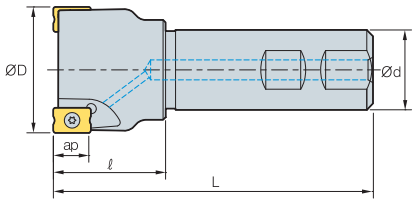
Parts

Specification	Screw	Wrench
Ø14~Ø50	FTKA0307	TW09S

Available inserts E10, E11

RM4PS4000












AA 90°

- AR: -6°
- RR: -24°~ -14°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
RM4PS	4032HR-S32	2	32	32	40	125	14	0.68
	4032HR-S32M	3	32	32	40	125	14	0.69
	4040HR-S32	3	40	32	42	125	14	0.83
	4040HR-S32M	4	40	32	43	125	14	0.83
	4040HR-S40	3	40	40	42	125	14	1.14
	4040HR-S42	3	40	42	42	125	14	1.23
	4050HR-S32	3	50	32	45	125	14	1.02
	4050HR-S32M	4	50	32	45	125	14	1.02
	4050HR-S40	3	50	40	45	125	14	1.35
	4050HR-S40M	4	50	40	45	125	14	1.34
	4050HR-S42	3	50	42	45	125	14	1.45
	4050HR-S42M	4	50	42	45	125	14	1.45
	4063HR-S32	4	63	32	45	125	14	1.25
	4063HR-S32M	6	63	32	45	125	14	1.24
	4063HR-S40	4	63	40	45	125	14	1.62
	4063HR-S40M	6	63	40	45	125	14	1.61
	4063HR-S42	4	63	42	45	125	14	1.71
	4063HR-S42M	6	63	42	45	125	14	1.7

Available inserts

LNEX-MF



LNEX-MM



LNEX-MA



LNMX-MF



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	151004PNR-MF											●	●	●				
	151004PNR-MM											●	●	●				
	151004PNR-MA																●	
	151008PNR-MF											●	●	●				
	151008PNR-MM								●			●	●	●				
	151008PNR-MA																●	
	151016PNR-MF											●	●	●				E10
	151016PNR-MM											●	●	●				E11
LNMX	151004PNR-MF									●		●	●	●				
	151004PNR-MM											●	●	●				
	151008PNR-MF								●	●		●	●	●				
	151008PNR-MM								●	●	●	●	●	●				
	151016PNR-MF									●	●		●	●				
	151016PNR-MM								●	●		●		●				

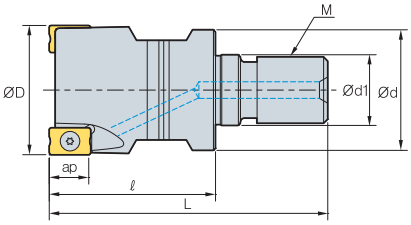
Parts

Specification	Screw	Wrench
Ø32~Ø63	FTKA0412B	TW15S

Available inserts **E10, E11**

RM4PM3000












AA 90°

- AR: -6°
- RR: -39°~ -16°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	kg
RM4PM	3014HR-M06	1	14	12	6.5	25	40	M06	9.0	0.02
	3016HR-M08	1	16	14.5	8.5	25	42	M08	9.0	0.02
	3018HR-M08	2	18	14.5	8.5	25	42	M08	9.0	0.03
	3020HR-M10	2	20	18	10.5	30	51	M10	9.0	0.06
	3025HR-M12	2	25	23	12.5	35	59	M12	9.0	0.11
	3032HR-M16	3	32	28	17	40	67	M16	9.0	0.21
	3040HR-M16	4	40	28	17	40	67	M16	9.0	0.26
	3050HR-M16	5	50	30	17	45	72	M16	9.0	0.41

Available inserts

LNEX-MF | LNEX-MM | LNEX-MA | LNMX-MF | LNMX-MM







Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNR-MF											●	●	●				E10 E11
	100605PNR-MM								●			●	●	●				
	100605PNR-MA																●	
	100605PNL-MM											●	●	●				
	100608PNR-MF								●			●	●	●				
	100608PNR-MM											●	●	●				
LNMX	100605PNR-MF									●		●	●	●				
	100605PNR-MM								●	●	●	●	●	●				
	100605PNL-MM								●	●		●	●	●				
	100608PNR-MF									●		●	●	●				
	100608PNR-MM								●	●			●	●				

Available adaptor

Designation		Available adaptor
RM4PM	3014HR-M06	MAT-M06
	3016HR-M08	MAT-M08
	3018HR-M08	
	3020HR-M10	MAT-M10
	3025HR-M12	MAT-M12
	3032HR-M16	MAT-M16
	3040HR-M16	
	3050HR-M16	

Designation: RM4PM3032HR-M16
Modular Head Threading Measure size (M16)

=

Adaptor spec.: MAT-M16-035-S32S
Adaptor Threading Measure (M16)

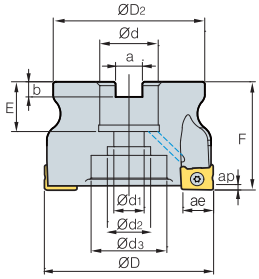
Parts

Specification	Screw	Wrench
Ø14~Ø50	FTKA0307	TW09S

Available inserts E10, E11 Available adaptor E342~E343

RM4ZC(M)3000/4000





AA 90°

- AR: -11°
- RR: -12°~ -10°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	ae	kg
RM4ZCM	3040HR	4	40	37	16	9	14	-	8.4	5.6	19	40	1.5	9.0	0.21
	3050HR	5	50	47	22	11	18	-	10.4	6.3	20	40	1.5	9.0	0.33
	3052HR	5	52	48	22	11	18	-	10.4	6.3	20	40	1.5	9.0	0.37
	4063HR	5	63	58	22	11	18	-	10.4	6.3	20	40	2.5	14.0	0.56
RM4ZC (RM4ZCM)	4066HR	5	66	61	25.4 (27)	14	20	-	9.5 (12.4)	6 (7)	25	50	2.5	14.0	0.74
	4080HR	6	80	70	25.4 (27)	14	20	35	9.5 (12.4)	6 (7)	25 (23)	50	2.5	14.0	1.09
	4100HR	7	100	80	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	25 (33)	63 (50)	2.5	14.0	1.71

( )Metric size

Available inserts

LNEX-MM



LNMX-MM



Designation			Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
3000 type	LNEX	100605PNL-MM											●	●	●				E11
	LNMX	100605PNL-MM								●	●		●	●	●				
4000 type	LNEX	151008PNL-MM											●	●	●				
	LNMX	151008PNL-MM									●			●	●				

Available arbors

Designation		Available arbors	
		RM4ZC	RM4ZCM
RM4ZCM	3040HR	BT□□-FMC16-□□ BT□□-SCA16-□□	
	3050HR 3052HR	BT□□-FMC22-□□	
RM4ZCM RM4ZC(M)	4063HR	BT□□-FMC22-□□	
	4066HR 4080HR	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR	BT□□-FMA31.75-□□ BT□□-SCA31.75-□□	BT□□-FMC32-□□

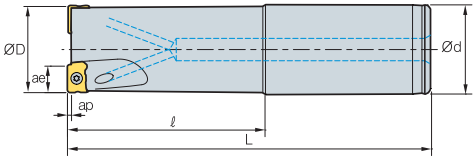
Parts

Specification	Screw	Wrench
Ø40~Ø52	FTKA0307	TW09S
Ø63~Ø100	FTKA0412B	TW15S

Available inserts E11 Available arbors and bolt E371~E373

RM4ZS3000





AA 90°

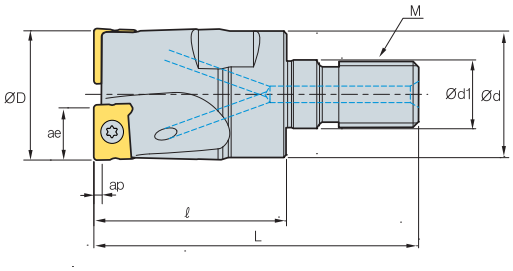
- AR: -11°
- RR: -17°~ -14°

(mm)

Designation			ØD	Ød	ℓ	L	ap	ae	kg
RM4ZS	3025HR-L25	2	25	25	120	200	1.5	9.0	0.62
	3032HR-L32	3	32	32	120	210	1.5	9.0	1.13
	3040HR-L32	4	40	32	120	250	1.5	9.0	1.53

RM4ZM3000





AA 90°

- AR: -11°
- RR: -17°~ -14°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	ae	kg
RM4ZM	3025HR-M12	2	25	23	12.5	35	59	M12	1.5	9.0	0.11
	3032HR-M16	3	32	29	17	40	67	M16	1.5	9.0	0.21
	3040HR-M16	4	40	29	17	40	67	M16	1.5	9.0	0.28

Available inserts

LNEX-MM



LNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNEX	100605PNL-MM											●	●	●				E11
LNMX	100605PNL-MM								●	●		●	●	●				

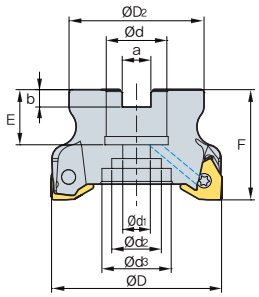
Parts

Specification	Screw	Wrench
Ø25~Ø40	FTKA0307	TW09S

Available inserts E11

RM6PCM-WN04 new





AA 90°

- AR: -6°
- RR: -14°~ -11°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
RM6PCM	040R-16-6-WN04	6	40	35	16	9	14	-	8.4	5.6	19	40	4.3	0.19
	040R-16-7-WN04	7	40	35	16	9	14	-	8.4	5.6	19	40	4.3	0.19
	050R-22-8-WN04	8	50	42	22	11	18	-	10.4	6.3	20	40	4.3	0.28
	050R-22-9-WN04	9	50	42	22	11	18	-	10.4	6.3	20	40	4.3	0.28
	063R-22-10-WN04	10	63	49	22	11	18	-	10.4	6.3	20	40	4.3	0.47
	063R-22-11-WN04	11	63	49	22	11	18	-	10.4	6.3	20	40	4.3	0.47

Available inserts

WNGX-MA new | WNGX-ML new | WNGX-MM new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	040304PNFR-MA																	E28
	040308PNFR-MA																	
	040312PNFR-MA																	
	040316PNFR-MA																	
WNGX	040304PNER-ML																	
	040308PNER-ML																	
	040312PNER-ML																	
	040316PNER-ML																	
WNGX	040304PNSR-MM																	
	040308PNSR-MM																	
	040312PNSR-MM																	
	040316PNSR-MM																	

Available arbors

Designation		NC arbors
RM6PCM	040R-16-6-WN04	BT□□-FMC16-□□
	040R-16-7-WN04	
	050R-22-8-WN04	BT□□-FMC22-□□
	050R-22-9-WN04	
	063R-22-10-WN04	
	063R-22-11-WN04	

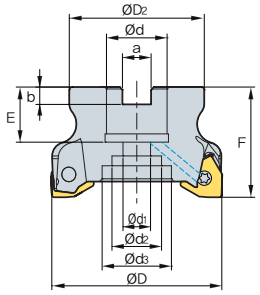
Parts

Specification	Screw	Wrench	Wrench
Ø40~Ø63	ETNA02506	TW07S	-

Available inserts E28 Available arbors and bolt E371~E373

RM6PC(M)-WN08 new





AA 90°

- AR: -6°
- RR: -14°~ -11°

(mm)

	Designation		ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
RM6PCM	050R-22-4-WN08	4	50	42	22	11	18	-	10.4	6.3	20	40	8.2	0.28
	050R-22-5-WN08	5	50	42	22	11	18	-	10.4	6.3	20	40	8.2	0.27
	063R-22-5-WN08	5	63	49	22	11	18	-	10.4	6.3	20	40	8.2	0.45
	063R-22-6-WN08	6	63	49	22	11	18	-	10.4	6.3	20	40	8.2	0.45
	080R-27-7-WN08	7	80	57	27	14	20	35	12.4	7	23	50	8.2	0.90
	080R-27-9-WN08	9	80	57	27	14	20	35	12.4	7	23	50	8.2	0.89
	100R-32-8-WN08	8	100	67	32	18	26	42	14.4	8	25	50	8.2	1.47
	100R-32-11-WN08	11	100	67	32	18	26	42	14.4	8	25	50	8.2	1.45
	125R-40-11-WN08	11	125	90	40	22	32	52	16.4	10	29	63	8.2	2.94
	125R-40-14-WN08	14	125	90	40	22	32	52	16.4	10	29	63	8.2	2.91
RM6PC	080R-25.4-7-WN08	7	80	57	25.4	14	20	35	9.5	6	25	50	8.2	0.91
	080R-25.4-9-WN08	9	80	57	25.4	14	20	35	9.5	6	25	50	8.2	0.91
	100R-31.75-8-WN08	8	100	67	31.75	18	26	42	12.7	8	32	63	8.2	1.69
	100R-31.75-11-WN08	11	100	67	31.75	18	26	42	12.7	8	32	63	8.2	1.73
	125R-38.1-11-WN08	11	125	90	38.1	22	32	52	15.9	9	35	63	8.2	1.98
	125R-38.1-14-WN08	14	125	90	38.1	22	32	52	15.9	9	35	63	8.2	2.90

Available inserts

WNGX-MA new



WNGX-ML new



WNGX-MM new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	080604PNFR-MA																	E28
	080608PNFR-MA																●	
	080612PNFR-MA																	
	080616PNFR-MA																	
	080620PNFR-MA																	
WNGX	080604PNER-ML									●			●●					
	080608PNER-ML									●			●●					
	080612PNER-ML																	

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	080616PNER-ML																	E28
	080620PNER-ML																	
WNGX	080604PNSR-MM									●		●						
	080608PNSR-MM									●		●						
	080612PNSR-MM																	
	080616PNSR-MM																	
	080620PNSR-MM																	

Available arbors

Designation		NC arbors
RM6PC	080R-25.4-7-WN08	BT□□-FMA25.4-□□
	080R-25.4-9-WN08	
	100R-31.75-8-WN08	BT□□-FMA31.75-□□
	100R-31.75-11-WN08	
	125R-38.1-11-WN08	BT□□-FMA38.1-□□
	125R-38.1-14-WN08	
RM6PCM	050R-22-4-WN08	BT□□-FMC22-□□
	050R-22-5-WN08	

Designation		NC arbors
RM6PCM	063R-22-5-WN08	BT□□-FMC22-□□
	063R-22-6-WN08	
	080R-27-7-WN08	BT□□-FMC27-□□
	080R-27-9-WN08	
	100R-32-8-WN08	BT□□-FMC32-□□
	100R-32-11-WN08	
	125R-40-11-WN08	BT□□-FMC40-□□
	125R-40-14-WN08	

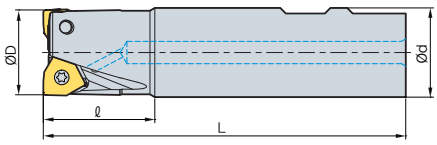
Parts

Specification	Screw	Wrench	Wrench
Ø50~Ø125	FTNA0512	-	TW20-100

Available inserts E28 Available arbors and bolt E371~E373

RM6PS-WN04 new





AA 90°

- AR: -6°
- RR: -32°~ -21°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
RM6PS	020R-2W20-110-WN04	2	20	20	35	110	4.3	0.22
	020R-3W20-110-WN04	3	20	20	35	110	4.3	0.22
	025R-3W25-110-WN04	3	25	25	35	110	4.3	0.36
	025R-4W25-110-WN04	4	25	25	35	110	4.3	0.35
	032R-5W32-110-WN04	5	32	32	35	110	4.3	0.60
	025R-6W32-110-WN04	6	32	32	35	110	4.3	0.60

Available inserts

WNGX-MA new | WNGX-ML new | WNGX-MM new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	040304PNFR-MA																	E28
	040308PNFR-MA																	
	040312PNFR-MA																	
	040316PNFR-MA																	
WNGX	040304PNER-ML																	
	040308PNER-ML																	
	040312PNER-ML																	
	040316PNER-ML																	
WNGX	040304PNSR-MM																	
	040308PNSR-MM																	
	040312PNSR-MM																	
	040316PNSR-MM																	

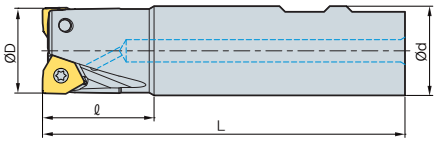
Parts

Specification	Screw	Wrench	Wrench
Ø20~Ø32	ETNA02506	TW07S	-

Available inserts E28

RM6PS-WN08 new





AA 90°

- AR: -6°
- RR: -32°~ -21°

(mm)

	Designation		ØD	Ød	ℓ	L	ap	kg
RM6PS	032R-2W32-120-WN08	3	32	32	40	120	8.2	0.65
	040R-3W32-120-WN08	3	40	32	40	120	8.2	0.69
	040R-4W32-120-WN08	4	40	32	40	120	8.2	0.69
	050R-4W32-120-WN08	4	50	32	40	120	8.2	0.76
	050R-5W32-120-WN08	5	50	32	40	120	8.2	0.76

Available inserts

WNGX-MA new | WNGX-ML new | WNGX-MM new



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNGX	080604PNFR-MA																	
	080608PNFR-MA																●	
	080612PNFR-MA																	
	080616PNFR-MA																	
	080620PNFR-MA																	
WNGX	080604PNER-ML									●			●	●				
	080608PNER-ML									●			●	●				
	080612PNER-ML																	E28
	080616PNER-ML																	
	080620PNER-ML																	
WNGX	080604PNSR-MM									●			●					
	080608PNSR-MM									●			●					
	080612PNSR-MM																	
	080616PNSR-MM																	
	080620PNSR-MM																	

Parts

Specification	Screw	Wrench	Wrench
Ø32~Ø50	FTNA0512	-	TW20-100

Available inserts E28

RM8AC(M)4000



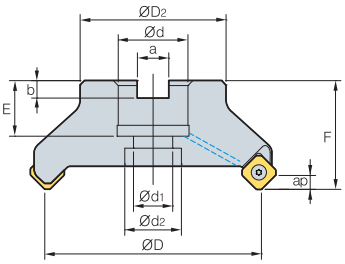


Fig. 1

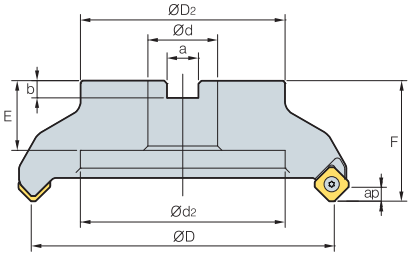


Fig. 2




AA 45°

- AR: -6°
- RR: -9°~ -6°

(mm)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM8ACM	4050HR-M	4	50	49	22	11	18	10.4	6.3	20	40	6.0	0.5	1
	4050HR-H	6	50	49	22	11	18	10.4	6.3	20	40	6.0	0.5	1
	4063HR-M	6	63	49	22	11	18	10.4	6.3	20	40	6.0	0.7	1
	4063HR-H	8	63	49	22	11	18	10.4	6.3	20	40	6.0	0.7	1
RM8AC (RM8ACM)	4080HR	5	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	6.0	1.2	1
	4080HR-M	7	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	6.0	1.2	1
	4080HR-H	10	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	6.0	1.3	1
	4100HR	6	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25.5)	63 (50)	6.0	1.7	1
	4100HR-M	8	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25.5)	63 (50)	6.0	1.7	1
	4100HR-H	12	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25.5)	63 (50)	6.0	1.7	1
	4125HR	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	6.0	3.6	1
	4125HR-M	10	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	6.0	3.6	1
	4125HR-H	16	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	6.0	3.7	1
	4160R	10	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	6.0	4.8	2
	4160R-M	12	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	6.0	5.3	2
	4160R-H	20	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	6.0	5.4	2
	4200R-M	14	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	6.0	7.1	2
	4200R-H	24	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	6.0	7.1	2
	4250R-M	16	250	180	47.625 (60)	-	180	25.4 (25.7)	14	38 (32)	63	6.0	11.9	2
	4250R-H	30	250	180	47.625 (60)	-	180	25.4 (25.7)	14	38 (32)	63	6.0	12.0	2
	4315R	18	315	240	47.625 (60)	-	238	25.4 (25.7)	14	38	63	6.0	18.8 (18.6)	2
	4315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14	38	63	6.0	18.8 (18.6)	2
	4400R-M	28	400	260	47.625 (60)	-	238	25.4 (25.7)	14	38	80	6.0	37.7 (37.4)	2

( )Metric size

Available inserts

SNEX-MF SNEX-ML SNEX-MM SNEX-MA SNEX-W SNMX-MF SNMX-MM



Designation		Cermet		Coated								Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ANN-MF								●	●		●	●	●				E22 E23
	1206ANN-ML												●	●				
	1206ANN-MM			●					●	●	●	●	●	●				
	1206ANN-MA																●	
	1206ANN-W								●			●	●					
SNMX	1206ANN-MF								●	●		●	●	●				
	1206ANN-MM			●					●	●	●	●	●	●				

Available arbors

Designation		Available arbors	
		RM8AC	RM8ACM
RM8ACM	4050HR-□	-	BT□□-FMC22-□□
	4063HR-□		
RM8AC (RM8ACM)	4080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	4160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	4200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	4250R-□		
	4315R-□		
	4400R-□		

Parts

Specification	Screw	Wrench
Ø50~Ø400	FTKA0410	TW15S

Available inserts E22, E23 Available arbors and bolt E371~E373

RMH8AC(M)4000

Shim type



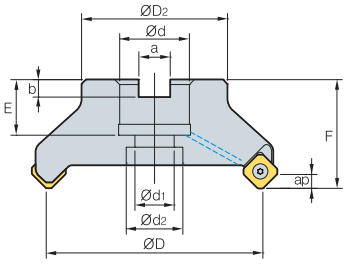


Fig. 1

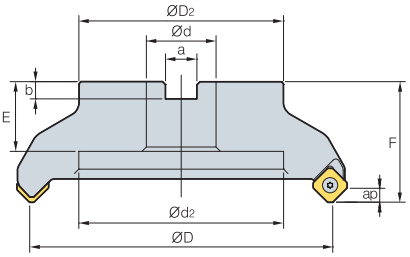


Fig. 2

AA 45°

- AR: -6°
- RR: -9°~ -6°

(mm)

Designation		⚙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RMH8AC (RMH8ACM)	4080HR-M	7	80	57	25.4 (27)	14	20	9.5 (12.4)	25 (23)	50	6.0	6.0	1.2	1
	4100HR-M	8	100	67	31.75 (32)	18	26	12.7 (14.4)	33 (25.5)	63 (50)	6.0	6.0	1.7	1
	4125HR-M	10	125	87	38.1 (40)	22	32	15.9 (16.4)	36 (30)	63	6.0	6.0	3.6	1
	4160R-M	12	160	107	50.8 (40)	-	107	19 (16.4)	38 (32)	63	6.0	6.0	5.3	2
	4200R-M	14	200	130	47.625 (60)	-	135	25.4 (25.7)	38 (32)	63	6.0	6.0	7.1	2
	4250R-M	16	250	180	47.625 (60)	-	180	25.4 (25.7)	38 (32)	63	6.0	6.0	11.9	2
	4315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	38	63	6.0	6.0	18.8 (18.6)	2
	4400R-M	26	400	260	47.625 (60)	-	238	25.4 (25.7)	38	80	6.0	6.0	37.7 (37.4)	2

( )Metric size

Available inserts

SNEX-MF	SNEX-ML	SNEX-MM	SNEX-MA	SNEX-W	SNMX-MF	SNMX-MM
						

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ANN-MF								●	●		●	●	●				E22 E23
	1206ANN-ML												●	●				
	1206ANN-MM			●					●	●	●	●	●	●				
	1206ANN-MA																●	
	1206ANN-W								●			●	●					
SNMX	1206ANN-MF								●	●		●	●	●				
	1206ANN-MM			●					●	●	●	●	●	●				

Available arbors

Designation		Available arbors	
		RMH8AC	RMH8ACM
RMH8AC (RMH8ACM)	4080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	4160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	4200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	4250R-□		
	4315R-□		
	4400R-□		

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø400	FTKA0412B	SS42RM8	SHXN0609F	TW15S

Available inserts E22, E23 Available arbors and bolt E371~E373

RM8AC(M)5000



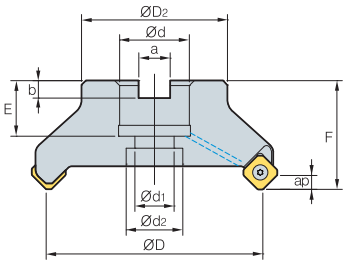


Fig. 1

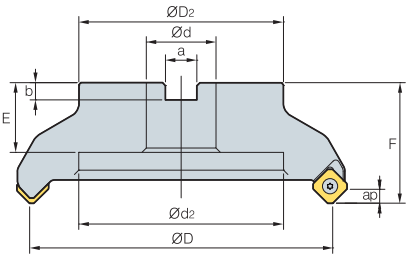


Fig. 2

AA
45°

- AR: -6°
- RR: -9°~ -6°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM8AC (RM8ACM)	5080HR-M	6	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	7.5	1.2	1
	5100HR-M	7	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0	33 (25)	63 (50)	7.5	2.5 (1.8)	1
	5125HR-M	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (30)	63	7.5	3.6	1
	5160R-M	10	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	7.5	5 (4.56)	2
	5200R-M	12	200	130	47.625 (60)	-	135	25.4 (25.7)	14.0	38	63	7.5	7.1 (6.8)	2
	5250R-M	15	250	180	47.625 (60)	-	180	25.4 (25.7)	14.0	38	63	7.5	11.9 (10.6)	2
	5315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14.0	38	63	7.5	19.1 (18.9)	2
	5400R-M	28	400	260	47.625 (60)	-	238	25.4 (25.7)	14.0	38	80	7.5	37.7 (37.5)	2

( )Metric size

Available inserts


SNEX-MF



SNEX-ML


SNEX-MM


SNMX-MF


SNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ANN-MF											●	●	●				E22 E23
	1507ANN-ML												●	●				
	1507ANN-MM											●	●	●				
SNMX	1507ANN-MF									●		●	●	●				
	1507ANN-MM								●	●		●	●	●				

Available arbors

Designation		Available arbors	
		RM8AC	RM8ACM
RM8AC (RM8ACM)	5080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	5160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	5200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	5250R-□		
	5315R-□		
	5400R-□		

Parts

Specification	Screw	Wrench
Ø80~Ø400	FTGA0513	TW20-100

Available inserts E22, E23 Available arbors and bolt E371~E373

RMH8AC(M)5000

Shim type



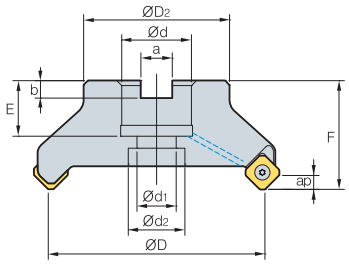


Fig. 1

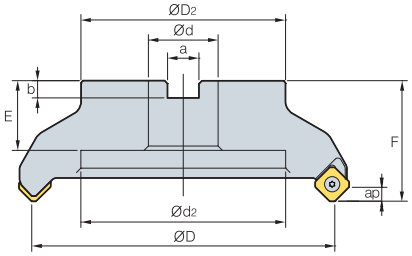


Fig. 2

AA 45°

- AR: -6°
- RR: -9°~ -6°

(mm)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RMH8AC (RMH8ACM)	5080HR-M	6	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	7.5	1.2	1
	5100HR-M	7	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0	33 (25)	63 (50)	7.5	2.5 (1.8)	1
	5125HR-M	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	7.5	3.6	1
	5160R-M	10	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	7.5	5 (4.56)	2
	5200R-M	12	200	130	47.625 (60)	-	135	25.4 (25.7)	14.0	38 (32)	63	7.5	7.1 (6.8)	2
	5250R-M	15	250	180	47.625 (60)	-	180	25.4 (25.7)	14.0	38 (32)	63	7.5	11.9 (10.6)	2
	5315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14.0	38	63	7.5	19.1 (18.9)	2
	5400R-M	22	400	260	47.625 (60)	-	238	25.4 (25.7)	14.0	38	80	7.5	37.7 (37.5)	2

( )Metric size

Available inserts


SNEX-MF



SNEX-ML


SNEX-MM


SNMX-MF


SNMX-MM

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ANN-MF											●	●	●				E22 E23
	1507ANN-ML												●	●				
	1507ANN-MM											●	●	●				
SNMX	1507ANN-MF									●		●	●	●				
	1507ANN-MM								●	●		●	●	●				

Available arbors

Designation		Available arbors	
		RMH8AC	RMH8ACM
RMH8AC (RMH8ACM)	5080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	5160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	5200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	5250R-□		
	5315R-□		
	5400R-□		

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø400	FTGA0513	SS53RM8	SHXN0712F	TW20-100

Available inserts E22, E23 Available arbors and bolt E371~E373

RM8EC(M)4000



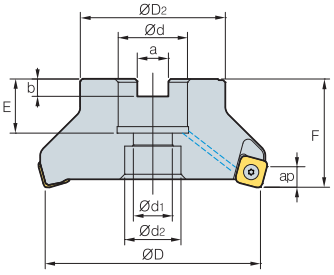


Fig. 1

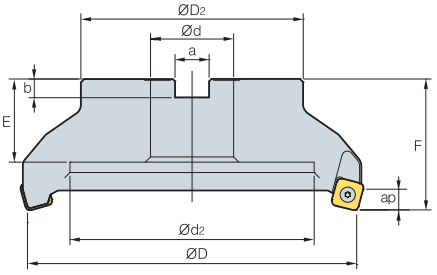


Fig. 2

AA 75°

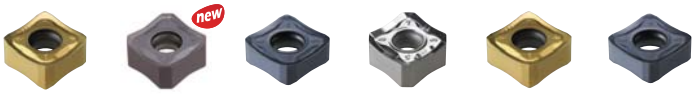
- AR: -6°
- RR: -8°~ -6°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM8ECM	4050HR-M	4	50	49	22	11	18	10.4	6.3	20	40	9.0	0.4	1
	4063HR-M	6	63	49	22	11	18	10.4	6.3	20	40	9.0	0.6	1
RM8EC (RM8ECM)	4080HR	5	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	9.0	1.2	1
	4080HR-M	7	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	9.0	1.1	1
	4100HR	6	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25)	63 (50)	9.0	1.6	1
	4100HR-M	8	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25)	63 (50)	9.0	2.5	1
	4125HR	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (29)	63	9.0	2.9 (3.3)	1
	4125HR-M	10	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (29)	63	9.0	3.0	1
	4160R	10	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	9.0	4.4	2
	4160R-M	12	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	9.0	4.0	2
	4200R-M	16	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	9.0	5.9	2
	4250R-M	16	250	180	47.625 (60)	-	180	25.4 (25.7)	14	38	63	9.0	10.9 (10.6)	2
	4315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14	38	63	9.0	18.1 (17.9)	2
	4400R-M	28	400	260	47.625 (60)	-	238	25.4 (25.7)	14	38	80	9.0	31.8 (31.5)	2

( )Metric size

Available inserts



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ENN-MF								●	●		●	●	●				E22 E23
	1206ENN-ML												●	●				
	1206ENN-MM								●	●		●	●	●				
	1206ENN-MA											●					●	
SNMX	1206ENN-MF								●	●		●	●	●				
	1206ENN-MM								●	●		●	●	●				

Available arbors

Designation		NC arbors	
		RM8EC	RM8ECM
RM8ECM	4050HR-□	-	BT□□-FMC22-□□
	4063HR-□		
RM8EC (RM8ECM)	4080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	4160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	4200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	4250R-□		
	4315R-□		
	4400R-□		

Parts

Specification	Screw	Wrench
Ø50~Ø400	PTKA0411-R3	TW15S

Available inserts E22, E23 Available arbors and bolt E371~E373

RMH8EC(M)4000

Shim type



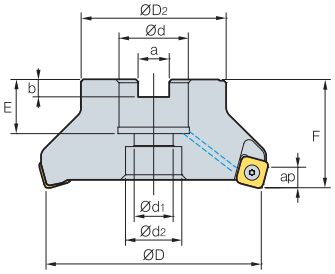


Fig. 1

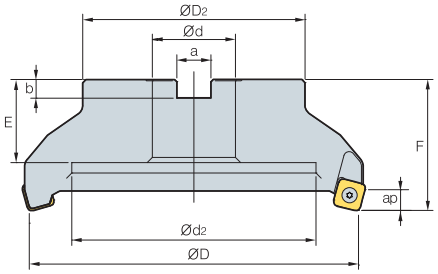


Fig. 2

AA 75°

- AR: -6°
- RR: -8°~ -6°

(mm)

Designation		⚙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RMH8EC (RMH8ECM)	4080HR-M	7	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	9.0	1.1	1
	4100HR-M	8	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25.5)	63 (50)	9.0	2.5	1
	4125HR-M	10	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	9.0	3.0	1
	4160R-M	12	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	9.0	4.0	2
	4200R-M	16	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	9.0	5.9	2
	4250R-M	16	250	180	47.625 (60)	-	180	25.4 (25.7)	14	38 (32)	63	9.0	10.9 (10.6)	2
	4315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14	38	63	9.0	18.1 (17.9)	2
	4400R-M	24	400	260	47.625 (60)	-	238	25.4 (25.7)	14	38	80	9.0	31.8 (31.5)	2

( )Metric size

Available inserts













Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206ENN-MF								●	●		●	●	●				
	1206ENN-ML												●	●				
	1206ENN-MM								●	●		●	●	●				E22
	1206ENN-MA											●					●	E23
SNMX	1206ENN-MF								●	●		●	●	●				
	1206ENN-MM								●	●		●	●	●				

Available arbors

Designation		Available arbors	
		RMH8EC	RMH8ACM
RMH8EC (RMH8ECM)	4080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	4160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	4200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	4250R-□		
	4315R-□		
	4400R-□		

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø400	PTKA0411-R3	SS42RM8	SHXN0609F	TW15S

Available inserts E22, E23 Available arbors and bolt E371~E373

RM8EC(M)5000



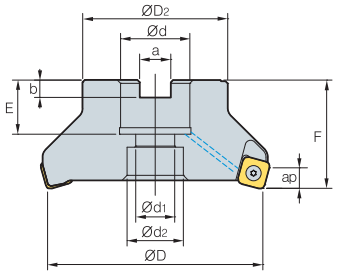


Fig. 1

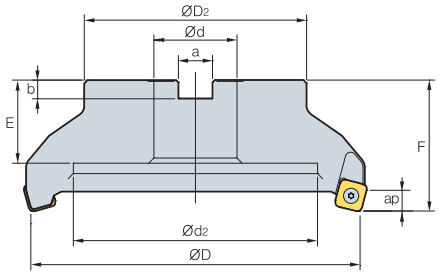


Fig. 2

AA 75°

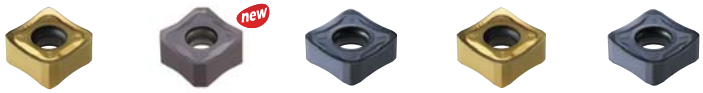
- AR: -6°
- RR: -8°~ -6°

(mm)

Designation		⊙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM8EC (RM8ECM)	5080HR-M	6	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	11.0	1.1	1
	5100HR-M	7	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0	33 (25)	63 (50)	11.0	2.1 (1.7)	1
	5125HR-M	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (30)	63	11.0	3.4 (3.3)	1
	5160R-M	10	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	11.0	4.4 (4.1)	2
	5200R-M	12	200	130	47.625 (60)	-	135	25.4 (25.7)	14.0	38	63	11.0	6.4 (6.1)	2
	5250R-M	15	250	180	47.625 (60)	-	180	25.4 (25.7)	14.0	38	63	11.0	11.0 (10.7)	2
	5315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14.0	38	63	11.0	18.0 (17.7)	2
	5400R-M	28	400	260	47.625 (60)	-	238	25.4 (25.7)	14.0	38	80	11.0	35.7 (35.4)	2

( )Metric size

Available inserts



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ENN-MF											●	●	●				E22 E23
	1507ENN-ML												●	●				
	1507ENN-MM											●	●	●				
SNMX	1507ENN-MF									●		●	●	●				
	1507ENN-MM									●		●	●	●				

Available arbors

Designation		Available arbors	
		RM8EC	RM8ECM
RM8EC (RM8ECM)	5080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	5160R-□	BT□□-FMA50.8-□□	
	5200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	5250R-□		
	5315R-□		
	5400R-□		

Parts

Specification	Screw	Wrench
Ø80~Ø400	FTGA0513	TW20-100

Available inserts E22, E23 Available arbors and bolt E371~E373

RMH8EC(M)5000

Shim type



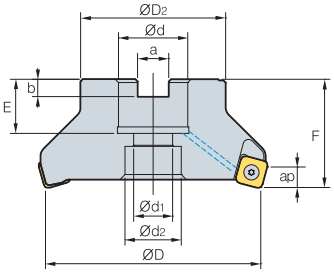


Fig. 1

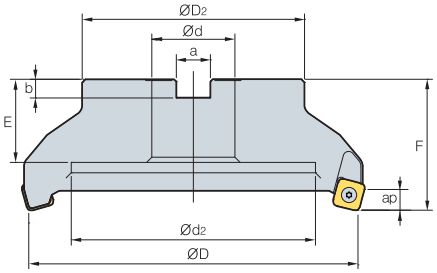


Fig. 2

AA 75°

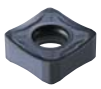
- AR: -6°
- RR: -8°~ -6°

(mm)

Designation		⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RMH8EC (RMH8ECM)	5080HR-M	6	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	11.0	1.1	1
	5100HR-M	7	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0	33 (25.5)	63 (50)	11.0	2.1 (1.7)	1
	5125HR-M	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	11.0	3.4 (3.3)	1
	5160HR-M	10	160	107	50.8 (60)	-	107	19 (16.4)	11 (9)	38 (32)	63	11.0	4.4 (4.1)	2
	5200R-M	12	200	130	47.625 (60)	-	135	25.4 (25.7)	14.0	38 (32)	63	11.0	6.4 (6.1)	2
	5250R-M	15	250	180	47.625 (60)	-	180	25.4 (25.7)	14.0	38 (32)	63	11.0	110 (10.7)	2
	5315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14.0	38	63	11.0	18.0 (17.7)	2
	5400R-H	22	400	260	47.625 (60)	-	238	25.4 (25.7)	14.0	38	80	11.0	35.7 (35.4)	2

( )Metric size

Available inserts

	SNEX-MF	SNEX-ML	SNEX-MM	SNMX-MF	SNMX-MM
					

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1507ENN-MF											●	●	●				E22 E23
	1507ENN-ML												●	●				
	1507ENN-MM											●	●	●				
SNMX	1507ENN-MF									●		●	●	●				
	1507ENN-MM									●		●	●	●				

Available arbors

Designation		Available arbors	
		RMH8EC	RMH8ECM
RMH8EC (RMH8ECM)	5080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	5100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	5125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	5160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	5200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	5250R-□		
	5315R-□		
	5400R-□		

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø400	FTGA0513	SS53RM8	SHXN0712F	TW20-100

Available inserts E22, E23 Available arbors and bolt E371~E373

RM8QC(M)4000



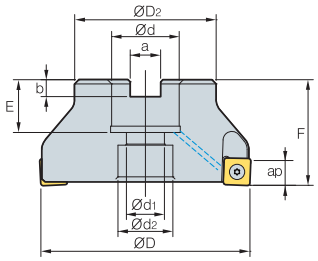


Fig. 1

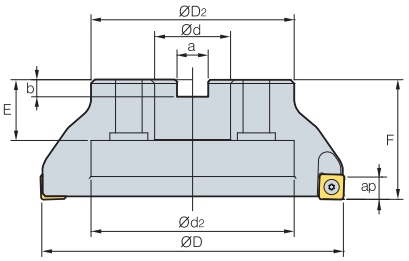


Fig. 2

AA 88°
- AR: -6°
- RR: -8°~ -6°

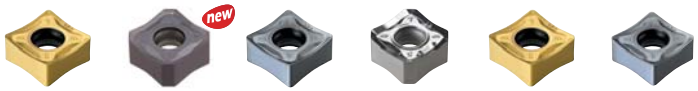
(mm)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM8QCM	4063HR-M	6	63	49	22	11	18	10.4	6.3	20	40	11.5	0.6	1
	4063HR-H	8	63	49	22	11	18	10.4	6.3	20	40	11.5	0.6	1
RM8QC (RM8QCM)	4080HR-M	7	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	11.5	1.1	1
	4080HR-H	10	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	11.5	1.0	1
	4100HR-M	8	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25.5)	63 (50)	11.5	1.7	1
	4100HR-H	12	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25.5)	63 (50)	11.5	1.6	1
	4125HR-M	10	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	11.5	3.3	1
	4125HR-H	14	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	11.5	3.3	1
	4160R-M	12	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	11.5	3.9	2
	4160R-H	18	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	11.5	3.9	2
	4200R-M	14	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	11.5	6.4	2
	4200R-H	22	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	11.5	6.4	2

Available inserts

( )Metric size

SNEX-MF | SNEX-ML | SNEX-MM | SNEX-MA | SNMX-MF | SNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206QNN-MF								●			●	●	●				
	1206QNN-ML												●	●				
	1206QNN-MM											●	●	●				
	1206QNN-MA																●	
	120612-MF											●	●	●				
	120612-ML												●	●				E22
	120612-MM											●						E23
	120612-MA																●	
SNMX	1206QNN-MF								●	●		●	●	●				
	1206QNN-MM								●	●		●	●	●				
	120612-MF									●		●	●	●				
	120612-MM								●	●		●	●	●				

Available arbors

Designation		Available arbors	
		RM8QC	RM8QCM
RM8QCM	4063HR-□	-	BT□□-FMC22-□□
RM8QC (RM8QCM)	4080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	4160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	4200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□

Parts

Specification	Screw	Shim
Ø63~Ø200	PTKA0411-R3	TW15S

Available inserts E22, E23 Available arbors and bolt E371~E373

RMH8QC(M)4000

Shim type



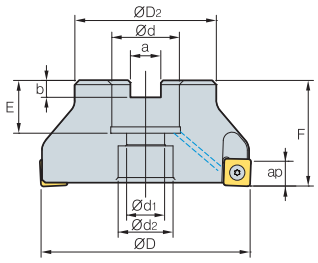


Fig. 1

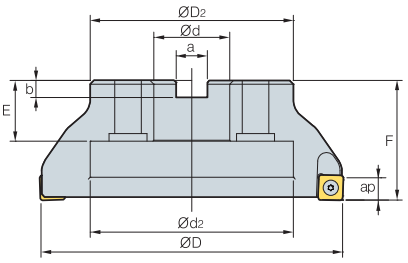


Fig. 2

AA 88°

- AR: -6°
- RR: -8°~ -6°

(mm)

Designation		⚙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RMH8QC (RMH8QCM)	4080HR-M	7	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	11.5	1.1	1
	4100HR-M	8	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25.5)	63 (50)	11.5	2.5	1
	4125HR-M	10	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (30)	63	11.5	3.0	1
	4160R-M	12	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	11.5	4.0	2
	4200R-M	16	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	11.5	5.9	2

( )Metric size

Available inserts

SNEX-MF | SNEX-ML | SNEX-MM | SNEX-MA | SNMX-MF | SNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEX	1206QNN-MF								●			●	●	●				
	1206QNN-ML												●	●				
	1206QNN-MM											●	●	●				
	1206QNN-MA																●	
	120612-MF											●	●	●				
	120612-ML												●	●				E22
	120612-MM											●						E23
	120612-MA																●	
SNMX	1206QNN-MF								●	●		●	●	●				
	1206QNN-MM								●	●		●	●	●				
	120612-MF									●		●	●	●				
	120612-MM								●	●		●	●	●				

Available arbors

Designation		Available arbors	
		RMH8AC	RMH8ACM
RMH8QC (RMH8QCM)	4080HR-□	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	4100HR-□	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	4125HR-□	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	4160R-□	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	4200R-□	BT□□-FMA47.625-□□	BT□□-FMB60-□□

Parts

Specification	Screw	Shim	Shim screw	Wrench
Ø80~Ø200	PTKA0411-R3	SS42RM8	SHXN0609F	TW15S

Available inserts E22, E23 Available arbors and bolt E371~E373

RMT8A(M)4000



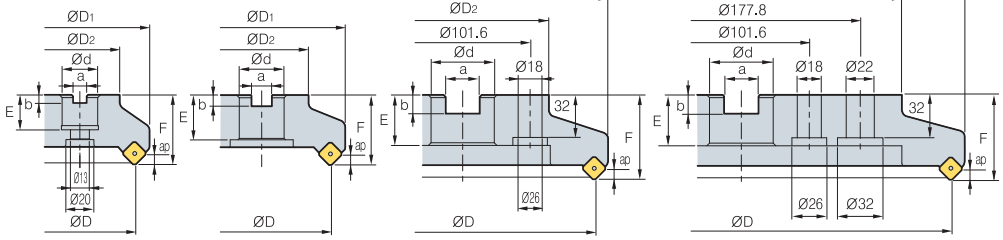


Fig. 1 Fig. 2 Fig. 3 Fig. 4

AA
45°

- AR: -6°
- RR: -6°

(mm)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8A (RMT8AM)	4080R	5	80	100	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	4	1.6	1
	4080R-M	6	80	100	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	4	1.6	1
	4100R	6	100	120	70	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	4	2.3	2
	4100R-M	8	100	120	70	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	4	2.3	2
	4125R	8	125	144	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	4	4.3	2
	4125R-M	10	125	144	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	4	4.3	2
	4160R	10	160	179	110	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	4	6.5	2
	4160R-M	14	160	179	110	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	4	6.5	2
	4200R	12	200	219	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	4	8.8	3
	4200R-M	18	200	219	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	4	8.8	3
	4250R	16	250	269	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	4	14.1	3
	4250R-M	22	250	269	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	4	14.1	3
	4315R	20	315	334	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	4	22.3	4
	4315R-M	28	315	334	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	4	22.3	4

( )Metric size

Available inserts

SNC(M)F-MF SNC(M)F-MM



Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1206ANN-MF																	E20 E21
	1206ANN-MM																	
SNMF	1206ANN-MF																	
	1206ANN-MM																	

Available arbors

Designation		General arbor	NC arbors	
			RMT8A	RMT8AM
RMT8A(M)	□080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	□125R	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	□160R	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	
	□200R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	□250R			
	□315R	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø80~Ø315	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available inserts E20, E21 Available arbors and bolt E371~E373

RMT8A(M)5000



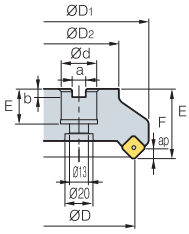


Fig. 1

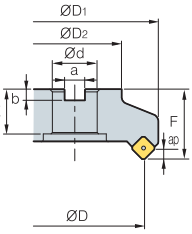


Fig. 2

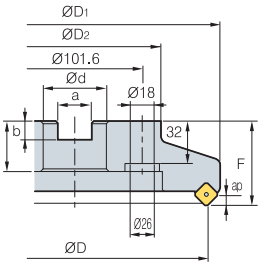


Fig. 3

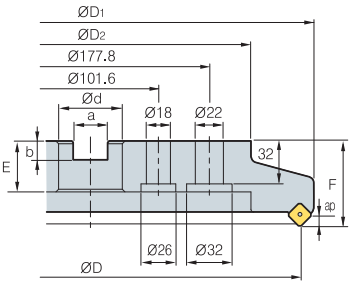


Fig. 4

AA 45°

- AR: -6°
- RR: -6°

(mm)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8A (RMT8AM)	5080R	5	80	104	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	6	1.8	1
	5080R-M	6	80	104	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	6	1.8	1
	5100R	6	100	124	70	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	6	2.6	2
	5100R-M	8	100	124	70	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	6	2.6	2
	5125R	8	125	149	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	6	4.3	2
	5125R-M	10	125	149	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	6	4.3	2
	5160R	10	160	184	110	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	6	6.5	2
	5160R-M	14	160	184	110	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	6	6.5	2
	5200R	12	200	224	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	9.0	3
	5200R-M	18	200	224	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	9.0	3
	5250R	16	250	274	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	14.4	3
	5250R-M	22	250	274	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	14.4	3
	5315R	20	315	339	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	22.2	4
	5315R-M	28	315	339	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	6	22.2	4

Available inserts

( )Metric size

SNC(M)F-MF SNC(M)F-MM





Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1507ANN-MF											●						E20 E21
	1507ANN-MM																	
SNMF	1507ANN-MF																	
	1507ANN-MM																	

Available arbors

Designation		General arbor	NC arbors	
			RMT8A	RMT8AM
RMT8A(M)	□080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75	FMC32
	□125R	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1	FMC32
	□160R	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8	
	□200R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	□250R			
	□315R	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø80~Ø315	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

Available inserts E20, E21 Available arbors and bolt E371~E373

RMT8E(M)4000



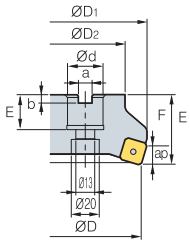


Fig. 1

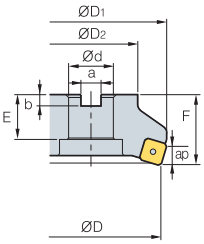


Fig. 2

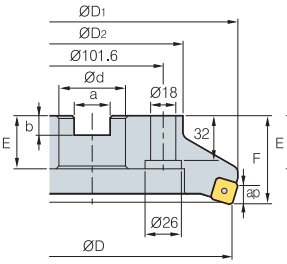


Fig. 3

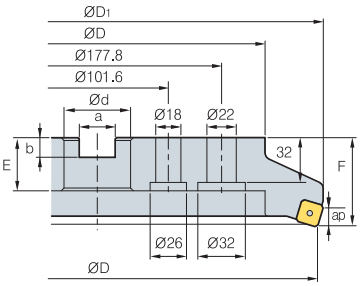


Fig. 4

AA 75°

- AR: -6°
- RR: -8°~ -6°

(mm)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8E (RMT8EM)	4080R	5	80	100	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	5	1.5	1
	4080R-M	6	80	100	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	5	1.5	1
	4100R	6	100	120	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	5	2	2
	4100R-M	8	100	120	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	5	2	2
	4125R	8	125	144	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	5	3.8	2
	4125R-M	10	125	144	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	5	3.8	2
	4160R	10	160	179	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	5	5.8	2
	4160R-M	14	160	179	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	5	5.8	2
	4200R	12	200	219	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	7.9	3
	4200R-M	18	200	219	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	7.9	3
	4250R	16	250	269	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	13.0	3
	4250R-M	22	250	269	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	13.0	3
	4315R	20	315	334	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	20.5	4
	4315R-M	28	315	334	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	20.5	4

Available inserts

( )Metric size

SNC(M)F-MF SNC(M)F-MM




Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1206ENN-MF											●						E20 E21
	1206ENN-MM																	
SNMF	1206ENN-MF								●									
	1206ENN-MM								●									

Available arbors

Designation		General arbor	NC arbors	
			RMT8E	RMT8E
RMT8E(M)	□080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	□125R	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	□160R	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	
	□200R □250R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	□315R	KCP-8*** (Center ring plug)		

*□□-NT number **□□-BT number ***Over milling 5

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø80~Ø315	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available inserts E20, E21 Available arbors and bolt E371~E373

RMT8E(M)5000



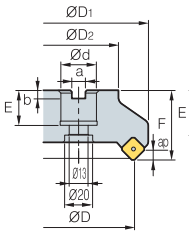


Fig. 1

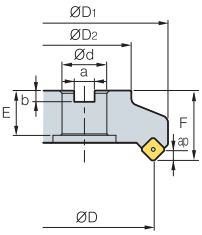


Fig. 2

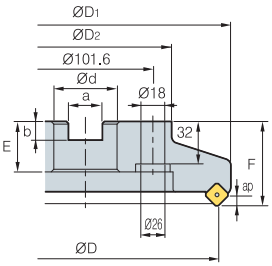


Fig. 3

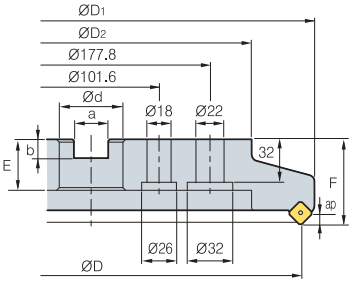


Fig. 4

AA 75°

- AR: -6°
- RR: -8°~ -6°

(mm)

Designation		⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8E (RMT8EM)	5080R	5	80	88	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	8	1.4	1
	5080R-M	6	80	88	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	8	1.4	1
	5100R	6	100	108	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	8	1.9	2
	5100R-M	8	100	108	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	8	1.9	2
	5125R	8	125	133	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	8	3.7	2
	5125R-M	10	125	133	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	8	3.7	2
	5160R	10	160	168	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	8	5.7	2
	5160R-M	14	160	168	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	8	5.7	2
	5200R	12	200	208	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	7.5	3
	5200R-M	18	200	208	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	7.5	3
	5250R	16	250	258	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	12.4	3
	5250R-M	22	250	258	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	12.4	3
	5315R	20	315	323	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	19.9	4
	5315R-M	28	315	323	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	8	19.9	4

( )Metric size

Available inserts

SNC(M)F-MF SNC(M)F-MM




Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNCF	1507ENN-MF											●						E20 E21
	1507ENN-MM																	
SNMF	1507ENN-MF																	
	1507ENN-MM																	

Available arbors

Designation		General arbor	NC arbors	
			RMT8EM	RMT8EM
RMT8E(M)	□080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	□125R	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□ BT**□□-FMA50.8-□□	FMB40
	□160R	NT*□□(M/U)-FMA50.8-□□		
	□200R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	□250R			
	□315R	KCP-8*** (Center ring plug)	-	-

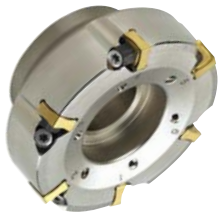
*□□-NT number **□□-BT number ***Over milling 5

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø80~Ø315	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

Available inserts E20, E21 Available arbors and bolt E371~E373

RMT8Q(M)



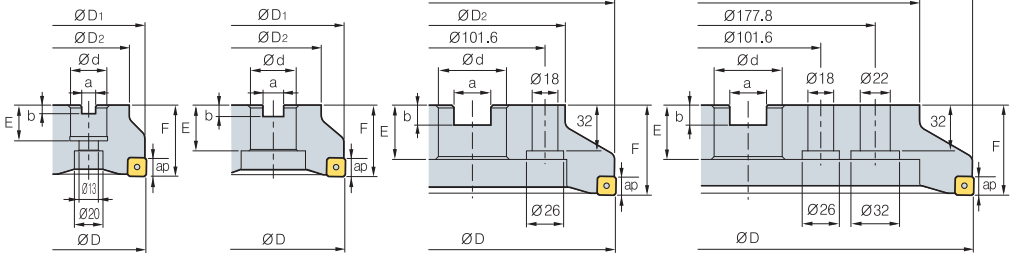


Fig. 1 Fig. 2 Fig. 3 Fig. 4

AA 88°
- AR: -6°
- RR: -11°~ -6°

(mm)

Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8Q (RMT8QM)	4080R	5	80	79	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	5	1.4	1
	4080R-M	6	80	79	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	5	1.4	1
	4100R	6	100	99	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	5	1.8	2
	4100R-M	8	100	99	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	5	1.8	2
	4125R	8	125	124	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	5	3.6	2
	4125R-M	10	125	124	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	5	3.6	2
	4160R	10	160	159	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	5	5.7	2
	4160R-M	14	160	159	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	5	5.7	2
	4200R	12	200	199	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	7.5	3
	4200R-M	18	200	199	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	7.5	3
	4250R	16	250	249	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	12.5	3
	4250R-M	22	250	249	180	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	12.5	3
	4315R	20	315	314	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	19.9	4
	4315R-M	28	315	314	240	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	5	19.9	4

( )Metric size

Available inserts

SNMF-MF SNMF-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNMF	1206QNN-MF																	E20
	1206QNN-MM								●									

Available arbors

Designation		General arbor	NC arbors	
			RMT8Q	RMT8QM
RMT8Q(M)	□080R	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□	FMC27
	□100R	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□	FMC32
	□125R	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□	FMB40
	□160R	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□	
	□200R	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□	FMB60
	□250R			
	□315R	KCP-8*** (Center ring plug)	-	

*□□-NT number **□□-BT number ***Over milling 5

Parts

Specification	Screw	Screw	Spring	Latch	Wrench
Ø80~Ø315	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100

Available inserts E20 Available arbors and bolt E371~E373

RM16AC(M)6000



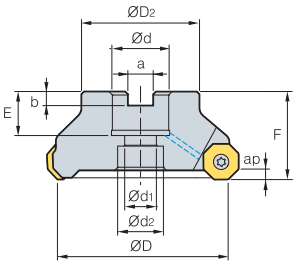


Fig. 1

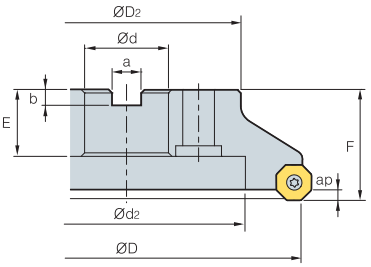


Fig. 2





AA 45°

- AR: -6°
- RR: -6°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM16ACM	6063HR-M	5	63	49	22	11	18	10.4	6.3	20	40	4.0	0.7	1
RM16AC (RM16ACM)	6080HR-M	6	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	4.0	1.2	1
	6100HR-M	7	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25)	63 (50)	4.0	1.9	1
	6125HR-M	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (29)	63	4.0	3.5	1
	6160R-M	10	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	4.0	4.1	2
	6200R-M	12	200	130	47.625 (60)	-	135	25.4 (25.7)	14	38 (32)	63	4.0	6.1	2
	6250R-M	15	250	180	47.625 (60)	-	180	25.4 (25.7)	14	38	63	4.0	11.5	2
	6315R-M	20	315	240	47.625 (60)	-	238	25.4 (25.7)	14	38	63	4.0	18.9	2
	6400R-M	26	400	260	47.625 (60)	-	238	25.4 (25.7)	14	38	80	4.0	32.7	2

( )Metric size

Available inserts

ONHX-MF | ONHX-ML | ONHX-MM | ONHX-W | ONHX-MA | ONMX-MF | ONMX-MM










Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
ONHX	060608-MM											●	●	●				E14
	060608-MF											●	●	●				
	060608-ML												●	●				
	060608-MA																●	
	060608-W										●	●	●					
	0606ANN-MM											●	●	●				
	0606ANN-MF											●	●	●				
ONMX	060608-MM								●	●		●	●	●				
	060608-MF									●		●	●	●				
	0606ANN-MM								●	●		●	●	●				
	0606ANN-MF									●	●	●	●	●				

Available arbors

Designation		Available arbors	
		RM16AC	RM16ACM
RM16AC(M)	6063HR-M		BT□□-FMC22-□□
	6080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	6100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	6125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	6160R-M	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	6200R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	6250R-M		
	6315R-M		
	6400R-M		

Parts

Specification	Screw	Wrench
Ø63~Ø400	FTGA0513	TW20-100

Available inserts E14 Available arbors and bolt E371~E373

RM16AC(M)8000



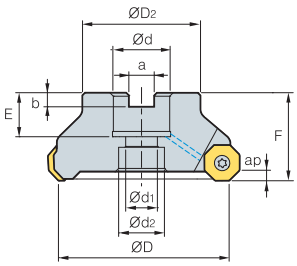


Fig. 1

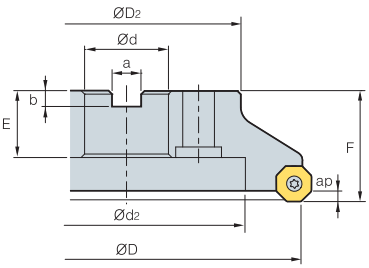


Fig. 2

AA 45°
• AR: -6°
• RR: -6°

(mm)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
RM16ACM	8063HR-M	5	63	49	22	11	18	10.4	6.3	20	40	5.5	0.7	1
RM16AC (RM16ACM)	8080HR-M	6	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	5.5	1.2	1
	8100HR-M	7	100	67	31.75 (32)	18	26	12.7 (14.4)	8	33 (25)	63 (50)	5.5	1.8	1
	8125HR-M	8	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (29)	63	5.5	3.5	1
	8160R-M	10	160	107	50.8 (40)	-	107	19 (16.4)	11 (9)	38 (32)	63	5.5	4.5	2
	8200R-M	12	200	130	47.625 (60)	-	135	25.4 (25.7)	14 (14)	38 (32)	63	5.5	5.8	2
	8250R-M	14	250	180	47.625 (60)	-	180	25.4 (25.7)	14	38	63	5.5	11.4	2
	8315R-M	18	315	240	47.625 (60)	-	238	25.4 (25.7)	14	38	63	5.5	18.8	2
	8400R-M	24	400	260	47.625 (60)	-	238	25.4 (25.7)	14	38	80	5.5	32.7	2

( )Metric size

Available inserts

ONHX-MF | ONHX-ML | ONHX-MM | ONHX-W | ONHX-MA | ONMX-MF | ONMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
ONHX	080608-MM																	E14
	080608-MF																	
	080608-ML																	
	080608-W																	
	080608-MA																	
	0806ANN-MM																	
	0806ANN-MF																	
ONMX	080608-MM																	
	080608-MF																	
	0806ANN-MM																	
	0806ANN-MF																	

Available arbors

Designation		Available arbors	
		RM16AC	RM16ACM
RM16AC(M)	8063HR-M	-	BT□□-FMC22-□□
	8080HR-M	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	8100HR-M	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	8125HR-M	BT□□-FMA38.1-□□	BT□□-FMB40-□□
	8160R-M	BT□□-FMA50.8-□□	BT□□-FMC40-□□
	8200R-M	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	8250R-M		
	8315R-M		
	8400R-M		

Parts

Specification	Screw	Wrench
Ø63~Ø400	FTGA0513	TW20-100

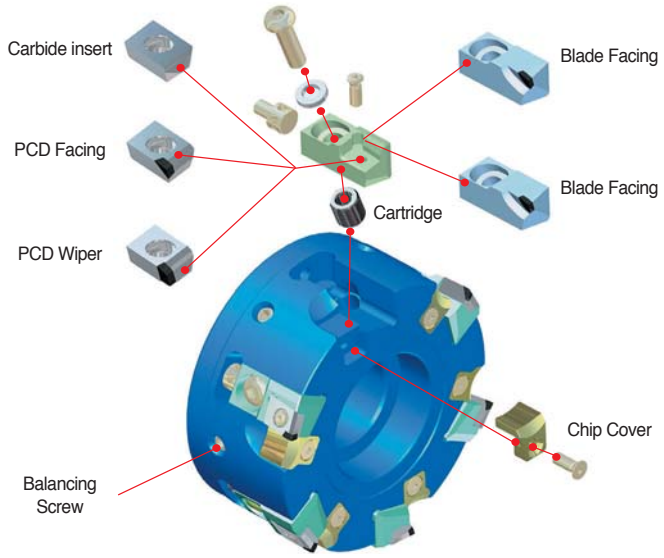
Available inserts E14 Available arbors and bolt E371~E373

Lighter tool ensures excellent performance in high speed machining

Aero Mill

- Excellent machining performance can be acquired especially at the high speeds due to the light aluminum cutter body that is 50% of the weight of a conventional steel cutter body
- High speed milling cutter for precise machining
- Special Aluminum material and high rake angle of insert provide rigid & stable machining
- High tolerance surface finishes can be acquired due to the low cutting load provided from the high rake angle
- Balanceable up to G2.5 level

Assembly structure of cutter

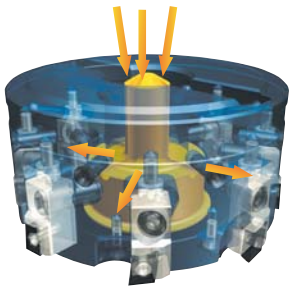
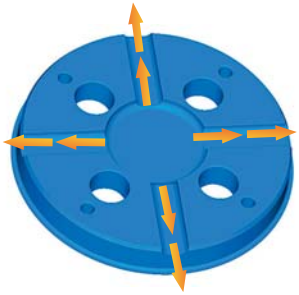


Features of cutter

- Increased stability based on cartridge type application
- Both insert and blade can be available in the same cutter
- Finishing to roughing can be possible because of wide chip pocket space
- Roughing and finishing available with carbide, PCD insert application
- Cutter breakage can be solved by making use of the chip cover

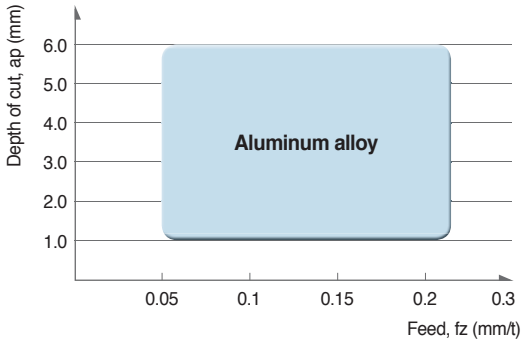
Coolant through system

- Specially designed coolant through system provides coolant from the center of the cutter to the insert enhances the cooling rate and chip evacuation.
- Direction of coolant has designed to focus directly to the insert cutting-edge to maximize chip evacuation and improve tool life
- Coolant bolt is applicable up to Ø160, coolant cover is applicable from Ø200 and over. Coolant devices are sold separately for through coolant system, through coolant arbor has to be used

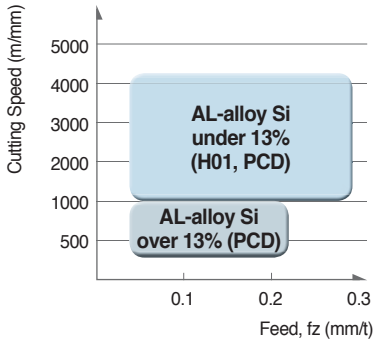
Coolant Bolt	Coolant Cover
	
For Ø80~Ø160	For Ø200 and over

Aero Mill

Application range

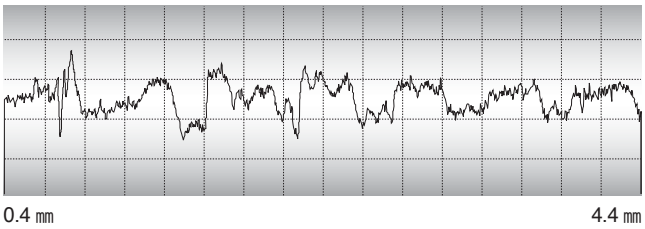


Recommended cutting condition



Surface finish

- **Workpiece** A6061
- **Cutting condition** vc = 1570 m/min vf = 3000 mm/min
  S = 5000 rpm fz = 0.1 mm/t
  ap = 0.5 mm Machine = PCV620
- **Designation** **Cutter** APD100R-A6Z (6 Flutes)
  Insert CDEW1204R-XCF (H01)

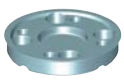


- Rmax: 2.1 ㎛
- Rz: 1.6 ㎛
- Ra: 0.3 ㎛

Max. revolution

Diameter (mm)	Max. revolution (rpm)
Ø80	16,000
Ø100	15,000
Ø125	12,500
Ø160	10,000
Ø200	8,000
Ø250	6,500
Ø315	5,000

Coolant parts

Diameter (mm)	Type	Designation		Shape	Note
Ø80	Coolant Bolt	CBP080-IN/MM			Extra charge
Ø100	Coolant Bolt	CBP100-IN	CBP100-MM-1		
Ø125	Coolant Bolt	CBP125-IN	CBP125-MM-1		
Ø160	Coolant Bolt	CBP160-IN	CBP160-MM		
Ø200	Coolant Cover	CCP200			
Ø250	Coolant Cover	CCP250			
Ø315	Coolant Cover	CCP315			

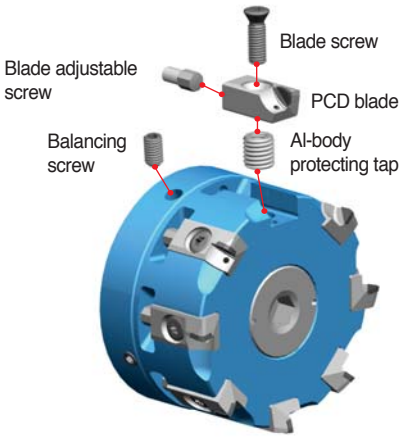
• Choice: CBP100-IN:APD type, General for unmarked item

Cone shaped head indexable drill

Aero Mill-Plus

- Improve tool life up to 20% with a coolant system that enables direct spray cooling to cutting blades
- Enable high feed milling by increasing the number of cutting blades by 20% through a simply structured coupling method for clamps
- Reduces set up time up to 40% by applying a spanner adjustment method
- Introduce an aluminum cutter body to provide a superior cutting performance during high speed milling

Assembly structure of cutter



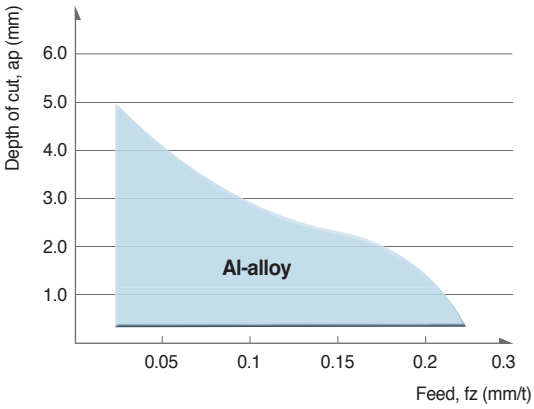
Features of cutter

- Prevent overload to the spindle bearings through weight reduction of the Al alloy body and enable high-speed processing
- Provide PCD Blade-dedicated cutter design to offer stable tool life and increase of applied blades
- Improve the blade life by applying a coolant system that enables direct spray cooling to cutting blades
- Adopt a clamping method with simple structure without set screw
- Reduce weight and apply a coolant bolt that is exclusively used for Aero-Mill Plus that applies coolant to remove internal chip

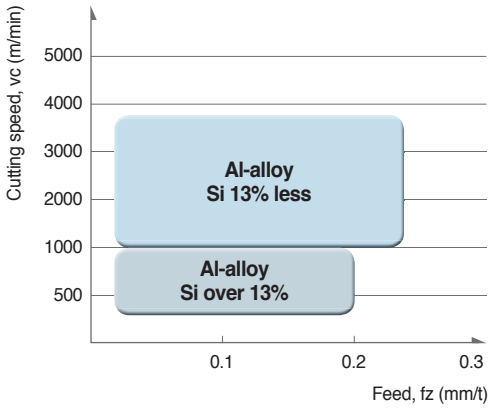
Code system

A	P	D	(M)	300	R	– PB	12Z
Aero-Mill	A.A 90°	Relief Angle	Inch type: None Metric type: M	Diameter (Ø)	Hand (R/L)	Aero-Mill Plus blade type	Number of tooth

Application range



Recommended cutting speed



Max. RPM

Diameter (mm)	Max. revolution (rpm)
Ø80	20,000
Ø100	18,000
Ø125	16,000
Ø160	13,000
Ø200	10,000
Ø250	8,000
Ø315	7,000

Coolant parts

Diameter (mm)	Type	inch/mm	Designation	Shape	Material	Note
Ø80	Coolant bolt	inch, mm	CB12-AMaP80		Steel	Included
Ø100		inch	CB16-AMP100			
		mm	CB16-AMP100M			
Ø125		inch	CB20-AMP125			
		mm	CB20-AMP125M			
Ø160		inch	CB24-AMP160			
		mm	CB20-AMP125M			
Ø200	Coolant cover	inch, mm	CCV-AMP200		Aluminum	Extra charge
Ø250			CCV-AMP250			
Ø315			CCV-AMP315			

Good performance in small-medium size of operations

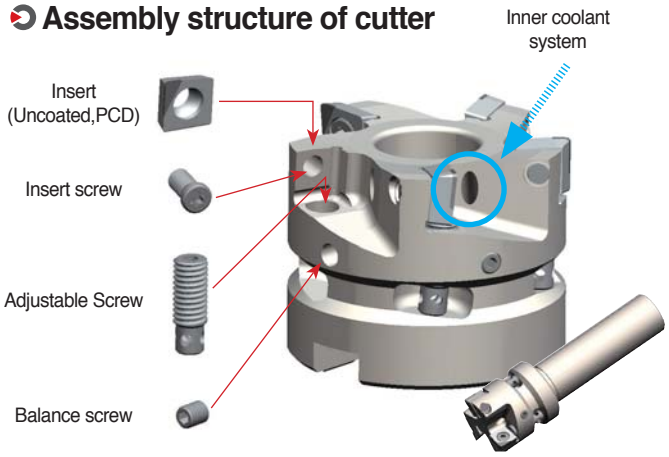
Aero Mill-Mini

- Good performance in small-medium size of operations
- Good duration of the steel body
- Choice of Uncoated carbide/PCD grades can be applied to various kind of work material
- Balance level: G25

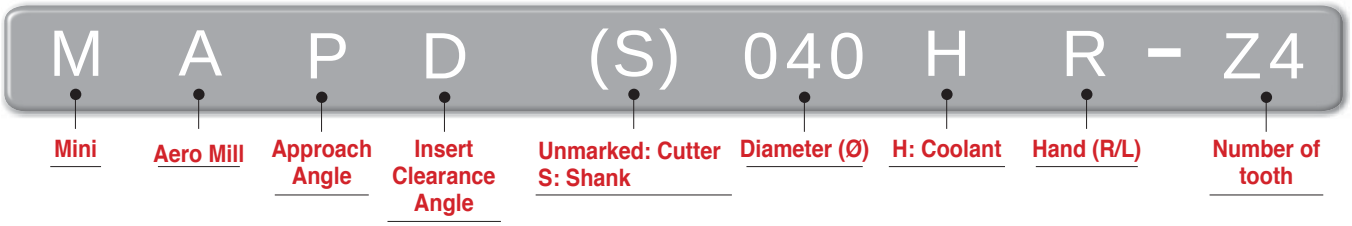
Features of cutter

- Simple and strong design of Screw-on clamping.
- Adjustable range: ± 0.1 mm Max
- Adjustable step: Min. 2 micro meter
- Wide chip pocket area for Roughing and Aluminum machining.
- Inner coolant system

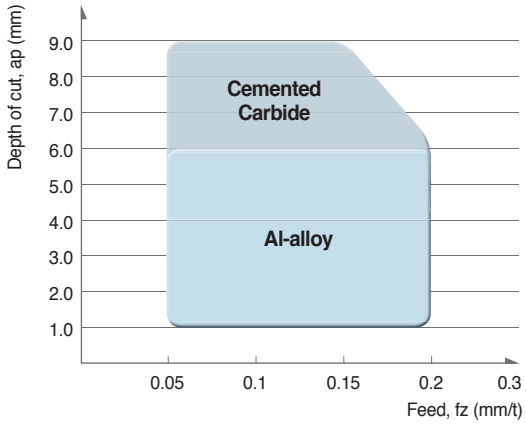
Assembly structure of cutter



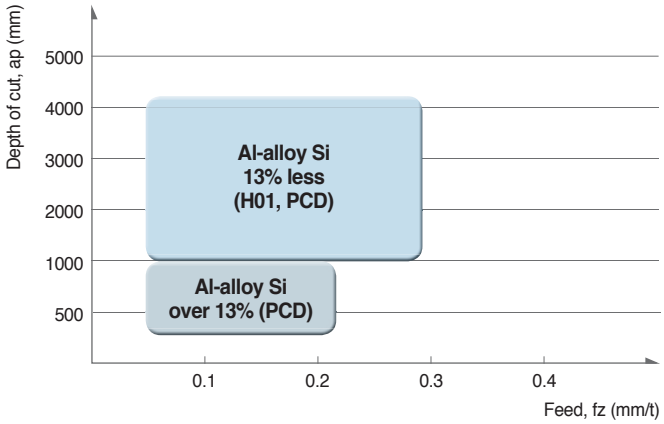
Code system



Application range



Recommended cutting condition

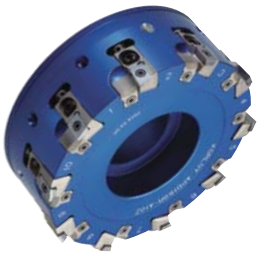


Max. RPM

Diameter	Max. RPM (min^{-1})
Ø32	26,000
Ø40	24,500
Ø50	22,000
Ø63	20,000

APD(M)-A

Cartridge + insert



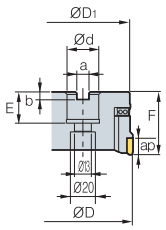


Fig. 1

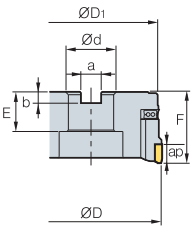


Fig. 2

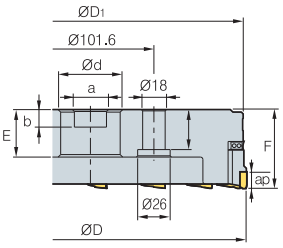


Fig. 3

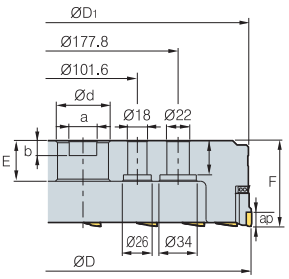


Fig. 4

AA
90°

- AR: 6°
- RR: 5°~9°

(mm)

Designation		◎	ØD	ØD1	Ød	a	b	E	F	ap	Max rpm	kg	Fig.
APD (APDM)	080R/L-A6Z	6	80	76	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	10	16000	0.75	1
	100R/L-A6Z	6	100	95	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	50	10	15000	0.95	2
	125R/L-A8Z	8	125	120	38.1 (40)	15.9 (16.4)	10 (9)	38 (30)	63	10	12500	1.8	2
	160R/L-A10Z	10	160	155	50.8 (40)	19.0 (16.4)	11 (9)	38 (30)	63	10	10000	2.9	2
	200R/L-A12Z	12	200	195	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	10	8000	4.0	3
	250R/L-A16Z	16	250	245	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	63	10	6500	6.3	3
	315R/L-A18Z	18	315	310	47.625 (60)	25.4 (25.7)	14 (14)	38 (38)	80	10	5000	11.3	4

( )Metric size

Available inserts

CDEW-XCF CDEW-XAF, NAF CDEW-XAW, NAW



Designation		Uncoated			PCD	page
		H01	G10	ST30A	DP200	
CDEW	1204R-XCF	●				E06 E07
	1204L-XCF					
	1204R-XAF				●	
	1204L-XAF					
	1204R-NAF				●	
	1204R-XAW				●	
	1204L-XAW					
	1204R-NAW				●	

Available arbors

Designation		General arbor	NC arbors
APD(M)	080R/L	NT*□□(M/U)-FMA25.4-25	BT**□□-FMA25.4
	100R/L	NT*□□(M/U)-FMA31.75-□□	BT**□□-FMA31.75
	125R/L	NT*□□(M/U)-FMA38.1-□□	BT**□□-FMA38.1
	160R/L	NT*□□(M/U)-FMA50.8-□□	BT**□□-FMA50.8
	200R/L	NT*□□(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□
	250R/L		
	315R/L	KCP-8*** (Center ring plug)	-

*□□-NT number **□□-BT number ***Over milling 5

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
Aluminum	1,000~4,000	0.05~0.30	DP200
	500~2,500	0.05~0.20	H01

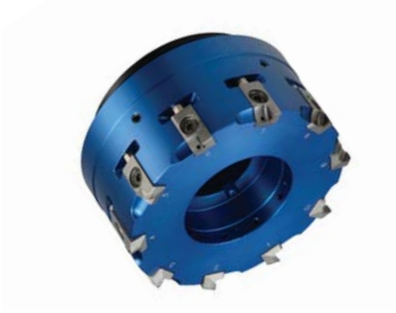
Parts

Specification	Cartridge	Chip cover	Chip cover Screw	Insert screw	Adjust screw	Cartridge Screw	Wrench for insert	Wrench for cartridge
Ø80~Ø315	LAPDR/L-AJ	CAPDR/L-AJ	PTMA0411	FTNA0411	AZ0514	BHA0619-NYLOK	TW15S	HW50

Available inserts E06, E07 Available arbors and bolt E371~E373

APD(M)-PB

Blade



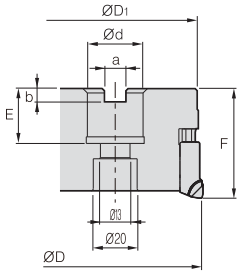


Fig. 1

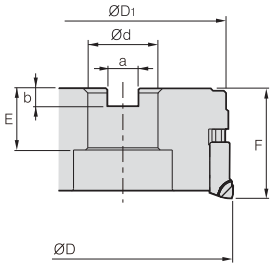


Fig. 2

AA 90°
- AR: 6°
- RR: -4°~1°

(mm)

Designation			Max	ØD	ØD1	Ød	a	b	E	F	ap	kg	Fig.
APD (APDM)	080R/L-PB6Z	6	10	80	77	25.4 (27)	9.5 (12.4)	6 (7)	23.5	50	5	0.55	1
	080R/L-PB8Z	8	10	80	77	25.4 (27)	9.5 (12.4)	6 (7)	23.5	50	5	0.55	1
	100R/L-PB6Z	6	12	100	97	31.75 (32)	12.7 (14.4)	8	34 (32)	50	5	0.92	2
	100R/L-PB8Z	8	12	100	97	31.75 (32)	12.7 (14.4)	8	34 (32)	50	5	0.92	2
	125R/L-PB8Z	8	14	125	122	38.1 (40)	15.9 (16.4)	10 (9)	40 (35)	63	5	1.9	2
	125R/L-PB10Z	10	14	125	122	38.1 (40)	15.9 (16.4)	10 (9)	40 (35)	63	5	1.9	2
	160R/L-PB10Z	10	20	160	157	50.8 (40)	19.0 (16.4)	11 (9)	41 (35)	63	5	3.3	2
	160R/L-PB12Z	12	20	160	157	50.8 (40)	19.0 (16.4)	11 (9)	41 (35)	63	5	3.3	2

( )Metric size

Available blades

	BAMPR-XAF	BAMPR-XAW	BAMPR-XAWR
			

Designation	PCD	page
	DP150	
BAMPR-XAF	●	E06
BAMPR-XAW	●	
BAMPR-XAWR		

Available arbors

Designation		NC arbors
APD(M)-PB	080R/L-PB□□Z	BT□□-FMA25.4(FMC27)-□□
	100R/L-PB□□Z	BT□□-FMA31.75(FMC32)-□□
	125R/L-PB□□Z	BT□□-FMA38.1(FMB40)-□□
	160R/L-PB□□Z	BT□□-FMA50.8(FMB/FMC40)-□□

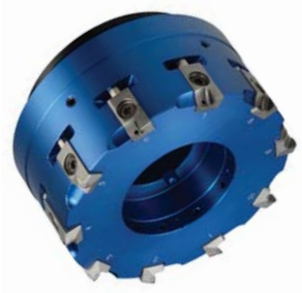
Parts

Specification	Blade screw	Blade adjustable screw	Al-body protecting tap	Balancing screw	Wrench for insert	Wrench for cartridge
Ø80~Ø160	ETKA0620	AZ0514-SPN6	UZD1010	KHE0610	SPN-6	TW25-100

Available inserts **E06** Available arbors and bolt **E371~E373**

APD(M)-PB

Blade



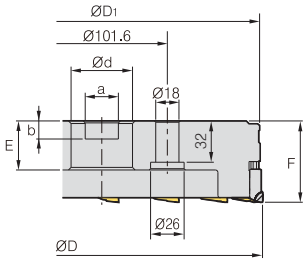


Fig. 1

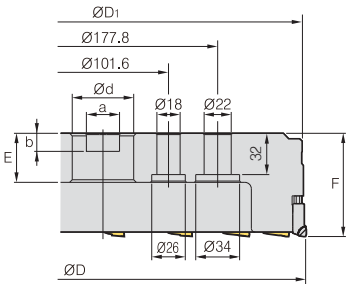


Fig. 2

AA 90°

- AR: -6°
- RR: -39°~ -16°

(mm)

Designation			Max	ØD	ØD1	Ød	a	b	E	F	ap	kg	Fig.
APD (APDM)	200R/L-PB12Z	12	26	200	197	47.625 (60)	25.4 (25.7)	14	40	63	5	4.0	1
	250R/L-PB16Z	16	32	250	247	47.625 (60)	25.4 (25.7)	14	40	63	5	6.5	1
	315R/L-PB18Z	18	42	315	312	47.625 (60)	25.4 (25.7)	14	40	63	5	11.3	2

( )Metric size

Available blades

BAMPR-XAF BAMPR-XAW BAMPR-XAWR



Designation	PCD	page
	DP150	
BAMPR-XAF	●	E06
BAMPR-XAW	●	
BAMPR-XAWR		

Available arbors

Designation		NC arbors
APD(M)-PB	200R/L-PB□□Z	BT□□-FMA47.625(FMB60)-□□
	250R/L-PB□□Z	
	315R/L-PB□□Z	

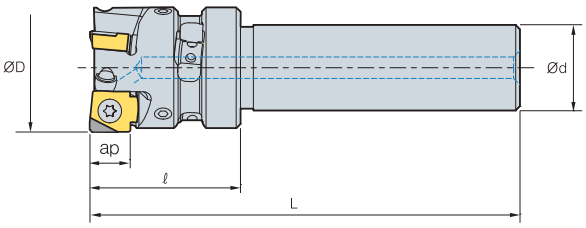
Parts

Specification	Blade screw	Blade adjustable screw	Al-body protecting tap	Balancing screw	Wrench for insert	Wrench for cartridge
Ø200~Ø315	ETKA0620	AZ0514-SPN6	UZD1010	KHE0610	SPN-6	TW25-100

Available inserts E06 Available arbors and bolt E371~E373

MAPDS000HR/L-Z0





※ PCD ap: 5mm

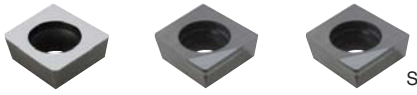
AA 90°
- AR: 6°
- RR: -4°~1°

(mm)

Designation			ØD	Ød	ℓ	L	ap	Max rpm	kg
MAPDS	032HR/L-Z3	3	32	20	35	100	9.5	26,000	0.35
	040HR/L-Z4	4	40	20	35	100	9.5	24,500	0.42

Available inserts

SNEW SNEW-XAF SNEW-NAF



Strengthened edge

Designation		Uncoated			PCD	page
		H01	G10	ST30A	DP200	
SNEW	09T3ADFR	●				E22 E23
	09T3ADTR-XAF				●	
	09T3ADTR-XAW				●	
	09T3ADTR-NAF				●	
	09T3ADTR-NAW				●	

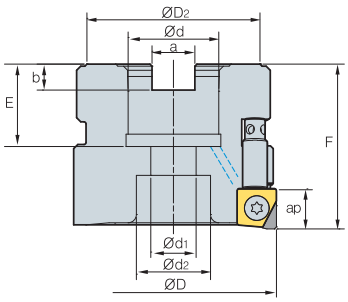
Parts

Specification	Insert screw	Adjust screw	Balance screw	Wrench for insert	Adjust wrench
Ø32~Ø63	FTKA0408	AHX0617F-NYLOK	KHD0405	TW15S	HW20L

Available inserts E22, E23

MAPD000HR/L-Z0





※ PCD ap: 5mm

AA 90°

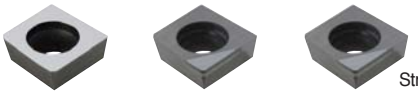
- AR: 6°
- RR: -1°~12°

(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	Max rpm	kg
MAPD	040HR/L-Z4	4	40	34	16	8.4	5.6	18	40	9	14	9.5	24,000	0.24
	050HR/L-Z5	5	50	42	22	10.4	6.3	20	40	11	18	9.5	22,000	0.35
	063HR/L-Z6	6	63	42	22	10.4	6.3	20	40	11	18	9.5	20,000	0.65

Available inserts

SNEW SNEW-XAF SNEW-NAF



Strengthened edge

Designation		Cermet			Uncoated				PCD	page
		CN2000	CN20	CN30	H01	G10	ST30A	ST20	DP200	
SNEW	09T3ADFR				●					E22 E23
	09T3ADTR-XAF								●	
	09T3ADTR-XAW								●	
	09T3ADTR-NAF								●	
	09T3ADTR-NAW								●	

Available arbors

Designation		NC arbors
MAPD	040HR/L-Z4	BT**□□-FMC16-□□ BT**□□-FMC22-□□ BT**□□-FMC22-□□
	050HR/L-Z5	
	063HR/L-Z6	

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
Aluminum	1,000~4,000 500~2,500	0.05~0.30 0.05~0.20	DP200 H01

Coolant bolt (Not included)

Designation	Applicable cutter	Available cutters
CB0525	MAPD040HR/L-Z4	Ø40
CB1025	MAPD050HR/L-Z5 MAPD063HR/L-Z6	Ø50 Ø63

Parts

Specification	Insert screw	Adjust screw	Balance screw	Wrench for insert	Adjust wrench
Ø32~Ø63	FTKA0408	AHX0617F-NYLOK	KHD0405	TW15S	HW20L

Available inserts E22, E23 Available arbors and bolt E371~E373

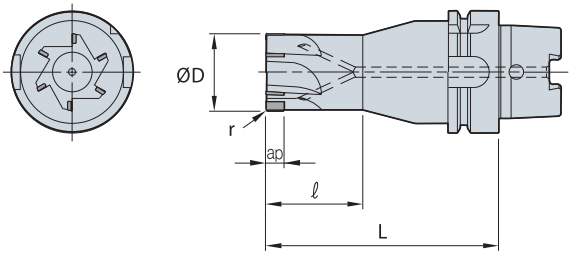
Code system

PDF 6 032 – HSK63A

- PDF — PCD Face cutter
- 6 — Tooth
- 032 — Diameter
- HSK63A — Shank

PCD Face cutter







AA
90°

- AR: 6°
- RR: 5°~9°

(mm)

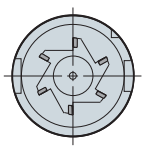
Designation		⊙	ØD	r	ap	ℓ	L
PDF	4032-HSK50A	4	32	0.5	8	50	120
	4040-HSK50A	4	40	0.5	8	50	120
	4032-HSK63A	4	32	0.5	8	50	120
	4040-HSK63A	4	40	0.5	8	50	120
	4050-HSK63A	4	50	0.5	8	50	120
	6063-HSK63A	6	63	0.5	12	-	100
	6063-HSK100A	6	63	0.5	12	-	100

Recommended cutting condition

Workpiece	vc (m/min)	fz (mm/t)	ap (mm)
Al, Brass, Alloy	200~2,000	0.02~0.1	0.05~4.0

Special PCD order sheet





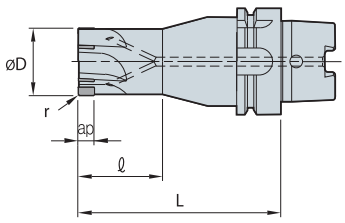


Fig. 1

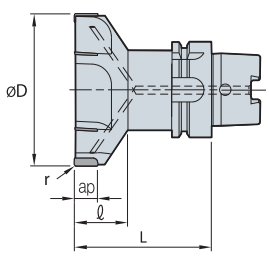


Fig. 2

Designation	Fig.	tooth	Dimensions (mm)					
			ØD	r	ap	ℓ	L	Shank spec.
PDF								

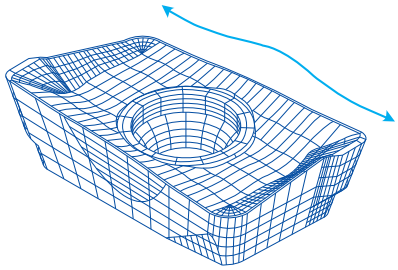
Various applications are available with multi-functional cutters

Alpha Mill

- Innovative curve cutting-edge and chip-breaker design ensures ideal 90-degree cutting, lower cutting resistance, and improved insert life.
- Various applications are available with multi-functional cutters. (Facing, Slotting, Square shoulder milling, etc.)
- Excellent performance ensured at large depth of cut operations due to strong cutting-edge and low cutting resistance.

Features of insert

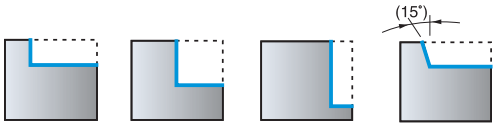
- Long tool life at high speed, high feed and deeper cutting by low cutting resistance and strong cutting-edge
- Distinguished features of Alpha-Curve reduce cutting resistance and improve cutting-edge strength and wear resistance



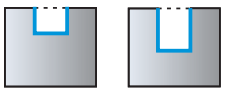
- Low cutting resistance is realized by KORLOY unique design-the alpha curve cutting-edge and optimal convex and concave design
- Highly efficient machining is available by the ideal application of the grade to material

Application example

Shouldering



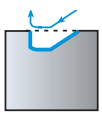
Slotting



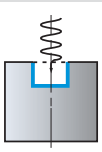
Drilling



Ramping



Helical cutting





Features of chip breakers

Type	Chip breaker	Cutting-edge	Features
Al	**MA**		• Optimal cutting-edge and buffed surface for aluminum workpieces ensure high performance in machining
Hard-to-cut material	**ML**		• Chip breaker with low cutting load is optimal for machining hard-to-cut materials
Light cutting	**MF**		• Chip breaker with low cutting load and harder cutting-edge than ML's are optimal for light cutting
General cutting	**MM**		• Optimal for milling in general ranges

Product constitution

Item description	Type	Nose R	MA	ML
APMT	**1000 type**	0.4	APMT0602PDFR-MA	-
		0.8	APMT060208PDFR-MA	-
	1500 type	0.4	APMT0903PDFR-MA	APMT0903PDER-ML
		0.8	APMT090308PDFR-MA	APMT090308PDER-ML
	2000 type	0.5	APMT11T3PDFR-MA	APMT11T3PDER-ML
		0.8	APMT11T308PDFR-MA	APMT11T308PDER-ML
	3000 type	0.4	APMT160404PDFR-MA	APMT160404PDER-ML
		0.8	APMT1604PDFR-MA	APMT1604PDER-ML
	4000 type	0.4	APMT180604PDFR-MA	APMT180604PDER-ML
		0.8	APMT1806PDFR-MA	APMT1806PDER-ML
		1.2	APMT180612PDFR-MA	APMT180612PDER-ML
		1.6	APMT180616PDFR-MA	APMT180616PDER-ML
		2.0	APMT180620PDFR-MA	APMT180620PDER-ML
		2.4	APMT180624PDFR-MA	APMT180624PDER-ML
		3.0	APMT180630R-MA	APMT180630R-ML

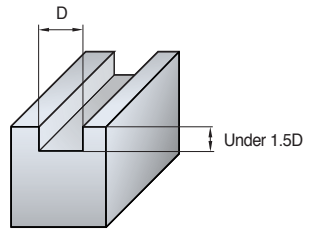
- The inserts can switch to the APMT type holders.

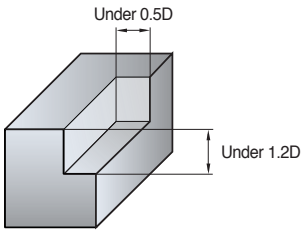
Recommended grades and chip breakers by workpiece

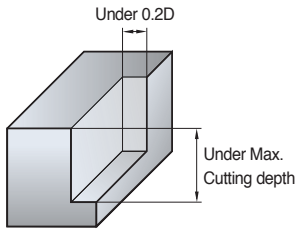
Chip breaker	Cutter edge	Recommended C/B and grade as per workpiece (●: 1st)													
		P				M		K		N		S		H	
		Low carbon steel/Mild steel		High carbon steel/Mild steel		Stainless steel		Cast iron		Aluminum alloy		Ti/Inconel		High hardness steel	
		C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades
MA		-	-	-	-	-	-	-	-	●	●H01	-	-	-	-
ML		-	-	-	-	●	●PC5300 ○PC5400 ○PC9530	-	-	-	-		●PC5300 ○PC5400	-	
MF		●	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NC5340	-	○PC3500 ○NCM325 ○NC5340	-	●PC5300 ○PC5400 ○PC9530	●	●PC6510 ○PC5300 ○PC5400	-	-	-	●PC5300 ○PC5400	-	
MM		-	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NC5340	●	●PC3500 ○PC5300 ○PC5400 ○NCM325 ○NC5340	-	●PC5300 ○PC5400 ○PC9530	-	●PC6510 ○PC5300 ○PC5400	-	-	-	●PC5300 ○PC5400	●	○PC2505 ●PC2510

Recommended depth of cut

1. Slotting	2. Shouldering	3. Shouldering







Recommended cutting condition (for Multi-edge type)

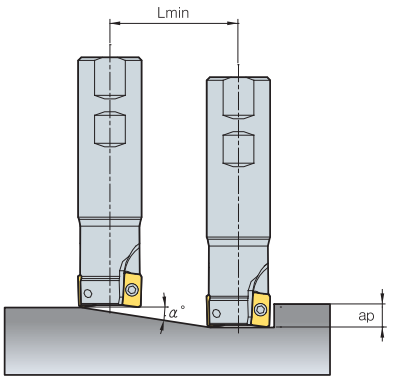
Workpiece	Grades	Fig.	Tool dia.									
			Ø10, 16		Ø20, 25		Ø32, 40		Ø50, 63		Ø80, 100	
			vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
Mild steel, Low carbon steel	NC5340 NCM325 PC5400 PC5300 PC3500 PC3600	①	50~80	0.05~0.08	80~100	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08
		②	65~90	0.08~0.1	100~120	0.08~0.1	120~140	0.08~0.1	120~140	0.08~0.1	120~140	0.08~0.1
		③	65~95	0.1~0.15	100~120	0.1~0.15	120~140	0.1~0.15	120~140	0.1~0.15	130~150	0.1~0.15
High carbon steel, Alloy steel	NC5340 NCM325 PC5300 PC3500 PC3600	①	45~60	0.05	60~80	0.05	80~100	0.05	80~100	0.05	80~100	0.05
		②	50~80	0.05~0.08	80~100	0.05~0.08	100~120	0.08~0.1	100~120	0.08~0.1	100~120	0.08~0.1
		③	50~80	0.1~0.15	80~100	0.1~0.15	110~130	0.1~0.15	100~120	0.1~0.15	110~130	0.1~0.15
Alloy tool steel	PC5300 PC3500 PC3600 PC2510 PC2505	①	40~55	0.05	50~70	0.05	70~90	0.05	70~90	0.05	70~90	0.05
		②	45~60	0.05~0.08	60~80	0.05~0.08	90~120	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08
		③	50~75	0.12~0.18	90~110	0.12~0.18	100~130	0.1~0.15	100~120	0.1~0.15	110~130	0.1~0.15
Stainless steel	PC5300 PC9530	①	35~50	0.054	50~70	0.054	70~90	0.05	70~90	0.05	70~90	0.05
		②	45~60	0.05~0.08	60~80	0.05~0.08	90~120	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08
		③	50~75	0.1~0.15	90~110	0.1~0.15	100~130	0.1~0.15	110~130	0.1~0.15	110~130	0.1~0.15
Cast iron	PC6510 PC5300	①	50~70	0.1~0.12	70~90	0.1~0.12	70~90	0.1~0.12	90~120	0.1~0.12	90~120	0.1~0.12
		②	50~80	0.12	80~100	0.12	90~120	0.12	100~140	0.12	100~140	0.12
		③	50~80	0.15~0.2	80~100	0.15~0.2	100~130	0.15~0.2	120~150	0.15~0.2	120~150	0.15~0.2
Aluminum alloy	H01	①	160~600	0.1~0.2	200~800	0.1~0.2	300~900	0.1~0.2	400~1,000	0.1~0.2	400~1,000	0.1~0.2
		②	200~650	0.15~0.3	250~900	0.15~0.3	300~950	0.15~0.3	400~1,000	0.1~0.4	400~1,000	0.1~0.4
		③	200~650	0.15~0.3	250~900	0.15~0.3	300~950	0.15~0.3	400~1,000	0.1~0.4	400~1,000	0.1~0.4
Hardened steel	PC5300 PC2510 PC2505	①	35~50	0.03	50~70	0.03	60~90	0.03	60~90	0.03	60~90	0.03
		②	45~60	0.05~0.08	60~80	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08
		③	50~80	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08

Recommended cutting condition (for Single-edge type)

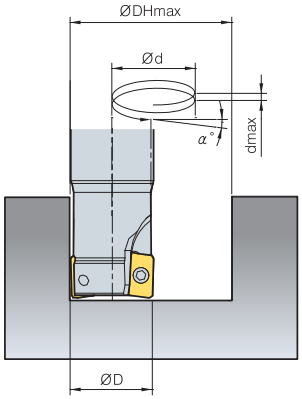
Workpiece	Grades	Fig.	Tool dia.									
			Ø10, 16		Ø20, 25		Ø32, 40		Ø50, 63		Ø80, 100	
			vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
Mild steel, low carbon steel	NC5340 NCM325 PC5400 PC5300 PC3500 PC3600	①	45~60	0.05~0.08	60~80	0.05~0.08	80~120	0.05~0.08	120~200	0.05~0.08	150~200	0.05~0.08
		②	60~90	0.08~0.1	80~120	0.08~0.1	120~180	0.08~0.1	180~250	0.08~0.1	200~250	0.08~0.1
		③	60~90	0.1~0.15	80~120	0.1~0.15	120~180	0.1~0.15	180~250	0.1~0.15	200~250	0.1~0.15
High carbon steel, alloy steel	NC5340 NCM325 PC5300 PC3500 PC3600	①	40~60	0.05	50~80	0.05	80~110	0.05	100~150	0.05	100~150	0.05
		②	50~80	0.05~0.08	80~100	0.05~0.08	110~150	0.05~0.1	150~200	0.05~0.1	150~200	0.05~0.1
		③	50~80	0.1~0.15	80~100	0.1~0.15	120~150	0.1~0.15	180~200	0.1~0.15	180~200	0.1~0.15
Alloy tool steel	PC5300 PC3500 PC3600 PC2510 PC2505	①	35~50	0.05	50~70	0.05	80~100	0.05	100~130	0.05	100~130	0.05
		②	45~70	0.05~0.08	70~100	0.05~0.08	100~130	0.05~0.1	130~180	0.05~0.1	130~180	0.05~0.1
		③	45~70	0.1~0.15	70~100	0.1~0.15	100~150	0.1~0.15	130~180	0.1~0.15	130~180	0.1~0.15
Stainless steel	PC5300 PC9530	①	35~50	0.05	50~70	0.05	80~100	0.05	100~130	0.05	100~130	0.05
		②	45~70	0.05~0.08	70~100	0.05~0.08	100~130	0.05~0.1	130~180	0.05~0.1	130~180	0.05~0.1
		③	45~70	0.1~0.15	70~100	0.1~0.15	100~150	0.1~0.15	130~180	0.1~0.15	130~180	0.1~0.15
Cast iron	PC6510 PC5300	①	50~80	0.08~0.12	80~100	0.08~0.12	80~100	0.15	120~150	0.15	120~150	0.15
		②	65~90	0.12~0.15	100~120	0.12~0.15	100~130	0.15~0.18	150~200	0.15~0.18	150~200	0.15~0.18
		③	65~90	0.15~0.2	100~120	0.15~0.2	100~130	0.15~0.2	150~200	0.15~0.2	150~200	0.15~0.2
Aluminum alloy	H01	①	200~600	0.15~0.2	250~800	0.15~0.2	300~900	0.15~0.2	400~1,000	0.1~0.2	400~1,000	0.1~0.2
		②	200~650	0.2~0.25	250~900	0.2~0.25	350~950	0.2~0.25	400~1,000	0.2~0.3	400~1,000	0.2~0.3
		③	200~650	0.25~0.3	250~900	0.25~0.3	350~950	0.25~0.3	400~1,000	0.3~0.4	400~1,000	0.3~0.4
Hardened steel	PC5300 PC2510 PC2505	①	35~50	0.03	50~70	0.03	60~90	0.03	60~90	0.03	60~90	0.03
		②	45~65	0.05~0.08	60~80	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08
		③	50~80	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08	80~100	0.05~0.08

Cutting condition for ramping and helical operation

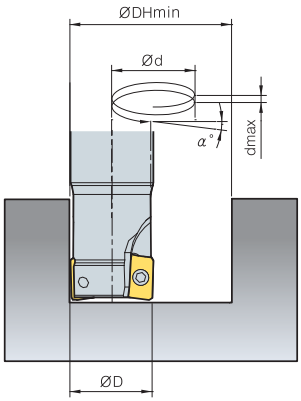
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole

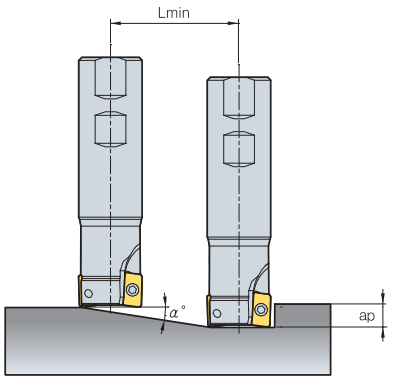


Designation	Tool dia. ØD (min)	ap	1. Ramping		2. Helical cutting for blind hole				3. Helical cutting for through hole	
			Maximum angle α(°)	Lmin (mm)	Max. desirable hole dia. ØDH Max (mm)	Max. pitch dmax (mm)	Min. desirable hole dia. ØDH Min (mm)	Max. pitch dmax (mm)	Min. desirable hole dia. ØDH Min (mm)	Max. pitch dmax (mm)
AMS1010HS	10	5	6.5	44	18.8	2.1	17.6	2.0	13	1.5
AMS1011HS	11		5.6	51	20.8	2.0	19.6	1.9	15	1.5
AMS1012HS	12		4.9	58	22.8	2.0	21.6	1.9	17	1.5
AMS1014HS	14		3.9	73	26.8	1.8	25.6	1.8	21	1.4
AMS1015HS	15		3.6	80	28.8	1.8	27.6	1.7	23	1.4
AMS1016HS	16		3.3	87	30.8	1.8	29.6	1.7	25	1.4
AMS1017HS	17		3.0	94	32.8	1.7	31.6	1.7	27	1.4
AMS1018HS	18		2.8	101	34.8	1.7	33.6	1.7	29	1.4
AMS1020HS	20		2.5	115	38.8	1.7	37.6	1.6	33	1.4
AMS1021HS	21		2.3	123	40.8	1.7	39.6	1.6	35	1.4
AMS1022HS	22		2.2	130	42.8	1.6	41.6	1.6	37	1.4
AMS1025HS	25		1.9	151	48.8	1.6	47.6	1.6	43	1.4
AMS1026HS	26		1.8	158	50.8	1.6	49.6	1.6	45	1.4
AMS1032HS	32		1.4	201	62.8	1.6	61.6	1.5	57	1.4
AMS1033HS	33		1.4	208	64.8	1.6	63.6	1.5	59	1.4
AMCM1032HS	32		1.4	201	62.8	1.6	61.6	1.5	57	1.4
AMCM1040HS	40		1.1	258	78.8	1.5	77.6	1.5	73	1.4
AMCM1050HS	50		0.9	330	98.8	1.5	97.6	1.5	93	1.4
AMCM1063HS	63		0.7	423	124.8	1.5	123.6	1.5	119	1.4
AMS1510HS	10	9	7.5	68	18.8	2.5	17.4	2.3	11	1.5
AMS1512HS	12		6.5	79	22.8	2.6	21.4	2.4	15	1.7
AMS1513HS	13		5.7	90	24.8	2.5	23.4	2.3	17	1.7
AMS1514HS	14		6.3	82	26.8	2.9	25.4	2.8	19	2.1
AMS1516HS	16		5.0	102	30.8	2.7	29.4	2.6	23	2.0
AMS1517HS	17		4.6	112	32.8	2.6	31.4	2.5	25	2.0
AMS1518HS	18		4.2	122	34.8	2.6	33.4	2.5	27	2.0
AMS1519HS	19		3.9	132	36.8	2.5	35.4	2.4	29	2.0
AMS1520HS	20		3.6	142	38.8	2.5	37.4	2.4	31	2.0
AMS1521HS	21		3.4	152	40.8	2.4	39.4	2.3	33	2.0
AMS1522HS	22		3.2	162	42.8	2.4	41.4	2.3	35	1.9
AMS1524HS	24		2.8	182	46.8	2.3	45.4	2.2	39	1.9
AMS1525HS	25		2.7	192	48.8	2.3	47.4	2.2	41	1.9
AMS1528HS	28		2.3	222	54.8	2.2	53.4	2.2	47	1.9
AMS1530HS	30		2.1	242	58.8	2.2	57.4	2.1	51	1.9
AMS1532HS	32		2.0	262	62.8	2.2	61.4	2.1	55	1.9
AMS1535HS	35		1.8	292	68.8	2.1	67.4	2.1	61	1.9
AMS1540HS	40		1.5	342	78.8	2.1	77.4	2.0	71	1.9
AMCM15040HS	40		1.5	342	78.8	2.1	77.4	2.0	71	1.9
AMCM15050HS	50		1.2	442	98.8	2.0	97.4	2.0	91	1.9
AMCM15063HS	63		0.9	572	124.8	2.0	123.4	1.9	117	1.8
AMCM15080HS	80		0.7	742	158.8	1.9	157.4	1.9	151	1.8
AMCM15100HS	100		0.5	942	198.8	1.9	197.4	1.9	191	1.8

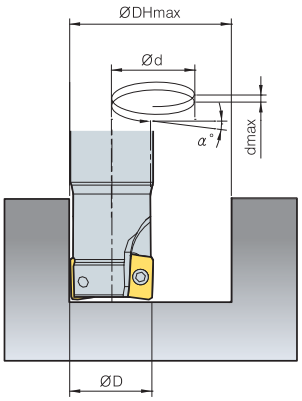
$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

Cutting condition for ramping and helical operation

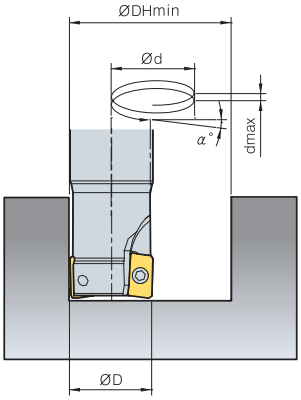
1. Ramping



2. Helical cutting for blind hole



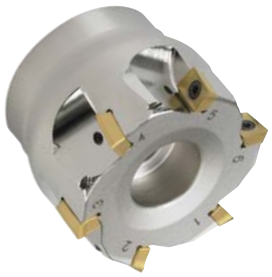
3. Helical cutting for through hole

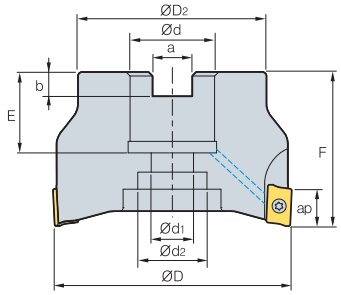


Designation	Tool dia. ØD (min)	ap	1. Ramping		2. Helical cutting for blind hole				3. Helical cutting for through hole	
			Maximum angle α(°)	Lmin (mm)	Max. desirable hole dia. ØDH Max (mm)	Max. pitch dmax (mm)	Min. desirable hole dia. ØDH Min (mm)	Max. pitch dmax (mm)	Min. desirable hole dia. ØDH Min (mm)	Max. pitch dmax (mm)
AMS2010HS	10	10	16.82	33	18	5.4	16.4	5.0	11	3.3
AMS2012HS	12		11.69	48	22	4.6	20.4	4.2	15	3.1
AMS2014HS	14		7.55	75	26	3.4	24.4	3.2	19	2.5
AMS2016HS	16		10.30	55	30	5.5	28	5.1	23	4.2
AMS2018HS	18		8.23	69	34	4.9	32	4.6	27	3.9
AMS2020HS	20		5.60	102	38	3.7	36	3.5	31	3.0
AMS2022HS	22		5.15	111	42	3.8	40	3.6	35	3.2
AMS2025HS	25		3.92	146	48	3.3	46	3.2	41	2.8
AMS2032HS	32		2.70	212	62	2.9	60	2.8	55	2.6
AMS2040HS	40		1.98	289	78	2.7	76	2.6	71	2.5
AMS2050HS	50		1.48	386	98	2.5	96	2.5	91	2.4
AMS2063HS	63		1.11	514	124	2.4	122	2.4	117	2.3
AMCM2040HS	40		1.29	445	78	2.6	76	2.5	71	2.1
AMCM2050HS	50		0.36	1576	98	0.6	96	0.6	91	0.6
AMCM2063HS	63		0.27	2104	124	0.6	122	0.6	117	0.6
AMCM2080HS	80		0.21	2784	158	0.6	156	0.6	151	0.5
AMCM2100HS	100		0.16	3584	198	0.6	196	0.5	191	0.5
AMS3025HS	25	10	4.72	121	48	4.0	46	3.8	36	3.0
AMS3032HS	32		3.00	191	62	3.2	60	3.1	50	2.6
AMS3040HS	40		2.29	250	78	3.1	76	3.0	66	2.6
AMS3050HS	50		1.64	350	98	2.8	96	2.7	86	2.5
AMS3063HS	63		1.22	470	124	2.6	122	2.6	112	2.4
AMCM3040HS	40		1.99	288	78	2.7	76	2.6	66	2.3
AMCM3050HS	50		1.67	343	98	2.9	96	2.8	86	2.5
AMCM3063HS	63		1.22	470	124	2.6	122	2.6	112	2.4
AMCM3080HS	80		0.90	636	158	2.5	156	2.5	146	2.3
AMCM3100HS	100		0.69	830	198	2.4	196	2.4	186	2.2
AMS2025MH	25	10	1.50	764	48	1.3	46	1.2	-	-
AMS2032MH	32		1.50	1146	62	1.6	60	1.6	-	-
AMS3040MH	40	16	1.50	1528	78	2.0	76	2.0	-	-
AMS4020HS	20	16	9.5	98	38.8	6.5	37.4	6.2	31	5.2
AMS4021HS	21		5.2	179	40.8	3.7	39.4	3.6	33	3.0
AMS4025HS	25		7.6	122	48.8	6.5	47.4	6.3	41	5.5
AMS4026HS	26		7.1	130	50.8	6.4	49.4	6.2	43	5.4
AMS4032HS	32		3.4	276	62.8	3.7	61.4	3.6	55	3.3
AMS4033HS	33		3.2	288	64.8	3.7	63.4	3.6	57	3.2
AMS4040HS	40		2.5	376	78.8	3.4	77.4	3.4	71	3.1
AMS4050HS	50		1.9	502	98.8	3.2	97.4	3.2	91	3.0
AMS4063HS	63		1.4	665	124.8	3.1	123.4	3.0	117	2.9
AMCM4050HS	50		1.9	502	98.8	3.2	97.4	3.2	91	3.0
AMCM4063HS	63		1.4	665	124.8	3.1	123.4	3.0	117	2.9
AMCM4080HS	80		1.1	878	158.8	2.9	157.4	2.9	151	2.8
AMCM4100HS	100		0.8	1128	198.8	2.9	197.4	2.9	191	2.8
AMCM4125HS	125		0.6	1442	248.8	2.8	247.4	2.8	241	2.7

$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

AMC(M)1000S





AA 90°

- AR: 9°~13°
- RR: -14°~5°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg
AMCM	1032HS	8	32	30	16	9	14	8.4	5.6	19	40	5.6	0.15
	1040HS-16	10	40	34	16	9	14	8.4	5.6	19	40	5.6	0.24
	1040HS-22	10	40	34	22	11	18	10.4	6.3	21	40	5.6	0.24
	1050HS	12	50	42	22	11	18	10.4	6.3	21	40	5.6	0.36
	1063HS	14	63	49	22	11	18	10.4	6.3	21	40	5.6	0.61

Available inserts

APMT-MA



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			

Available arbors

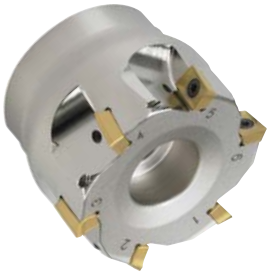
Designation		Ød	NC arbors
AMCM	1032HS	16	BT□□-FMC16-□□
	1040HS-16		
	1040HS-22	22	BT□□-FMC22-□□
	1050HS		
	1063HS		

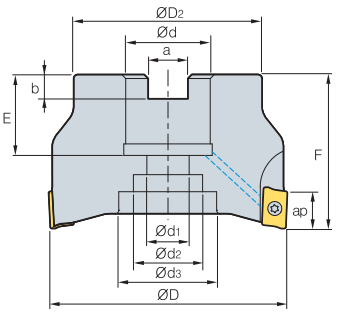
Parts

Specification	Screw	Wrench
Ø32~Ø63	FTKA01842	TW06S-A

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)1500S





AA 90°

- AR: 9°~13°
- RR: -14°~5°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	kg
AMCM	15040HS	5	40	34	16	9	14	-	8.4	5.6	19	40	9	0.22
	15050HS	6	50	42	22	11	18	-	10.4	6.3	21	40	9	0.34
	15063HS	8	63	49	22	11	18	-	10.4	6.3	21	40	9	0.57
AMC (AMCM)	15080HS	10	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	24 (23)	50	9	1.10
	15100HS	12	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (26)	63	9	2.10

( )Metric size

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Available arbors

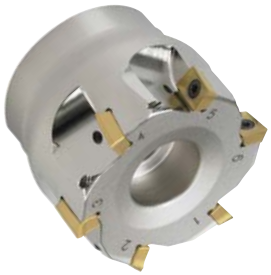
Designation		Ød	NC arbors
AMC(M)	15040HS	16	BT□□-FMC16-□□
	15050HS 15063HS	22	BT□□-FMC22-□□
	15080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	15100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

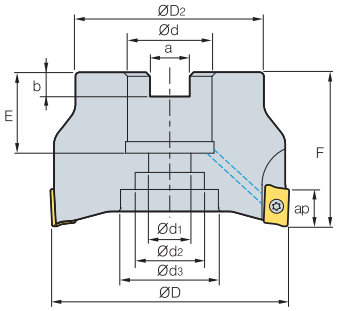
Parts

Specification	Screw	Wrench
Ø40~Ø100	FTKA02565S	TW08S

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)2000S





AA 90°

- AR: 9°~13°
- RR: -14°~5°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
AMCM	2040HS	5	40	34	16	9	14	-	8.4	5.6	18	40	11	0.22
	2050HS	6	50	42	22	11	18	-	10.4	6.3	20	40	11	0.34
	2063HS	8	63	49	22	11	18	-	10.4	6.3	20	40	11	0.57
AMC (AMCM)	2080HS	8	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	25 (22)	50	11	1.10
	2100HS	10	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (28)	63	11	2.10

( )Metric size

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF








Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	E05
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Available arbors

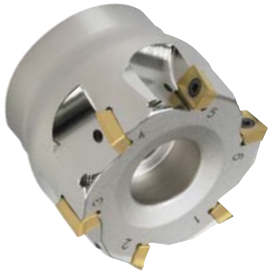
Designation		Ød	NC arbors
AMC(M)	2040HS	16	BT□□-FMC16-□□
	2050HS 2063HS	22	BT□□-FMC22-□□
	2080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	2100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

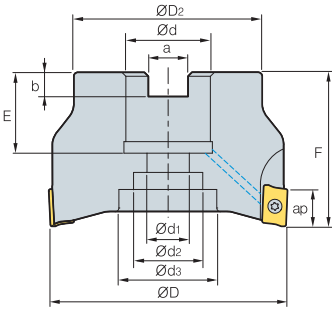
Parts

Specification	Screw	Wrench
Ø40~Ø100	FTKA02565S	TW08S

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)3000S





AA 90°

- AR: 14°
- RR: -12°~8°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
AMCM	3040HS	4	40	34	16	9	14	-	8.4	5.6	18	40	16	0.18
	3050HS	5	50	42	22	11	18	-	10.4	6.3	20	40	16	0.28
	3063HS	6	63	49	22	11	18	-	10.4	6.3	20	40	16	0.50
AMC (AMCM)	3080HS	7	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	25 (22)	50	16	1.02
	3100HS	8	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (28)	63	16	2.05

• It is recommended to use an exclusive holder with the "New" sticker for APMT inserts.

( )Metric size

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	E05
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

Available arbors

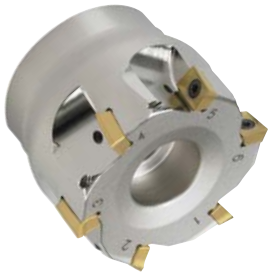
Designation		Ød	NC arbors
AMC(M)	3040HS	16	BT□□-FMC16-□□
	3050HS 3063HS	22	BT□□-FMC22-□□
	3080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

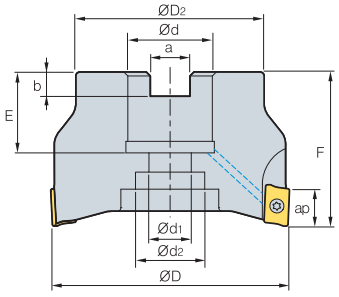
Parts

Specification	Screw	Wrench
Ø40~Ø100	FTKA0410	TW15S

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)3000S-K





AA 90°

- AR: 14°
- RR: -12°~8°

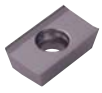
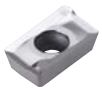
(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg
AMCM	3040HS-K	4	40	34	16	9	14	8.4	5.6	18	40	16	0.15
	3050HS-K	5	50	42	22	11	18	10.4	6.3	20	40	16	0.24
	3063HS-K	6	63	49	22	11	18	10.4	6.3	20	40	16	0.24
AMC (AMCM)	3080HS-K	7	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (22)	50	16	0.36
	3100HS-K	8	100	67	31.75 (32)	18	26	12.7 (14.4)	8 (8)	32 (28)	63	16	0.61

• It is recommended to use an exclusive holder with the "New" sticker for APMT inserts.

( )Metric size

Available inserts

APKT	APKT-MF	APKT-MM	APKT-MM1	APKT-MA	APKT-MA2	APKT-MA3
						

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APKT	1604PDSR			●						●		●						E04
	1604PDSR-MF			●									●					
	1604PDSR-MM			●	●					●	●	●	●					
	160432R-MM1																	
	1604PDFR-MA														●		●	
	1604PDFR-MA2																●	
	160416FR-MA2																	
	160432FR-MA2																	
	1604PDFR-MA3															●	●	

Available arbors

Designation		Ød	NC arbors
AMC(M)	3040HS-K	16	BT□□-FMC16-□□
	3050HS-K 3063HS-	22	BT□□-FMC22-□□
	3080HS-K	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100HS-K	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

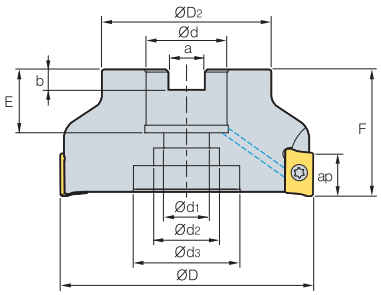
Parts

Specification	Screw	Wrench
Ø40~Ø100	FTKA0410	TW15S

Available inserts E04 Available arbors and bolt E371~E373

AMC(M)4000S







AA 90°

- AR: 13°~15°
- RR: -12°~7°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
AMCM	4050HS	5	50	42	22	11	18	-	10.4	6.3	21	40	17	0.28
	4063HS	6	63	49	22	11	18	-	10.4	6.3	21	40	17	0.50
AMC (AMCM)	4080HS	7	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	24 (23)	50	17	1.00
	4100HS	8	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (25)	63 (50)	17	2.10
	4125HS	9	125	87	38.1 (40)	22	32	52	15.9 (16.4)	10 (9)	35 (29)	63	17	3.30
	4160S	10	160	107	50.8 (40)	-	-	100	19 (16.4)	11 (9)	38 (32)	63	17	3.6
	4200S	10	200	108	47.625 (60)	-	-	132	25.4 (25.7)	14 (14)	40 (38)	63	17	6

( )Metric size

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	180620PDER-ML													●	●			E05
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

Available arbors

Designation		Ød	NC arbors
AMC(M)	4050HS 4063HS	22	BT□□-FMC22-□□
	4080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

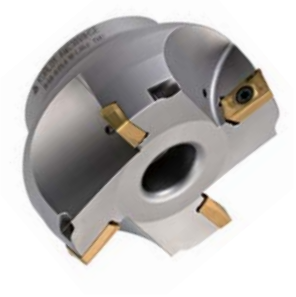
Designation		Ød	NC arbors
AMC(M)	4125HS	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□
	4160S	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMC40-□□
	4200S	47.625	BT□□-FMA47.625-□□
		60	BT□□-FMB60-□□

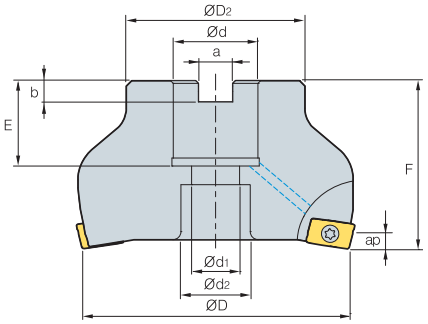
Parts

Specification	Screw	Wrench
Ø50~Ø200	FTKA0410	TW15S

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)1000SE/2000SE





AA 75°
• AR: 45°
• RR: 0°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg
AMCM	1040HSE	4	40	34	16	9	14	8.4	5.6	19	40	2.5	0.26
	1050HSE	5	50	42	22	11	18	10.4	6.3	21	40	2.5	0.39
AMC (AMCM)	2080HSE	5	80	57	25.4 (27)	14	20	9.5 (12.4)	6.0 (7.0)	25 (22)	50	4	1.2
	2100HSE	6	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0 (8.0)	32 (28)	63	4	2.33

( )Metric size

Available inserts

APMT-MM



APMT-MF



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	060202PDSR-MM				●					●				●	●			E05
		0602PDSR-MM				●			●	●	●	●	●	●	●	●			
		060208PDSR-MM				●					●	●			●	●			
		060212R-MM				●						●			●	●			
2000 type	APMT	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
		11T3PDSR-MF				●					●	●		●	●	●			
		11T308PDSR-MM				●					●	●	●		●	●			
		11T312PDSR-MM				●					●	●	●		●	●			
		11T316R-MM				●					●	●			●	●			
		11T318R-MM																	
		11T324R-MM				●					●	●			●	●			

Available arbors

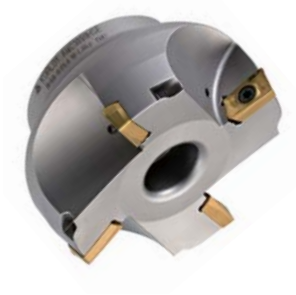
Type	Designation		Ød	NC arbors
1000 type	AMC(M)	1040HSE	16	BT□□-FMC16-□□
		1050HSE	22	BT□□-FMC22-□□
2000 type	AMC(M)	2080HSE	25.4	BT□□-FMA25.4-□□
			27	BT□□-FMC27-□□
		2100HSE	31.75	BT□□-FMA31.75-□□
			32	BT□□-FMC32-□□

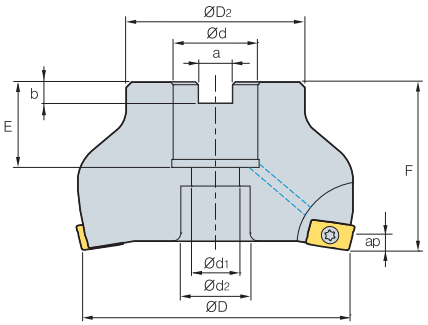
Parts

Specification	Screw	Wrench	Wrench
Ø40~Ø50 (1000 type)	FTKA01842	-	TW06S-A
Ø80~Ø100 (2000 type)	FTKA02565S	TW08S	-

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)3000SE





AA 75°
• AR: 45°
• RR: 0°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg
AMC (AMCM)	3080HSE	4	80	57	25.4 (27)	14	20	9.5 (12.4)	6.0 (7.0)	25 (22)	50	6	1.3
	3100HSE	5	100	67	31.75 (32)	18	26	12.7 (14.4)	8.0 (8.0)	32 (28)	63	6	2.3

( )Metric size

Available inserts

APMT-MM



APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

Available arbors

Designation		Ød	NC arbors
AMC(M)	3080HSE	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100HSE	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

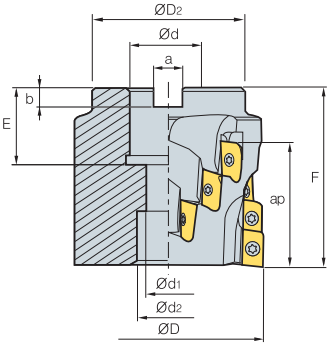
Parts

Specification	Screw	Wrench
Ø80~Ø100	FTKA0410	TW08S

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)2000M









AA 90°

- AR: 9°
- RR: -9°~ -5°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	kg
AMCM	2050M	16	50	40	22	11	18	10.4	6.3	21	58	4	39	0.7
AMC (AMCM)	2063M	16	63	50	25.4 (27)	13.5	20	9.5 (12.4)	6 (7)	25 (25)	58	4	39	0.8
	2080M	20	80	60	31.75 (32)	-	45	12.7 (14.4)	8 (8)	35 (28)	63	5	39	0.96
	2100M	24	100	80	38.1 (40)	-	56	15.9 (16.4)	10 (9)	38 (30)	63	6	39	1.2

( )Metric size

Available inserts





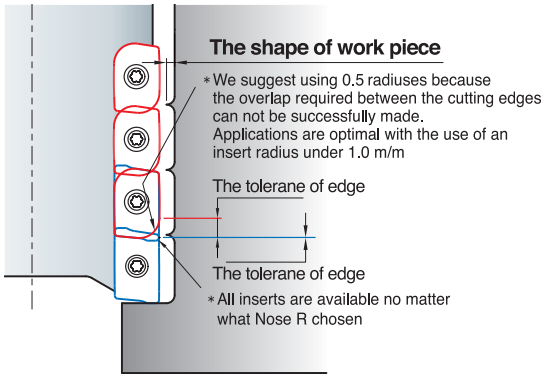



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			E05
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Available arbors

Designation		Ød	NC arbors	
AMC(M)	2050M	22.225	BT□□-FMA22.225-□□	BT□□-SMA22.225-□□
		22	BT□□-FMC22-□□	BT□□-SMC22-□□
	2063M	25.4	BT□□-FMA25.4-□□	BT□□-SMA25.4-□□
		27	BT□□-FMC27-□□	BT□□-SMC27-□□
	2080M	31.75	BT□□-FMA31.75-□□	BT□□-SMA31.75-□□
		32	BT□□-FMC32-□□	BT□□-SMC32-□□
	2100M	38.1	BT□□-FMA38.1-□□	BT□□-SMA38.1-□□
		40	BT□□-FMC40-□□	BT□□-SMC40-□□

Caution when clamping the inserts



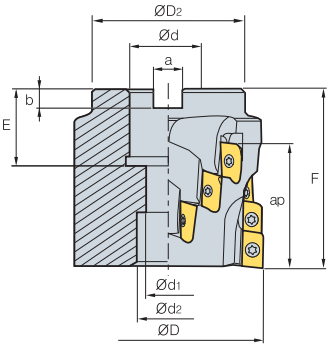
Parts

Specification	Screw	Wrench
Ø50~Ø100	FTKA02565S	TW08S

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)3000M







AA 90°

- AR: 9°
- RR: -9°~ -5°

(mm)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	kg
AMC (AMCM)	3063M	16	63	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	38 (38)	85	4	57	1.1
	3080M	20	80	67	31.75 (32)	14	26	12.7 (14.4)	8 (8)	40 (40)	100	4	71	2.23
	3100M	30	100	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	40 (40)	100	6	71	3.59

( )Metric size

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF





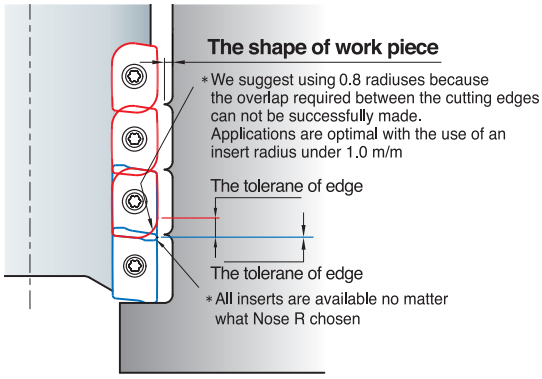



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	E05
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

Available arbors

Designation		Ød	NC arbors	
AMC(M)	3063M	25.4	BT□□-FMA25.4-□□	BT□□-SMA25.4-□□
		27	BT□□-FMC27-□□	BT□□-SMC27-□□
	3080M	31.75	BT□□-FMA31.75-□□	BT□□-SMA31.75-□□
		32	BT□□-FMC32-□□	BT□□-SMC32-□□
	3100M	38.1	BT□□-FMA38.1-□□	BT□□-SMA38.1-□□
		40	BT□□-FMC40-□□	BT□□-SMC40-□□

Caution when clamping the inserts



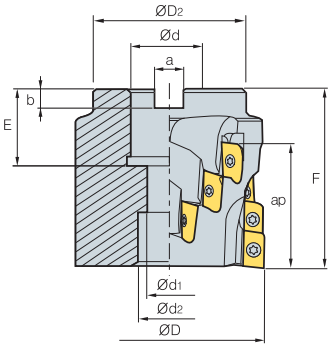
Parts

Specification	Screw	Wrench
Ø63~Ø100	FTKA0410	TW15S

Available inserts E05 Available arbors and bolt E371~E373

AMC(M)4000M









AA 90°

- AR: 9°
- RR: -9°~ -5°

(mm)

Designation		⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No. of flute	ap	kg
AMC (AMCM)	4063M	16	63	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	38 (38)	85	4	61.1	1.1
	4080M	20	80	67	31.75 (32)	14	26	12.7 (14.4)	8 (8)	40 (40)	100	4	76.1	2.23
	4100M	30	100	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	40 (40)	100	6	76.1	3.59
	4125M	18	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	36 (29)	68	6	46.1	4.0

( )Metric size

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF







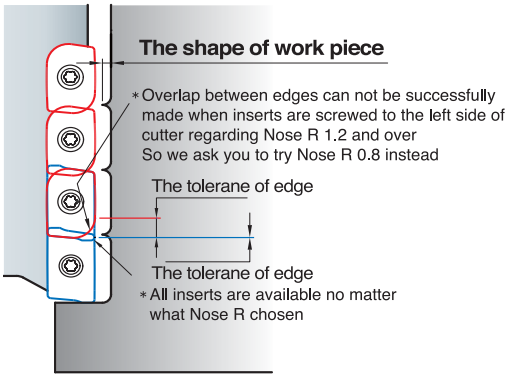

Designation		Cermet CN2000	Cermet CN30	Coated NCM325	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated G10	Uncoated H01	page
APMT	1806PDFR-MA															●		E05
	180604PDFR-MA															●		
	180612PDFR-MA															●		
	180616PDFR-MA															●		
	180620PDFR-MA															●		
	180624PDFR-MA															●		
	180630R-MA															●		
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet CN2000	Cermet CN30	Coated NCM325	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC6510	Coated PC5300	Coated PC5400	Uncoated G10	Uncoated H01	page
APMT	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM			●				●	●	●	●	●	●	●	●			
	1806PDSR-MF			●							●		●	●	●			
	180612PDSR-MM			●						●	●			●	●			E05
	180616PDSR-MM			●							●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM			●							●			●	●			
	180630R-MM										●			●	●			
	180632R-MM			●							●			●	●			

Available arbors

Designation		⌀d	NC arbors	
AMC(M)	4063M	25.4	BT□□-FMA25.4-□□	BT□□-SMA25.4-□□
		27	BT□□-FMC27-□□	BT□□-SMC27-□□
	4080M	31.75	BT□□-FMA31.75-□□	BT□□-SMA31.75-□□
		32	BT□□-FMC32-□□	BT□□-SMC32-□□
	4100M	38.1	BT□□-FMA38.1-□□	BT□□-SMA38.1-□□
		40	BT□□-FMC40-□□	BT□□-SMC40-□□
	4125M	38.1	BT□□-FMA38.1-□□	BT□□-SMA38.1-□□
		40	BT□□-FMC40-□□	BT□□-SMC40-□□

Caution when clamping the inserts



Parts

Specification	Screw	Wrench
Ø63~Ø125	FTKA0410	TW15S

Available inserts E05 Available arbors and bolt E371~E373

AMS1000S



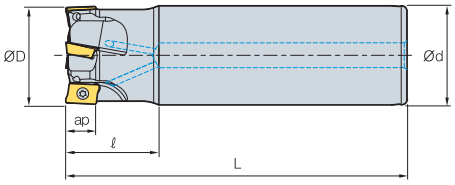


Fig. 1

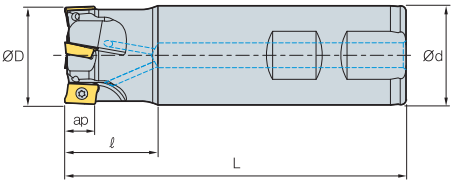


Fig. 2

AA
90°

- AR: 7.5°~13°
- RR: -17°~ -6°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
AMS	1010HS	2	10	10	20	80	5.6	0.04	2
	1011HS	2	11	10	20	80	5.6	0.04	2
	1012HS-2	2	12	12	25	80	5.6	0.06	2
	1012HS-2L12	2	12	12	25	120	5.6	0.09	1
	1012HS-3	3	12	12	25	80	5.6	0.06	2
	1014HS-2	2	14	16	25	90	5.6	0.11	2
	1014HS-2L16	2	14	16	25	140	5.6	0.18	1
	1014HS-3	3	14	16	25	90	5.6	0.11	2
	1015HS	3	15	16	25	90	5.6	0.11	2
	1015HS-3L16	3	15	16	25	140	5.6	0.18	1
	1016HS-3	3	16	16	25	90	5.6	0.12	2
	1016HS-3L16	3	16	16	25	160	5.6	0.22	1
	1016HS-4	4	16	16	25	90	5.6	0.12	2
	1017HS	4	17	16	25	90	5.6	0.12	2
	1017HS-3L16	3	17	16	25	160	5.6	0.22	1
	1018HS	4	18	16	25	90	5.6	0.12	2
	1018HS-4L16	4	18	16	25	180	5.6	0.25	1
	1020HS-4	4	20	20	30	110	5.6	0.23	2
	1020HS-4L20	4	20	20	30	200	5.6	0.43	1
	1020HS-5	5	20	20	30	110	5.6	0.23	2
	1021HS	5	21	20	30	110	5.6	0.24	2
	1021HS-4L20	4	21	20	30	200	5.6	0.43	1
	1022HS	5	22	20	30	110	5.6	0.27	2
	1025HS	7	25	25	30	120	5.6	0.39	2
	1026HS	7	26	25	30	120	5.6	0.39	2
	1032HS	8	32	32	35	120	5.6	0.65	2
	1033HS	8	33	32	35	120	5.6	0.65	2

Available inserts

APMT-MA



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			
	060216R-MM										●			●	●			

Parts

Specification	Screw	Wrench
Ø10~Ø33	FTKA01842	TW06S-A

Available inserts E05

AMS1500S



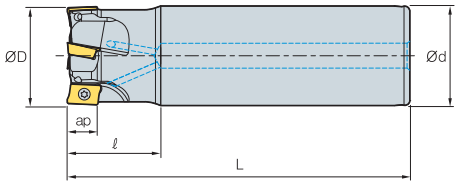


Fig. 1

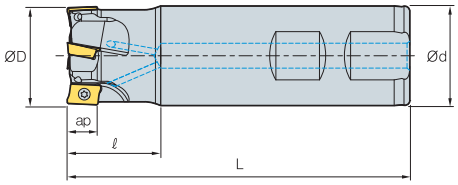


Fig. 2








AA
90°

- AR: 7.5°~12.5°
- RR: -28°~ -14°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
AMS	15010HS	1	10	10	25	80	9	0.04	2
	15010HS-1L16	1	10	16	30	160	9	0.21	1
	15012HS	1	12	16	25	80	9	0.10	2
	15012HS-1L16	1	12	16	30	160	9	0.21	1
	15013HS	1	13	16	25	80	9	0.10	2
	15014HS	1	14	16	25	80	9	0.10	2
	15014HS-1L16	1	14	16	30	160	9	0.21	1
	15016HS	2	16	16	30	90	9	0.11	2
	15016HS-2L16	2	16	16	30	160	9	0.21	1
	15017HS	2	17	16	30	90	9	0.12	2
	15017HS-2L16	2	17	16	30	160	9	0.21	1
	15018HS	2	18	16	30	90	9	0.14	2
	15018HS-2L16	2	18	16	30	160	9	0.21	1
	15019HS	2	19	16	30	90	9	0.16	2
	15020HS	2	20	20	30	90	9	0.18	2
	15020HS-2L20	2	20	20	30	160	9	0.34	1
	15020HS-3	3	20	20	30	90	9	0.18	2
	15021HS	2	21	20	30	90	9	0.20	2
	15021HS-2L20	2	21	20	30	160	9	0.34	1
	15021HS-3	3	21	20	30	90	9	0.2	2
	15022HS	3	22	20	30	110	9	0.23	2
	15022HS-3L20	3	22	20	30	180	9	0.38	1
	15024HS	3	24	20	30	110	9	0.30	2
	15024HS-4	4	24	20	30	110	9	0.3	2
	15025HS-3S20	3	25	20	30	110	9	0.35	2
	15025HS	3	25	25	30	110	9	0.35	2
	15025HS-3L25	3	25	25	30	180	9	0.59	1

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			E05
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Parts

Specification	Screw	Wrench
Ø10~Ø14	FTKA02555S	TW08S
Ø16~Ø25	FTKA02565S	

Available inserts E05

AMS1500S



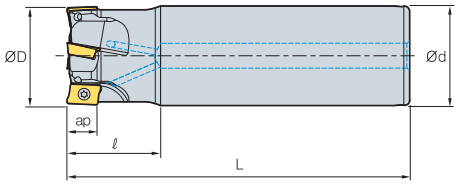


Fig. 1

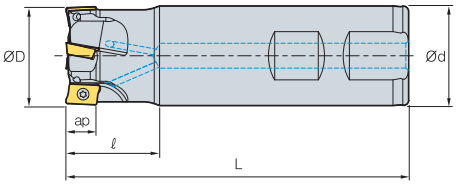


Fig. 2

AA
90°

- AR: 7.5°~12.5°
- RR: -28°~ -14°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
AMS	15025HS-4S20	4	25	20	30	110	9	0.25	2
	15025HS-4S25	4	25	25	30	110	9	0.25	2
	15028HS	4	28	25	30	110	9	0.36	2
	15028HS-4L25	4	28	25	30	180	9	0.61	1
	15028HS-5	5	28	25	30	110	9	0.36	2
	15030HS	4	30	25	30	110	9	0.38	2
	15030HS-4L25	4	30	25	30	180	9	0.62	1
	15030HS-5	5	30	25	30	110	9	0.38	2
	15032HS	4	32	32	30	110	9	0.60	2
	15032HS-4L32	4	32	32	30	180	9	1.00	1
	15032HS-5	5	32	32	30	110	9	0.6	2
	15035HS	5	35	32	30	110	9	0.70	2
	15035HS-6	6	35	32	30	110	9	0.7	2
	15040HS-S32	5	40	32	35	130	9	0.80	2
	15040HS-5L32	5	40	32	35	200	9	1.20	1
	15040HS-6S32	6	40	32	35	130	9	0.8	2
	15040HS-S40	5	40	40	35	130	9	1.13	2
	15040HS-6S40	6	40	40	35	130	9	1.13	2
	15040HS-S42	5	40	42	35	130	9	1.23	2
	15040HS-6S42	6	40	42	35	130	9	1.23	2

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Parts

Specification	Screw	Wrench
Ø25~Ø40	FTKA02565S	TW08S

Available inserts E05

AMS2000S



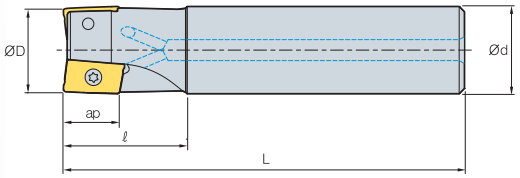


Fig. 1

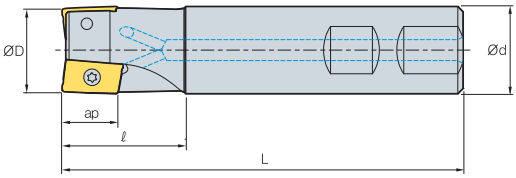
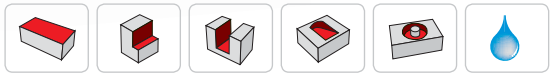


Fig. 2



AA
90°

- AR: 3°~14°
- RR: -25°~ -18°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
AMS	2010HS	1	10	10	20	85	11	0.04	2
	2010HS-1L16	1	10	16	30	160	11	0.21	1
	2012HS	1	12	16	25	85	11	0.10	2
	2012HS-1L16	1	12	16	30	160	11	0.21	1
	2014HS	1	14	16	25	90	11	0.12	2
	2014HS-1L16	1	14	16	30	160	11	0.21	1
	2016HS	2	16	16	25	90	11	0.12	2
	2016HS-2L16	2	16	16	30	180	11	0.21	1
	2018HS	2	18	16	25	90	11	0.12	2
	2018HS-2L16	2	18	16	30	180	11	0.21	1
	2020HS	2	20	20	30	100	11	0.21	2
	2020HS-2L20	2	20	20	30	210	11	0.49	1
	2022HS	3	22	20	35	115	11	0.25	2
	2022HS-3L20	3	22	20	35	180	11	0.38	1
	2025HS	3	25	25	35	115	11	0.40	2
	2025HS-3L25	3	25	25	40	180	11	0.59	1
	2032HS	4	32	32	40	125	11	0.70	2
	2032HS-4L32	4	32	32	50	180	11	1.00	1
	2040HS	5	40	32	42	130	11	0.84	2
	2040HS-5L32	5	40	32	50	200	11	1.20	1
	2040HS-S40	5	40	40	42	130	11	1.15	2
	2040HS-S42	5	40	42	42	130	11	2.00	2
	2050HS	6	50	32	45	135	11	1.06	2
	2050HS-S40	6	50	40	45	135	11	1.38	2
	2050HS-S42	6	50	42	45	135	11	1.50	2
	2063HS	8	63	32	45	135	11	1.31	2
	2063HS-S40	8	63	40	45	135	11	1.62	2
	2063HS-S42	8	63	42	45	135	11	1.70	2

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Parts

Specification	Screw	Wrench
Ø10~Ø14	FTKA02555S	TW08S
Ø16~Ø63	FTKA02565S	

Available inserts E05

AMS3000S



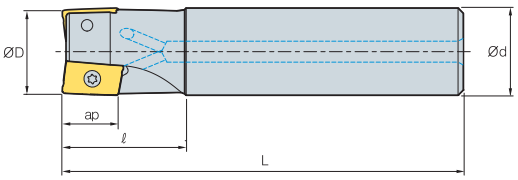


Fig. 1

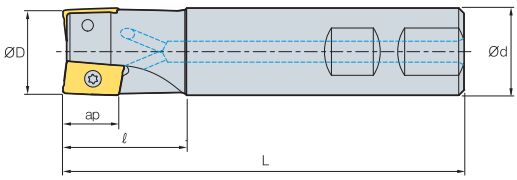
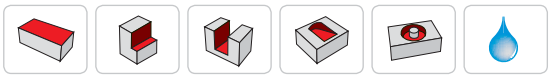


Fig. 2



AA 90°

- AR: 3°~14°
- RR: -18°~ -10°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
AMS	3025HS	2	25	25	35	115	16	0.40	2
	3025HS-2M25	2	25	25	35	180	16	0.65	1
	3025HS-2L25	2	25	25	60	220	16	0.75	1
	3032HS	3	32	32	40	125	16	0.69	2
	3032HS-2M32	2	32	32	40	200	16	1.13	1
	3032HS-2L32	2	32	32	65	260	16	1.52	1
	3032HS-3M32	3	32	32	40	200	16	1.12	1
	3032HS-3L32	3	32	32	65	260	16	1.48	1
	3040HS	4	40	32	42	130	16	0.80	2
	3040HS-3M32	3	40	32	42	200	16	1.24	1
	3040HS-3L32	3	40	32	42	260	16	1.61	1
	3040HS-4M32	4	40	32	42	200	16	1.21	1
	3040HS-4L32	4	40	32	42	260	16	1.58	1
	3040HS-S40	4	40	40	42	130	16	1.10	2
	3040HS-S42	4	40	42	42	130	16	1.20	2
	3050HS	5	50	32	45	135	16	1.00	2
	3050HS-S40	5	50	40	45	135	16	1.30	2
	3050HS-S42	5	50	42	45	135	16	1.40	2
	3063HS	6	63	32	45	135	16	1.25	2
	3063HS-S40	6	63	40	45	135	16	1.50	2
	3063HS-S42	6	63	42	45	135	16	1.54	2

Available inserts

	APMT-MA	APMT-ML	APMT-MM	APMT-MF
				

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	E05
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

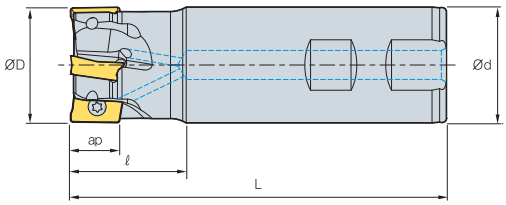
Parts

Specification	Screw	Wrench
Ø25 Ø32~Ø63	FTKA0408 FTKA0410	TW15S

Available inserts E05

AMS3000S-K





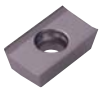
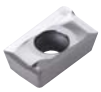
AA 90°

- AR: 14°
- RR: -18°~ -10°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
AMS	3025HS-K	2	25	25	35	115	16	0.4
	3032HS-K	3	32	32	40	125	16	0.69
	3040HS-K	4	40	32	42	130	16	0.8
	3040HS-K-S40	4	40	40	42	130	16	1.1
	3040HS-K-S42	4	40	42	42	130	16	1.2
	3050HS-K	5	50	32	45	135	16	1.0
	3050HS-K-S40	5	50	40	45	135	16	1.3
	3050HS-K-S42	5	50	42	45	135	16	1.4
	3063HS-K	6	63	32	45	135	16	1.25
	3063HS-K-S40	6	63	40	45	135	16	1.5
	3063HS-K-S42	6	63	42	45	135	16	1.54

Available inserts

	APKT	APKT-MF	APKT-MM	APKT-MM1	APKT-MA	APKT-MA2	APKT-MA3
							

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APKT	1604PDSR			●						●			●					
	1604PDSR-MF			●										●				
	1604PDSR-MM			●	●					●		●	●	●				
	160432R-MM1																	
	1604PDFR-MA														●		●	E04
	1604PDFR-MA2																●	
	160416FR-MA2																	
	160432FR-MA2																	
	1604PDFR-MA3															●	●	

Parts

Specification	Screw	Wrench
Ø25 Ø32~Ø63	FTKA0408 FTKA0410	TW15S

Available inserts E04

AMS4000S



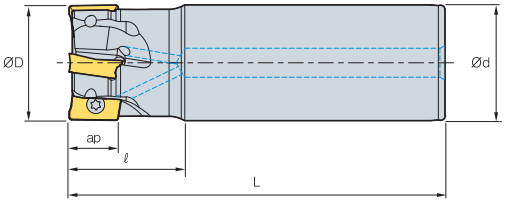


Fig. 1

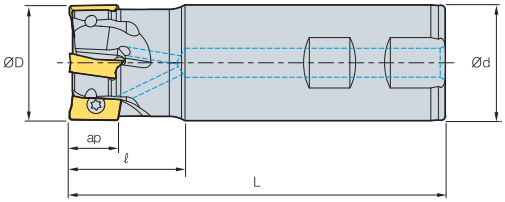


Fig. 2



AA 90°

- AR: 7°~13°
- RR: -20°~ -6°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
AMS	4020HS	1	20	20	30	90	17	0.18	2
	4020HS-M	1	20	20	30	160	17	0.17	1
	4021HS	1	21	20	30	90	17	0.19	2
	4021HS-M	1	21	20	30	160	17	0.34	1
	4025HS	2	25	25	40	110	17	0.35	2
	4025HS-2M25	2	25	25	40	180	17	0.58	1
	4025HS-2L25	2	25	25	40	230	17	0.8	1
	4026HS	2	26	25	40	110	17	0.37	2
	4026HS-2M25	2	26	25	40	180	17	0.60	1
	4026HS-2L25	2	26	25	40	230	17	0.82	1
	4032HS	3	32	32	40	125	17	0.65	2
	4032HS-2M32	2	32	32	50	200	17	1.17	1
	4032HS-2L32	2	32	32	50	260	17	1.5	1
	4032HS-3M32	3	32	32	50	200	17	1.10	1
	4032HS-3L32	3	32	32	50	260	17	1.48	1
	4033HS	3	33	32	40	125	17	0.68	2
	4033HS-2M32	2	33	32	50	200	17	1.12	1
	4033HS-2L32	2	33	32	50	260	17	1.55	1
	4033HS-3M32	3	33	32	50	200	17	1.12	1
	4033HS-3L32	3	33	32	50	260	17	1.55	1

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	180620PDER-ML													●	●			E05
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

Parts

Specification	Screw	Wrench
Ø20~Ø25 Ø32~Ø63	FTKA0408 FTKA0410	TW15S

Available inserts E05

AMS4000S



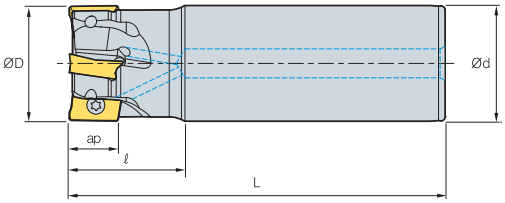


Fig. 1

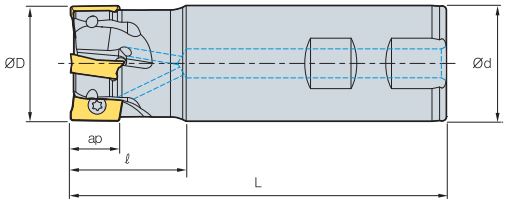
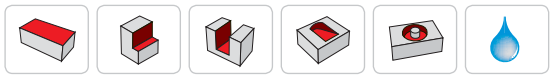


Fig. 2



AA 90°

- AR: 7°~13°
- RR: -20°~ -6°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	Fig.
AMS	4040HS-3M32	3	40	32	50	200	17	1.20	1
	4040HS-3L32	3	40	32	50	260	17	1.60	1
	4040HS-4M32	4	40	32	50	200	17	1.20	1
	4040HS-4L32	4	40	32	50	260	17	1.60	1
	4040HS-S32	4	40	32	40	130	17	0.76	2
	4040HS-S40	4	40	40	40	130	17	1.10	2
	4040HS-S42	4	40	42	40	130	17	1.20	2
	4050HS-S32	5	50	32	40	135	17	0.95	2
	4050HS-S40	5	50	40	40	135	17	1.30	2
	4050HS-S42	5	50	42	40	135	17	1.40	2
	4063HS-S32	6	63	32	40	135	17	1.25	2
	4063HS-S40	6	63	40	40	135	17	1.60	2
	4063HS-S42	6	63	42	40	135	17	1.70	2

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	180620PDER-ML													●	●			E05
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM			●				●	●	●	●	●	●	●	●			
	1806PDSR-MF			●							●		●	●	●			
	180612PDSR-MM			●						●	●			●	●			
	180616PDSR-MM			●							●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM			●							●			●	●			
	180630R-MM										●			●	●			
	180632R-MM			●							●			●	●			

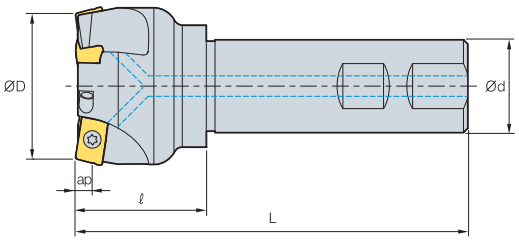
Parts

Specification	Screw	Wrench
Ø40~Ø63	FTKA0410	TW15S

Available inserts **E05**

AMS1000SE/2000SE





AA 75°

- AR: -4.5°~ -1°
- RR: -3°~0°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
AMS	1025HSE	3	25	25	30	115	2.5	0.41
AMS	2025HSE	2	25	25	30	115	4	0.4
	2032HSE	3	32	32	40	125	4	0.72
	2040HSE	3	40	32	40	130	4	0.86
	2040HSE-S40	3	40	40	40	130	4	1.2
	2040HSE-S42	3	40	42	40	130	4	1.3
	2050HSE	4	50	32	40	135	4	0.98
	2050HSE-S40	4	50	40	40	135	4	1.3
	2050HSE-S42	4	50	42	40	135	4	1.4
	2063HSE	5	63	32	40	135	4	1.24
	2063HSE-S40	5	63	40	40	135	4	1.57
	2063HSE-S42	5	63	42	40	135	4	1.62

Available inserts

APMT-MF



APMT-MM



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	060202PDSR-MM				●					●				●	●			E05
		0602PDSR-MM				●			●	●	●	●	●	●	●	●			
		060208PDSR-MM				●					●	●			●	●			
		060212R-MM				●						●			●	●			
		060216R-MM										●			●	●			
2000 type	APMT	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
		11T3PDSR-MF				●					●	●		●	●	●			
		11T308PDSR-MM				●					●	●	●		●	●			
		11T312PDSR-MM				●					●	●	●		●	●			
		11T316R-MM				●					●	●			●	●			
		11T318R-MM																	
		11T324R-MM				●					●	●			●	●			

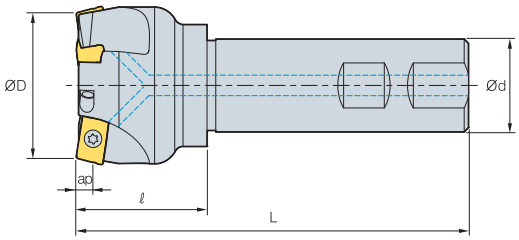
Parts

Specification	Screw	Wrench	Wrench
Ø25 (1000 type)	FTKA01842	-	TW06S-A
Ø25~Ø63 (2000 type)	FTKA02565S	TW08S	-

Available inserts E05

AMS3000SE





AA 75°

- AR: -4.5°~ -1°
- RR: -3°~0°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
AMS	3050HSE	3	50	32	45	135	6	1.0
	3050HSE-S40	3	50	40	45	135	6	1.3
	3050HSE-S42	3	50	42	45	135	6	1.4
	3063HSE	4	63	32	45	135	6	1.3
	3063HSE-S40	4	63	40	45	135	6	1.6
	3063HSE-S42	4	63	42	45	135	6	1.7

Available inserts

APMT-MF



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			E05
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

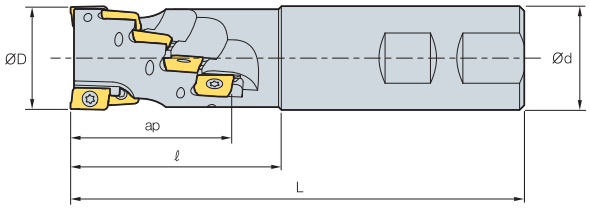
Parts

Specification	Screw	Wrench
Ø50~Ø63	FTKA0410	TW15S

Available inserts E05

AMS1000M/1500M







AA
90°

- AR: 7°~9°
- RR: -13°~ -10°

(mm)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	kg
AMS	1016M	6	16	16	30	80	2	15.5	0.3
	1020M	12	20	20	32	85	3	20.5	0.3
	1025M	20	25	25	39	95	4	25.5	0.3
AMS	15020M	3	20	20	42	105	1	26.5	0.3
	15025M	8	25	25	50	110	2	35	0.3
	15032M	10	32	32	60	120	2	44	0.3

Available inserts

APMT-MA



APMT-ML

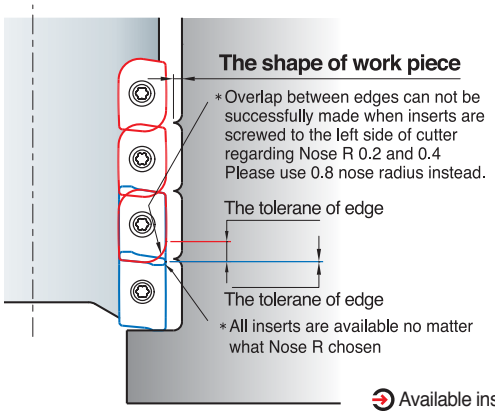


APMT-MM



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	0602PDFR-MA																●	E05
		060208PDFR-MA																	
		060202PDSR-MM				●					●				●	●			
		0602PDSR-MM				●			●	●	●	●	●	●	●	●			
		060208PDSR-MM				●					●	●			●	●			
		060212R-MM				●						●			●	●			
		060216R-MM									●	●			●	●			
1500 type	APMT	0903PDFR-MA																●	
		090308PDFR-MA																	
		0903PDER-ML													●	●			
		090308PDER-ML													●	●			
		0903PDSR-MM				●			●	●	●	●		●	●	●			
		090308PDSR-MM				●					●	●			●	●			
		090312R-MM										●			●	●			
		090316R-MM				●					●	●			●	●			
		090320R-MM									●	●			●	●			

Caution when clamping the inserts



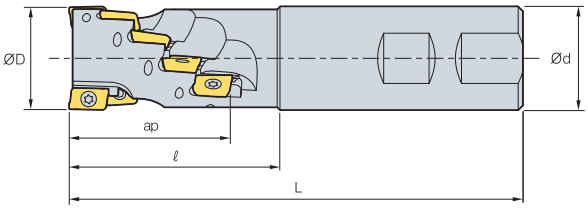
Parts

Specification	Screw	Wrench	Wrench
Ø16~Ø25 (1000 type)	FTKA01842	-	TW06S-A
Ø20~Ø32 (1500 type)	FTKA02565S	TW08S	-

Available inserts E05

AMS2000M











AA 90°

- AR: 7°~9°
- RR: -13°~ -10°

(mm)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	kg
AMS	2020M	3	20	20	45	120	1	29.4	0.32
	2025M	8	25	25	55	130	2	38.9	0.40
	2032M	10	32	32	65	140	2	48.5	0.65
	2040M	14	40	40	75	150	2	58	0.75

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF

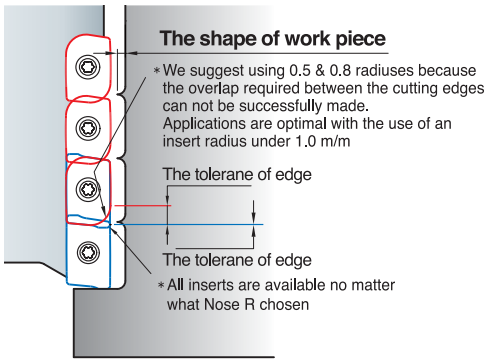







Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	E05
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Caution when clamping the inserts



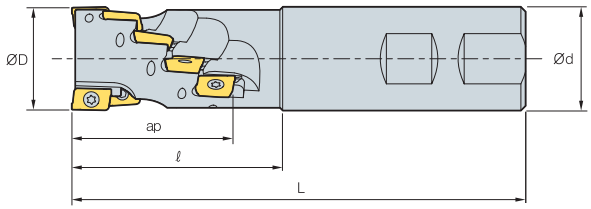
Parts

Specification	Screw	Wrench
Ø20~Ø40	FTKA02565S	TW08S

Available inserts E05

AMS4000M







AA 90°

- AR: 7°~9°
- RR: -13°~ -10°

(mm)

Designation			ØD	Ød	ℓ	L	No. of flute	ap	kg
AMS	4032M	4	32	32	60	130	2	31.6	0.65
	4040M	6	40	40	70	140	2	46	1.11
	4050M-S40	6	50	40	55	125	2	46	1.22
	4050M	8	50	40	70	140	2	61	1.37

Available inserts

APMT-MA



APMT-ML



APMT-MM

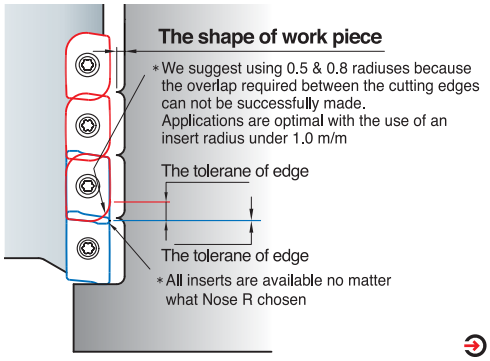


APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			
	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

Caution when clamping the inserts



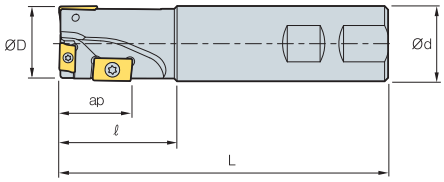
Parts

Specification	Screw	Wrench
Ø32~Ø50	FTKA0410	TW15S

Available inserts E05

AMS1000MH/1500MH





AA 90°

- AR: 9°~12°
- RR: -12°~ -10°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	APMT 0602	APMT 0903	APM(X)T 11T3 -	APMT 1604	APKT 1604 -
AMS	1014MH	3	14	12	30	120	11	0.16	3	-	-	-	-
	1016MH	3	16	14	30	140	11	0.20	3	-	-	-	-
	1018MH	3	18	16	30	140	11	0.21	3	-	-	-	-
AMS	15020MH	3	20	20	35	140	17	0.31	1	2	-	-	-

Available inserts

APMT-MA APMT-ML APMT-MM







Type	Designation		Cermet		Coated											Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
1000 type	APMT	0602PDFR-MA																●	E05
		060208PDFR-MA																	
		060202PDSR-MM				●					●				●	●			
		0602PDSR-MM				●			●	●	●	●	●	●	●	●			
		060208PDSR-MM				●					●	●			●	●			
2000 type	APMT	0903PDFR-MA																●	
		090308PDFR-MA																	
		0903PDER-ML													●	●			
		090308PDER-ML													●	●			
		0903PDSR-MM				●			●	●	●	●		●	●	●			
		090308PDSR-MM				●					●	●			●	●			

Parts

Specification	Screw	Wrench	Wrench
Ø14~Ø18 (1000 type)	FTKA01842	-	TW06S-A
Ø20 (1500 type)	FTKA02565S	TW08S	-

Available inserts E05

Recommended cutting condition

	Drilling	Shouldering	Slotting
vc (m/min)	80~200	80~200	80~200
fz (mm/t)	0.03~0.06	0.05~0.25	0.05~0.20

- Please keep the drill depth under 0.25D when you're drilling
- Please keep the step depth from 0.2 to 0.3mm

AMS2000MH/3000MH



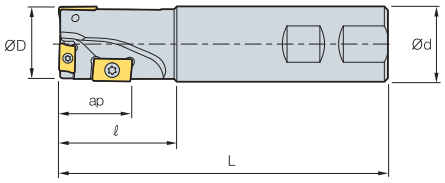


Fig. 1

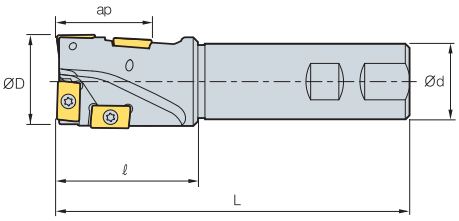
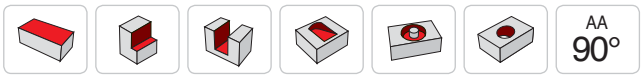


Fig. 2



AA 90°

- AR: 9°~12°
- RR: -12°~ -10°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg	APMT 0602	APMT 0903	APM(X)T 11T3 -	APMT 1604	APKT 1604 -	Fig.
AMS	2025MH	3	25	25	40	130	20	0.45	-	-	3	-	-	1
	2032MH	3	32	32	50	140	30	0.75	-	-	1	2	-	1
AMS	3040MH-K	4	40	32	60	150	40	0.90	-	-	-	-	4	2

Available inserts



Type	Designation		Cermet		Coated											Uncoated		page
			CN2000	CN30	NCM325	NCM335	NC5330	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	G10	H01	
2000 type	APMT	11T3PDFR-MA																●	E04 E05
		11T308PDFR-MA																	
		11T3PDER-ML												●	●				
		11T308PDER-ML												●	●				
		11T3PDSR-MM			●		●	●	●	●	●	●	●	●	●				
		11T3PDSR-MF					●			●	●		●	●	●				
		11T308PDSR-MM					●			●	●	●		●	●				
		11T312PDSR-MM					●			●	●	●		●	●				
		11T316R-MM					●			●	●			●	●				
		11T318R-MM					●												
		11T324R-MM					●			●	●			●	●				
3000 type	APMT	1604PDSR-MM			●		●	●	●	●	●	●	●	●	●				
		1604PDSR-MF					●			●	●		●	●	●				
3000-K type	APKT	1604PDSR-MM			●	●				●		●	●	●					
		1604PDSR-MF			●									●					

Parts

Specification	Screw	Wrench	Wrench
Ø25~Ø32 (2000 type)	FTKA02565S	TW08S	-
Ø40 (3000 type)	FTKA0410	TW15S	-

Recommended cutting condition

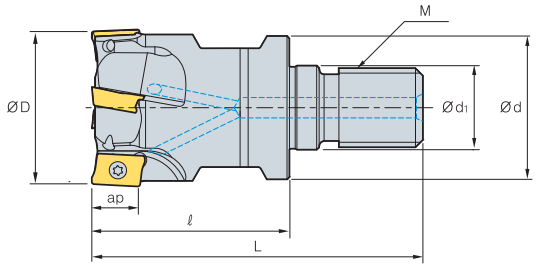
	Drilling	Shouldering	Slotting
vc (m/min)	80~200	80~200	80~200
fz (mm/t)	0.03~0.06	0.05~0.25	0.05~0.20

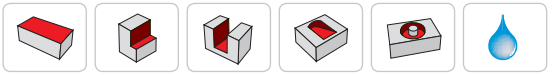
- Please keep the drill depth under 0.25D when you're drilling
- Please keep the step depth from 0.2 to 0.3mm

Available inserts E04, E05

AMM1000







AA 90°

- AR: 7.5°~12.5°
- RR: -28°~ -6°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	kg
AMM	1012HR-M06	3	12	11	6.5	25	40	M06	5.6	0.02
	1016HR-M08	4	16	14.5	8.5	25	42	M08	5.6	0.03
	1020HR-M10	5	20	18	10.5	30	51	M10	5.6	0.07
	1025HR-M12	7	25	23	12.5	35	59	M12	5.6	0.12
	1032HR-M16	8	32	29	17	40	67	M16	5.6	0.23

Available inserts

APMT-MA



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			
	060216R-MM										●			●	●			

Available adaptor

Designation		Available adaptor
AMM	1012HR-M06	MAT-M06
	1016HR-M08	MAT-M08
	1020HR-M10	MAT-M10
	1025HR-M12	MAT-M12
	1032HR-M16	MAT-M16

Designation: AMM1032HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MAT-M16-035-S32S
Adaptor threading measure (M16)

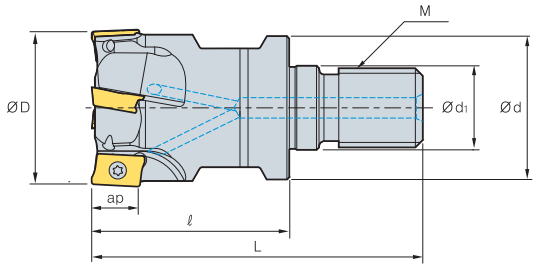
Parts

Specification	Screw	Wrench
Ø12~Ø32	FTKA01842	TW06S-A

Available inserts E05 Available adaptor E342~E343

AMM1500












AA 90°

- AR: 7.5°~12.5°
- RR: -28°~ -6°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	kg
AMM	15010HR-M06	1	10	9.5	6.5	25	40	M06	9	0.01
	15012HR-M06	1	12	11	6.5	25	40	M06	9	0.02
	15016HR-M08	2	16	14.5	8.5	25	42	M08	9	0.03
	15020HR-M10	2	20	18	10.5	30	51	M10	9	0.06
	15025HR-M12	3	25	23	12.5	35	59	M12	9	0.12
	15032HR-M16	4	32	29	17	40	67	M16	9	0.22

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated												Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			E05
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Available adaptor

Designation		Available adaptor
AMM	15010HR-M06	MAT-M06
	15012HR-M06	
	15016HR-M08	MAT-M08
	15020HR-M10	MAT-M10
	15025HR-M12	MAT-M12
	15032HR-M16	MAT-M16

Designation: AMM1032HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MAT-M16-035-S32S
Adaptor threading measure (M16)

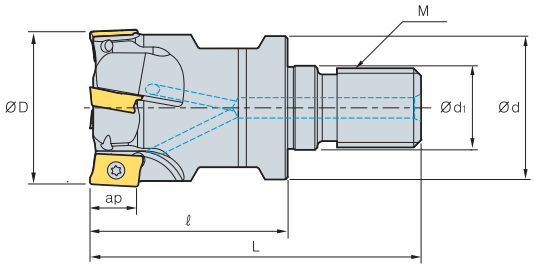
Parts

Specification	Screw	Wrench
Ø10~Ø14	FTKA02555S	TW08S
Ø16~Ø32	FTKA02565S	

Available inserts E05 Available adaptor E342~E343

AMM2000





AA 90°

- AR: 7.5°~12.5°
- RR: -28°~ -6°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	kg
AMM	2016HR-M08	2	16	14.5	8.5	25	42	M08	11	0.04
	2020HR-M10	2	20	18	10.5	30	51	M10	11	0.07
	2025HR-M12	3	25	23	12.5	35	59	M12	11	0.04
	2032HR-M16	4	32	29	17	40	67	M16	11	0.23
	2040HR-M16	5	40	29	17	40	67	M16	11	0.25

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	E05
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Available adaptor

Designation		Available adaptor
AMM	2016HR-M08	MAT-M08
	2020HR-M10	MAT-M10
	2025HR-M12	MAT-M12
	2032HR-M16	MAT-M16
	2040HR-M16	

Designation: AMM1032HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MAT-M16-035-S32S
Adaptor threading measure (M16)

Parts

Specification	Screw	Wrench
Ø16~Ø40	FTKA02565S	TW08S

Available inserts E05 Available adaptor E342~E343

Guarantee strong constrain force by 2-side constraint

BT/HSK Tooling System

Code system (Single, Multi-edge type)

BT50 HAT 4 063 114 – 4 F

Arbor type	Item Name	Type	Diameter	Length (ap)	No. of flute	Front piece or total length
BT30/40/50 HSK40/50/63/100	AM HAT RM	1000 type 1500 type 2000 type 3000 type 4000 type	063: Ø63	Length: 114 HS: Coolant + Single	No. of flute: 4 No. of tooth: 4	Front Piece (Y/N) Y: F No code: No L: Long type

Code system (Modular type)

BT50 MAT M16 092

Arbor type	Item category	M Dimensions	Total length (L)
BT30/40/50 HSK40/50/63/100	MAT	M16	092: 92

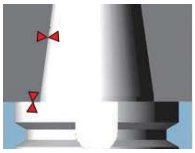
DBT system

Feature of (D)BT arbor

- Guaranteed strong force by 2-side constraint
- Guarantee strengthen cutting at high speed
- Guaranteed superior surface roughness

DBT (Constrain, increased surface roughness)

2-side constraint
(Taper, 1-side)

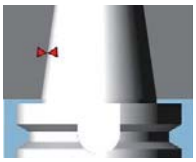




DBT Workpiece
Ra = 0.3㎛

BT

1-side constraint
(Taper)





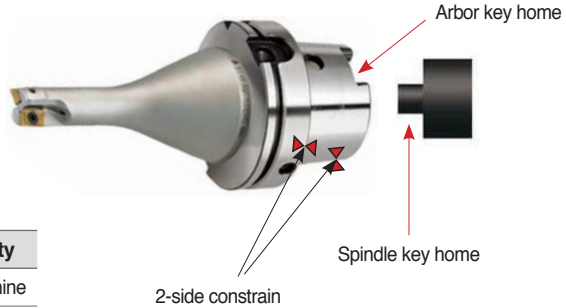
BT Workpiece
Ra = 0.5㎛

HSK system

Feature of HSK arbor

- Guaranteed strong constrain force by 2-side constraint
- Guaranteed strengthened cutting at high speeds
- Guaranteed superior surface roughness
- Guaranteed repeatability at axle direction and repeated direction

HSK A: HSK T key tolerance comparison

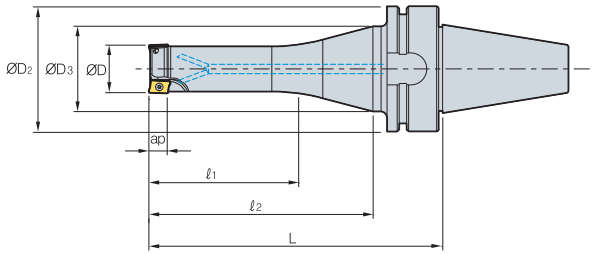


HSK tolerance comparison

Arbor type	Max. tolerance	Min. tolerance	Available facility
HSK-T	0.075	0.035	Multi-tasking machine
HSK-A	0.33	0.08 (General)	MCT

BT30 AM1000HS





AA 90°

- AR: 7.5°~13°
- RR: -28°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
BT30	AM1010HS-2	2	10	46	41	35	83	112	5.6
	AM1012HS-2	2	12	46	41	35	83	112	5.6
	AM1012HS-3	3	12	46	41	35	83	112	5.6
	AM1016HS-3	3	16	46	41	35	83	112	5.6
	AM1016HS-4	4	16	46	41	35	83	112	5.6
	AM1020HS-4	4	20	46	41	45	98	127	5.6
	AM1020HS-5	5	20	46	41	45	98	127	5.6

Available inserts

APMT-MA



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			E05
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			
	060216R-MM										●			●	●			

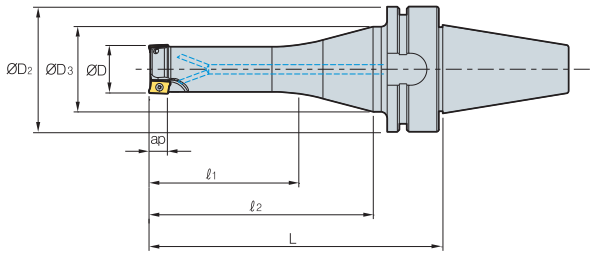
Parts

Specification	Screw	Wrench	Wrench
Ø10~Ø20	FTKA01842	-	TW06S-A

Available inserts **E05**

BT40 AM1500HS





AA 90°

- AR: 7.5°~13°
- RR: -28°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
BT40	AM15016HS-2	2	16	63	50	45	83	117	9
	AM15016HS-2L	2	16	63	50	35	118	152	9
	AM15020HS-2	2	20	63	50	60	98	132	9
	AM15020HS-3	3	20	63	50	60	98	132	9
	AM15020HS-2L	2	20	63	50	50	118	152	9
	AM15025HS-3	3	25	63	50	75	113	147	9
	AM15025HS-4	4	25	63	50	75	113	147	9
	AM15025HS-3L	3	25	63	50	65	133	167	9
	AM15032HS-4	4	32	63	50	80	113	147	9
	AM15032HS-5	5	32	63	50	80	113	147	9
	AM15032HS-4L	4	32	63	50	70	133	167	9
	AM15040HS-5	5	40	63	50	60	98	132	9
	AM15040HS-6	6	40	63	50	60	98	132	9
	AM15040HS-5L	5	40	63	50	50	118	152	9

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

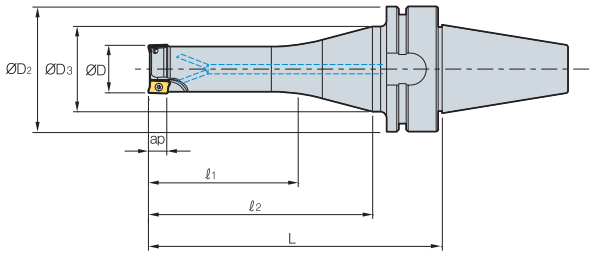
Parts

Specification	Screw	Wrench	Wrench
Ø16~Ø40	FTKA02565S	TW08S	-

Available inserts E05

BT40 AM2000HS





AA 90°

- AR: 7°~10°
- RR: -20°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
BT40	AM2016HS-2	2	16	63	50	45	83	117	11
	AM2016HS-2L	2	16	63	50	35	118	152	11
	AM2020HS-2	2	20	63	50	60	98	132	11
	AM2020HS-2L	2	20	63	50	50	118	152	11
	AM2025HS-3	3	25	63	50	75	113	147	11
	AM2025HS-3L	3	25	63	50	65	133	167	11
	AM2032HS-4	4	32	63	50	80	113	147	11
	AM2032HS-4L	4	32	63	50	70	133	167	11
	AM2040HS-5	5	40	63	50	60	98	132	11
	AM2040HS-5L	5	40	63	50	50	118	152	11
	AM2050HS-6	6	50	63	50	60	98	132	11
	AM2050HS-6L	6	50	63	50	50	118	152	11

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF








Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			E05
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

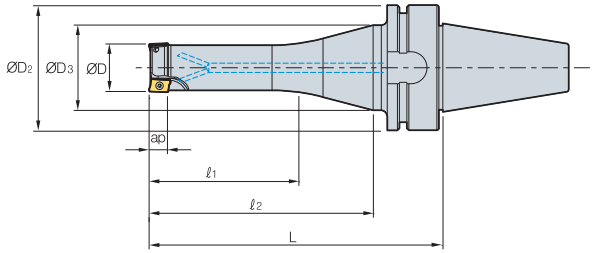
Parts

Specification	Screw	Wrench
Ø16~Ø50	FTKA02565S	TW08S

Available inserts E05

BT50 AM3000HS





AA 90°

- AR: 7°~10°
- RR: -20°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
BT50	AM3025HS-2	2	25	100	80	65	113	158	16
	AM3025HS-2L	2	25	100	80	55	123	168	16
	AM3032HS-3	3	32	100	80	70	113	158	16
	AM3032HS-3L	3	32	100	80	60	123	168	16
	AM3040HS-4	4	40	100	80	50	98	143	16
	AM3040HS-4L	4	40	100	80	40	108	153	16
	AM3050HS-5	5	50	100	80	50	98	143	16
	AM3050HS-5L	5	50	100	80	40	108	153	16

Available inserts



APMT-MA



APMT-ML


APMT-MM


APMT-MF

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			E05
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

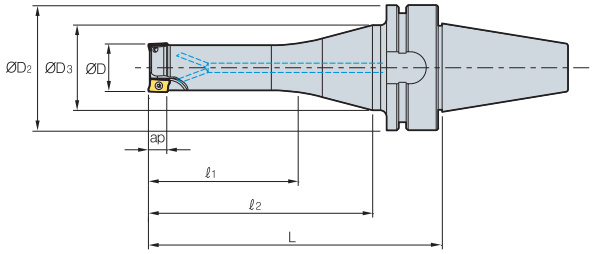
Parts

Specification	Screw	Wrench
Ø25 Ø32~Ø50	FTKA0408 FTKA0410	TW15S

Available inserts E05

BT50 AM4000HS





AA 90°

- AR: 7°~10°
- RR: -20°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
BT50	AM4020HS-1	1	20	100	80	50	98	143	17
	AM4025HS-2	2	25	100	80	65	113	158	17
	AM4032HS-3	3	32	100	80	70	113	158	17
	AM4032HS-3L	3	32	100	80	60	123	168	17
	AM4040HS-4	4	40	100	80	50	98	143	17
	AM4040HS-4L	4	40	100	80	40	108	153	17
	AM4050HS-5	5	50	100	80	50	98	143	17
	AM4050HS-5L	5	50	100	80	40	108	153	17

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF








Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			
	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

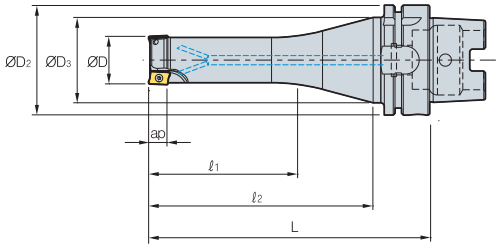
Parts

Specification	Screw	Wrench
Ø20~Ø25 Ø32~Ø50	FTKA0408 FTKA0410	TW15S

Available inserts E05

HSK63A AM1000HS





AA 90°

- AR: 7.5°~13°
- RR: -28°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
HSK63A	AM1010HS-2	2	10	63	53	35	83	116	5.6
	AM1012HS-2	2	12	63	53	35	83	116	5.6
	AM1012HS-3	3	12	63	53	35	83	116	5.6
	AM1016HS-3	3	16	63	53	35	83	116	5.6
	AM1016HS-4	4	16	63	53	35	83	116	5.6
	AM1020HS-4	4	20	63	53	45	98	131	5.6
	AM1020HS-5	5	20	63	53	45	98	131	5.6

Available inserts

APMT-MA



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			
	060216R-MM										●			●	●			

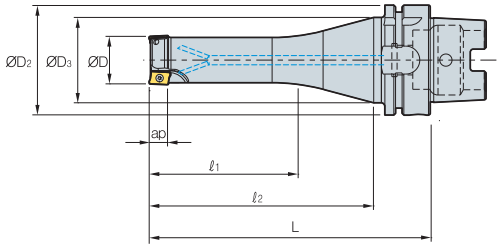
Parts

Specification	Screw	Wrench	Wrench
Ø10~Ø20	FTKA01842	-	TW06S-A

Available inserts E05

HSK63A AM1500HS





AA 90°

- AR: 7.5°~13°
- RR: -28°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
HSK63A	AM15016HS-2	2	16	63	53	45	83	116	9
	AM15016HS-2L	2	16	63	53	35	118	151	9
	AM15020HS-2	2	20	63	53	60	98	131	9
	AM15020HS-3	3	20	63	53	60	98	131	9
	AM15020HS-2L	2	20	63	53	50	118	151	9
	AM15025HS-3	3	25	63	53	75	113	146	9
	AM15025HS-4	4	25	63	53	75	113	146	9
	AM15025HS-3L	3	25	63	53	65	133	166	9
	AM15032HS-4	4	32	63	53	80	113	146	9
	AM15032HS-5	5	32	63	53	80	113	146	9
	AM15032HS-4L	4	32	63	53	70	133	166	9
	AM15040HS-5	5	40	63	53	60	98	131	9
	AM15040HS-6	6	40	63	53	60	98	131	9
	AM15040HS-5L	5	40	63	53	50	118	151	9

Available inserts

APMT-MA



APMT-ML



APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

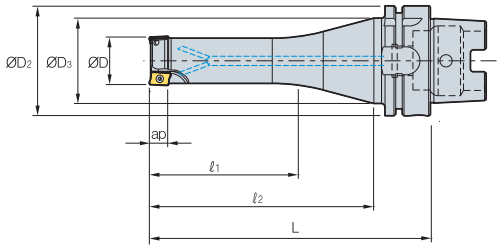
Parts

Specification	Screw	Wrench	Wrench
Ø16~Ø40	FTKA02565S	TW08S	-

Available inserts E05

HSK63A AM2000HS





AA 90°

- AR: 7°~10°
- RR: -20°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
HSK63A	AM2016HS-2	2	16	63	53	45	83	116	11
	AM2016HS-2L	2	16	63	53	35	118	151	11
	AM2020HS-2	2	20	63	53	60	98	131	11
	AM2020HS-2L	2	20	63	53	50	118	151	11
	AM2025HS-3	3	25	63	53	75	113	146	11
	AM2025HS-3L	3	25	63	53	65	133	166	11
	AM2032HS-4	4	32	63	53	80	113	146	11
	AM2032HS-4L	4	32	63	53	70	133	166	11
	AM2040HS-5	5	40	63	53	60	98	131	11
	AM2040HS-5L	5	40	63	53	50	118	151	11
	AM2050HS-6	6	50	63	53	60	98	131	11
	AM2050HS-6L	6	50	63	53	50	118	151	11

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF








Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	E05
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

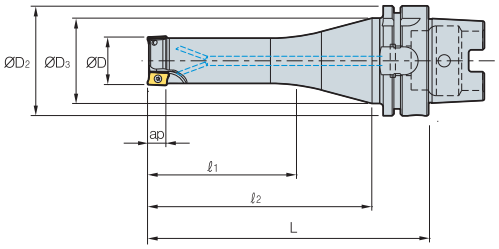
Parts

Specification	Screw	Wrench
Ø16~Ø50	FTKA02565S	TW08S

Available inserts E05

HSK63A AM3000HS





AA 90°

- AR: 7°~10°
- RR: -20°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
HSK63A	AM3025HS-2	2	25	63	53	65	113	146	16
	AM3025HS-2L	2	25	63	53	55	123	156	16
	AM3032HS-3	3	32	63	53	70	113	146	16
	AM3032HS-3L	3	32	63	53	60	123	156	16
	AM3040HS-4	4	40	63	53	50	98	131	16
	AM3040HS-4L	4	40	63	53	40	108	141	16
	AM3050HS-5	5	50	63	53	50	98	131	16
	AM3050HS-5L	5	50	63	53	40	108	141	16

Available inserts

APMT-MA | APMT-ML | APMT-MM | APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	E05
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

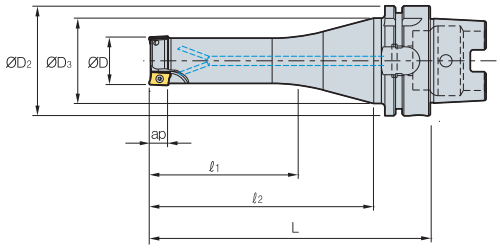
Parts

Specification	Screw	Wrench
Ø25 Ø32~Ø50	FTKA0408 FTKA0410	TW15S

Available inserts E05

HSK63A AM4000HS





AA 90°

- AR: 7°~10°
- RR: -20°~ -7°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
HSK63A	AM4020HS-1	1	20	63	53	50	98	131	17
	AM4025HS-2	2	25	63	53	65	113	146	17
	AM4032HS-3	3	32	63	53	70	113	146	17
	AM4032HS-3L	3	32	63	53	60	123	156	17
	AM4040HS-4	4	40	63	53	50	98	131	17
	AM4040HS-4L	4	40	63	53	40	108	141	17
	AM4050HS-5	5	50	63	53	50	98	131	17
	AM4050HS-5L	5	50	63	53	40	108	141	17

Available inserts

APMT-MA



APMT-ML



APMT-MM



APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			
	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

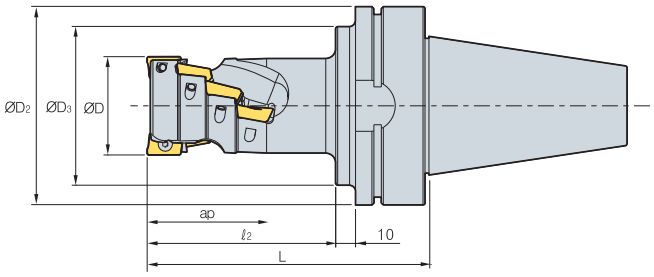
Parts

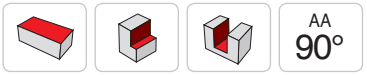
Specification	Screw	Wrench
Ø20~Ø25 Ø32~Ø50	FTKA0408 FTKA0410	TW15S

Available inserts E05

BT30/40 AM1000







• AR: -12.5°~13°
• RR: -17°~ -6°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
BT30	AM1016015-2	6	16	46	41	30	62	2	15.5
	AM1020020-3	12	20	46	41	32	64	3	20.5
	AM1025025-4	20	25	46	41	39	71	4	25.5
BT40	AM1016015-2	6	16	63	50	30	67	2	15.5
	AM1020020-3	12	20	63	50	32	69	3	20.5
	AM1025025-4	20	25	63	50	39	76	4	25.5

Available inserts

APMT-MA

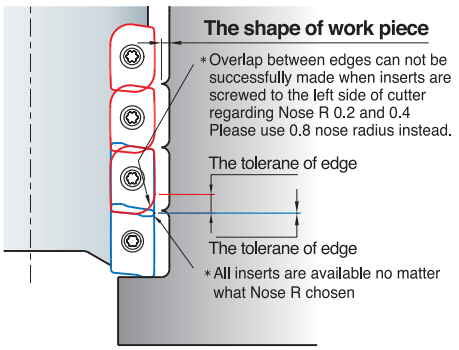


APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●						●			●	●			
	0602PDSR-MM				●				●	●	●	●	●	●	●			
	060208PDSR-MM				●						●	●		●	●			
	060212R-MM				●							●		●	●			
	060216R-MM											●		●	●			

Caution when clamping the inserts



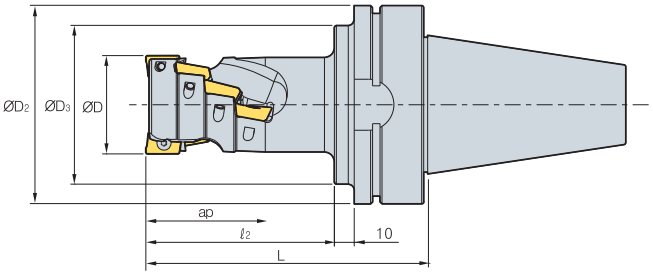
Parts

Specification	Screw	Wrench	Wrench
Ø16~Ø25	FTKA01842	-	TW06S-A

Available inserts E05

BT30/40 AM1500









AA
90°

- AR: -12.5°~13°
- RR: -17°~ -6°

(mm)

Designation			ØD	ØD2	ØD3	ℓ1	ℓ2	L	ap
BT30	AM15020026-1	3	20	46	41	42	74	1	26.5
	AM15025035-2	8	25	46	41	50	62	2	35
	AM15032044-2	10	32	46	41	60	92	2	44
BT40	AM15020026-1	3	20	63	50	42	79	1	26.5
	AM15025035-2	8	25	63	50	50	87	2	35
	AM15032044-2	10	32	63	50	60	97	2	44

Available inserts

APMT-MA



APMT-ML



APMT-MM

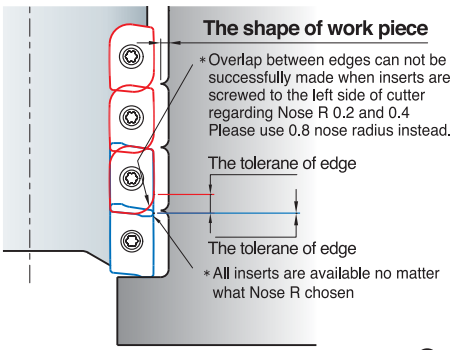


Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Parts

Specification	Screw	Wrench	Wrench
Ø20~Ø32	FTKA02565S	TW08S	-

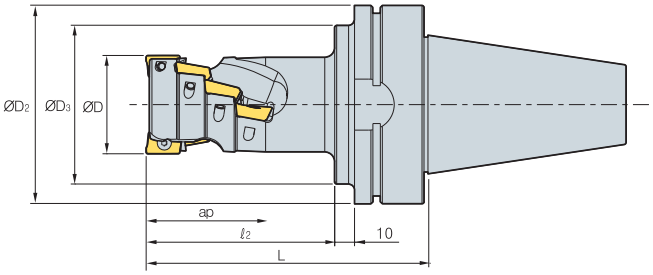
Caution when clamping the inserts



Available inserts E05

BT30/40 AM2000









AA 90°

- AR: -9°
- RR: -13°~ -8°

(mm)

Designation			ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
BT30	AM2020029-1	3	20	46	41	45	77	1	29.4
	AM2025038-2	8	25	46	45	55	87	2	38.9
	AM2032048-2	10	32	46	45	65	97	2	48.5
	AM2040058-2	14	40	46	45	75	107	2	58
	AM2050039-4	16	50	46	45	58	90	4	39
	AM2063039-4	16	63	46	45	58	90	4	39
	AM2080039-5	20	80	46	45	63	95	5	39
	AM2100039-6	24	100	46	45	63	95	6	39
BT40	AM2020029-1	3	20	63	50	45	82	1	29.4
	AM2025038-2	8	25	63	50	55	92	2	38.9
	AM2032048-2	10	32	63	50	65	102	2	48.5
	AM2040058-2	14	40	63	50	75	112	2	58
	AM2050039-4	16	50	63	50	58	95	4	39
	AM2063039-4	16	63	63	50	58	95	4	39
	AM2080039-5	20	80	63	50	63	100	5	39
	AM2100039-6	24	100	63	50	63	100	6	39

Available inserts

APMT-MA



APMT-ML



APMT-MM

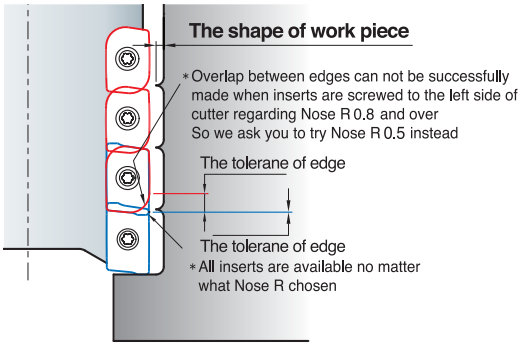


APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			E05
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Caution when clamping the inserts



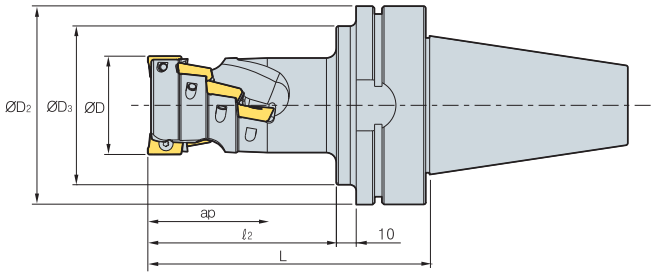
Parts

Specification	Screw	Wrench
Ø20~Ø100	FTKA02565S	TW08S

Available inserts E05

BT50 AM3000







AA 90°

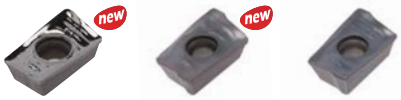
- AR: 13°~15°
- RR: -11°~ -4°

(mm)

Designation			ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
BT50	AM3050043-2	6	50	100	80	72	120	2	43
	AM3063057-4	16	63	100	80	86	134	4	57
	AM3080071-4	20	80	100	80	100	148	4	71
	AM3100071-6	30	100	100	80	100	148	6	71

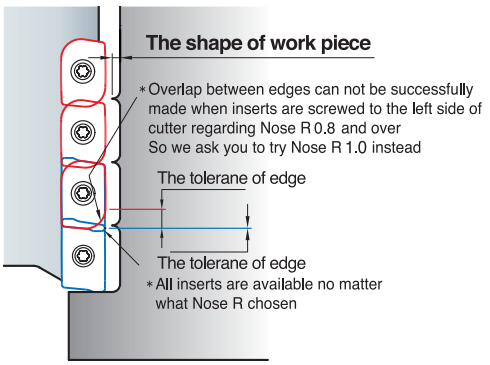
Available inserts

APMT-MA APMT-ML APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	E05
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●	●			

Caution when clamping the inserts



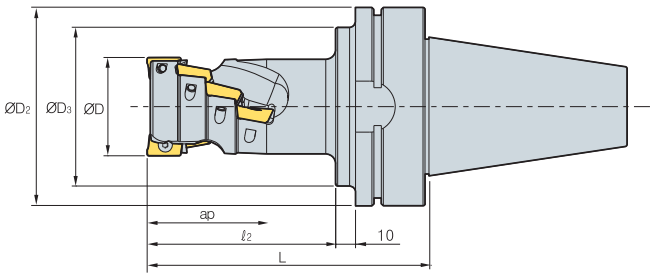
Parts

Specification	Screw	Wrench
Ø50~Ø100	FTKA0410	TW15S

Available inserts E05

BT50 AM4000









AA 90°

- AR: 13°~15°
- RR: -11°~ -4°

(mm)

Designation			ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
BT50	AM4040046-2	6	40	100	80	75	123	2	46
	AM4050061-2	8	50	100	80	95	143	2	61
	AM4063061-4	16	63	100	80	90	138	4	61
	AM4080076-4	20	80	100	80	105	153	4	76
	AM4100076-6	30	100	100	80	105	153	6	76

Available inserts

APMT-MA | APMT-ML | APMT-MM | APMT-MF

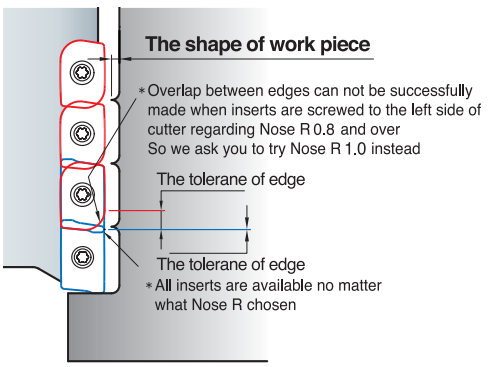







Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA																●	E05
	180604PDFR-MA																●	
	180612PDFR-MA																●	
	180616PDFR-MA																●	
	180620PDFR-MA																●	
	180624PDFR-MA																●	
	180630R-MA																●	
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			
	180620PDER-ML													●	●			
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

Caution when clamping the inserts



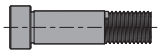
Parts

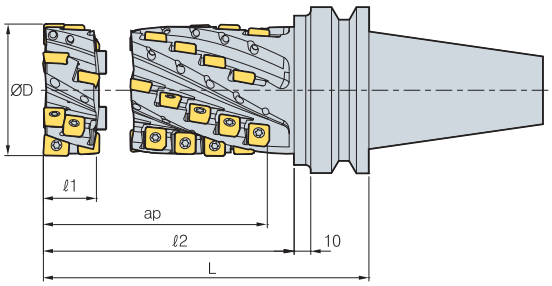
Specification	Screw	Wrench
Ø40~Ø100	FTKA0410	TW15S

Available inserts E05

BT50 HAT4000







(mm)

Designation		SPMT	ZPMT	ØD	ℓ1	ℓ2	L	No. of flute	ap	Application
BT50- (Set)	HAT4050094-2F	10	1	50	32	119	160	2	94	HAT4050032-2F
	HAT4050104-2F	11	1	50	32	129	170	2	104	
	HAT4050114-2F	12	1	50	32	139	180	2	114	
	HAT4063094-4F	20	2	63	32	119	160	4	94	HAT4063032-4F
	HAT4063104-4F	22	2	63	32	129	170	4	104	
	HAT4063114-4F	24	2	63	32	139	180	4	114	
	HAT4080094-4F	20	2	80	33	119	160	4	94	HAT4080033-4F
	HAT4080104-4F	22	2	80	33	129	170	4	104	
	HAT4080114-4F	24	2	80	33	139	180	4	114	
(Front Piece)	HAT4050032-2F	3	1	50	32	-	-	2	-	-
	HAT4063032-4F	6	2	63	32	-	-	4	-	
	HAT4080033-4F	6	2	80	33	-	-	4	-	

Available inserts

SPMT-MM



ZPMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
SPMT	120508-MMN																	E25
ZPMT	1505PPSR-MMN																	E31

Set specification

Set Designation	Designation	Front Piece	Clamping Bolt
HAT4050094-2F HAT4050104-2F HAT4050114-2F	HAT4050062-2F HAT4050072-2F HAT4050082-2F	HAT4050032-2F	HSB1255
HAT4063094-4F HAT4063104-4F HAT4063114-4F	HAT4063062-4F HAT4063072-4F HAT4063082-4F	HAT4063032-4F	HSB1670
HAT4080094-4F HAT4080104-4F HAT4080114-4F	HAT4080061-4F HAT4080071-4F HAT4080081-4F	HAT4080033-4F	HSB1682

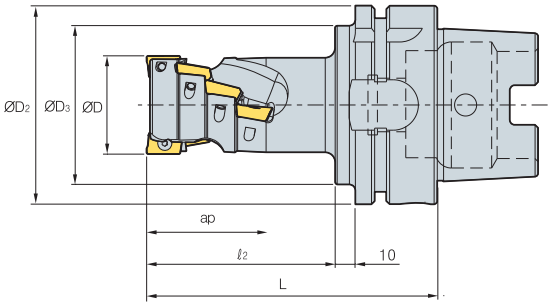
Parts

Specification	Screw	Wrench
Ø50~Ø80	ETNA0511	TW20

Available inserts E25, E31

HSK63A AM1000









AA 90°

- AR: -12.5°~13°
- RR: -17°~ -6°

(mm)

Designation		⌀	ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
HSK63A	AM1016015-2	6	16	63	53	30	66	2	15.5
	AM1020020-3	12	20	63	53	32	68	3	20.5
	AM1025025-4	20	25	63	53	39	75	4	25.5

Available inserts

APMT-MA

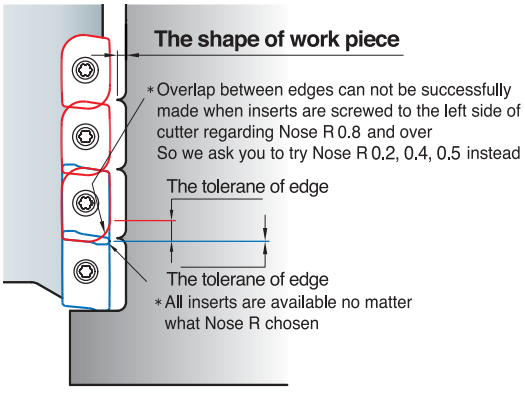


APMT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0602PDFR-MA																●	E05
	060208PDFR-MA																	
	060202PDSR-MM				●					●				●	●			
	0602PDSR-MM				●			●	●	●	●	●	●	●	●			
	060208PDSR-MM				●					●	●			●	●			
	060212R-MM				●						●			●	●			
	060216R-MM										●			●	●			

Caution when clamping the inserts



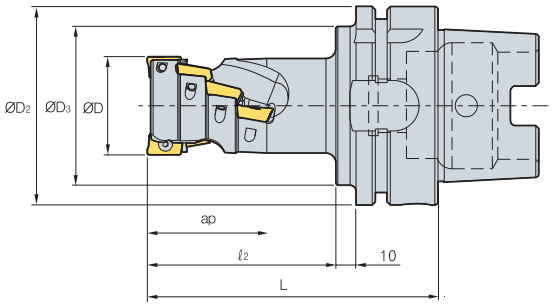
Parts

Specification	Screw	Wrench	Wrench
Ø16~Ø25	FTKA01842	-	TW06S-A

Available inserts E05

HSK63A AM1500





AA 90°

- AR: -12.5°~13°
- RR: -17°~ -6°

(mm)

Designation			ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
HSK63A	AM15020026-1	3	20	63	53	42	78	1	26.5
	AM15025035-2	8	25	63	53	50	86	2	35
	AM15032044-2	10	32	63	53	60	96	2	44

Available inserts



APMT-MA

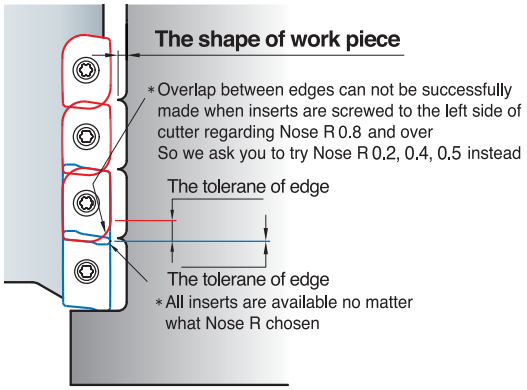


APMT-ML


APMT-MM

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	0903PDFR-MA																●	E05
	090308PDFR-MA																	
	0903PDER-ML													●	●			
	090308PDER-ML													●	●			
	0903PDSR-MM				●			●	●	●	●		●	●	●			
	090308PDSR-MM				●					●	●			●	●			
	090312R-MM										●			●	●			
	090316R-MM				●					●	●			●	●			
	090320R-MM									●	●			●	●			

Caution when clamping the inserts



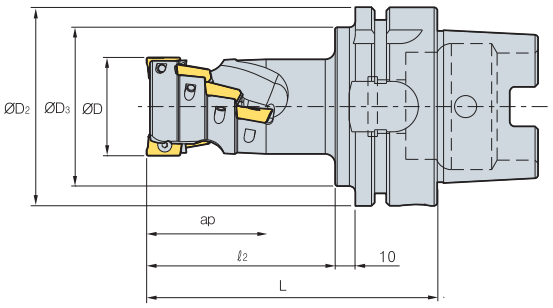
Parts

Specification	Screw	Wrench	Wrench
Ø20~Ø32	FTKA02565S	TW08S	-

Available inserts E05

HSK63A AM2000









AA 90°

- AR: -12.5°~13°
- RR: -17°~ -6°

(mm)

Designation		⊚	ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
HSK63A	AM2020029-1	3	20	63	53	45	81	1	29.4
	AM2025038-2	8	25	63	53	55	91	2	38.9
	AM2032048-2	10	32	63	53	65	101	2	48.5
	AM2040058-2	14	40	63	53	75	111	2	58
	AM2050039-4	16	50	63	53	58	94	4	39
	AM2063039-4	16	63	63	53	58	94	4	39
	AM2080039-5	20	80	63	53	63	99	5	39
	AM2100039-6	24	100	63	53	63	99	6	39

Available inserts

APMT-MA



APMT-ML



APMT-MM

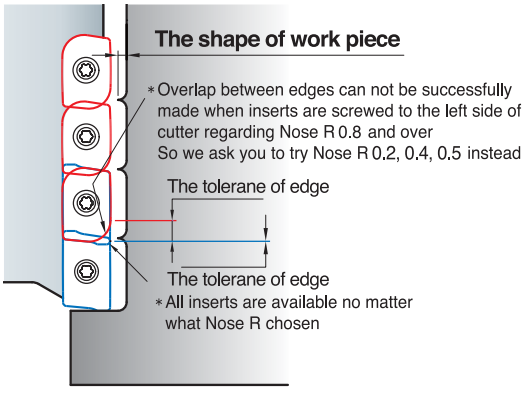


APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	11T3PDFR-MA																●	
	11T308PDFR-MA																	
	11T3PDER-ML													●	●			
	11T308PDER-ML													●	●			
	11T3PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	11T3PDSR-MF				●					●	●		●	●	●			E05
	11T308PDSR-MM				●					●	●	●		●	●			
	11T312PDSR-MM				●					●	●	●		●	●			
	11T316R-MM				●					●	●			●	●			
	11T318R-MM																	
	11T324R-MM				●					●	●			●	●			

Caution when clamping the inserts



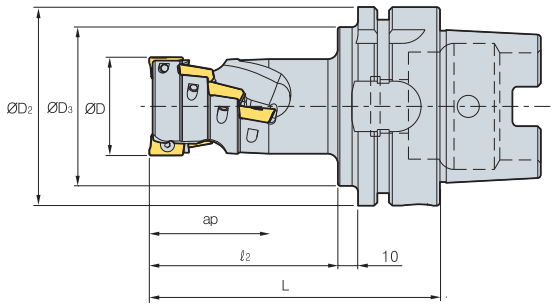
Parts

Specification	Screw	Wrench
Ø20~Ø100	FTKA02565S	TW08S

Available inserts E05

HSK100A AM3000





AA 90°

- AR: -13°~15°
- RR: -11°~ -4°

(mm)

Designation		⊙	ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
HSK100A	AM3050043-2	6	50	100	88	72	111	2	43
	AM3063057-4	16	63	100	88	86	125	4	57
	AM3080071-4	20	80	100	88	100	139	4	71
	AM3100071-6	30	100	100	88	100	139	6	71

Available inserts

APMT-MA APMT-ML APMT-MM APMT-MF

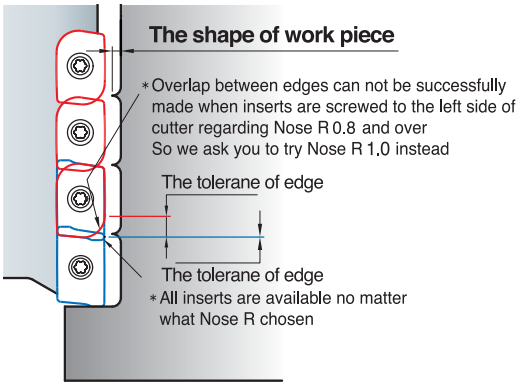







Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1604PDFR-MA																●	
	160404PDFR-MA																	
	1604PDER-ML													●	●			
	160404PDER-ML													●	●			
	1604PDSR-MM			●	●			●	●	●	●	●	●	●	●			
	1604PDSR-MF				●					●	●		●	●	●			E05
	160410PDSR-MM										●			●	●			
	160416PDSR-MM				●					●	●			●	●			
	160424R-MM				●					●	●			●	●			
	160430R-MM										●			●	●			
	160432R-MM				●					●	●			●				

Caution when clamping the inserts



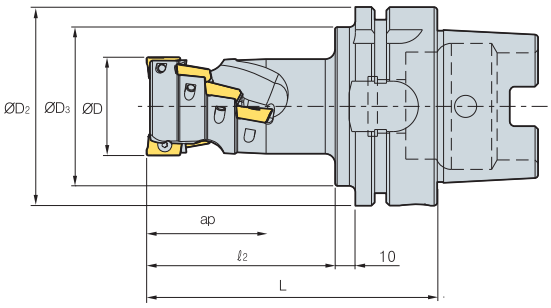
Parts

Specification	Screw	Wrench
Ø50~Ø100	FTKA0410	TW15S

Available inserts E05

HSK100A AM4000









AA 90°

- AR: -13°~15°
- RR: -11°~ -4°

(mm)

Designation			ØD	ØD2	ØD3	ℓ2	L	No. of flute	ap
HSK100A	AM4040046-2	6	40	100	88	75	114	2	46
	AM4050061-2	8	50	100	88	95	134	2	61
	AM4063061-4	16	63	100	88	90	129	4	61
	AM4080076-4	20	80	100	88	105	144	4	76
	AM4100076-6	30	100	100	88	105	144	6	76

Available inserts

APMT-MA



APMT-ML



APMT-MM



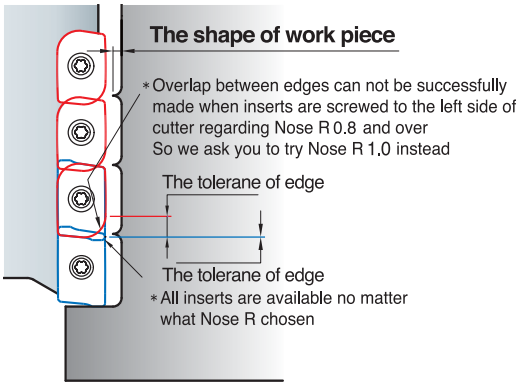
APMT-MF



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	1806PDFR-MA															●		E05
	180604PDFR-MA															●		
	180612PDFR-MA															●		
	180616PDFR-MA															●		
	180620PDFR-MA															●		
	180624PDFR-MA															●		
	180630R-MA															●		
	1806PDER-ML													●	●			
	180604PDER-ML													●	●			
	180612PDER-ML													●	●			
	180616PDER-ML													●	●			

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	G10	H01	
APMT	180620PDER-ML													●	●			E05
	180624PDER-ML													●	●			
	180630R-ML													●	●			
	1806PDSR-MM				●			●	●	●	●	●	●	●	●			
	1806PDSR-MF				●						●		●	●	●			
	180612PDSR-MM				●					●	●			●	●			
	180616PDSR-MM				●						●			●	●			
	180620PDSR-MM																	
	180624PDSR-MM				●						●			●	●			
	180630R-MM										●			●	●			
	180632R-MM				●						●			●	●			

Caution when clamping the inserts



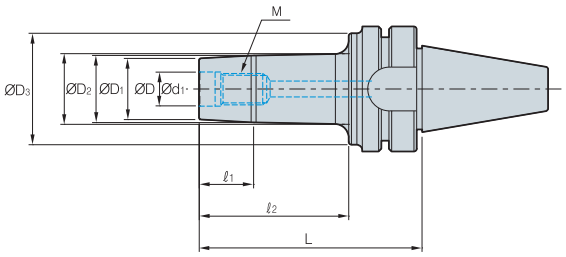
Parts

Specification	Screw	Wrench
Ø40~Ø100	FTKA0410	TW15S

Available inserts E05

BT30/BT40/BT50





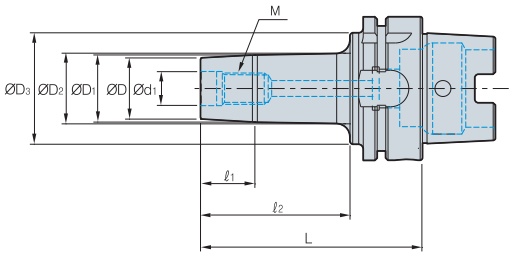
(mm)

Designation		ØD	ØD1	ØD2	ØD3	Ød1	ℓ1	ℓ2	L	M
BT30-	MAT-M06-053	11	11.7	13	30	6.5	5	21	53	M06*1.0
	MAT-M08-057	14.5	15.7	17.5	35	8.5	7	25	57	M08*1.25
	MAT-M10-062	18	19.7	24	38	10.5	7	30	62	M10*1.5
	MAT-M12-067	23	24.7	27.5	41	12.5	10	35	67	M12*1.75
	MAT-M16-067	29	31.7	33.5	41	17	10	35	67	M16*2.0
BT40-	MAT-M06-062	11	11.7	14	40	6.5	5	25	62	M06*1.0
	MAT-M06-077	11	11.7	14	40	6.5	5	40	77	M06*1.0
	MAT-M06-092	11	11.7	14	40	6.5	5	55	92	M06*1.0
	MAT-M08-067	14.5	15.7	19	44	8.5	7	30	67	M08*1.25
	MAT-M08-082	14.5	15.7	19	44	8.5	7	45	82	M08*1.25
	MAT-M08-097	14.5	15.7	19	44	8.5	7	60	97	M08*1.25
	MAT-M10-072	18	19.7	23	50	10.5	10	35	72	M10*1.5
	MAT-M10-087	18	19.7	23	50	10.5	10	50	87	M10*1.5
	MAT-M10-102	18	19.7	23	50	10.5	10	65	102	M10*1.5
	MAT-M12-077	23	24.7	30	55	12.5	10	40	77	M12*1.75
	MAT-M12-092	23	24.7	30	55	12.5	13	55	92	M12*1.75
	MAT-M12-107	23	24.7	30	55	12.5	13	70	107	M12*1.75
	MAT-M16-077	29	31.7	37	55	17	13	40	77	M16*2.0
	MAT-M16-092	29	31.7	37	55	17	13	55	92	M16*2.0
	MAT-M16-107	29	31.7	37	55	17	13	70	107	M16*2.0
BT50-	MAT-M06-083	11	11.7	15	40	6.5	5	35	83	M06*1.0
	MAT-M06-098	11	11.7	15	40	6.5	5	50	98	M06*1.0
	MAT-M06-113	11	11.7	15	40	6.5	5	65	113	M06*1.0
	MAT-M08-088	14.5	15.7	20	45	8.5	7	40	88	M08*1.25
	MAT-M08-103	14.5	15.7	20	45	8.5	7	55	103	M08*1.25
	MAT-M08-118	14.5	15.7	20	45	8.5	7	70	118	M08*1.25
	MAT-M10-093	18	19.7	25	55	10.5	10	45	93	M10*1.5
	MAT-M10-113	18	19.7	25	55	10.5	10	65	113	M10*1.5
	MAT-M10-128	18	19.7	25	55	10.5	10	80	128	M10*1.5
	MAT-M12-103	23	24.7	33	65	12.5	10	55	103	M12*1.75
	MAT-M12-118	23	24.7	33	65	12.5	13	70	118	M12*1.75
	MAT-M12-133	23	24.7	33	65	12.5	13	85	133	M12*1.75
	MAT-M16-103	29	31.7	41	85	17	13	55	103	M16*2.0
	MAT-M16-118	29	31.7	41	85	17	13	70	118	M16*2.0
	MAT-M16-133	29	31.7	41	85	17	13	85	133	M16*2.0

Available modular E41

HSK63A/HSK100A





(mm)

Designation		ØD	ØD1	ØD2	ØD3	Ød1	ℓ1	ℓ2	L	M
HSK63A-	MAT-M06-061	11	11.7	27	40	6.5	5	25	61	M06*1.0
	MAT-M06-076	11	11.7	27	40	6.5	5	40	76	M06*1.0
	MAT-M06-091	11	11.7	27	40	6.5	5	55	91	M06*1.0
	MAT-M08-066	14.5	15.7	30.5	44	8.5	7	30	66	M08*1.25
	MAT-M08-081	14.5	15.7	30.5	44	8.5	7	45	81	M08*1.25
	MAT-M08-096	14.5	15.7	30.5	44	8.5	7	60	96	M08*1.25
	MAT-M10-071	18	19.7	34	50	10.5	10	35	71	M10*1.5
	MAT-M10-086	18	19.7	34	50	10.5	10	50	86	M10*1.5
	MAT-M10-101	18	19.7	34	50	10.5	10	65	101	M10*1.5
	MAT-M12-076	23	24.7	36.5	55	12.5	10	40	76	M12*1.75
	MAT-M12-091	23	24.7	36.5	55	12.5	13	55	91	M12*1.75
	MAT-M12-106	23	24.7	36.5	55	12.5	13	70	106	M12*1.75
	MAT-M16-076	29	31.7	38.5	55	17	13	40	76	M16*2.0
	MAT-M16-091	29	31.7	38.5	55	17	13	55	91	M16*2.0
	MAT-M16-106	29	31.7	38.5	55	17	13	70	106	M16*2.0
HSK100A-	MAT-M06-074	11	11.7	15	40	6.5	5	35	74	M06*1.0
	MAT-M06-089	11	11.7	15	40	6.5	5	50	89	M06*1.0
	MAT-M06-104	11	11.7	15	40	6.5	5	65	104	M06*1.0
	MAT-M08-079	14.5	15.7	20	45	8.5	7	40	79	M08*1.25
	MAT-M08-094	14.5	15.7	20	45	8.5	7	55	94	M08*1.25
	MAT-M08-109	14.5	15.7	20	45	8.5	7	70	109	M08*1.25
	MAT-M10-084	18	19.7	25	55	10.5	10	45	84	M10*1.5
	MAT-M10-104	18	19.7	25	55	10.5	10	65	104	M10*1.5
	MAT-M10-119	18	19.7	25	55	10.5	10	80	119	M10*1.5
	MAT-M12-094	23	24.7	33	65	12.5	10	55	94	M12*1.75
	MAT-M12-109	23	24.7	33	65	12.5	13	70	109	M12*1.75
	MAT-M12-124	23	24.7	33	65	12.5	13	85	124	M12*1.75
	MAT-M16-094	29	31.7	41	85	17	13	55	94	M16*2.0
	MAT-M16-109	29	31.7	41	85	17	13	70	109	M16*2.0
	MAT-M16-124	29	31.7	41	85	17	13	85	124	M16*2.0

Available modular **E41**

Rigid body employs high tensile aluminum

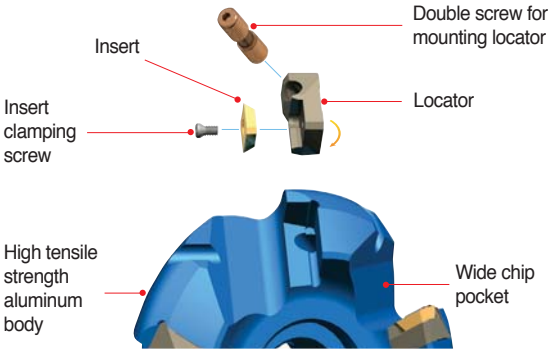
Future Mill

- Light-weight aluminum body (50% of steel body) can be used for high speed cutting, tapping center, and on low power machines
- Easy handling
- It can be used for aluminum alloys, medium cutting of steel, and cast iron
- Rigid body employs high tensile aluminum
- Locators for excellent durability
- A variety of chip breaker are available
- The high rake angle provides low cutting loads and good surface roughness

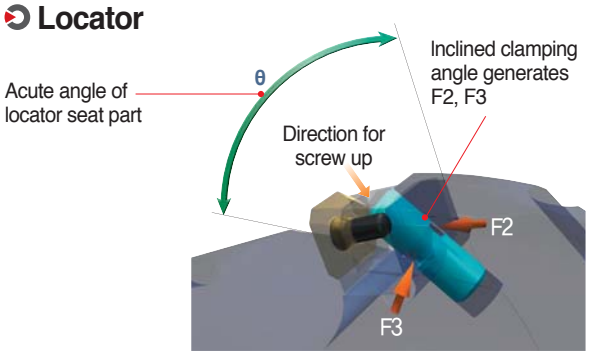
Features of cutter

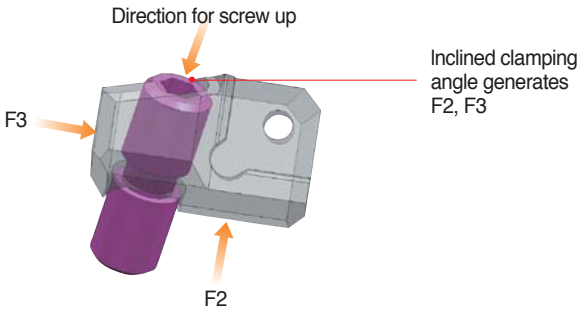
- Strong clamping between aluminum body and locator with double screw provides high efficiency
- Acute angle of locator seat provides strong clamping
- Wide chip pocket area provides good chip evacuation
- High tensile strength aluminum body

Assembly structure of cutter



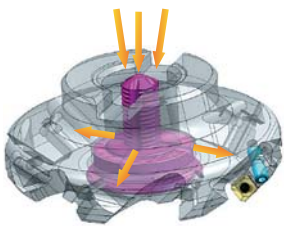
Locator



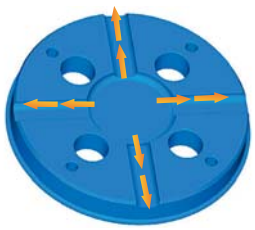


Through coolant system

- Exclusively designed coolant bolt and cover provide excellent coolant action and chip evacuation for improved tool life
- Exact coolant direction to cutting area
- Exclusive coolant bolt and cover are sold separately. Through coolant arbor is required

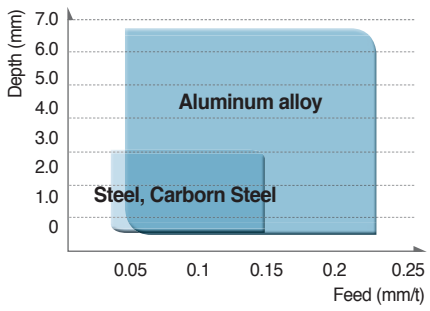


• Bolt: Ø63~Ø160

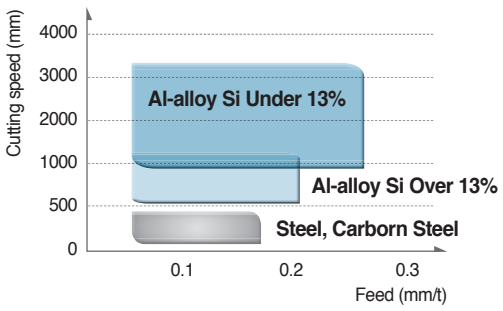


• Cover: Over Ø200

Application range as per workpiece



Cutting speed



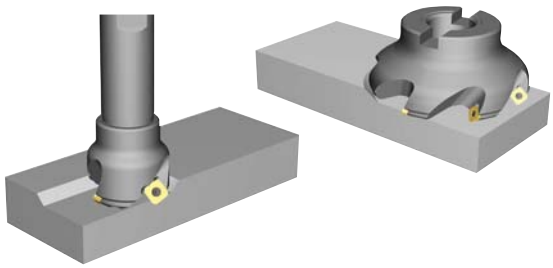
Max. available revolution

Cutter diameter	Max. revolution
Ø63	20,000
Ø80	16,000
Ø100	13,000
Ø125	10,000
Ø160	8,000
Ø200	6,500
Ø250	5,000
Ø315	4,000

Future Mill (FMA)

Features

- General milling cutter for high productivity
- Adjustable pitch of cutter and various chip breaker offer wide application range.
- Light cutter body allows high speed cutting and can be used in low horse power machine
- Smooth cutting with low cutting load is accomplished with High-rake angle



Features of chip breaker

Type	Chip breaker	Cutting-edge	Features
Light cutting	No C/B		• Superior surface roughness at finishing due to ground type cermet insert
	MF 		• Superior cutting quality for light and difficult-to-cut material machining through the low cutting load of chip breaker
General cutting	MM 		• Suitable for various cutting due to special shape design for general cutting
Roughing	MR 		• Tough cutting-edge provides stable cutting performance in severe interruption
For aluminum	MA 		• Superior cutting quality for aluminum due to sharp cutting-edge and buffed surface - S□ET-MA: Sharp cutting-edge due to high accurate grinding - S□XT-MA: Suitable cutting-edge for roughing

Recommended cutting condition

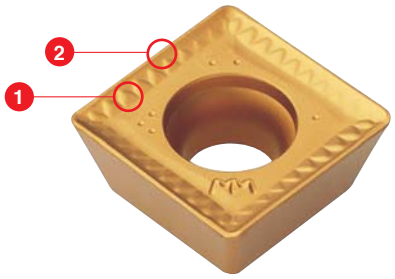
(mm)

ISO	Grades	vc (m/min)	MF	MM	MR	MA
			fz (mm/t)	fz (mm/t)	fz (mm/t)	fz (mm/t)
P	NC5330	210~350	0.05~0.20	0.10~0.30	0.10~0.30	-
	NCM325	190~310	0.05~0.20	0.10~0.30	0.10~0.30	-
	PC3500	160~270	0.05~0.20	0.10~0.30	0.10~0.30	-
M	PC9530	90~150	0.05~0.15	0.10~0.30	-	-
	NCM335	70~120	0.05~0.15	0.10~0.30	-	-
K	PC5300	110~180	0.05~0.20	0.10~0.30	-	-
Aluminum	H01	260~440	-	-	-	0.10~0.35

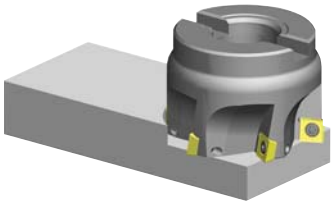
Future Mill (FMP)

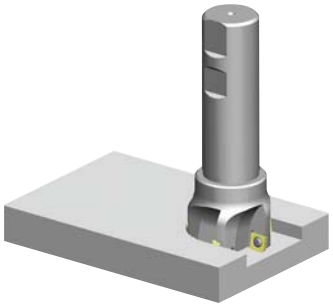
Features

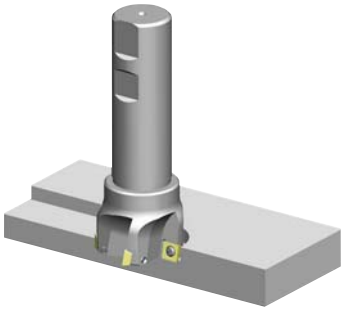
- The strong cutting-edge ensures excellent tool life in high feed and high speed, deep depth of cut, with low cutting loads
- Optimal grades for most workpieces make high efficiency cutting possible
- Unique chip breaker makes good chip evacuation and lower cutting loads (1)
- Innovative curve cutting-edge lowers cutting load and provides a stronger cutting-edge (2)



Machining examples







Features of chip breaker

- Innovative special cutting-edge and chip breaker design ensures ideal 90˚cutting and low cutting load
- Various applications are available with multi functional cutters (Facing, Slotting, Shouldering)
- Improved tool life due to special coated grades
- Superior cutting quality at deep cutting depth through the low cutting load and strong cutting-edge

Recommended C/B and grade as per workpiece

Chip breaker	Cutter edge	Recommended C/B and grade as per workpiece (●: 1st)									
		Low carbon steel/Mild steel		High carbon steel/Mild steel		Stainless steel		Cast iron		Aluminum alloy	
		C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades	C/B	Grades
MF Low cutting load type		●	○NCM325 ○NC5330 ●NCM335		●NCM325 ○NC5330 ○NCM335	●	○NCM325 ○NC5330 ●NCM335	●	●PC6510 ○PC215K	-	-
MM Reinforced cutting edge type			○NCM325 ○NC5330 ●NCM335		●NCM325 ○NC5330 ○NCM335		○NCM325 ○NC5330 ●NCM335		●PC6510 ○PC215K	-	-
MA Sharp cutting edge type		-	-	-	-	-	-	-	-	●	●H01 ○G10

Recommended cutting condition

(mm)

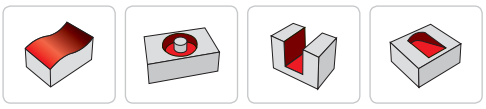
ISO	Cutting Speed vc (m/min)					
	CVD Coated		PVD Coated			Carbide
	NCM325	NCM335	PC6510	PC8520	PC9530	H01
P	190~310	180~290	-	-	-	-
M	110~180	100~160	-	110~180	90~150	-
K	-	-	180~230	-	-	-
N	-	-	-	-	-	260~440

Future Mill (FMR)

Features

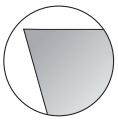
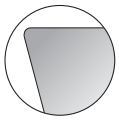
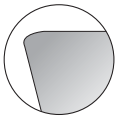
- Wide coverage for medium to roughing, general steel to high hardness mold materials
- 2 step shape of insert provides strong clamping and can minimize components to replace the shim
- 4-8 cutting-edge available per insert (Inscribed circle 05, 06, 07, 08, 10, 12, 16, 20)
- Uneven flute spacing prevents vibration on high speed applications and provides more stable machining
- Precise design of the insert seat prevents insert from chattering
- Special design of the insert bottom prevents movement and chatter of insert
- Easy to change cutting-edge due to the rotation prevention design of the insert

Machining examples



Copying | Helical | Slotting & Side cutting | Ramping

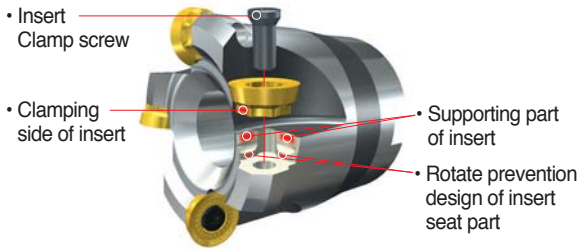
FMR Insert cutting-edge shape

Designation	RDHW□□□□M0F	RDHW□□□□M0E	RDHW□□□□M0S
Cutting edge shape (G calss)			

Features of chip breakers

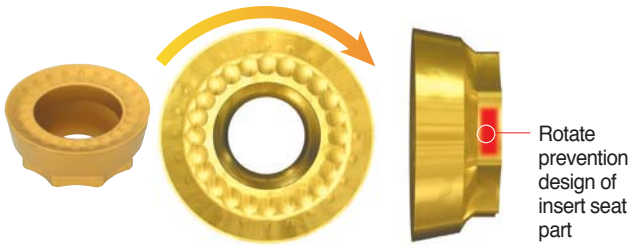
Chip breakers		Cutter edge	Features
Finishing **MF**			• Low cutting resistance chip breaker design guarantees long tool life good performance at finishing and difficult-to-cut material machining
Medium **MM**			• Suitable for general milling at wide application range
Aluminum **MA**			• Sharp cutting-edge and buffed top face for aluminum machining prevent welding and control chip flow

Clamping system



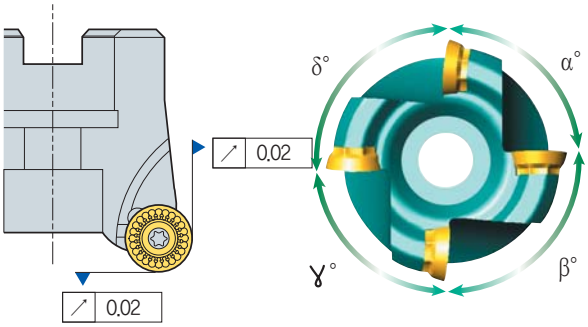
FMR□3000 type
FMR□4000 type

FMR□5000 type
FMR□6000 type



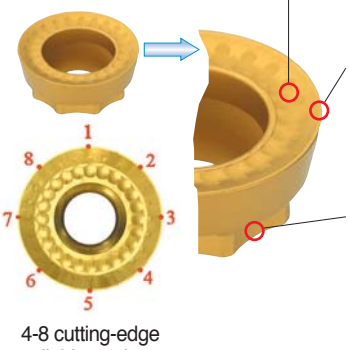
RDKT10T3M0-□□
RDKT1204M0-□□

RDKT1605M0-MM
RDKT2006M0-MM



Good surface finish due to the precise design of insert seat part of cutter

Uneven flute spacing prevents vibration at high speed application and provides stable machining



4-8 cutting-edge available per insert

Special chip breaker for low cutting load
Minimized heat generation due to smooth chip flow

Smooth cutting-edge preparation
Inclined land angle
Low cutting load and better surface roughness

Facial contact through curved face
Prevent rotation at high speed cutting
Stable and tight clamping of insert
Good positioning of insert repeatedly

Future Mill (FMR)

Chip removal rate (cm^3/min)

Workpiece		Grades	Ø8	Ø10	Ø12	Ø15	Ø16	Ø20	Ø21	Ø25	Ø26	Ø32	Ø33	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160
P	General structure steel (under 200HB)	PC3500 PC5300	4.97	9.94	9.94	14.92	31.83	31.83	47.74	47.74	47.74	71.61	38.19	95.49	119.36	143.23	167.11	190.98	133.69	509.29
			vc = 250, fz = 0.25, ap = 0.5, ae = 0.5D				vc = 300, fz = 0.4 ap = 1.0, ae = 0.5D		vc = 250, fz = 0.4, ap = 1.5, ae = 0.5D											vc = 200, fz = 0.5 ap = 4.0, ae = 0.5D
	General carbon steel (under 30 HRC)		3.97	7.95	7.95	11.93	25.46	25.46	38.19	38.19	38.19	57.29	38.19	76.39	95.49	114.59	133.69	152.78	133.69	458.36
			vc = 200, fz = 0.25, ap = 0.5, ae = 0.5D				vc = 250, fz = 0.4 ap = 1.0, ae = 0.5D		vc = 200, fz = 0.4, ap = 1.5, ae = 0.5D											vc = 180, fz = 0.5 ap = 4.0, ae = 0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.86	5.72	5.72	8.59	22.91	22.91	34.37	34.37	34.37	51.56	34.37	68.75	85.94	103.13	120.32	137.5	120.32	407.43
			vc = 180, fz = 0.20, ap = 0.5, ae = 0.5D				vc = 200, fz = 0.4 ap = 1.0, ae = 0.5D		vc = 180, fz = 0.4, ap = 1.5, ae = 0.5D											vc = 160, fz = 0.5 ap = 4.0, ae = 0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1.24	2.48	2.48	3.72	11.45	11.45	14.32	17.18	14.32	21.48	14.32	28.64	35.8	42.97	50.13	57.29	50.13	249.55
			vc = 130, fz = 0.15, ap = 0.4, ae = 0.5D				vc = 170, fz = 0.3 ap = 0.9, ae = 0.5D		vc = 150, fz = 0.3, ap = 1.0, ae = 0.5D											vc = 140, fz = 0.4 ap = 3.5, ae = 0.5D
	Alloy steel (over 50 HRC)		0.95	1.9	1.9	2.86	7.63	7.63	9.54	11.45	9.54	14.32	9.54	19.09	23.87	28.64	33.42	38.19	33.42	152.78
			vc = 100, fz = 0.15, ap = 0.4, ae = 0.5D				vc = 130, fz = 0.3 ap = 0.9, ae = 0.5D		vc = 100, fz = 0.3, ap = 1.0, ae = 0.5D											vc = 100, fz = 0.4 ap = 3.0, ae = 0.5D
M	Stainless steel	PC5300	2.06	4.13	4.13	6.2	16.55	16.55	12.41	24.82	12.41	18.62	12.41	24.82	31.03	37.24	43.44	49.65	43.44	331.04
			vc = 130, fz = 0.20, ap = 0.5, ae = 0.5D				vc = 200, fz = 0.2 ap = 1.0, ae = 0.5D		vc = 100, fz = 0.3, ap = 1.0, ae = 0.5D											vc = 130, fz = 0.5 ap = 4.0, ae = 0.5D
K	Cast iron	PC5300	2.86	5.72	5.72	8.59	14.32	14.32	21.48	21.48	21.48	32.22	21.48	42.97	53.71	64.45	75.2	85.94	75.2	366.69
			vc = 180, fz = 0.20, ap = 0.5, ae = 0.5D				vc = 180, fz = 0.2 ap = 1.0, ae = 0.5D		vc = 180, fz = 0.2, ap = 1.5, ae = 0.5D											vc = 180, fz = 0.4 ap = 4.0, ae = 0.5D

Required machine power (P_{KW} = 0.75 x P_{HP})

•RDKT10□□

Workpiece		Grades	Ø21	Ø25	Ø26	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Cutting condition vc	fz	ap	ae
P	General structure steel (under 200HB)	PC3500 PC5300	2.2	2.2	2.2	3.3	4.4	5.5	6.6	7.7	8.8	250	0.4	1.5	0.5D
	General carbon steel (under 30 HRC)		2.1	2.1	2.1	3.1	4.1	5.2	6.2	7.3	8.3	200	0.4	1.5	0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	2.2	3.3	4.5	5.6	6.7	7.9	9	180	0.4	1.5	0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1.1	1.1	1.1	1.6	2.1	2.6	3.2	3.7	4.2	150	0.3	1.0	0.5D
	Alloy steel (over 50 HRC)		0.7	0.7	0.7	1.1	1.4	1.7	2.1	2.4	2.8	100	0.3	1.0	0.5D
M	Stainless steel	PC5300	0.6	0.6	0.6	0.8	1.2	1.5	1.7	2	2.3	130	0.2	1.5	0.5D
K	Cast iron	PC5300	0.6	0.6	0.6	0.9	1.2	1.5	1.8	2.1	2.4	180	0.2	1.5	0.5D

• The figures in the above chart means Php value.

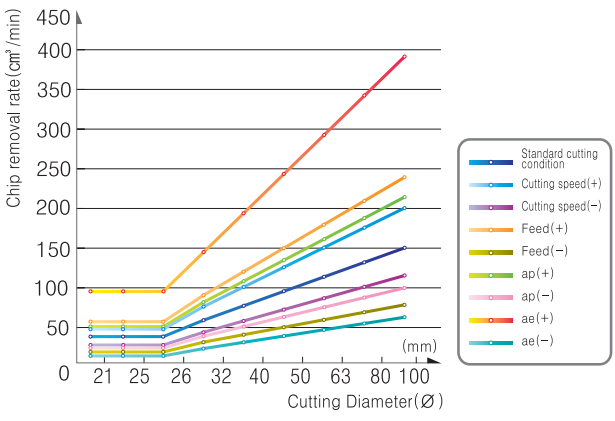
•RDKT12□□

Workpiece		Grades	Ø32	Ø33	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Cutting condition vc	fz	ap	ae
P	General structure steel (under 200HB)	PC3500 PC5300	1.7	1.7	2.6	3.5	3.5	4.4	5.3	6.1	200	0.4	1.5	0.5D
	General carbon steel (under 30 HRC)		2	2	3.1	4.1	2.6	5.2	6.2	7.2	180	0.4	1.5	0.5D
	High carbon steel, Alloy steel (30~40 HRC)		2.2	2.2	3.3	4.4	2.8	5.6	6.7	7.8	160	0.4	1.5	0.5D
	High carbon steel, Alloy steel (40~50 HRC)		1	1	1.5	1.6	2.1	2.6	3.1	3.6	140	0.3	1.0	0.5D
	Alloy steel (over 50 HRC)		0.7	0.7	1	1.4	0.8	1.7	2.1	2.4	100	0.3	1.0	0.5D
M	Stainless steel	PC5300	0.5	0.5	0.8	1.1	0.7	1.4	1.7	2	130	0.2	1.5	0.5D
K	Cast iron	PC5300	0.6	0.6	0.9	1.2	0.7	1.5	1.8	2.1	180	0.2	1.5	0.5D

• The figures in the above chart means Php value.

Chip removal rate by cutting condition

• Used insert: RDKT10□□



• Variation of cutting condition

Standard	ISO vc = 200 fz = 0.4 ap = 1.5 ae = 0.5D
Speed (+)	250
Speed (−)	150
Feed (+)	0.6
Feed (−)	0.2
ap (+)	2
ap (−)	1
ae (+)	D
ae (−)	0.2D

Recommended cutting condition

• Side milling, slotting, ramping, copying

Workpiece		Hardness	Grades	Cutting speed (m/min)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	Cabon steel	200HB ≤	PC5300	280	≤ 1.0	≤ 0.4	≤ 1.2	≤ 0.4	≤ 1.5	≤ 0.4	≤ 1.7	≤ 0.4	≤ 2.0	≤ 0.5	≤ 2.4	≤ 0.6	≤ 3.0	≤ 0.7	≤ 4.0	≤ 0.8
			PC5400	245																
		30HRC ≤	PC5300	250	≤ 0.7	≤ 0.4	≤ 1.2	≤ 0.4	≤ 1.5	≤ 0.4	≤ 1.7	≤ 0.4	≤ 2.0	≤ 0.5	≤ 2.4	≤ 0.6	≤ 3.0	≤ 0.7	≤ 4.0	≤ 0.8
			PC5400	210																
	Alloy steel	30~40HRC	PC5300	195	≤ 0.7	≤ 0.2	≤ 0.9	≤ 0.2	≤ 1.2	≤ 0.2	≤ 1.5	≤ 0.2	≤ 1.7	≤ 0.3	≤ 2.0	≤ 0.4	≤ 2.7	≤ 0.5	≤ 3.7	≤ 0.6
			PC5400	170																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	150	≤ 0.7	≤ 0.2	≤ 0.9	≤ 0.2	≤ 1.2	≤ 0.2	≤ 1.5	≤ 0.2	≤ 1.7	≤ 0.3	≤ 2.0	≤ 0.4	≤ 2.7	≤ 0.5	≤ 3.7	≤ 0.6
			PC5400	130																
		Tensile strength 350MPa ≤	PC5300	120	≤ 0.7	≤ 0.2	≤ 0.9	≤ 0.2	≤ 1.2	≤ 0.2	≤ 1.5	≤ 0.2	≤ 1.7	≤ 0.3	≤ 2.0	≤ 0.4	≤ 2.7	≤ 0.5	≤ 3.7	≤ 0.6
			PC5400	105																
M	Stainless steel	270HB≤	PC5300	130	≤ 0.7	≤ 0.2	≤ 0.9	≤ 0.2	≤ 1.2	≤ 0.2	≤ 1.5	≤ 0.2	≤ 1.7	≤ 0.3	≤ 2.0	≤ 0.4	≤ 2.7	≤ 0.5	≤ 3.7	≤ 0.6
			PC5400	110																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	145	≤ 0.7	≤ 0.4	≤ 1.2	≤ 0.4	≤ 1.5	≤ 0.4	≤ 1.7	≤ 0.4	≤ 2.0	≤ 0.5	≤ 2.4	≤ 0.6	≤ 3.0	≤ 0.7	≤ 4.0	≤ 0.8
			PC5400	110																

• Plunging

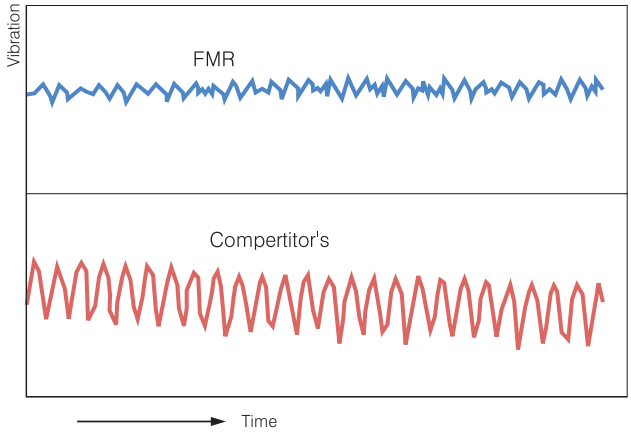
Workpiece		Hardness	Grades	Cutting speed (m/min)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	Cabon steel	200HB ≤	PC5300	280	≤ 2.5	≤ 0.2	≤ 3.0	≤ 0.2	≤ 3.5	≤ 0.2	≤ 4.0	≤ 0.2	≤ 5.0	≤ 0.3	≤ 6.0	≤ 0.4	≤ 8.0	≤ 0.5	≤ 10.0	≤ 0.6
			PC5400	245																
		30HRC ≤	PC5300	250	≤ 2.5	≤ 0.2	≤ 3.0	≤ 0.2	≤ 3.5	≤ 0.2	≤ 4.0	≤ 0.2	≤ 5.0	≤ 0.3	≤ 6.0	≤ 0.4	≤ 8.0	≤ 0.5	≤ 10.0	≤ 0.6
			PC5400	210																
	Alloy steel	30~40HRC	PC5300	195	≤ 2.5	≤ 0.1	≤ 3.0	≤ 0.1	≤ 3.5	≤ 0.1	≤ 4.0	≤ 0.1	≤ 5.0	≤ 0.2	≤ 6.0	≤ 0.3	≤ 8.0	≤ 0.4	≤ 10.0	≤ 0.5
			PC5400	170																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	150	≤ 2.5	≤ 0.1	≤ 3.0	≤ 0.1	≤ 3.5	≤ 0.1	≤ 4.0	≤ 0.1	≤ 5.0	≤ 0.2	≤ 6.0	≤ 0.3	≤ 8.0	≤ 0.4	≤ 10.0	≤ 0.5
			PC5400	130																
		Tensile strength 350MPa ≤	PC5300	120	≤ 2.5	≤ 0.1	≤ 3.0	≤ 0.1	≤ 3.5	≤ 0.1	≤ 4.0	≤ 0.1	≤ 5.0	≤ 0.2	≤ 6.0	≤ 0.3	≤ 8.0	≤ 0.4	≤ 10.0	≤ 0.5
			PC5400	105																
M	Stainless steel	270HB≤	PC5300	130	≤ 2.5	≤ 0.1	≤ 3.0	≤ 0.1	≤ 3.5	≤ 0.1	≤ 4.0	≤ 0.1	≤ 5.0	≤ 0.2	≤ 6.0	≤ 0.3	≤ 8.0	≤ 0.4	≤ 10.0	≤ 0.5
			PC5400	110																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	145	≤ 2.5	≤ 0.2	≤ 3.0	≤ 0.2	≤ 3.5	≤ 0.2	≤ 4.0	≤ 0.2	≤ 5.0	≤ 0.3	≤ 6.0	≤ 0.4	≤ 8.0	≤ 0.5	≤ 10.0	≤ 0.6
			PC5400	110																

• Helical cutting

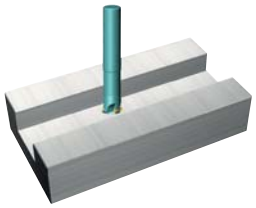
Workpiece		Hardness	Grades	Cutting speed (m/min)	FMR1000		FMR1500		FMR2000		FMR2500		FMR3000		FMR4000		FMR5000		FMR6000	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	Cabon steel	200HB ≤	PC5300	280	≤ 1.0	≤ 0.2	≤ 1.0	≤ 0.2	≤ 1.0	≤ 0.2	≤ 1.0	≤ 0.2	≤ 2.0	≤ 0.3	≤ 2.0	≤ 0.4	≤ 4.0	≤ 0.5	≤ 4.0	≤ 0.6
			PC5400	245																
		30HRC ≤	PC5300	250	≤ 0.7	≤ 0.2	≤ 0.7	≤ 0.2	≤ 0.7	≤ 0.2	≤ 0.7	≤ 0.2	≤ 2.0	≤ 0.3	≤ 2.0	≤ 0.4	≤ 4.0	≤ 0.5	≤ 4.0	≤ 0.6
			PC5400	210																
	Alloy steel	30~40HRC	PC5300	195	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 1.7	≤ 0.2	≤ 1.7	≤ 0.3	≤ 3.7	≤ 0.4	≤ 3.7	≤ 0.5
			PC5400	170																
	High alloy steel (alloy constituent > 5%)	40~50HRC	PC5300	150	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 1.7	≤ 0.2	≤ 1.7	≤ 0.3	≤ 3.7	≤ 0.4	≤ 3.7	≤ 0.5
			PC5400	130																
		Tensile strength 350MPa ≤	PC5300	120	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 1.7	≤ 0.2	≤ 1.7	≤ 0.3	≤ 3.7	≤ 0.4	≤ 3.7	≤ 0.5
			PC5400	105																
M	Stainless steel	270HB≤	PC5300	130	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 0.7	≤ 0.1	≤ 1.7	≤ 0.2	≤ 1.7	≤ 0.3	≤ 3.7	≤ 0.4	≤ 3.7	≤ 0.5
			PC5400	110																
K	Cast iron, Ductile cast iron	Low tensile	PC5300	145	≤ 1.0	≤ 0.2	≤ 1.0	≤ 0.2	≤ 1.0	≤ 0.2	≤ 1.0	≤ 0.2	≤ 2.0	≤ 0.3	≤ 2.0	≤ 0.4	≤ 4.0	≤ 0.5	≤ 4.0	≤ 0.6
			PC5400	110																

Future Mill (FMR)

FMR Vibration test



Machining example



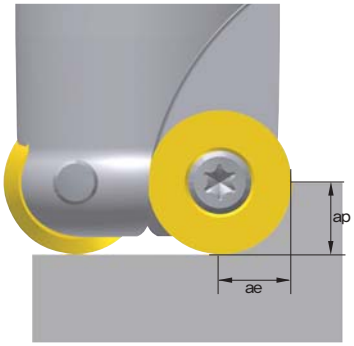
- **Workpiece** STD11
- **Cutting condition** vc = 200m/min
  fz = 0.40mm/t
  ap = 2.0mm
  ae = 4.0mm
- **Designation** FMRS3032RD-S
  RDKT10T3M0-MM
  (PC3500)

Cutting condition formulas for milling

Cutting speed	RPM
$vc = \frac{\pi \times D \times n}{1000}$ (m/min)	$n = \frac{vc \times 1000}{\pi \times D}$ (min^{-1})

Feed (per tooth)	Feed (per minute)
$fz = \frac{vf}{Z \times n}$ (mm/t)	$vf = fz \times n \times z$ (mm/min)

Chip removal rate	Required machine power
$Q = \frac{ap \times ae \times vf}{1000}$ (cm^3/min)	$Pkw = \frac{Q \times kc}{60 \times 102 \times \eta}$ (kW) $Php = \frac{Pc}{0.75}$ (hp)



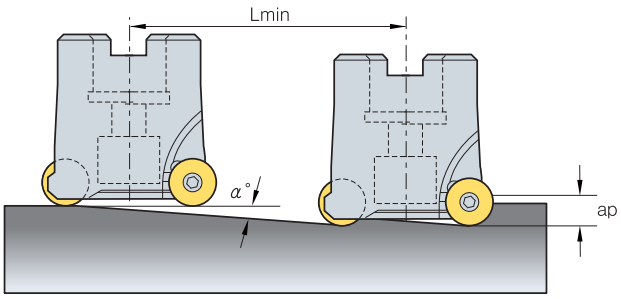
vc = Cutting speed (m/min)	**Pkw** = Required machine power (kW)
n = Revolution per a minute (min^{-1})	**Php** = Horsepower requirement (hp)
D = Cutting diameter (mm)	**Q** = Chip removal amount (cm^3/min)
De = Efficient cutting diameter (mm)	**ap** = Depth of cut (mm)
vf = Feed per a minute (mm/min)	**ae** = Width of cut (mm)
fz = Feed per tooth (mm/t)	**Kc** = Specific cutting resistance (MPa)
z = Number of tooth	η = Mechanical efficiency (%)
Pc = Power requirement (kW)	

Feed as per cutting depth

Designation	Chip breaker	Depth of cut (mm)								
		0.2~0.5	0.5~1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
RDHW0501M0	-	0.25	0.15	-	-	-	-	-	-	-
RDHW06T1M0	-	0.30	0.20	0.10	-	-	-	-	-	-
RDHW0702M0	-	0.35	0.25	0.10	0.07	-	-	-	-	-
RDHW0803M0	-	0.40	0.30	0.15	0.01	-	-	-	-	-
RDKT10T3M0 -	MF/MM	-	0.40	0.35	0.30	0.20	-	-	-	-
RDKT1204M0 -	MF/MM	-	0.50	0.45	0.30	0.25	0.22	-	-	-
RDHW1605M0	-	-	0.60	0.50	0.45	0.35	0.30	0.20	0.10	-
RDHW2006M0	-	-	-	0.60	0.50	0.40	0.30	0.25	0.15	0.10
RDKT1605M0 -	MM	-	0.60	0.50	0.45	0.35	0.30	0.20	0.10	-
RDKT2006M0 -	MM	-	-	0.60	0.50	0.40	0.30	0.25	0.15	0.10

Future Mill (FMR)

Ramping technical data



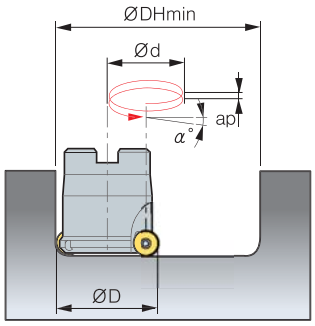
$$Lmin = \frac{ap}{\tan \alpha^{\circ}} \text{ (mm)}$$

※ Lmin: Min. inclination cutting length
α°: Max. ramping angle
ap: Depth of cut

Section	Tool dia.	Ramping angle α° (Max)	Cutting length L (mm) by ramping angle									
			ap = 1	ap = 2	ap = 2.5	ap = 3	ap = 3.5	ap = 4	ap = 5	ap = 6	ap = 8	ap = 10
FMR1000	08	18.14	3	6	8	-	-	-	-	-	-	-
	10	11.7	5	10	12	-	-	-	-	-	-	-
	12	8.43	7	13	17	-	-	-	-	-	-	-
	15	5.93	10	19	24	-	-	-	-	-	-	-
FMR1500	10	20.67	21	5	7	8	-	-	-	-	-	-
	12	10.05	10	11	14	17	-	-	-	-	-	-
	16	6.12	6	19	23	28	-	-	-	-	-	-
	20	4.36	4	26	33	39	-	-	-	-	-	-
FMR2000	15	9.42	6	12	15	18	21	-	-	-	-	-
	20	5.85	10	20	24	29	34	-	-	-	-	-
FMR2500	16	13.7	4	8	10	12	14	16	-	-	-	-
	20	9.29	6	12	15	18	21	24	-	-	-	-
	25	6.56	9	17	22	26	30	35	-	-	-	-
FMR3000	25	21.8	3	5	6	8	9	10	13	-	-	-
	32	13.24	4	9	11	13	15	17	21	-	-	-
	40	9.09	6	13	16	19	22	25	31	-	-	-
	50	6.52	9	17	22	26	31	35	44	-	-	-
	63	4.76	12	24	30	36	42	48	60	-	-	-
	80	3.52	16	33	41	49	57	65	81	-	-	-
	100	2.69	21	43	53	64	74	85	106	-	-	-
FMR4000	32	15.95	3	7	9	10	12	14	17	21	-	-
	40	10.3	6	11	14	17	19	22	28	33	-	-
	50	7.13	8	16	20	24	28	32	40	48	-	-
	63	5.08	11	22	28	34	39	45	56	67	-	-
	80	3.69	16	31	39	47	54	62	78	93	-	-
	100	2.79	21	41	51	62	72	82	103	123	-	-
	125	2.14	27	54	67	80	94	107	134	161	-	-
FMR5000	40	7.4	8	15	19	23	27	31	38	46	62	-
	50	5.22	11	22	27	33	38	44	55	66	88	-
	63	3.79	15	30	38	45	53	60	75	91	121	-
	80	2.97	19	39	48	58	67	77	96	116	154	-
	100	2.09	27	55	69	82	96	110	137	164	219	-
	125	1.63	35	70	88	105	123	141	176	211	281	-
FMR6000	40	7.44	8	15	19	23	27	31	38	46	61	77
	50	4.97	11	23	29	34	40	46	57	69	92	46
	63	3.69	16	31	39	47	54	62	78	93	124	62
	80	2.72	21	42	53	63	74	84	105	126	168	84
	100	2.12	27	54	68	81	95	108	135	162	216	108
	125	1.57	36	73	91	109	128	146	182	219	292	146

Future Mill (FMR)

Helical cutting technical data - ØDH Min



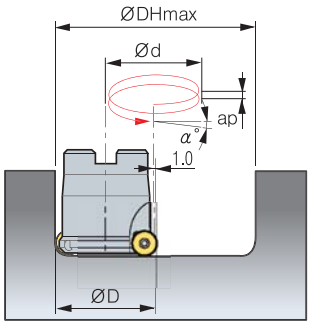
- ØD = Tool dia. (mm), ØDH Min, Max = Min, Max diameter (mm)
- Ød = Tool path (mm)
- ØDH Min (Min diameter) = ØD × 2 - Insert size, ØDH Max (Max diameter) = ØD × 2 - 2
- Ød (Tool path) = ØDH Min, Max - ØD

(mm)

Section	Insert	Tool dia.	ØDH Min	Ød	Ramping angle (α°)									
					ap = 1	ap = 2	ap = 2.5	ap = 3	ap = 3.5	ap = 4	ap = 5	ap = 6	ap = 8	ap = 10
FMR1000	5	08	11	3	6.11	12.35	15.57	-	-	-	-	-	-	-
	5	10	15	5	3.65	7.34	7.34	-	-	-	-	-	-	-
	5	12	19	7	2.61	5.23	5.23	-	-	-	-	-	-	-
	5	15	25	10	1.83	3.65	3.65	-	-	-	-	-	-	-
FMR1500	6	10	14	4	4.57	9.20	9.20	13.95	-	-	-	-	-	-
	6	12	18	6	3.04	6.11	6.11	9.20	-	-	-	-	-	-
	6	16	26	10	1.83	3.65	3.65	5.49	-	-	-	-	-	-
	6	20	34	14	1.30	2.61	2.61	3.92	-	-	-	-	-	-
FMR2000	7	15	23	8	2.28	4.57	4.57	6.88	8.04	-	-	-	-	-
	7	20	33	13	1.40	2.81	2.81	4.22	4.92	-	-	-	-	-
FMR2500	8	16	24	8	2.28	4.57	4.57	6.88	8.04	9.20	-	-	-	-
	8	20	32	12	1.52	3.04	3.04	4.57	5.34	6.11	-	-	-	-
	8	25	42	17	1.07	2.15	2.15	3.22	3.76	4.30	-	-	-	-
FMR3000	10	25	40	15	1.22	2.43	2.43	3.65	4.27	4.88	6.11	-	-	-
	10	32	54	22	0.83	1.66	1.66	2.49	2.91	3.32	4.15	-	-	-
	10	40	70	30	0.61	1.22	1.22	1.83	2.13	2.43	3.04	-	-	-
	10	50	90	40	0.46	0.91	0.91	1.37	1.60	1.83	2.28	-	-	-
	10	63	116	53	0.34	0.69	0.69	1.03	1.21	1.38	1.72	-	-	-
	10	80	150	70	0.26	0.52	0.52	0.78	0.91	1.04	1.30	-	-	-
	10	100	190	90	0.20	0.41	0.41	0.61	0.71	0.81	1.01	-	-	-
FMR4000	12	32	52	20	0.91	1.83	1.83	2.74	3.20	3.65	4.57	5.49	-	-
	12	40	68	28	0.65	1.30	1.30	1.96	2.28	2.61	3.26	3.92	-	-
	12	50	88	38	0.48	0.96	0.96	1.44	1.68	1.92	2.40	2.88	-	-
	12	63	114	51	0.36	0.72	0.72	1.07	1.25	1.43	1.79	2.15	-	-
	12	80	148	68	0.27	0.54	0.54	0.81	0.94	1.07	1.34	1.61	-	-
	12	100	188	88	0.21	0.41	0.41	0.62	0.73	0.83	1.04	1.24	-	-
	12	125	238	113	0.16	0.32	0.32	0.48	0.57	0.65	0.81	0.97	-	-
FMR5000	16	40	64	24	0.76	1.52	1.52	2.28	2.66	3.04	3.81	4.57	6.11	-
	16	50	84	34	0.54	1.07	1.07	1.61	1.88	2.15	2.69	3.22	4.30	-
	16	63	110	47	0.39	0.78	0.78	1.16	1.36	1.55	1.94	2.33	3.11	-
	16	80	144	64	0.29	0.57	0.57	0.86	1.00	1.14	1.43	1.71	2.28	-
	16	100	184	84	0.22	0.43	0.43	0.65	0.76	0.87	1.09	1.30	1.74	-
	16	125	234	109	0.17	0.33	0.33	0.50	0.59	0.67	0.84	1.00	1.34	-
FMR6000	20	50	80	30	0.61	1.22	1.22	1.83	2.13	2.43	3.04	3.65	4.88	6.11
	20	63	106	43	0.42	0.85	0.85	1.27	1.49	1.70	2.12	2.55	3.40	4.25
	20	80	140	60	0.30	0.61	0.61	0.91	1.06	1.22	1.52	1.83	2.43	3.04
	20	100	180	80	0.23	0.46	0.46	0.68	0.80	0.91	1.14	1.37	1.83	2.28
	20	125	230	105	0.17	0.35	0.35	0.52	0.61	0.70	0.87	1.04	1.39	1.74
	20	160	300	140	0.13	0.26	0.26	0.39	0.46	0.52	0.65	0.78	1.04	1.30

Future Mill (FMR)

Helical cutting technical data - ØDH Max



- ØD = Tool dia. (mm), ØDH Min, Max = Min, Max diameter (mm)
- Ød = Tool path (mm)
- ØDH Min (Min diameter) = ØD × 2 - Insert size, ØDH Max (Max diameter) = ØD × 2 - 2
- Ød (Tool path) = ØDH Min, Max - ØD

(mm)

Section	Insert	Tool dia.	ØDH Max	Ød	Ramping angle (α°)									
					ap = 1	ap = 2	ap = 2.5	ap = 3	ap = 3.5	ap = 4	ap = 5	ap = 6	ap = 8	ap = 10
FMR1000	5	08	14	6	3.04	6.11	7.65	-	-	-	-	-	-	-
	5	10	18	8	2.28	4.57	5.72	-	-	-	-	-	-	-
	5	12	22	10	1.83	3.65	4.57	-	-	-	-	-	-	-
	5	15	28	13	1.40	2.81	3.51	-	-	-	-	-	-	-
FMR1500	6	10	18	8	2.28	4.57	5.72	6.88	-	-	-	-	-	-
	6	12	22	10	1.83	3.65	4.57	5.49	-	-	-	-	-	-
	6	16	30	14	1.30	2.61	3.26	3.92	-	-	-	-	-	-
	6	20	38	18	1.01	2.03	2.54	3.04	-	-	-	-	-	-
FMR2000	7	15	28	13	1.40	2.81	3.51	4.22	4.92	-	-	-	-	-
	7	20	38	18	1.01	2.03	2.54	3.04	3.55	-	-	-	-	-
FMR2500	8	16	30	14	1.30	2.61	3.26	3.92	4.57	5.23	-	-	-	-
	8	20	38	18	1.01	2.03	2.54	3.04	3.55	4.06	-	-	-	-
	8	25	48	23	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
FMR3000	10	25	48	23	0.79	1.59	1.98	2.38	2.78	3.18	3.97	-	-	-
	10	32	62	30	0.61	1.22	1.52	1.83	2.13	2.43	3.04	-	-	-
	10	40	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	-	-	-
	10	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	-	-	-
	10	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	-	-	-
	10	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	-	-	-
	10	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	-	-	-
FMR4000	12	32	62	30	0.61	1.22	1.52	1.83	2.13	2.43	3.04	3.65	-	-
	12	40	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	2.88	-	-
	12	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	-	-
	12	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	-	-
	12	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	-	-
	12	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	-	-
	12	125	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	-	-
FMR5000	16	40	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	2.88	3.85	-
	16	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	-
	16	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	-
	16	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	-
	16	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	-
	16	125	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	-
FMR6000	20	50	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	3.81
	20	63	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	2.99
	20	80	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	2.34
	20	100	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	1.86
	20	125	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	1.48
	20	160	318	158	0.12	0.23	0.29	0.35	0.40	0.46	0.58	0.69	0.92	1.16

Future Mill series for mold making

FMR P-positive

- Stable clamping system enables stable machining and productivity
- Varied product line-up ensures wide application range
- Optimal shape and grade with high hardness for hard-to-cut material machining

Features

- P-positive relief angle (11˚) ensures high rigidity and high machinability in die steel and high-resistant alloy machining
- Flat clearance face of insert prevents interference and revolution while machining
- Optimal grades and chip breakers for various workpieces
- Chip breaker
  - Concave shape ensures wide chip pocket and lowers cutting temperature
- Clearance face for preventing rotation
  - Prevents rotation in machining
  - Divides corners
  - Prevents interference in high-feed machining
  - Ensures stable clamping
- Through-coolant system
  - Superb chip evacuation
  - Low cutting heat ensures long tool life

Features of chip breakers

Chip breaker	Cutting-edge	Applications	Features
MA		Aluminum machining	• Optimal cutting-edge for aluminum machining and buffed surface ensure high machinability
ML		Titanium & Inconel machining	• Excellent results in titanium machining thanks to a high hardness cutting-edge and the chip breaker reducing the cutting load
MF		Fine finishing	• Chip breaker for low cutting resistance enables fine finishing.
MM		General machining	• Optimal for general machining
None C/B		Super hard material machining	• Optimal for high hardness die steel and heat resistant alloy

Recommended cutting condition

∗Recommended chip breaker: ● First ○Second

	Workpiece		Hardness	Grades	Cutting conditions				Chip breaker					
					vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)	MA	ML	MF	MM	None C/B 1	None C/B 2
P	Low carbon steel		HB80~180	PC5400	100~250	0.12~0.70	0.3~6.0	0.7D~0.1D	-	-	●	○	-	-
P	High carbon steel		HB180~280	PC5400	100~220	0.12~0.70	0.3~6.0	0.7D~0.1D	-	-	●	○	-	-
P	Low alloy steel		Under HRC27	PC3600	180~290	0.20~0.60	0.3~6.0	0.7D~0.1D	-	-	-	●	○	-
P				PC5400/PC5300	100~200	0.20~0.60	0.3~6.0	0.7D~0.1D	-	-	-	●	○	-
P	Low pre-hardened steel		HRC20~50	PC3600	130~250	0.30~0.50	~0.5	0.7D~0.1D	-	-	-	-	●	○
P				PC2510/PC5300	50~150	0.30~0.50	~0.5	0.7D~0.1D	-	-	-	-	●	○
P	High alloy steel		Under HRC27	PC3600	130~250	0.30~0.50	~0.5	0.7D~0.1D	-	-	-	●	○	-
P				PC5300	100~220	0.30~0.50	~0.5	0.7D~0.1D	-	-	-	●	○	-
P	High pre-hardened steel		HRC20~48	PC2510/PC5300	50~150	0.30~0.50	~0.5	0.7D~0.1D	-	-	-	-	●	○
M	Stainless steel		Under HB270	PC5300/PC5400	100~150	0.20~0.60	0.3~6.0	0.7D~0.1D	-	-	○	●	-	-
K	Gray cast iron, Ductile cast iron		Under 350MPa	PC5300	120~210	0.20~0.60	0.3~6.0	0.7D~0.1D	-	-	○	●	-	-
N	Aluminum		-	H01	300~800	0.30~0.60	0.3~6.0	0.7D~0.1D	●	-	-	-	-	-
S	Heat resistant alloy	Fe	HRC20~30	PC5300/PC5400	35~60	0.30~0.50	~0.5	0.7D~0.1D	-	●	○	-	-	-
S		Ni or Co	HRC40~45	PC5300/PC5400	30~50	0.30~0.50	~0.5	0.7D~0.1D	-	●	○	-	-	-
S	Titanium		HRC35~45	PC5300/PC5400	40~70	0.30~0.50	~1.5	0.7D~0.1D	-	●	○	-	-	-
H	High hardened materials		Over HRC50	PC2505/PC2510	30~50	0.30~0.50	~0.5	0.7D~0.1D	-	-	-	-	●	○

Feed per tooth according to ap (fz, mm/t)

(mm)

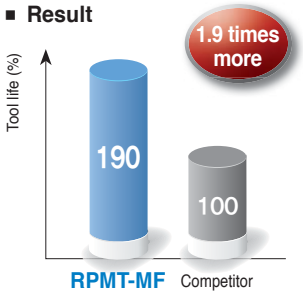
Insert	Insert size (d)	Feed per tooth according to ap							
		ap = 1	ap = 2	ap = 3	ap = 4	ap = 5	ap = 6	ap = 8	ap = 10
RPMT08	8	0.30	0.22	0.18	0.15	-	-	-	-
RPMT10	10	0.40	0.28	0.25	0.20	0.12	-	-	-
RPMT12	12	0.60	0.45	0.35	0.30	0.25	0.20	-	-
RPMT16	16	0.65	0.45	0.40	0.32	0.30	0.28	0.23	-
RPMT20	20	0.70	0.50	0.42	0.35	0.32	0.29	0.25	0.22

Performance evaluation

P Alloy steel (E355C Heat treatment, HRC 38~40)

- **Cutting conditions**: vc (m/min) = 250, fz (mm/tooth) = 0.6, ap (mm) = 1, wet
- **Tools**: **Insert** RPMT1204M0E-MF (PC5300), **Holder** FMRS4032HRP-3L25

■ Result

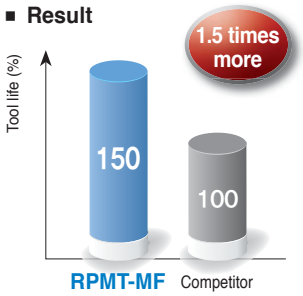




P Low pre-hardened steel (40CrMnNiMo8-6-4 Heat treatment, HRC 30~45)

- **Cutting conditions**: vc (m/min) = 178, fz (mm/tooth) = 0.72, ap (mm) = 1.5, dry
- **Tools**: **Insert** RPMT1606M0S-MM (PC5300), **Holder** FMRCM5063HRP-4

■ Result

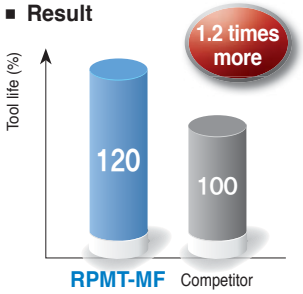


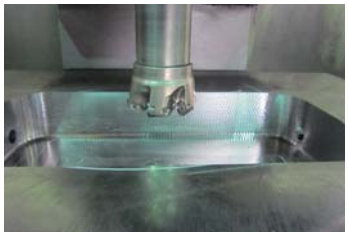


P Low pre-hardened steel (C55E4, HRC 28~33)

- **Cutting conditions**: vc (m/min) = 178, fz (mm/tooth) = 0.74, ap (mm) = 0.8, dry
- **Tools**: **Insert** RPMT1204M0E-MF (PC5300), **Holder** FMRCM4063HRP-6

■ Result

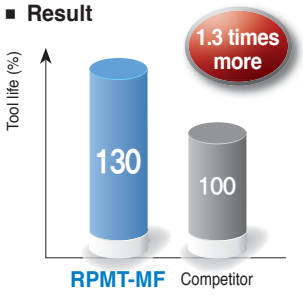




P High pre-hardened steel (X40CrMoV5-1, HRC 50~52)

- **Cutting conditions**: vc (m/min) = 50, fz (mm/tooth) = 0.15, ap (mm) = 4.0, dry
- **Tools**: **Insert** RPMW1204M0S1 (PC5300), **Holder** FMRS4032HRP-3L25

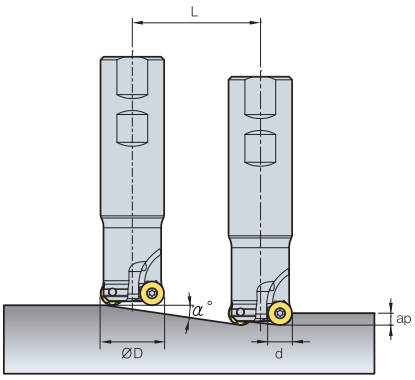
■ Result





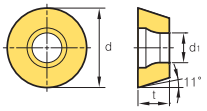
FMR P-positive

Maximum angle table for ramping machining



$$Lmin = \frac{ap}{\tan \alpha^\circ} (mm)$$

※ L (mm): Cutting length
α°: Max. ramping angle
ap: Depth of cut



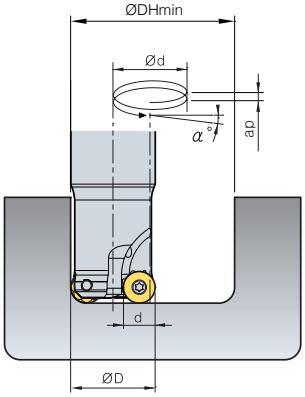
(mm)

Section	Insert size (d)	Tool dia. (ØD)	Ramping angle α° (max)	Cutting length L (mm) by ap									
				ap = 1	ap = 2	ap = 2.5	ap = 3	ap = 3.5	ap = 4	ap = 5	ap = 6	ap = 8	ap = 10
FMR2500	8	17	4.7	12	24	30	36	42	48	-	-	-	-
	8	18	4.1	14	28	34	41	48	55	-	-	-	-
	8	20	15.4	4	7	9	11	13	14	-	-	-	-
	8	21	13.9	4	8	10	12	14	16	-	-	-	-
	8	25	9.8	6	12	14	17	20	23	-	-	-	-
	8	26	9.2	6	12	16	19	22	25	-	-	-	-
FMR3000	10	25	13.8	4	8	10	12	14	16	20	-	-	-
	10	26	12.6	4	9	11	13	16	18	22	-	-	-
	10	32	8.4	7	14	17	20	24	27	34	-	-	-
	10	33	8.0	7	14	18	21	25	29	36	-	-	-
	10	40	5.8	10	20	25	30	34	39	49	-	-	-
	10	50	4.2	14	27	34	41	48	55	68	-	-	-
	10	63	3.1	19	37	47	56	65	75	93	-	-	-
	10	66	2.9	20	40	50	60	69	79	99	-	-	-
FMR4000	12	25	4.5	13	25	32	38	44	51	63	76	-	-
	12	26	4.1	14	28	35	42	49	56	70	84	-	-
	12	32	14.7	4	8	10	11	13	15	19	23	-	-
	12	33	13.8	4	8	10	12	14	16	20	24	-	-
	12	40	9.6	6	12	15	18	21	24	30	36	-	-
	12	50	6.7	9	17	21	26	30	34	43	51	-	-
	12	63	4.8	12	24	30	36	42	48	60	72	-	-
	12	66	4.5	13	26	32	38	45	51	64	77	-	-
	12	80	3.5	17	33	41	50	58	66	83	99	-	-
	12	100	2.6	22	44	55	65	76	87	109	131	-	-
FMR5000	16	40	17.8	3	6	8	9	11	12	16	19	25	-
	16	50	11.3	5	10	13	15	18	20	25	30	40	-
	16	63	7.6	7	15	19	22	26	30	37	45	60	-
	16	66	7.1	8	16	20	24	28	32	40	48	64	-
	16	80	5.3	11	21	27	32	37	43	53	64	85	-
	16	100	4.0	14	29	36	43	51	58	72	87	116	-
	16	125	3.0	19	38	48	58	67	77	96	115	154	-
	16	160	2.2	26	52	65	78	90	103	129	155	207	-
FMR6000	20	50	17.8	3	6	8	9	11	12	16	19	25	31
	20	63	11.1	5	10	13	15	18	20	25	30	41	51
	20	80	7.4	8	15	19	23	27	31	38	46	61	77
	20	100	5.3	11	21	27	32	37	43	53	64	85	107
	20	125	4.0	14	29	36	43	51	58	72	87	116	145
	20	160	2.9	20	40	49	59	69	79	99	119	158	198
	20	200	2.2	26	52	65	78	90	103	129	155	207	258
	20	250	1.7	33	67	84	100	117	134	167	200	267	334

∗ Insert size (d): Please refer page E13, applicable insert drawing.

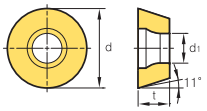
FMR P-positive

Minimum hole diameter table for helical machining (ØDH Min)



- ØD = Tool dia. (mm)
- Ød (Tool path, mm) = ØDH Min, Max - ØD
- ØDH Min (Minimum hole diameter) = ØD × 2 - Insert size (d)
- ØDH Max (Maximum hole diameter) = ØD × 2 - 2
- Ramping angle by ap (α°) = $\tan^{-1}\left(\frac{ap}{\pi \times Ød}\right)$

  Helical angle adjusted by ap cannot exceed maximum angle
- ap = Depth of cut



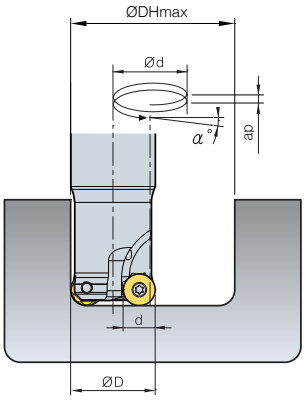
(mm)

Section	Insert size (d)	Tool dia. (ØD)	Ramping angle α° (max)	ØDH Min	Ød	Ramping angle (α°) by ap									
						ap = 1	ap = 2	ap = 2.5	ap = 3	ap = 3.5	ap = 4	ap = 5	ap = 6	ap = 8	ap = 10
FMR2500	8	17	4.7	26	9	2.03	4.06	-	-	-	-	-	-	-	-
	8	18	4.1	28	10	1.83	3.65	-	-	-	-	-	-	-	-
	8	20	15.4	32	12	1.52	3.04	3.81	4.57	5.34	6.11	-	-	-	-
	8	21	13.9	34	13	1.40	2.81	3.51	4.22	4.92	5.63	-	-	-	-
	8	25	9.8	42	17	1.07	2.15	2.69	3.22	3.76	4.30	-	-	-	-
	8	26	9.2	44	18	1.01	2.03	2.54	3.04	3.55	4.06	-	-	-	-
FMR3000	10	25	13.8	40	15	1.22	2.43	3.04	3.65	4.27	4.88	-	-	-	-
	10	26	12.6	42	16	1.14	2.28	2.85	3.43	4.00	4.57	-	-	-	-
	10	32	8.4	54	22	0.83	1.66	2.07	2.49	2.91	3.32	-	-	-	-
	10	33	8.0	56	23	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
	10	40	5.8	70	30	0.61	1.22	1.52	1.83	2.13	2.43	-	-	-	-
	10	50	4.2	90	40	0.46	0.91	1.14	1.37	1.60	1.83	-	-	-	-
	10	63	3.1	116	53	0.34	0.69	0.86	1.03	1.21	1.38	-	-	-	-
	10	66	2.9	122	56	0.33	0.65	0.81	0.98	1.14	1.30	-	-	-	-
FMR4000	12	25	4.5	38	13	1.40	2.81	3.51	-	-	-	-	-	-	-
	12	26	4.1	40	14	1.30	2.61	3.26	-	-	-	-	-	-	-
	12	32	14.7	52	20	0.91	1.83	2.28	2.74	3.20	3.65	4.57	5.49	-	-
	12	33	13.8	54	21	0.87	1.74	2.17	2.61	3.04	3.48	4.35	5.23	-	-
	12	40	9.6	68	28	0.65	1.30	1.63	1.96	2.28	2.61	3.26	3.92	-	-
	12	50	6.7	88	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	2.88	-	-
	12	63	4.8	114	51	0.36	0.72	0.89	1.07	1.25	1.43	1.79	2.15	-	-
	12	66	4.5	120	54	0.34	0.68	0.84	1.01	1.18	1.35	1.69	2.03	-	-
	12	80	3.5	148	68	0.27	0.54	0.67	0.81	0.94	1.07	1.34	1.61	-	-
	12	100	2.6	188	88	0.21	0.41	0.52	0.62	0.73	0.83	1.04	1.24	-	-
FMR5000	16	40	17.8	64	24	0.76	1.52	1.90	2.28	2.66	3.04	3.81	4.57	6.11	-
	16	50	11.3	84	34	0.54	1.07	1.34	1.61	1.88	2.15	2.69	3.22	4.30	-
	16	63	7.6	110	47	0.39	0.78	0.97	1.16	1.36	1.55	1.94	2.33	3.11	-
	16	66	7.1	116	50	0.36	0.73	0.91	1.09	1.28	1.46	1.83	2.19	2.92	-
	16	80	5.3	144	64	0.29	0.57	0.71	0.86	1.00	1.14	1.43	1.71	2.28	-
	16	100	4.0	184	84	0.22	0.43	0.54	0.65	0.76	0.87	1.09	1.30	1.74	-
	16	125	3.0	234	109	0.17	0.33	0.42	0.50	0.59	0.67	0.84	1.00	1.34	-
	16	160	2.2	304	144	0.13	0.25	0.32	0.38	0.44	0.51	0.63	0.76	1.01	-
FMR6000	20	50	17.8	80	30	0.61	1.22	1.52	1.83	2.13	2.43	3.04	3.65	4.88	6.11
	20	63	11.1	106	43	0.42	0.85	1.06	1.27	1.49	1.70	2.12	2.55	3.40	4.25
	20	80	7.4	140	60	0.30	0.61	0.76	0.91	1.06	1.22	1.52	1.83	2.43	3.04
	20	100	5.3	180	80	0.23	0.46	0.57	0.68	0.80	0.91	1.14	1.37	1.83	2.28
	20	125	4.0	230	105	0.17	0.35	0.43	0.52	0.61	0.70	0.87	1.04	1.39	1.74
	20	160	2.9	300	140	0.13	0.26	0.33	0.39	0.46	0.52	0.65	0.78	1.04	1.30
	20	200	2.2	380	180	0.10	0.20	0.25	0.30	0.35	0.41	0.51	0.61	0.81	1.01
	20	250	1.7	480	230	0.08	0.16	0.20	0.24	0.28	0.32	0.40	0.48	0.63	0.79

∗ Insert size (d): Please refer page E13, applicable insert drawing.

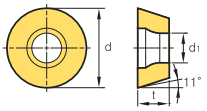
FMR P-positive

Maximum hole diameter table for helical machining (ØDH Max)



- ØD = Tool dia. (mm)
- Ød (Tool path, mm) = ØDH Min, Max - ØD
- ØDH Min (Minimum hole diameter) = ØD × 2 - Insert size (d)
- ØDH Max (Maximum hole diameter) = ØD × 2 - 2
- Ramping angle by ap (α°) = $\tan^{-1}\left(\frac{ap}{\pi \times Ød}\right)$

  Helical angle adjusted by ap cannot exceed maximum angle
- ap = Depth of cut



(mm)

Section	Insert size (d)	Tool dia. (ØD)	Ramping angle α°(max)	ØDH Max	Ød	Ramping angle (α°) by ap									
						ap = 1	ap = 2	ap = 2.5	ap = 3	ap = 3.5	ap = 4	ap = 5	ap = 6	ap = 8	ap = 10
FMR2500	8	17	4.7	32	15	1.22	2.43	3.04	3.65	-	-	-	-	-	-
	8	18	4.1	34	16	1.14	2.28	2.85	3.43	-	-	-	-	-	-
	8	20	15.4	38	18	1.01	2.03	2.54	3.04	3.55	4.06	-	-	-	-
	8	21	13.9	40	19	0.96	1.92	2.40	2.88	3.37	3.85	-	-	-	-
	8	25	9.8	48	23	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
	8	26	9.2	50	24	0.76	1.52	1.90	2.28	2.66	3.04	-	-	-	-
FMR3000	10	25	13.8	48	23	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
	10	26	12.6	50	24	0.76	1.52	1.90	2.28	2.66	3.04	-	-	-	-
	10	32	8.4	62	30	0.61	1.22	1.52	1.83	2.13	2.43	-	-	-	-
	10	33	8.0	64	31	0.59	1.18	1.47	1.77	2.06	2.36	-	-	-	-
	10	40	5.8	78	38	0.48	0.96	1.20	1.44	1.68	1.92	-	-	-	-
	10	50	4.2	98	48	0.38	0.76	0.95	1.14	1.33	1.52	-	-	-	-
	10	63	3.1	124	61	0.30	0.60	0.75	0.90	1.05	1.20	-	-	-	-
	10	66	2.9	130	64	0.29	0.57	0.71	0.86	1.00	1.14	-	-	-	-
FMR4000	12	25	4.5	48	23	0.79	1.59	1.98	2.38	2.78	3.18	-	-	-	-
	12	26	4.1	50	24	0.76	1.52	1.90	2.28	2.66	3.04	-	-	-	-
	12	32	14.7	62	30	0.61	1.22	1.52	1.83	2.13	2.43	3.04	3.65	-	-
	12	33	13.8	64	31	0.59	1.18	1.47	1.77	2.06	2.36	2.95	3.54	-	-
	12	40	9.6	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	2.88	-	-
	12	50	6.7	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	-	-
	12	63	4.8	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	-	-
	12	66	4.5	130	64	0.29	0.57	0.71	0.86	1.00	1.14	1.43	1.71	-	-
	12	80	3.5	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	-	-
	12	100	2.6	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	-	-
FMR5000	16	40	17.8	78	38	0.48	0.96	1.20	1.44	1.68	1.92	2.40	2.88	3.85	-
	16	50	11.3	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	-
	16	63	7.6	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	-
	16	66	7.1	130	64	0.29	0.57	0.71	0.86	1.00	1.14	1.43	1.71	2.28	-
	16	80	5.3	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	-
	16	100	4.0	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	-
	16	125	3.0	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	-
	16	160	2.2	318	158	0.12	0.23	0.29	0.35	0.40	0.46	0.58	0.69	0.92	-
FMR6000	20	50	17.8	98	48	0.38	0.76	0.95	1.14	1.33	1.52	1.90	2.28	3.04	3.81
	20	63	11.1	124	61	0.30	0.60	0.75	0.90	1.05	1.20	1.50	1.80	2.39	2.99
	20	80	7.4	158	78	0.23	0.47	0.58	0.70	0.82	0.94	1.17	1.40	1.87	2.34
	20	100	5.3	198	98	0.19	0.37	0.47	0.56	0.65	0.74	0.93	1.12	1.49	1.86
	20	125	4.0	248	123	0.15	0.30	0.37	0.45	0.52	0.59	0.74	0.89	1.19	1.48
	20	160	2.9	318	158	0.12	0.23	0.29	0.35	0.40	0.46	0.58	0.69	0.92	1.16
	20	200	2.2	398	198	0.09	0.18	0.23	0.28	0.32	0.37	0.46	0.55	0.74	0.92
	20	250	1.7	498	248	0.07	0.15	0.18	0.22	0.26	0.29	0.37	0.44	0.59	0.74

* Insert size (d): Please refer page E13, applicable insert drawing.

FMAC(M)3000



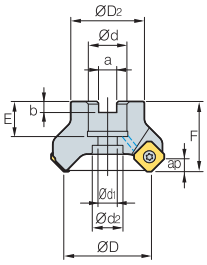


Fig. 1

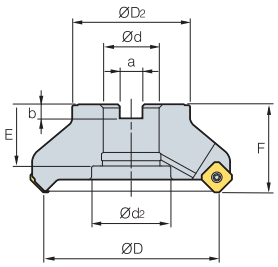


Fig. 2

AA
45°

- AR: 21°
- RR: -17°~ -12°

(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMACM	3050HR	4	50	42	22	10.4	6.3	20	40	11	17.5	4.0	0.4	1
	3050HR-H	6	50	42	22	10.4	6.3	20	40	11	17.5	4.0	0.4	1
	3063HR	5	63	49	22	10.4	6.3	20	40	11	17.5	4.0	0.5	1
	3063HR-H	8	63	49	22	10.4	6.3	20	40	11	17.5	4.0	0.6	1
FMAC (FMACM)	3080HR	6	80	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (23)	50	14	20	4.0	1.1	1
	3080HR-H	10	80	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (23)	50	14	20	4.0	1.2	1
	3100HR	7	100	67	31.75 (32)	12.7 (14.4)	8 (8)	35 (25.5)	50	(18)	45 (26)	4.0	1.7	2 (1)
	3100HR-H	12	100	67	31.75 (32)	12.7 (14.4)	8 (8)	35 (25.5)	50	(18)	45 (26)	4.0	1.7	2 (1)
	3125HR	8	125	87	38.1 (40)	15.9 (16.4)	10 (9)	42 (29)	63	(22)	55 (32)	4.0	3.3 (3.5)	2 (1)
	3125HR-H	14	125	87	38.1 (40)	15.9 (16.4)	10 (9)	42 (29)	63	(22)	55 (32)	4.0	3.3 (3.5)	2 (1)

( )Metric size

Available inserts

SEET-MF SEET-MM SEET-MA SEXT-MF SEXT-MM SEXT-MR SEEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	0903AGFN-MA													●			●	E19 E20
	0903AGSN-MF									●	●	●	●					
	0903AGSN-MM										●	●	●					
SEXT	0903AGSN-MF								●		●	●	●					
	0903AGSN-MM							●	●		●	●	●					
	0903AGSN-MR																	
SEEW	0903AGTN																	

Available arbors

Designation		Ød	NC arbors
FMAC(M)	3050HR-□ 3063HR-□	22	BT□□-FMC22-□□
	3080HR-□	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100HR-□	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	3125HR-□	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMB/FMC40-□□

Parts

Specification	Screw	Insert wrench
Ø50~Ø125	FTKA0307	TW09S

Available inserts E19, E20 Available arbors and bolt E371~E373

FMAC(M)4000



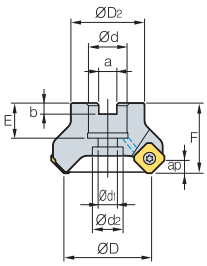


Fig. 1

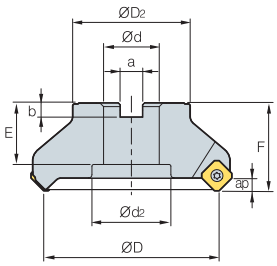


Fig. 2

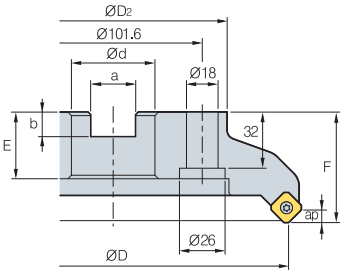


Fig. 3

AA 45°

- AR: 21°
- RR: -17°~ -12°

(mm)

Designation		⚙	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMACM	4050HR	3	50	42	22	10.4	6.3	20	40	11	18	6.5	0.4	1
	4063HR	4	63	49	22	10.4	6.3	20	40	11	18	6.5	0.6	1
	4063HR-M	5	63	49	22	10.4	6.3	20	40	11	18	6.5	0.6	1
	4063HR-H	6	63	49	22	10.4	6.3	20	40	11	18	6.5	0.6	1
FMAC (FMACM)	4080HR	5	80	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (23)	50	14	20	6.5	1.1	1
	4080HR-M	6	80	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (23)	50	14	20	6.5	1.1	1
	4080HR-H	8	80	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (23)	50	14	20	6.5	1.1	1
	4100HR	5	100	67	31.75 (32)	12.7 (14.4)	8 (8)	33 (25)	63 (50)	18	26	6.5	2 (1.6)	1
	4100HR-M	7	100	67	31.75 (32)	12.7 (14.4)	8 (8)	33 (25)	63 (50)	18	26	6.5	2 (1.6)	1
	4100HR-H	10	100	67	31.75 (32)	12.7 (14.4)	8 (8)	33 (25)	63 (50)	18	26	6.5	2 (1.6)	1
	4125HR	6	125	87	38.1 (40)	15.9 (16.4)	10 (9)	35 (29)	63	22	32	6.5	3.1	1
	4125HR-M	8	125	87	38.1 (40)	15.9 (16.4)	10 (9)	35 (29)	63	22	32	6.5	3.1	1
	4125HR-H	12	125	87	38.1 (40)	15.9 (16.4)	10 (9)	35 (29)	63	22	32	6.5	3.1	1
	4160R	7	160	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (35)	63	-	-	6.5	4.8	2
	4160R-M	10	160	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (35)	63	-	-	6.5	4.8	2
	4160R-H	16	160	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (35)	63	-	-	6.5	4.8	2
	4200R	8	200	130	47.625 (60)	25.4 (25.7)	14	38 (32)	63	-	-	6.5	6.1	3
	4200R-M	12	200	130	47.625 (60)	25.4 (25.7)	14	38 (32)	63	-	-	6.5	6.1	3
	4200R-H	18	200	130	47.625 (60)	25.4 (25.7)	14	38 (32)	63	-	-	6.5	6.1	3

Available inserts

( )Metric size

SEET-MF SEET-MM SEET-MA SEXT-MF SEXT-MM SEXT-MR SEEW SEEW-W



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	14M4AGFN-MA																●	E19 E20
	14M4AGSN-MF									●	●	●	●					
	14M4AGSN-MM								●	●	●	●	●					
SEXT	14M4AGSN-MF								●		●	●	●					
	14M4AGSN-MM			●	●			●	●	●	●	●	●					

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEXT	14M4AGSN-MR									●		●						E19 E20
SEEW	14M4AGTN	●																
	14M4AGFN-W																	
	14M4AGSN-W											●						
	14M4AGTN-W								●		●							

Available arbors

Designation		Ød	NC arbors
FMAC(M)	4125HR-□	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMB40-□□
	4160R-□	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMB/FMC40-□□
	4200R-□	47.625	BT□□-FMA47.625-□□
		60	BT□□-FMB60-□□

Designation		Ød	NC arbors
FMAC(M)	4050HR-□ 4063HR-□	22	BT□□-FMC22-□□
	4080HR-□	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HR-□	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

Parts

Specification	Screw	Shim	Shim screw	Insert wrench	Shim screw
Ø50~Ø200	FTGA03512	SS42SAF	SHXN0509F	TW15S	HW35L

Available inserts E19, E20 Available arbors and bolt E371~E373

FMAC(M)3000-A

Aluminum body



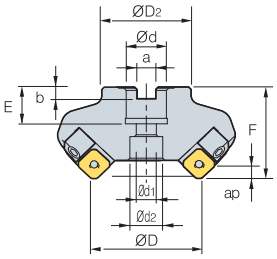


Fig. 1

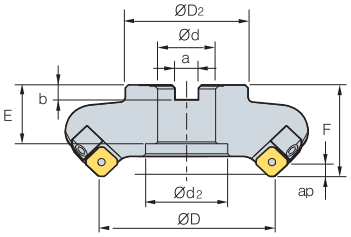


Fig. 2



AA
45°

- AR: 21°
- RR: -16°~ -12°

(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMACM	3063R-A	3	63	49	22	10.4	6.3	20	40	11	18	4	0.5	1
FMAC (FMACM)	3080R-A	4	80	57	25.4 (27)	9.5 (12.4)	6 (7)	25	50	13.5	20	4	0.6	1
	3100R-A	5	100	67	31.75 (32)	12.7 (14.4)	8 (8)	32	50	-	45	4	0.8	2
	3100R-25.4-A	5	100	67	25.4	9.5	6	25	50	-	38	4	0.9	2
	3125R-A	6	125	87	38.1 (40)	15.9 (16.4)	10 (9)	38	63	-	56	4	1.6	2
	3125R-25.4-A	6	125	70	25.4	9.5	6	25	63	-	38	4	1.7	2

( )Metric size

Available inserts

SEET-MF SEET-MM SEET-MA SEXT-MF SEXT-MM SEXT-MR SEEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	0903AGFN-MA													●			●	E19 E20
	0903AGSN-MF									●	●	●	●					
	0903AGSN-MM										●	●	●					
SEXT	0903AGSN-MF								●		●	●	●					
	0903AGSN-MM							●	●		●	●	●					
	0903AGSN-MR																	
SEEW	0903AGTN																	

Available arbors

Designation		Ød	NC arbors
FMAC(M)	3063R-□	22	BT□□-FMC22-□□
	3080R-□	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100R-□	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	3125R-□	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMB40-□□

Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw
Ø63~Ø125	FTKA0307	TW09S	HW30L	LFMA3R-A	DHA620

Available inserts E19, E20 Available arbors and bolt E371~E373

FMAC(M)4000-A

Aluminum body



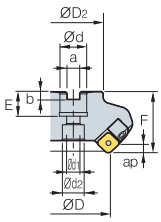


Fig. 1

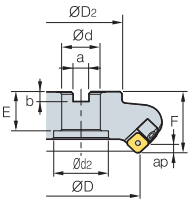


Fig. 2

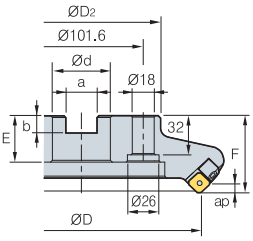


Fig. 3

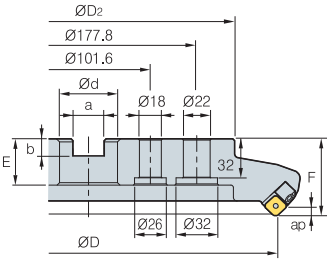


Fig. 4



AA
45°

- AR: 21°
- RR: -16°~ -12°

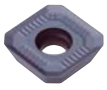
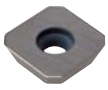
(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMACM	4063R-A	3	63	49	22	10.4	6.3	20	50	11	18	6.5	0.6	1
FMAC (FMACM)	4080R-A	4	80	67	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	13.5	20	6.5	0.8	1
	4100R-A	5	100	67	31.75 (32)	12.7 (14.4)	8 (8)	32	50	-	45	6.5	1.1	2
	4100R-25.4-A	5	100	67	25.4	9.5	6	25	50	-	38	6.5	1.2	2
	4125R-A	6	125	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (35)	63	-	56	6.5	1.7	2
	4125R-25.4-A	6	125	70	25.4	9.5	6	25	63	-	38	6.5	1.8	2
	4160R-A	7	160	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (35)	63	-	75	6.5	2.5	2
	4200R-A	8	200	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (32)	63	-	-	6.5	3.2	3
	4250R-A	10	250	180	47.625 (60)	25.4 (25.7)	14 (14)	38	63	-	-	6.5	4.1	3
	4315R-A	12	315	240	47.625 (60)	25.4 (25.7)	14 (14)	38	63	-	-	6.5	6.7	4

Note) Through coolant type between Ø50~Ø125

( )Metric size

Available inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF	SEXT-MM	SEXT-MR	SEEW	SEEW-W
							

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	14M4AGFN-MA																●	E19 E20
	14M4AGSN-MF									●	●	●	●					
	14M4AGSN-MM								●	●	●	●	●					
SEXT	14M4AGSN-MF								●		●	●	●					
	14M4AGSN-MM			●	●			●	●	●	●	●	●					

Designation		Cermet		Coated											Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEXT	14M4AGSN-MR									●		●						E19 E20
SEEW	14M4AGTN	●																
	14M4AGFN-W																	
	14M4AGSN-W											●						
	14M4AGTN-W								●	●								

Available arbors

Designation		Ød	NC arbors
FMAC(M)	4063R-□	22	BT□□-FMC22-□□
	4080R-□	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HR-□	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	4125R-□	38.1	BT□□-FMA38.1-□□

Designation		Ød	NC arbors
FMAC(M)	4125R-□	40	BT□□-FMB40-□□
	4160R-□	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMB/FMC40-□□
	4200R-□	47.625	BT□□-FMA47.625-□□
	4250R-□	60	BT□□-FMB60-□□
	4315R-□	60	BT□□-FMB60-□□

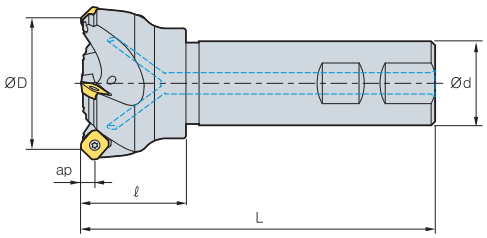
Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw
Ø63~Ø315	FTGA03512	TW15S	HW40L	LFMA4R-A	DHA0830

Available inserts E19, E20 Available arbors and bolt E371~E373

FMAS3000





AA 45°

- AR: 23°
- RR: -17°~ -13°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
FMAS	3025HR	2	25	25	35	115	4	0.4
	3032HR	3	32	25	40	125	4	0.5
	3032HR-S32	3	32	32	40	130	4	0.8
	3040HR	3	40	32	40	130	4	0.9
	3040HR-S40	3	40	40	40	140	4	1.3
	3040HR-S42	3	40	42	40	140	4	1.4
	3050HR	4	50	32	40	135	4	1
	3050HR-S40	4	50	40	40	140	4	1.3
	3050HR-S42	4	50	42	40	140	4	1.5
	3063HR	5	63	32	45	135	4	1.2
	3063HR-S40	5	63	40	45	145	4	1.6
	3063HR-S42	5	63	42	45	145	4	1.7

Available inserts

SEET-MF | SEET-MM | SEET-MA | SEXT-MF | SEXT-MM | SEXT-MR | SEEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SEET	0903AGFN-MA													●			●	E19 E20
	0903AGSN-MF									●	●	●	●					
	0903AGSN-MM										●	●	●					
SEXT	0903AGSN-MF								●		●	●	●					
	0903AGSN-MM							●	●		●	●	●					
	0903AGSN-MR																	
SEEW	0903AGTN																	

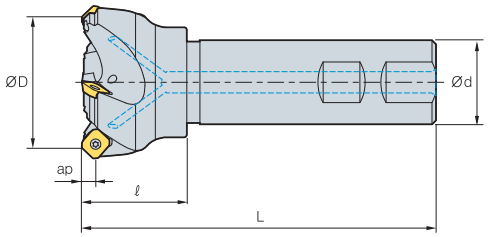
Parts

Specification	Screw	Insert wrench
Ø25~Ø63	FTKA0307	TW09S

Available inserts E19, E20

FMAS4000





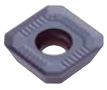
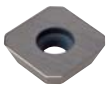
AA 45°

- AR: 23°
- RR: -17°~ -13°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
FMAS	4050HR	3	50	32	45	135	6.5	1
	4050HR-S40	3	50	40	45	135	6.5	1.3
	4050HR-S42	3	50	42	45	135	6.5	1.45
	4063HR	4	63	32	45	135	6.5	1.2
	4063HR-S40	4	63	40	45	135	6.5	1.5
	4063HR-S42	4	63	42	45	135	6.5	1.6

Available inserts

SEET-MF	SEET-MM	SEET-MA	SEXT-MF	SEXT-MM	SEXT-MR	SEEW	SEEW-W
							

Designation		Cermet		Coated										Uncoated			page
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SEET	14M4AGFN-MA																●	
	14M4AGSN-MF									●	●	●	●					
	14M4AGSN-MM								●	●	●	●	●					
SEXT	14M4AGSN-MF								●		●	●	●					
	14M4AGSN-MM			●	●			●	●	●	●	●	●					E19
	14M4AGSN-MR									●		●						E20
SEEW	14M4AGTN		●															
	14M4AGFN-W																	
	14M4AGSN-W											●						
	14M4AGTN-W								●		●							

Parts

Specification	Screw	Shim	Shim screw	Insert wrench	Shim screw
Ø50~Ø63	FTGA03512	SS42SAF	SHXN0509F	TW15S	HW35L

Available inserts E19, E20

FMPC(M)3000



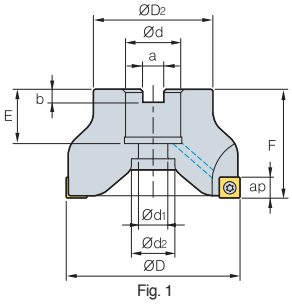


Fig. 1

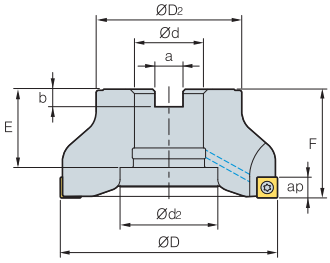


Fig. 2

AA 90°

- AR: 10°
- RR: -9°~ -8°

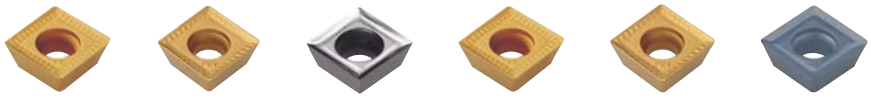
(mm)

Designation		⌀	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMPCM	3050HS	5	50	40	22	10.4	6.3	20	40	11	18	7	0.3	1
	3063HS	6	63	40	22	10.4	6.3	20	40	11	18	7	0.5	1
FMPC (FMPCM)	3080HS	7	80	55	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	14	20	7	1.0	1
	3100HS	8	100	67	31.75 (32)	12.7 (14.4)	8 (8)	36 (26)	50	18	45 (26)	7	1.5	2 (1)

( )Metric size

Available inserts

SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA



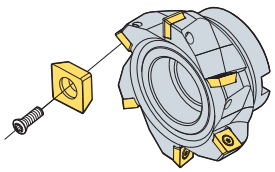
Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	09M402R-MA													●			●	
	09M405R-MF																	
	09M405R-MM																	
SDXT	09M405R-MF			●					●	●	●	●	●					E17
	09M405L-MF																	E18
	09M405R-MM			●	●			●	●	●	●	●	●					
	09M405L-MM								●		●							
	09M405R-MA																●	

Available arbors

Designation		Ød	NC arbors
FMPC(M)	3050HS 3063HS	22	BT□□-FMC22-□□
	3080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□

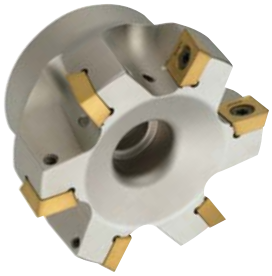
Parts

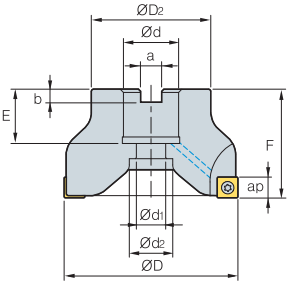
Specification	Screw	Wrench
Ø50~Ø100	FTGA03508	TW15S

Assembling	
	

Available inserts E17, E18 Available arbors and bolt E371~E373

FMPC(M)4000





AA 90°

- AR: 10°
- RR: -9°~ -8°

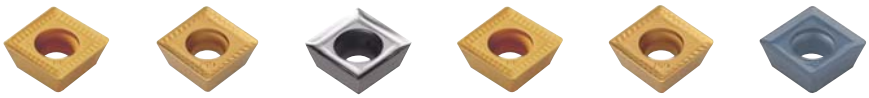
(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg
FMPCM	4063HS	5	63	49	22	10.4	6.3	20 (20)	50 (50)	11	18	11	0.4
FMPC (FMPCM)	4080HS	6	80	57	25.4 (27)	9.5 (12.4)	6 (7)	25 (23)	50 (50)	14	20	11	0.9
	4100HS	7	100	67	31.75 (32)	12.7 (14.4)	8 (8)	33 (25)	63 (50)	18	26	11	1.9 (1.5)
	4125HS	8	125	87	38.1 (40)	15.9 (16.4)	10 (9)	35 (29)	63	22	32	11	3.1

( )Metric size

Available inserts

SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	130504R-MA																●	E17 E18
	130508R-MF																	
	130508R-MM																	
SDXT	130508R-MF			●					●	●	●	●	●					
	130508R-MM			●	●			●	●	●	●	●	●					
	130538-MM																	
	130508R-MA																●	

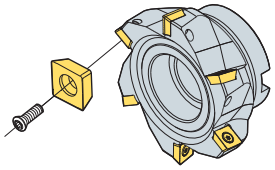
Available arbors

Designation		Ød	NC arbors
FMPC(M)	4063HS	22	BT□□-FMC22-□□
	4080HS	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HS	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	4125HS	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMB/FMC40-□□

Parts

Specification	Screw	Wrench
Ø63~Ø125	FTNC04511	TW20S

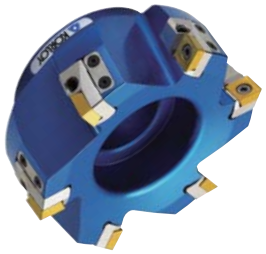
Assembling



Available inserts E17,E18 Available arbors and bolt E371~E373

FMPC(M)3000-A

Aluminum body



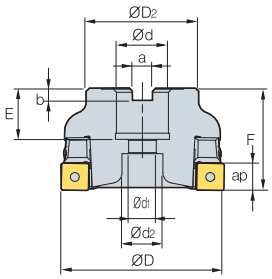


Fig. 1

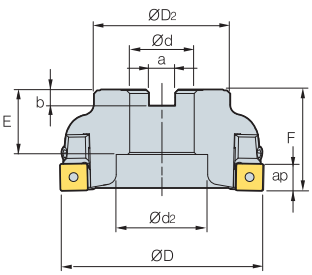


Fig. 2




AA
90°

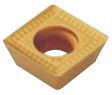
- AR: 10°
- RR: -9°~ -7.3°

(mm)

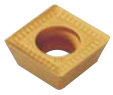
Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMPCM	3063S-A	3	63	40	22	10.4	6.3	20	40	11.0	18	7	0.2	1
FMPC (FMPCM)	3080S-A	4	80	55	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	13.5	20	7	0.4	1
	3100S-A	5	100	67	31.75 (32)	12.7 (14.4)	8 (8)	32	50	-	45	7	0.6	2
	3100S-25.4-A	5	100	67	25.4	9.5	6	25	50	-	38	7	0.7	2

( )Metric size

Available inserts


SDET-MF

SDET-MM

SDET-MA

SDXT-MF

SDXT-MM

SDXT-MA

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	09M402R-MA													●			●	
	09M405R-MF																	
	09M405R-MM																	
SDXT	09M405R-MF			●					●	●	●	●	●					E17
	09M405L-MF																	E18
	09M405R-MM			●	●			●	●	●	●	●	●					
	09M405L-MM								●		●							
	09M405R-MA																●	

Available arbors

Designation		Ød	NC arbors
FMPC(M)	3063S-□	22	BT□□-FMC22-□□
	3080S-□	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	3100S-□	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	3125S-□	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMB/FMC40-□□

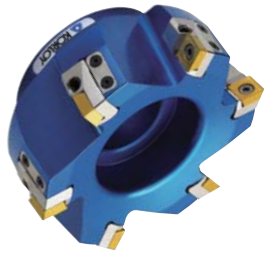
Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw	Chip cover	Chip cover screw
Ø63	FTGA03508	TW15S	HW30L	LFMP3R-A	DHA0624	CFMP3R14R1-A	PXMA0306
Ø80~Ø100	FTGA03508	TW15S	HW30L	LFMP3R-A	DHA0624	CFMP3R-A	PXMA0306

Available inserts **E17, E18** Available arbors and bolt **E371~E373**

FMPC(M)4000-A

Aluminum body



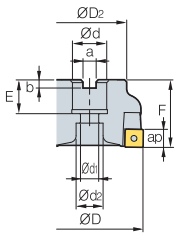


Fig. 1

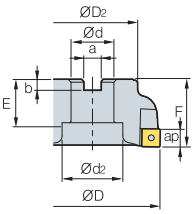


Fig. 2

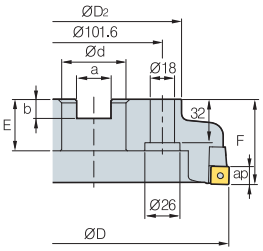


Fig. 3

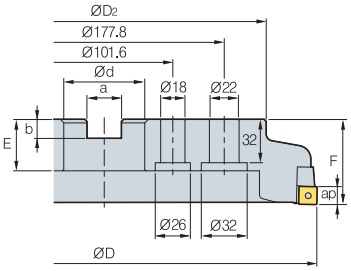


Fig. 4




AA
90°

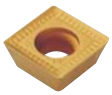
- AR: 10°
- RR: -9°~ -7.3°

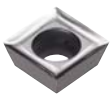
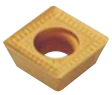
(mm)

Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMPCM	4063S-A	3	63	49	22	10.4	6.3	20	50	11	18	11	0.6	1
FMPC (FMPCM)	4080S-A	4	80	67	25.4 (27)	9.5 (12.4)	6 (7)	25 (22)	50	13.5	20	11	0.8	1
	4100S-A	5	100	67	31.75 (32)	12.7 (14.4)	8 (8)	32	50	-	45	11	1.1	2
	4100S-25.4-A	5	100	67	25.4	9.5	6	25	50	-	38	11	1.2	2
	4125S-A	6	125	87	38.1 (40)	15.9 (16.4)	10 (9)	38 (35)	63	-	56	11	1.7	2
	4125S-25.4-A	6	125	70	25.4	9.5	6	25	63	-	38	11	1.8	2
	4160S-A	8	160	107	50.8 (40)	19.0 (16.4)	11 (9)	38 (35)	63	-	75	11	2.5	2
	4200S-A	10	200	130	47.625 (60)	25.4 (25.7)	14 (14)	38 (32)	63	-	-	11	3.2	3
	4250S-A	12	250	180	47.625 (60)	25.4 (25.7)	14 (14)	38	63	-	-	11	4.1	3
	4315S-A	15	315	240	47.625 (60)	25.4 (25.7)	14 (14)	38	63	-	-	11	6.7	4

( )Metric size

Available inserts


SDET-MF

SDET-MM

SDET-MA

SDXT-MF

SDXT-MM

SDXT-MA

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	130504R-MA																●	E17 E18
	130508R-MF																	
	130508R-MM																	
SDXT	130508R-MF			●					●	●	●	●	●					
	130508R-MM			●	●			●	●	●	●	●	●					
	130538-MM																	
	130508R-MA																●	

Available arbors

Designation		Ød	NC arbors
FMAC(M)	4063R-□	22	BT□□-FMC22-□□
	4080R-□	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HR-□	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	4125R-□	38.1	BT□□-FMA38.1-□□

Designation		Ød	NC arbors
FMAC(M)	4125R-□	40	BT□□-FMB40-□□
	4160R-□	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMB/FMC40-□□
	4200R-□	47.625	BT□□-FMA47.625-□□
	4250R-□	60	BT□□-FMB60-□□
	4315R-□	60	BT□□-FMB60-□□

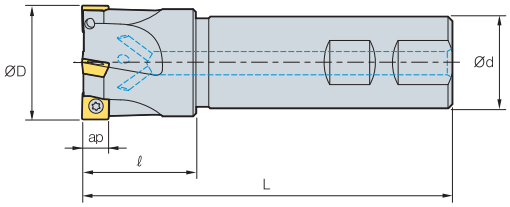
Parts

Specification	Screw	Insert wrench	Locator wrench	Locator	Locator screw	Chip cover	Chip cover screw
Ø63~Ø80	FTNC04509	TW20S	HW40L	LFMP4R1-A	DHA0825	CFMP3R14R1-A	PXMA0306
Ø100~Ø315	FTNC04509	TW20S	HW40L	LFMP4R-A	DHA0830	CFMP4R-A	PXMA0306

Available inserts E17, E18 Available arbors and bolt E371~E373

FMPS3000





AA 90°

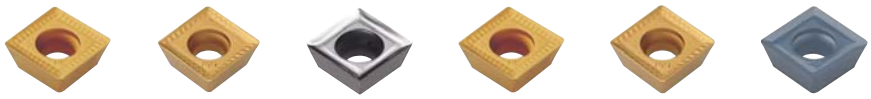
- AR: 10°
- RR: -9°~ -8°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
FMPS	3025HS	2	25	25	35	115	7	0.4
	3032HS	3	32	25	40	125	7	0.5
	3040HS	4	40	32	40	130	7	0.8
	3040HS-S40	4	40	40	45	140	7	1.2
	3040HS-S42	4	40	42	45	140	7	1.3
	3050HS	5	50	32	40	135	7	1
	3050HS-S40	5	50	40	40	140	7	1.3
	3050HS-S42	5	50	42	40	140	7	1.4
	3063HS	6	63	32	45	135	7	1.2
	3063HS-S40	6	63	40	45	145	7	1.6
	3063HS-S42	6	63	42	45	145	7	1.7

Available inserts

SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA

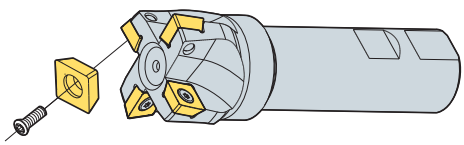


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	09M402R-MA													●			●	
	09M405R-MF																	
	09M405R-MM																	
SDXT	09M405R-MF			●					●	●	●	●	●					E17
	09M405L-MF																	E18
	09M405R-MM			●	●			●	●	●	●	●	●					
	09M405L-MM								●		●							
	09M405R-MA																●	

Parts

Specification	Screw	Wrench
Ø25~Ø63	FTGA03508	TW15S

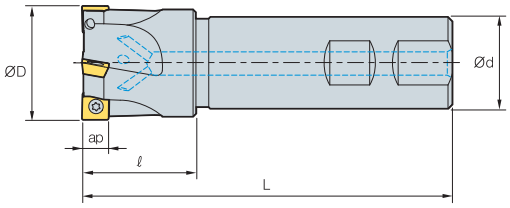
Assembling



Available inserts E17, E18

FMPS4000










AA 90°

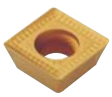
- AR: 10°
- RR: -9°~ -8°

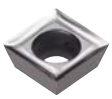
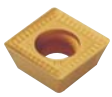
(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
FMPS	4040HS	3	40	32	40	130	11	1
	4040HS-S40	3	40	40	40	140	11	1.3
	4040HS-S42	3	40	42	40	140	11	1.4
	4050HS	4	50	32	45	135	11	1.5
	4050HS-S40	4	50	40	45	145	11	1.7
	4050HS-S42	4	50	42	45	145	11	1.6
	4063HS	5	63	32	45	135	11	2.1
	4063HS-S40	5	63	40	45	145	11	2.4
	4063HS-S42	5	63	42	45	145	11	2.6

Available inserts

SDET-MF | SDET-MM | SDET-MA | SDXT-MF | SDXT-MM | SDXT-MA



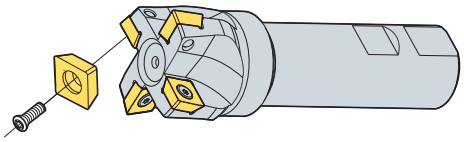


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	PD2000	ST30A	G10	H01	
SDET	130504R-MA																●	E17 E18
	130508R-MF																	
	130508R-MM																	
SDXT	130508R-MF			●					●	●	●	●	●					
	130508R-MM			●	●			●	●	●	●	●	●					
	130538-MM																	
	130508R-MA																●	

Parts

Specification	Screw	Wrench
Ø40~Ø63	FTNC04511	TW20S

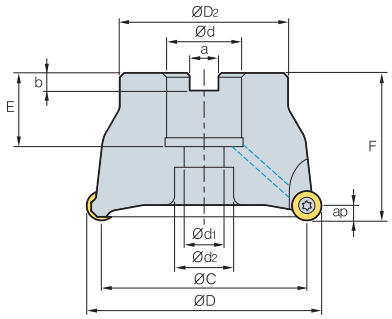
Assembling



Available inserts E17, E18

FMRC(M)3000







• AR: 5°
• RR: -5°

(mm)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg
FMRCM	3040HRD	3	40	30	36	16	8.4	5.6	18	40	9	14	5.0	0.2
	3040HRD-H	4	40	30	36	16	8.4	5.6	18	40	9	14	5.0	0.2
	3050HRD	4	50	40	42	22	10.4	6.3	20	40	11	16.5	5.0	0.3
	3050HRD-H	5	50	40	42	22	10.4	6.3	20	40	11	16.5	5.0	0.3
	3063HRD	5	63	53	49	22	10.4	6.3	20	50	11	16.5	5.0	0.64
	3063HRD-H	6	63	53	49	22	10.4	6.3	20	50	11	16.5	5.0	0.64
FMRC (FMRCM)	3080HRD	6	80	70	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (22)	50 (50)	14	19	5.0	1.1
	3080HRD-H	7	80	70	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (22)	50 (50)	14	19	5.0	1.1
	3100HRD	7	100	90	67	31.75 (32)	12.7 (14.4)	8 (8.0)	32 (28)	63 (63)	18	26	5.0	2.1
	3100HRD-H	8	100	90	67	31.75 (32)	12.7 (14.4)	8 (8.0)	32 (28)	63 (63)	18	26	5.0	2.1

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63 ( )Metric size

Available inserts

RDKT-MF RDKT-MM RDCT-MA



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	10T3M0-MA																●	E15 E16
RDKT	10T3M0-MF											●		●				
	10T3M0-MM			●						●		●	●	●				

Available arbors

Designation		Ød	Available arbors
FMRC(M)	3040HRD 3040HRD-H	16	BT□□-FMC16-□□
	3050HRD 3050HRD-H 3063HRD 3063HRD-H	22	BT□□-FMC22-□□
	3080HRD	25.4	BT□□-FMA/FMB25.4-□□
	3080HRD-H	27	BT□□-FMB/FMC27-□□
	3100HRD	31.75	BT□□-FMA31.75-□□
	3100HRD-H	32	BT□□-FMC32-□□

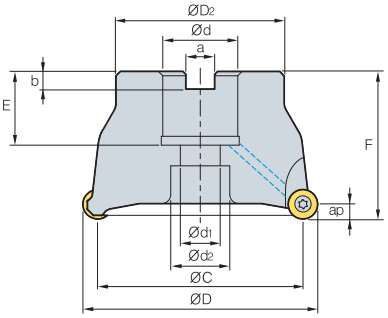
Parts

Specification	Screw	Wrench
Ø40~Ø100	FTGA03508	TW15S

Available inserts E15, E16 Available arbors and bolt E371~E373

FMRC(M)4000







• AR: 5°
• RR: -5°

(mm)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg
FMRCM	4050HRD	4	50	38	42	22	10.4	6.3	20	50	11	18	6.0	0.4
	4063HRD	4	63	51	49	22	10.4	6.3	20	50	11	18	6.0	0.6
	4063HRD-M	5	63	51	49	22	10.4	6.3	20	50	11	18	6.0	0.6
FMRC (FMRCM)	4080HRD	5	80	68	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (23)	50 (50)	14	20	6.0	1.0
	4080HRD-M	6	80	68	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (23)	50 (50)	14	20	6.0	1.0
	4100HRD	6	100	88	67	31.75 (32)	12.7 (14.4)	8 (8.0)	33 (25)	63 (50)	18	26	6.0	1.9 (1.5)
	4100HRD-M	7	100	88	67	31.75 (32)	12.7 (14.4)	8 (8.0)	33 (25)	63 (50)	18	26	6.0	1.9 (1.5)
	4125HRD	7	125	113	87	38.1 (40)	15.9 (16.4)	10 (9.0)	35 (29)	63 (63)	22	32	6.0	3.0
	4125HRD-M	8	125	113	87	38.1 (40)	15.9 (16.4)	10 (9.0)	35 (29)	63 (63)	22	32	6.0	3.0

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63 ( )Metric size

Available inserts


RDKT-MF


RDKT-MM


RDCT-MA

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	1204M0-MA																●	E15 E16
RDKT	1204M0-MF											●		●				
	1204M0-MM			●						●		●	●	●				

Available arbors

Designation		Ød	NC arbors
FMRC(M)	4063HRD	22	BT□□-FMC22-□□
	4063HRD-M		
	4080HRD		
	4080HRD	25.4	BT□□-FMA/FMB25.4-□□
	4080HRD-M	27	BT□□-FMB/FMC27-□□
	4100HRD	31.75	BT□□-FMA31.75-□□
	4100HRD-M	32	BT□□-FMC32-□□
	4125HRD	38.1	BT□□-FMA/FMB38.1-□□
	4125HRD-M	40	BT□□-FMB/FMC40-□□

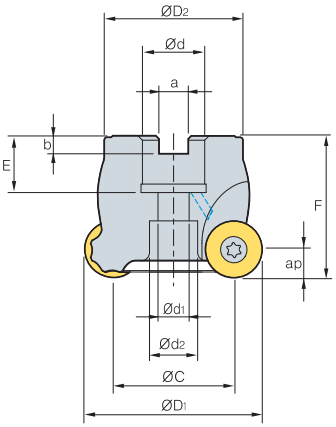
Parts

Specification	Screw	Wrench
Ø50~Ø125	FTKA0410	TW15S

Available inserts E15, E16 Available arbors and bolt E371~E373

FMRC(M)5000







• AR: 5°
• RR: -5°

(mm)

Designation			ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg
FMRCM	5050HRD	3	50	34	42	22	10.4	6.3	20	50	11	16.5	8.0	0.4
	5063HRD	4	63	47	49	22	10.4	6.3	20	50	11	18	8.0	0.6
	5063HRD-H	5	63	47	49	22	10.4	6.3)	20	50	11	18	8.0	0.6
FMRC (FMRCM)	5080HRD	5	80	64	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (23)	50 (50)	14	20	8.0	0.9
	5080HRD-H	6	80	64	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (23)	50 (50)	14	20	8.0	0.9
	5100HRD	6	100	84	67	31.75 (32)	12.7 (14.4)	8 (8)	33 (25)	63 (50)	18	26	8.0	1.9 (1.4)
	5100HRD-H	7	100	84	67	31.75 (32)	12.7 (14.4)	8 (8)	33 (25)	63 (50)	18	26	8.0	1.9 (1.4)
	5125HRD	7	125	109	87	38.1 (40)	15.9 (16.4)	10 (9)	35 (29)	63 (63)	22	32	8.0	3
	5125HRD-H	8	125	109	87	38.1 (40)	15.9 (16.4)	10 (9)	35 (29)	63 (63)	22	32	8.0	3

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40~Ø63 ( )Metric size

Available inserts

RDHW-E,F,S | RDKT-MF | RDKT-ML | RDKT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	1605M0E																	
	1605M0F																	
	1605M0S																	E15
RDKT	1605M0-MM									●								E16
	1605M0-MF																	
	1605M0-ML																	

Available arbors

Designation		Ød	NC arbors
FMRC(M)	5050HRD	22	BT□□-FMC22-□□
	5063HRD		
	5063HRD-H		
	5080HRD	25.4	BT□□-FMA/FMB25.4-□□
	5080HRD-H	27	BT□□-FMB/FMC27-□□
	5100HRD	31.75	BT□□-FMA31.75-□□
	5100HRD-H	32	BT□□-FMC32-□□
	5125HRD	38.1	BT□□-FMA/FMB38.1-□□
	5125HRD-H	40	BT□□-FMB/FMC40-□□

Parts

Specification	Screw	Wrench
Ø50~Ø125	FTGA0513-P	TW20-100

Available inserts E15, E16 Available arbors and bolt E371~E373

FMRC(M)6000



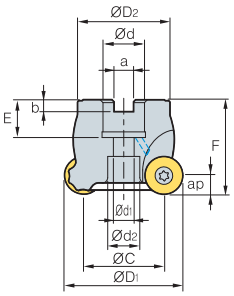


Fig. 1

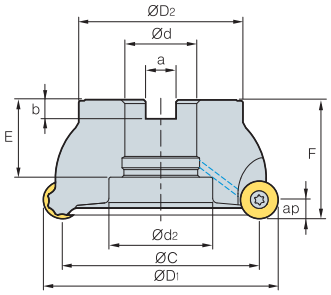


Fig. 2

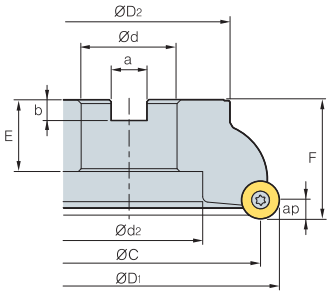


Fig. 3



• AR: 5°
• RR: -5°

(mm)

Designation		⊚	ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
FMRCM	6063HRD	3	63	43	49	22	10.4	6.3	20	50	11	17	10.0	0.5	1
	6063HRD-M	4	63	43	49	22	10.4	6.3	20	50	11	17	10.0	0.5	1
FMRC (FMRCM)	6080HRD	4	80	60	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (22)	50	14	20	10.0	0.8	1
	6080HRD-M	5	80	60	57	25.4 (27)	9.5 (12.4)	6 (7.0)	25 (22)	50	14	20	10.0	0.8	1
	6100HRD	5	100	80	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	63	18	26	10.0	1.6	1
	6100HRD-M	6	100	80	67	31.75 (32)	12.7 (14.4)	8 (8)	32 (28)	63	18	26	10.0	1.6	1
	6125HRD	6	125	105	87	38.1 (40)	15.9 (16.4)	10 (9)	41 (29)	63	- (22)	55 (32)	10.0	2.7 (2.9)	2 (1)
	6125HRD-M	7	125	105	87	38.1 (40)	15.9 (16.4)	10 (9)	41 (29)	63	- (22)	55 (32)	10.0	2.7 (2.9)	2 (1)
	6160RD	7	160	140	107	50.8 (40)	19 (16.4)	11 (9)	38 (35)	63	-	78	10.0	4.4	3
	6160RD-M	8	160	140	107	50.8 (40)	19 (16.4)	11 (9)	38 (35)	63	-	78	10.0	4.4	3

Note) It's general that you measure of inner diameter when the diameter of FMRC/FMRCM is Ø40 - Ø63 is not inner coolant ( )Metric size

Available inserts

RDHW-E,F,S



RDKT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	2006M0E																	E15
	2006M0F																	E15
	2006M0S																	E16
RDKT	2006M0-MM									●								

Available arbors

Designation		Ød	NC arbors
FMRC(M)	6063HRD	22	BT□□-FMC22-□□
	6063HRD-M		
	6080HRD	25.4	BT□□-FMA/FMB25.4-□□
	6080HRD-M	27	BT□□-FMB/FMC27-□□
	6100HRD	31.75	BT□□-FMA31.75-□□
	6100HRD-M	32	BT□□-FMC32-□□
	6125HRD	38.1	BT□□-FMA/FMB38.1-□□
	6125HRD-M	40	BT□□-FMB/FMC40-□□
	6160RD	50.8	BT□□-FMA50.8-□□
	6160RD-M	40	BT□□-FMB/FMC40-□□

Parts

Specification	Screw	Wrench
Ø63~Ø160	FTGA0515-P	TW20-100

Available inserts E15, E16 Available arbors and bolt E371~E373

FMRS1000/1500



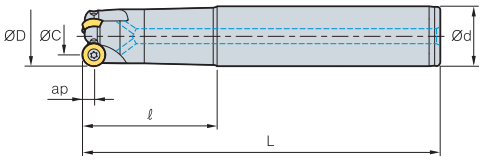


Fig. 1

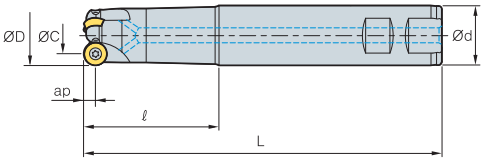


Fig. 2



• AR: 5°
• RR: -5°~ -1°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.
FMRS	1008HRD-M	1	8	5.5	10	30	80	2.5	0.2	1
	1008HRD-L	1	8	5.5	10	50	100	2.5	0.2	1
	1010HRD-M	2	10	5	12	44	100	2.5	0.2	1
	1010HRD-L	2	10	5	12	64	120	2.5	0.2	1
	1012HRD-M	2	12	7	12	44	100	2.5	0.3	1
	1012HRD-L	2	12	7	16	80	160	2.5	0.3	1
	1015HRD-M	3	15	10	16	80	160	2.5	0.3	1
	1015HRD-L	3	15	10	16	100	200	2.5	0.4	1
FMRS	1510HRD-M	1	10	6	12	44	100	3.0	0.2	1
	1510HRD-L	1	10	6	12	64	120	3.0	0.2	1
	1512HRD-M	2	12	6	12	54	110	3.0	0.3	1
	1512HRD-L	2	12	6	16	80	160	3.0	0.3	1
	1516HRD-M	3	16	10	16	60	130	3.0	0.3	1
	1516HRD-L	3	16	10	20	90	180	3.0	0.4	1
	1520HRD-M	3	20	14	20	80	150	3.0	0.4	1
	1520HRD-L	3	20	14	20	90	200	3.0	0.5	1

Available inserts

RDHW-E,F,S



RDKW



Type	Designation		Cermet		Coated											Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
1000 type	RDHW	0501M0E											●						E15 E16
		0501M0F																	
		0501M0S																	
	RDKW	0501M0E																	
1500 type	RDHW	06T1M0E											●						
		06T1M0F																	
		06T1M0S																	
	RDKW	06T1M0E																	

Parts

Specification	Screw	Wrench
Ø8~Ø15 (1000 type)	FTNA0203	TW06P
Ø10~Ø20 (1500 type)	FTNA02205	TW06P

Available inserts **E15, E16**

FMRS2000/2500



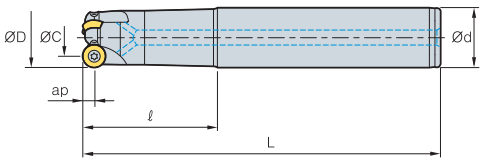


Fig. 1

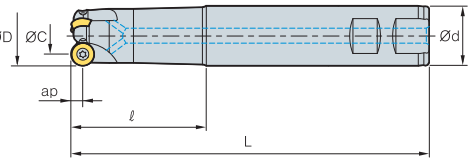


Fig. 2



• AR: 5°
• RR: -5°~ -1°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.
FMRS	2015HRD-S	2	15	8	16	55	115	3.5	0.3	2
	2015HRD-M	2	15	8	20	80	150	3.5	0.4	1
	2015HRD-L	2	15	8	20	90	200	3.5	0.5	1
	2020HRD-S	3	20	14	20	65	125	3.5	0.3	2
	2020HRD-M	3	20	14	20	80	150	3.5	0.4	1
	2020HRD-L	3	20	14	25	90	200	3.5	0.5	1
FMRS	2516HRD-S	2	16	8	16	65	125	4.0	0.3	2
	2516HRD-M	2	16	8	16	80	150	4.0	0.4	1
	2516HRD-L	2	16	8	20	90	200	4.0	0.5	1
	2520HRD-S	2	20	12	20	65	125	4.0	0.4	2
	2520HRD-M	2	20	12	20	80	150	4.0	0.5	1
	2520HRD-L	2	20	12	25	90	200	4.0	0.6	1
	2525HRD-S	3	25	17	25	55	125	4.0	0.5	2
	2525HRD-M	3	25	17	25	90	200	4.0	0.6	1
	2525HRD-L	3	25	17	32	110	250	4.0	0.7	1

Available inserts

		RDHW-E,F,S	RDKW
			

Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
2000 type	RDHW	0702M0E											●						
		0702M0F																	
		0702M0S																	
	RDKW	0702M0E									●								E15
2500 type	RDHW	0803M0E											●						E16
		0803M0F																	
		0803M0S																	
	RDKW	0803M0E																	

Parts

Specification	 Screw	 Wrench
Ø15~Ø20 (2000 type)	FTNA02555	TW07S
Ø16~Ø25 (2500 type)	FTNA0305 FTNA0306 (Ø20 over)	TW09S

Available inserts E15, E16

FMRS3000



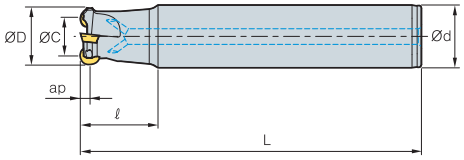


Fig. 1

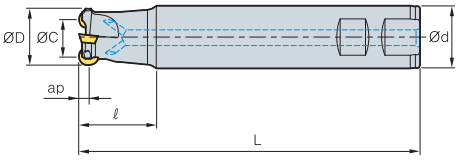


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.
FMRS	3021HRD-M	1	21	11	20	40	150	5	0.4	1
	3021HRD-M2	2	21	11	20	40	150	5	0.4	1
	3021HRD-L	1	21	11	20	50	200	5	0.6	1
	3021HRD-L2	2	21	11	20	50	200	5	0.6	1
	3025HRD-S	2	25	15	25	35	115	5	0.5	2
	3025HRD-M	2	25	15	25	70	200	5	0.7	1
	3025HRD-L	2	25	15	25	100	250	5	1	1
	3026HRD-M	2	26	16	25	70	200	5	0.65	1
	3026HRD-L	2	26	16	25	100	250	5	0.7	1
	3032HRD-S	3	32	22	32	40	125	5	1	2
	3032HRD-M	3	32	22	32	70	200	5	1.3	1
	3032HRD-L	3	32	22	32	150	300	5	1.6	1
	3040HRD-S	4	40	30	32	40	125	5	1.3	2
	3040HRD-M	4	40	30	32	70	200	5	1.5	1
	3040HRD-L	4	40	30	32	150	300	5	1.8	1

Available inserts

RDKT-MF



RDKT-MM



RDCT-MA



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	10T3M0-MA																●	E15 E16
RDKT	10T3M0-MF											●		●				
	10T3M0-MM			●						●		●	●	●				

Parts

Specification	Screw	Wrench
Ø21~Ø40	FTGA03508 (07)	TW15S

Available inserts E15, E16

FMRS4000



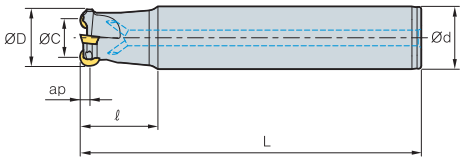


Fig. 1

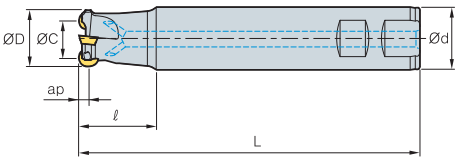


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.
FMRS	4032HRD-S	2	32	20	32	40	125	6	0.8	2
	4032HRD-M	2	32	20	32	70	200	6	1.1	1
	4032HRD-L	2	32	20	32	150	300	6	1.6	1
	4033HRD-S	2	33	21	32	40	125	6	0.9	2
	4033HRD-M	2	33	21	32	70	200	6	1.1	1
	4033HRD-L	2	33	21	32	150	300	6	1.7	1
	4040HRD-S	3	40	28	32	40	125	6	1	2
	4040HRD-M	3	40	28	32	70	200	6	1.6	1
	4040HRD-L	3	40	28	32	150	300	6	1.8	1
	4040HRD-S40	3	40	28	40	40	125	6	1.3	2
	4040HRD-M40	3	40	28	40	70	200	6	2	1
	4040HRD-L40	3	40	28	40	150	300	6	2.4	1
	4040HRD-S42	3	40	28	42	40	125	6	1.6	2
	4040HRD-M42	3	40	28	42	70	200	6	2.4	1
	4040HRD-L42	3	40	28	42	150	300	6	2.8	1
	4050HRD-S	4	50	38	42	50	125	6	1.5	2
	4050HRD-M	4	50	38	42	50	250	6	2.1	1
	4050HRD-L	4	50	38	42	50	300	6	2.7	1
	4050HRD-S40	4	50	38	40	50	150	6	2	2
	4050HRD-M40	4	50	38	40	50	250	6	2.6	1
	4050HRD-L40	4	50	38	40	50	300	6	3.2	1

Available inserts

RDKT-MF



RDKT-MM



RDCT-MA



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	1204M0-MA																●	E15 E16
RDKT	1204M0-MF											●		●				
	1204M0-MM			●						●		●	●	●				

Parts

Specification	Screw	Wrench
Ø32~Ø50	FTKA0410	TW15S

Available inserts E15, E16

FMRS5000



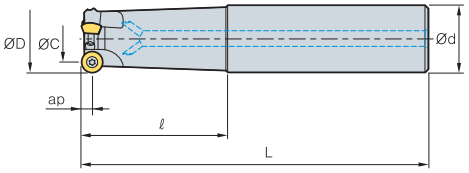


Fig. 1

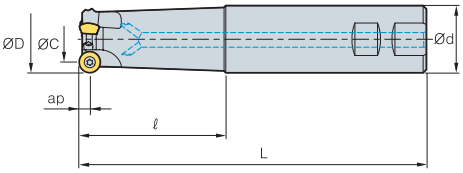


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.
FMRS	5040HRD-S	2	40	24	32	40	125	8	1.4	2
	5040HRD-M	2	40	24	32	70	200	8	1.8	1
	5040HRD-L	2	40	24	32	150	300	8	2.0	1
	5040HRD-S40	2	40	24	40	40	125	8	1.6	2
	5040HRD-M40	2	40	24	40	70	200	8	2.0	1
	5040HRD-L40	2	40	24	40	150	300	8	2.4	1
	5040HRD-S42	2	40	24	42	40	125	8	2.0	2
	5040HRD-M42	2	40	24	42	70	200	8	2.4	1
	5040HRD-L42	2	40	24	42	150	300	8	2.8	1
	5050HRD-S40	3	50	34	40	50	150	8	2.0	2
	5050HRD-M40	3	50	34	40	50	250	8	2.4	1
	5050HRD-L40	3	50	34	40	50	300	8	2.6	1
	5050HRD-S	3	50	34	42	50	150	8	1.5	2
	5050HRD-M	3	50	34	42	50	250	8	1.8	1
	5050HRD-L	3	50	34	42	50	300	8	2.0	1
	5063HRD-S40	4	63	47	40	50	150	8	1.7	2
	5063HRD-M40	4	63	47	40	50	250	8	2.0	1
	5063HRD-L40	4	63	47	40	50	300	8	2.3	1
	5063HRD-S	4	63	47	42	50	150	8	1.6	2
	5063HRD-M	4	63	47	42	50	250	8	1.8	1
	5063HRD-L	4	63	47	42	50	300	8	2.0	1

Available inserts

RDHW-E,F,S | RDKT-MF | RDKT-ML | RDKT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	1605M0E																	
	1605M0F																	
	1605M0S																	E15
RDKT	1605M0-MF																	E16
	1605M0-MM									●								
	1605M0-ML																	

Parts

Specification	Screw	Wrench
Ø40~Ø63	FTGA0513-P	TW20-100

Available inserts **E15, E16**

FMRS6000



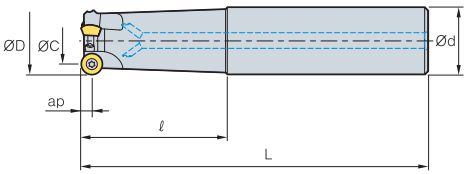


Fig. 1

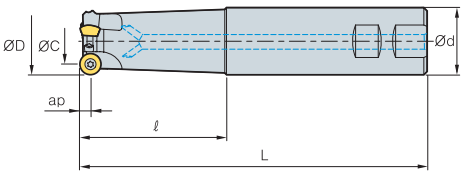


Fig. 2



• AR: 5°
• RR: -8°~ -5°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.
FMRS	6050HRD-S40	3	50	31	40	50	150	10	1.3	2
	6050HRD-S42	3	50	31	42	50	150	10	1.4	2
	6050HRD-M40	3	50	31	40	50	250	10	2.2	1
	6050HRD-M42	3	50	31	42	50	250	10	2.4	1
	6050HRD-L40	3	50	31	40	50	300	10	2.7	1
	6050HRD-L42	3	50	31	42	50	300	10	3.0	1
	6063HRD-S40	4	63	44	40	50	150	10	1.5	2
	6063HRD-S42	4	63	44	42	50	150	10	1.6	2
	6063HRD-M40	4	63	44	40	50	250	10	2.5	1
	6063HRD-M42	4	63	44	42	50	250	10	2.7	1
	6063HRD-L40	4	63	44	40	50	300	10	3.0	1
	6063HRD-L42	4	63	44	42	50	300	10	3.2	1

Available inserts

RDHW-E,F,S



RDKT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDHW	2006M0E																	E15
	2006M0F																	E15
	2006M0S																	E16
RDKT	2006M0-MM									●								

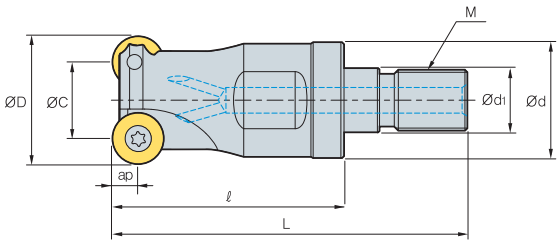
Parts

Specification	Screw	Wrench
Ø50~Ø63	FTGA0515-P	TW20-100

Available inserts E15, E16

FMRM1000/1500







• AR: 0°~5°
• RR: -5°~ -1°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg
FMRM	1008HRD-M06	1	8	5.5	9.5	6.5	25	40	M06	2.5	0.02
	1010HRD-M06	2	10	5	9.5	6.5	25	40	M06	2.5	0.02
	1012HRD-M06	2	12	7	11	6.5	25	40	M06	2.5	0.02
	1015HRD-M08	3	15	10	14.5	8.5	30	47	M08	2.5	0.04
	1510HRD-M06	1	10	7	9.5	6.5	25	40	M06	3.0	0.02
	1512HRD-M06	2	12	6	11	6.5	25	40	M06	3.0	0.02
	1516HRD-M08	3	16	10	14.5	8.5	30	47	M08	3.0	0.02
	1520HRD-M10	3	20	14	18	10.5	35	56	M10	3.0	0.07

Available inserts

RDHW-E,F,S



RDKW



Type	Designation	Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
1000 type	RDHW 0501M0E (F,S)											●						E15 E16
	RDKW 0501M0E																	
1500 type	RDHW 06T1M0E (F,S)											●						
	RDKW 06T1M0E																	

Available adaptor

Designation		Available adaptor
FMRM	008HRD-M06	MAT-M06
	1010HRD-M06	
	1012HRD-M06	
	1015HRD-M08	MAT-M08
	1510HRD-M06	MAT-M06
	1512HRD-M06	
	1515HRD-M08	MAT-M08
	1520HRD-M10	MAT-M10

Designation: FMRM1008HRD-M06
Modular head threading measure size (M06)

II

Adaptor spec.: MAT-M06-020-S10S
Adaptor threading measure (M06)

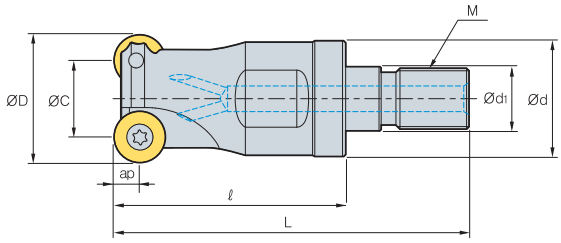
Parts

Specification	Screw	Wrench
Ø8~Ø15 (1000 type)	FTNA0203	TW06P
Ø10~Ø20 (1500 type)	FTNA02205	TW06P

Available inserts E15, E16 Available adaptor E342~E343

FMRM2000/2500







• AR: 0°~5°
• RR: -5°~ -1°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg
FMRM	2015HRD-M08	2	15	8	14.5	8.5	30	47	M08	3.5	0.04
	2020HRD-M10	3	20	13	18	10.5	35	56	M10	3.5	0.07
	2516HRD-M08	2	16	8	14.5	8.5	30	47	M08	4.0	0.04
	2520HRD-M10	2	20	12	18	10.5	35	56	M10	4.0	0.07
	2525HRD-M12	3	25	17	22.5	12.5	45	69	M12	4.0	0.13

Available inserts

RDHW-E,F,S



RDKW



Type	Designation		Cermet		Coated												Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
2000 type	RDHW	0702M0E (F,S)											●						E15 E16
	RDKW	0702M0E									●								
2500 type	RDHW	0803M0E (F,S)											●						
	RDKW	0803M0E																	
		1605MO-MF																	

Available adaptor

Designation		Available adaptor
FMRM	2015HRD-M08	MAT-M08
	2020HRD-M10	MAT-M10
	2516HRD-M08	MAT-M08
	2520HRD-M10	MAT-M10
	2525HRD-M12	MAT-M12

Designation: FMRM1008HRD-M06
Modular Head Threading Measure size (M06)

II

Adaptor spec.: MAT-M06-020-S10S
Adaptor Threading Measure (M06)

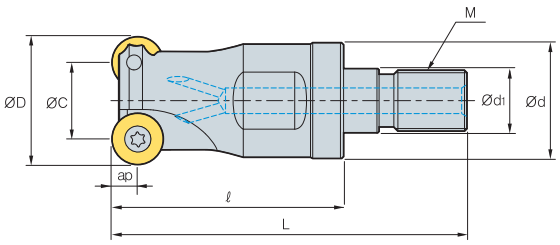
Parts

Specification	Screw	Wrench
Ø15~Ø20 (2000 type)	FTNA02555	TW07S
Ø16~Ø25 (2500 type)	FTNA0305	TW09S

Available inserts E15, E16 Available adaptor E342~E343

FMRM3000







• AR: 5°
•RR:-8°~ -5°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg
FMRM	3021HRD-M10	2	21	11	18	10.5	35	56	M10	5.0	0.1
	3025HRD-M12	2	25	15	22.5	12.5	45	69	M12	5.0	0.15
	3032HRD-M16	3	32	22	29	17	50	77	M16	5.0	0.2
	3042HRD-M16	4	42	32	29	17	50	77	M16	5.0	0.24

Available inserts

RDHW-E,F,S | RDCT-MA | RDKT-MF | RDKT-ML | RDKT-MM



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RDCT	10T3M0-MA																●	E15 E16
RDKT	10T3M0-MF											●		●				
	10T3M0-MM			●						●		●	●	●				

Available adaptor

Designation		Available adaptor
FMRM	3021HRD-M10	MAT-M10
	3025HRD-M12	MAT-M12
	3032HRD-M16	MAT-M16
	3042HRD-M16	

Designation: FMRM1008HRD-M06
Modular Head Threading Measure size (M06)

II

Adaptor spec.: MAT-M06-020-S10S
Adaptor Threading Measure (M06)

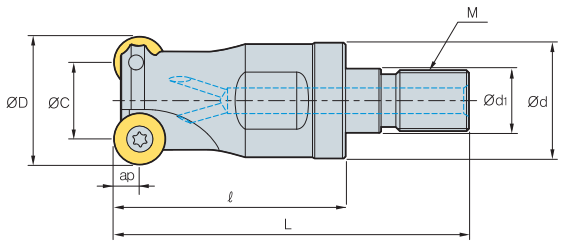
Parts

Specification	Screw	Wrench
Ø21~Ø42	FTGA03508 (07)	TW15S

Available inserts E15, E16 Available adaptor E342~E343

FMRM4000/5000







• AR: 5°
• RR: -8°~ -5°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg
FMRM	4025HRD-M12	2	25	13	22.5	12.5	45	69	M12	6.0	0.12
	4032HRD-M16	2	32	20	29	17	50	77	M16	6.0	0.22
	4040HRD-M16	3	40	28	29	17	50	77	M16	6.0	0.23
	4042HRD-M16	4	42	28	29	17	50	77	M16	6.0	0.25
	5040HRD-M16	2	40	24	29	17	50	77	M16	8.0	0.25

Available inserts

RDHW-E,F,S | RDCT-MA | RDKT-MF | RDKT-ML | RDKT-MM



Type	Designation		Cermet		Coated											Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
4000 type	RDCT	1204M0-MA																●	E15 E16
	RDKT	1204M0-MF											●		●				
		1204M0-MM			●						●		●	●	●				
5000 type	RDHW	1605M0E,F,S																	
	RDKT	1605M0-MF																	
		1605M0-ML																	
		1605M0-MM									●								

Available adaptor

Designation		Available adaptor
FMRM	4025HRD-M12	MAT-M12
	4032HRD-M16	MAT-M16
	4040HRD-M16	
	4042HRD-M16	
	5040HRD-M16	MAT-M16

Designation: FMRM1008HRD-M06
Modular head threading measure size (M06)

=

Adaptor spec.: MAT-M06-020-S10S
Adaptor threading measure (M06)

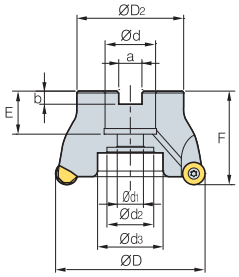
Parts

Specification	Screw	Wrench
Ø25~Ø42 (4000 type)	FTKA0410	TW15S
Ø40 (5000 type)	FTGA0513-P	TW20-100

Available inserts E15, E16 Available adaptor E342~E343

FMRCM3000 new







• AR: 5°
• RR: -4°~ 0°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	d3	a	b	E	F	ap	kg	Insert size
FMRCM	3040HRP-5	5	40	38	16	9	14	-	8.4	5.6	19	40	5	0.22	10
	3050HRP-6	6	50	45	22	11	18	-	10.4	6.3	20	40	5	0.35	10
	3052HRP-6	6	52	45	22	11	18	-	10.4	6.3	20	40	5	0.37	10
	3063HRP-6	6	63	50	22	11	18	-	10.4	6.3	20	40	5	0.55	10
	3063HRP-7	7	63	50	22	11	18	-	10.4	6.3	20	40	5	0.56	10
	3066HRP-7	7	66	50	22	11	18	-	10.4	6.3	20	40	5	0.60	10

Available inserts

RPCT-MA | RPET-ML | RPMT-MF | RPMT-MM | RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	10T3M0-MA																●	E16
RPET	10T3M0E-ML													●	●			
RPMT	10T3M0E-MF										●			●	●			
	10T3M0S-MM							●	●		●			●	●			
RPMW	10T3M0E1							●	●		●			●	●			

Available arbors

Designation		Ød	Available arbors
FMRCM	3040HRP-5	16	BT□□-FMC16-□□
	3050HRP-6	22	BT□□-FMC22-□□
	3052HRP-6	22	BT□□-FMC22-□□
	3063HRP-6	22	BT□□-FMC22-□□
	3063HRP-7	22	BT□□-FMC22-□□
	3066HRP-7	22	BT□□-FMC22-□□

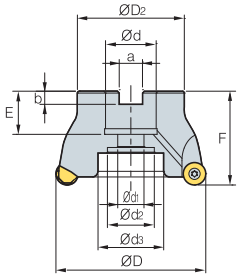
Parts

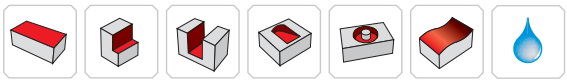
Specification	Screw	Wrench
Ø40~Ø66	FTGA03508	TW15S

Available inserts E16 Available arbors and bolt E371~E373

FMRC(M)4000 new







• AR: 5°
• RR: -2°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg	Insert size
FMRCM	4050HRP-4	4	50	45	22	11	18	-	10.4	6.3	20	40	6	0.26	12
	4050HRP-5	5	50	45	22	11	18	-	10.4	6.3	20	40	6	0.28	12
	4052HRP-5	5	52	45	22	11	18	-	10.4	6.3	20	40	6	0.30	12
	4063HRP-5	5	63	50	22	11	18	-	10.4	6.3	20	40	6	0.44	12
	4063HRP-6	6	63	50	22	11	18	-	10.4	6.3	20	40	6	0.48	12
	4066HRP-6	6	66	50	22	11	18	-	10.4	6.3	20	40	6	0.50	12
FMRC (FMRCM)	4080HRP-6	6	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	24 (23)	50	6	0.92	12
	4080HRP-7	7	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	24 (23)	50	6	0.90	12
	4100HRP-7	7	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (25)	63 (53)	6	1.46	12

( )Metric size

Available inserts

RPCT-MA RPET-ML RPMT-MF RPMT-MM RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1204M0-MA																●	E16
RPET	1204M0E-ML													●	●			
RPMT	1204M0E-MF										●			●	●			
	1204M0S-MM							●	●		●			●	●			
RPMW	1204M0S1							●	●		●			●	●			
	1204M0S2													●	●			

Available arbors

Designation		Ød	Available arbors
FMRCM	4050HRP-4	22	BT□□-FMC22-□□
	4050HRP-5		
	4052HRP-5		
	4063HRP-5		
	4063HRP-6		
	4066HRP-6		
FMRC(M)	4080HRP-6	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4080HRP-7	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	4100HRP-7	31.75	BT□□-FMA31.5-□□
		32	BT□□-FMC32-□□

Parts

Specification	Screw	Wrench
Ø50~Ø100	FTKA0410	TW15S

Available inserts E16 Available arbors and bolt E371~E373

FMRC(M)5000 new



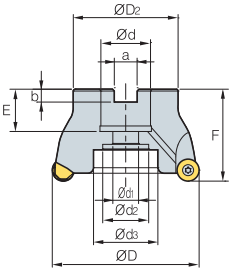


Fig. 1

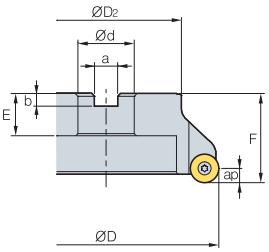


Fig. 2

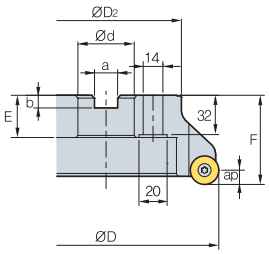


Fig. 3

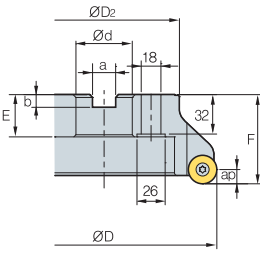


Fig. 4



• AR: 5°
• RR: -1°~ 0°

(mm)

Designation		◎	ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg	Fig.	Insert size
FMRCM	5063HRP-4	4	63	50	22	11	18	-	10.4	6.3	20	40	8	0.43	1	16
	5063HRP-5	5	63	50	22	11	18	-	10.4	6.3	20	40	8	0.44	1	16
	5066HRP-5	5	66	50	22	11	18	-	10.4	6.3	20	40	8	0.48	1	16
FMRC (FMRCM)	5080HRP-5	5	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	24 (23)	50	8	0.77	1	16
	5080HRP-6	6	80	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	24 (23)	50	8	0.82	1	16
	5100HRP-6	6	100	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (25)	63 (55)	8	1.42	1	16
	5125HRP-7	7	125	87	38.1 (40)	22	32	52	15.9 (16.4)	10 (9)	35 (29)	68 (63)	8	2.78	1	16
	5125HRP-8	8	125	87	38.1 (40)	22	32	52	15.9 (16.4)	10 (9)	35 (29)	68 (63)	8	2.79	1	16
	5160HRP-8	8	160	107	50.8 (40)	-	-	100	19 (16.4)	11 (9)	38 (32)	63	8	4.01	2 (3)	16

( )Metric size

Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1606M0-MA																●	E16
RPET	1606M0E-ML													●	●			
RPMT	1606M0E-MF										●			●	●			
	1606M0S-MM							●	●		●			●	●			
RPMW	1606M0S1							●	●		●			●	●			

Available arbors

Designation		Ød	Available arbors
FMRCM	5063HRP-4	22	BT□□-FMC22-□□
	5063HRP-5		
	5066HRP-5		
FMRC(M)	5080HRP-5	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	5080HRP-6	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	5100HRP-6	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	5125HRP-7	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□
	5125HRP-8	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□
	5160RP-8	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMC40-□□

Parts

Specification	Screw	Wrench
Ø63~Ø160	FTGA0512-P	TW20-100

Available inserts E16 Available arbors and bolt E371~E373

FMRC(M)6000 new



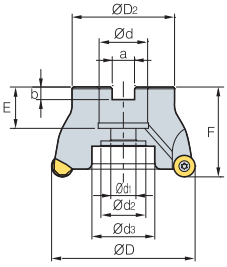


Fig. 1

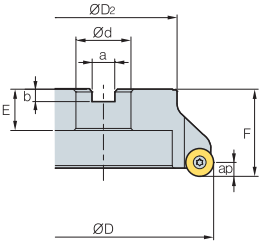


Fig. 2

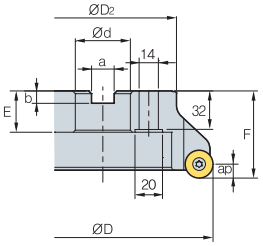


Fig. 3

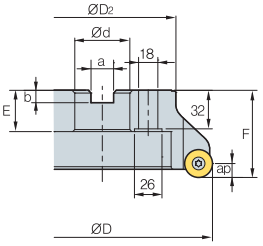


Fig. 4



• AR: 5°
• RR: 0°

(mm)

Designation			ØD	ØC	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg	Fig.	Insert size
FMRCM	6063HRP-4	4	63	43	50	22	11	18	-	10.4	6.3	20	40	10	0.37	1	20
FMRC (FMRCM)	6080HRP-5	5	80	60	57	25.4 (27)	14	25	35	9.5 (12.4)	6 (7)	24 (23)	50	10	0.87	1	20
	6100HRP-5	5	100	80	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (25)	63 (55)	10	1.31	1	20
	6100HRP-6	6	100	80	67	31.75 (32)	18	26	42	12.7 (14.4)	8 (8)	32 (25)	63 (55)	10	1.40	1	20
	6125HRP-5	5	125	105	87	38.1 (40)	22	32	52	15.9 (16.4)	10 (9)	35 (29)	68 (63)	10	2.77	1	20
	6125HRP-7	7	125	105	87	38.1 (40)	22	32	52	15.9 (16.4)	10 (9)	35 (29)	68 (63)	10	2.89	1	20
	6160RP-6	6	160	140	107	50.8 (40)	-	-	100	19 (16.4)	11 (9)	38 (32)	63	10	3.58	2 (3)	20
	6160RP-8	8	160	140	107	50.8 (40)	-	-	100	19 (16.4)	11 (9)	38 (32)	63	10	3.53	2 (3)	20
	6200RP-8	8	200	180	130	47.625 (60)	-	-	132	25.4 (25.7)	14 (14)	38	63	10	5.15	4	20
	6250RP-9	9	250	230	180	47.625 (60)	-	-	180	25.4 (25.7)	14 (14)	38	63	10	9.72	4	20

( )Metric size

Available inserts

RPCT-MA RPET-ML RPMT-MF RPMT-MM RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	2007M0-MA																●	E16
RPET	2007M0E-ML													●	●			
RPMT	2007M0E-MF										●			●	●			
	2007M0S-MM							●	●		●			●	●			
RPMW	2007M0S1							●	●		●			●	●			

Available arbors

Designation		Ød	Available arbors
FMRCM	6063HRP-4	22	BT□□-FMC22-□□
FMRC(M)	6080HRP-5	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	6100HRP-5	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	6100HRP-6	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	6125HRP-5	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□

Designation		Ød	Available arbors
FMRC(M)	6125HRP-7	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□
	6160RP-6	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMC40-□□
	6160RP-8	50.8	BT□□-FMA50.8-□□
		40	BT□□-FMC40-□□
	6200RP-8	47.625	BT□□-FMA47.625-□□
		60	BT□□-FMC60-□□
	6250RP-9	47.625	BT□□-FMA47.625-□□
		60	BT□□-FMC60-□□

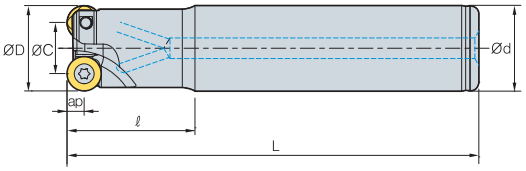
Parts

Specification	Screw	Wrench
Ø63~Ø250	FTKA0615-P	TW25-100

Available inserts E16 Available arbors and bolt E371~E373

FMRS2500 new







• AR: -4°
• RR: -4°~ -1°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Insert size
FMRS	2517HRP-2S16	2	17	9	16	35	90	4	0.11	8
	2517HRP-2M16	2	17	9	16	35	150	4	0.20	8
	2517HRP-2L16	2	17	9	16	35	200	4	0.27	8
	2518HRP-2M16	2	18	10	16	35	150	4	0.20	8
	2518HRP-2L16	2	18	10	16	35	200	4	0.28	8
	2520HRP-3S20	3	20	12	20	35	130	4	0.27	8
	2520HRP-3M20	3	20	12	20	100	180	4	0.36	8
	2520HRP-3L20	3	20	12	20	130	250	4	0.50	8
	2521HRP-3S20	3	21	13	20	35	130	4	0.28	8
	2521HRP-3M20	3	21	13	20	35	180	4	0.40	8
	2521HRP-3L20	3	21	13	20	35	250	4	0.55	8
	2525HRP-4S25	4	25	17	25	35	150	4	0.48	8
	2525HRP-4M25	4	25	17	25	60	180	4	0.60	8
	2525HRP-4L25	4	25	17	25	130	250	4	0.81	8
	2526HRP-4S25	4	26	18	25	35	150	4	0.48	8
	2526HRP-4L25	4	26	18	25	130	250	4	0.85	8

Available inserts

RPET-ML RPMT-MF RPMT-MM RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPET	0803M0E-ML													●	●			E16
RPMT	0803M0E-MF										●			●	●			
	0803M0S-MM							●	●		●			●	●			
RPMW	0803M0E1							●	●		●			●	●			

Parts

Specification	Screw	Wrench
Ø17 Ø18~Ø26	FTNA0305 FTNA0306	TW09S

Available inserts E16

FMRS3000 new



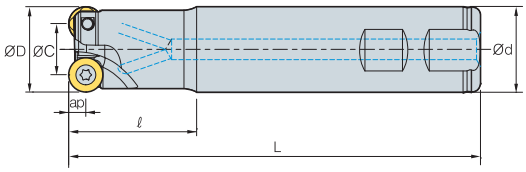


Fig. 1

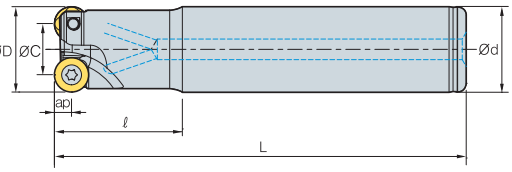


Fig. 2

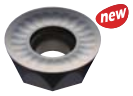


• AR: -4°
• RR: -1°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.	Insert size
FMRS	3025HRP-2M20	2	25	15	20	40	170	5	0.40	2	10
	3025HRP-2S25	2	25	15	25	40	120	5	0.39	1	10
	3025HRP-2M25	2	25	15	25	60	160	5	0.52	2	10
	3025HRP-2L25	2	25	15	25	130	250	5	0.80	2	10
	3026HRP-2L25	2	26	16	25	30	200	5	0.69	2	10
	3032HRP-3S32	3	32	22	32	40	125	5	0.68	1	10
	3032HRP-3L32	3	32	22	32	60	200	5	1.08	2	10
	3032HRP-4S32	4	32	22	32	40	125	5	0.66	1	10
	3032HRP-4L25	4	32	22	25	60	200	5	0.74	2	10
	3033HRP-4S32	4	33	23	32	40	125	5	0.67	1	10
	3033HRP-4M32	4	33	23	32	60	180	5	1.00	2	10
	3033HRP-4L32	4	33	23	32	180	300	5	1.64	2	10

Available inserts

	RPCT-MA	RPET-ML	RPMT-MF	RPMT-MM	RPMW
					

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	10T3M0-MA																●	E16
RPET	10T3M0E-ML													●	●			
RPMT	10T3M0E-MF										●			●	●			
	10T3M0S-MM							●	●		●			●	●			
RPMW	10T3M0E1							●	●		●			●	●			

Parts

Specification	Screw	Wrench
Ø25~Ø26 Ø32~Ø33	FTGA03507 FTGA03508	TW15S

Available inserts E16

FMRS4000 new



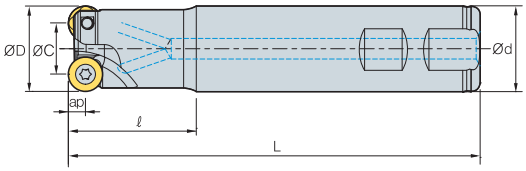


Fig. 1

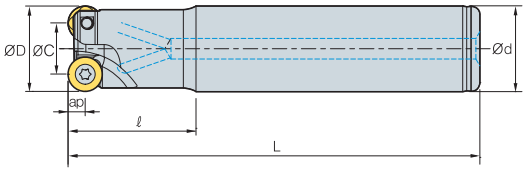


Fig. 2

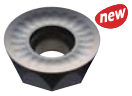


• AR: -4°
• RR: -2°~ 0°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Fig.	Insert size
FMRS	4025HRP-2S25	2	25	13	25	60	160	6	0.46	1	12
	4026HRP-2L25	2	26	14	25	60	200	6	0.48	2	12
	4032HRP-2L25	2	32	20	25	40	190	6	0.68	2	12
	4032HRP-2S32	2	32	20	32	50	125	6	0.64	1	12
	4032HRP-2L32	2	32	20	32	50	250	6	1.40	2	12
	4032HRP-3S32	3	32	20	32	50	125	6	0.64	1	12
	4032HRP-3M32	3	32	20	32	60	160	6	0.85	2	12
	4033HRP-3M32	3	33	21	32	60	200	6	1.01	2	12
	4033HRP-3L32	3	33	21	32	60	300	6	1.67	2	12
	4040HRP-3S32	3	40	28	32	35	105	6	0.60	1	12
	4040HRP-3M32	3	40	28	32	50	160	6	0.96	2	12
	4040HRP-4S32	4	40	28	32	35	105	6	0.60	1	12
	4040HRP-4M32	4	40	28	32	35	150	6	0.87	2	12
	4040HRP-4L32	4	40	28	32	35	250	6	1.46	2	12
	4050HRP-4M32	4	50	38	32	50	150	6	1.10	2	12
	4050HRP-4M40	4	50	38	40	50	150	6	1.44	2	12
	4050HRP-4M42	4	50	38	42	50	150	6	1.55	2	12

Available inserts

		RPCT-MA	RPET-ML	RPMT-MF	RPMT-MM	RPMW
						

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1204M0-MA																●	E16
RPET	1204M0E-ML													●	●			
RPMT	1204M0E-MF										●			●	●			
	1204M0S-MM							●	●		●			●	●			
RPMW	1204M0S1							●	●		●			●	●			
	1204M0S2													●	●			

Parts

Specification	Screw	Wrench
Ø25~Ø26	FTKA0408	TW15S
Ø32~Ø50	FTKA0410	

Available inserts E16

FMRS5000/6000 new



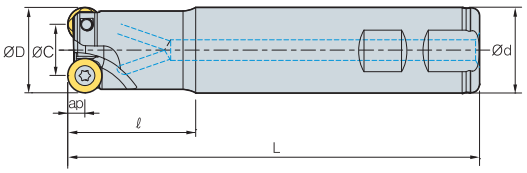


Fig. 1

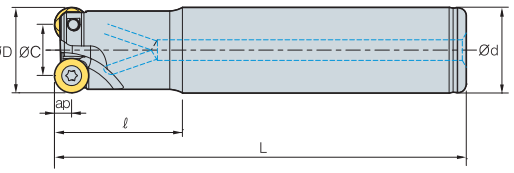


Fig. 2



• AR: -4°
• RR: 0°

(mm)

Designation			ØD	ØC	Ød	ℓ	L	ap	kg	Insert size	Fig.
FMRS	5040HRP-2M32	2	40	24	32	50	160	8	0.92	16	2
	5040HRP-2L32	2	40	24	32	50	250	8	1.45	16	2
	5050HRP-3M40	3	50	34	40	50	160	8	1.48	16	2
	5050HRP-3L40	3	50	34	40	50	300	8	2.86	16	2
	6050HRP-3S32	3	50	30	32	50	160	10	1.06	20	1
	6050HRP-3M32	3	50	30	32	50	200	10	1.30	20	2
	6050HRP-3S40	3	50	30	40	50	125	10	1.45	20	1
	6050HRP-3M40	3	50	30	40	50	200	10	1.85	20	2

Available inserts

RPCT-MA | RPET-ML | RPMT-MF | RPMT-MM | RPMW



Type	Designation		Cermet		Coated											Uncoated		page
			CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
5000 type	RPCT	1606M0-MA																●	E16
	RPET	1606M0E-ML													●	●			
	RPMT	1606M0E-MF										●			●	●			
		1606M0S-MM										●			●	●			
	RPMW	1606M0S1							●	●		●			●	●			
6000 type	RPCT	2007M0-MA																●	E16
	RPET	2007M0E-ML													●	●			
	RPMT	2007M0E-MF										●			●	●			
		2007M0S-MM							●	●		●			●	●			
	RPMW	2007M0S1							●	●		●			●	●			

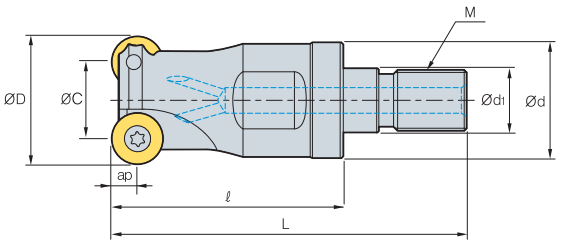
Parts

Specification	Screw	Wrench
Ø40~Ø50 (5000 type)	FTGA0511-P	TW20-100
Ø50 (6000 type)	FTKA0615-P	TW25-100

Available inserts E16

FMRM2500 new





• AR: -4°
• RR: -4°~ 0°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg	Insert size
FMRM	2517HRP-M08	2	17	9	14.5	8.5	25	42	M08	4	0.03	8
	2521HRP-M10	3	21	13	18	10.5	30	51	M10	4	0.06	8
	2526HRP-M12	4	26	18	23	12.5	35	59	M12	4	0.11	8
	2533HRP-M16	4	33	25	29	17	40	67	M16	4	0.22	8
	2540HRP-M16	5	40	32	29	17	40	67	M16	4	0.26	8

Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPET	0803M0E-ML													●	●			E16
RPMT	0803M0E-MF										●			●	●			
	0803M0S-MM							●	●		●			●	●			
RPMW	0803M0E1							●	●		●			●	●			

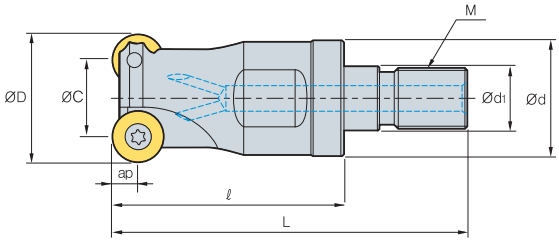
Parts

Specification	Screw	Wrench
Ø17 Ø21~Ø40	FTNA0305 FTNA0306	TW09S

Available inserts E16 Available adaptor E342~E343

FMRM3000 new







• AR: -4°
• RR: -1°~ 0°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg	Insert size
FMRM	3026HRP-M12	3	26	16	23	12.5	35	59	M12	5	0.10	10
	3033HRP-M16	3	33	23	29	17	40	67	M16	5	0.20	10
	3035HRP-M16	3	35	25	29	17	40	67	M16	5	0.22	10
	3040HRP-M16	3	40	30	29	17	40	67	M16	5	0.25	10
	3042HRP-M16	3	42	32	29	17	40	67	M16	5	0.27	10

Available inserts

RPCT-MA | RPET-ML | RPMT-MF | RPMT-MM | RPMW



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	10T3M0-MA																●	E16
RPET	10T3M0E-ML													●	●			
RPMT	10T3M0E-MF										●			●	●			
	10T3M0S-MM							●	●		●			●	●			
RPMW	10T3M0E1							●	●		●			●	●			

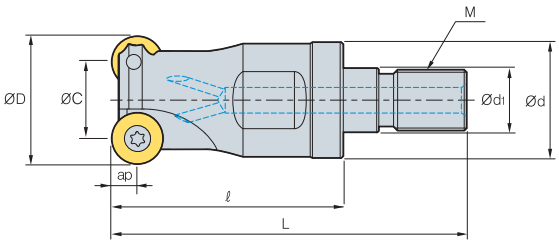
Parts

Specification	Screw	Wrench
Ø26 Ø33~Ø42	FTGA03507 FTGA03508	TW15S

Available inserts E16 Available adaptor E342~E343

FMRM4000 new







• AR: -4°
• RR: 0°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg	Insert size
FMRM	4026HRP-M12	2	26	14	23	12.5	35	59	M12	6	0.10	12
	4033HRP-M16	3	33	21	29	17	40	67	M16	6	0.21	12
	4035HRP-M16	3	35	23	29	17	40	67	M16	6	0.21	12
	4040HRP-M16	4	40	28	29	17	40	67	M16	6	0.24	12
	4042HRP-M16	4	42	30	29	17	40	67	M16	6	0.25	12

Available inserts



Designation		Cermet		Coated										Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1204M0-MA																●	E16
RPET	1204M0E-ML													●	●			
RPMT	1204M0E-MF										●			●	●			
	1204M0S-MM							●	●		●			●	●			
RPMW	1204M0S1							●	●		●			●	●			
	1204M0S2													●	●			

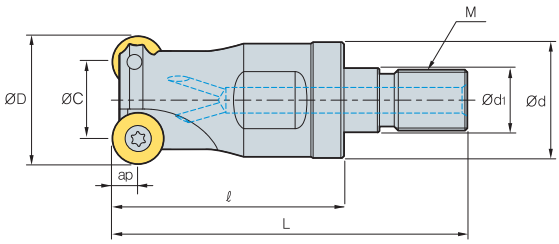
Parts

Specification	Screw	Wrench
Ø26 Ø33~Ø42	FTKA0408 FTKA0410	TW15S

Available inserts E16 Available adaptor E342~E343

FMRM5000 new







• AR: -4°
• RR: 0°

(mm)

Designation			ØD	ØC	Ød	Ød1	ℓ	L	M	ap	kg	Insert size
FMRM	5040HRP-M16	2	40	24	29	17	40	67	M16	8	0.21	16
	5042HRP-M16	2	42	26	29	17	40	67	M16	8	0.23	16

Available inserts



Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
RPCT	1606M0-MA																●	E16
RPET	1606M0E-ML													●	●			
RPMT	1606M0E-MF										●			●	●			
	1606M0S-MM							●	●		●			●	●			
RPMW	1606M0S1							●	●		●			●	●			

Parts

Specification	Screw	Wrench	Wrench
Ø40~Ø42	FTGA0511-P	-	TW20-100

Available inserts E16 Available adaptor E342~E343

Stable machining, high efficiency milling tools for small diameter machining

HFM new

- Increase productivity through improved insert shape and size, high feed per tooth, and many cutting-edges, for small diameter machining
- Stable tool life through the combination of the reinforced toughness on corner and suitable grades of high hardness in the area of high speed and high hardness

Code system

• Shank type

HFM	S	1	010	H	R	- 2	L	10
High Feed Mill	Tool type	Inscribed circle of insert	Tool dia.	Coolant type	Hand	No. of tooth	Shank length	Shank Dia.
	S: Shank	1: 04 type insert	010: Ø10	No code: None H: Thru-hole	R: Right L: Left	2: 2teeth	S: Standard type M: Middle type L: Long type	10: Ø10

• Modular type

HFM	M	1	010	H	R	- M06
High Feed Mill	Tool type	Inscribed circle of insert	Tool dia.	Coolant type	Hand	M Dimensions
	M: Modular	1: 04 type insert	010: Ø10	No code: None H: Thru-hole	R: Right L: Left	

• Modular adapter

MAT -	M10 -	010 -	S20	S	- C -	170
Modular Adaptor	M Dimensions	Neck length	Shank Dia.	Neck type	Adaptor material	Adaptor length
	M10	010: 10mm	S20: Ø20	T: Taper S: Straight	Unmarked: Steel C: Carbide	170: 170mm

Features

- Apply helix cutting-edge on insert, low cutting load and reinforce toughness on corner
- Increased rigidity with double relief angle (11, 13), prevent interference with high feed
- To apply the negative axial rake angle when set up the holder, increased chipping resistance
- Tool life is increased with suitable C/B and grade for every material



• Holder setup
- To set up the negative axial rake angle, increased chipping resistance

• No. of tooth
- Increased tool life with increased flutes
- HRM(D) Ø20 (2 flutes) ➔ HFM Ø20 (5 flutes)



• Relief angle
- 11, 13 double relief angle increase rigidity and prevent interference

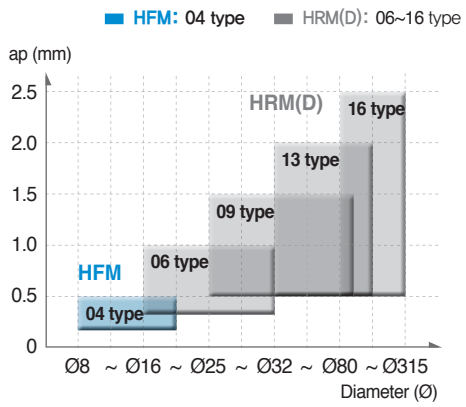
• Major cutting-edge
- Improved sharpness of principle edge
- Improved toughness of corner edge

Features of chip breakers

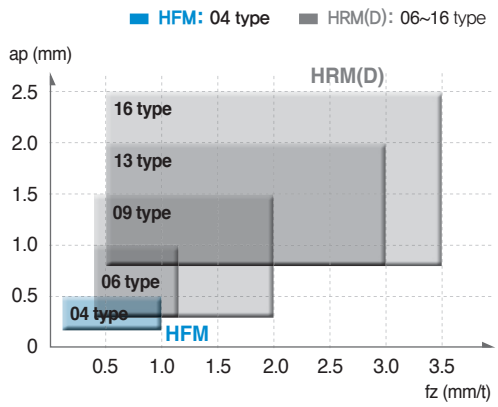
Chip breaker	Cutting-edge	Applications	Features
MF		Fine finishing Titanium & Inconel machining	• Low cutting resistance C/B, suitable for light cutting
None C/B		Super hard material machining	• High toughness shape, suitable for hard die steel cutting

Application area

Application area (ap & Diameter)

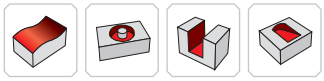


Application area (ap & fz)



Recommended cutting condition

(●: 1st, ○: 2nd)



Workpiece		KOR (KS)	USA (AISI)	GER (DIN)	HB (HRC)	Grades	Cutting conditions vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)	Chip breaker MF	Chip breaker None C/B
P	Mild steel	SM20C	1020	C22	120~180	PC5400 (PC5300)	100~220	0.5~1.0	~0.5	0.7D~0.1D	●	-
P	Carbon steel	SM45C	1045	C45	200	PC5400 (PC5300)	100~200	0.5~1.0	~0.5	0.7D~0.1D	●	-
P	Alloy steel	SCM440	4140	41CrMo4	270 (28)	PC5300	100~200	0.5~1.0	~0.5	0.7D~0.1D	●	-
P	Pre-hardened steel	KP4M	P20 (Improved)	1.2738 (Improved)	300 (32)	PC5300 (PC2510) new	100~180	0.5~0.9	~0.4	0.7D~0.1D	●	○
P	Pre-hardened steel	NIMAX	P21 (Improved)	-	370 (40)	PC5300 (PC2510) new	100~180	0.5~0.9	~0.4	0.7D~0.1D	●	○
P	Pre-hardened steel	CENA1	P21 (Improved)	-	370 (40)	PC5300 (PC2510) new	100~180	0.5~0.9	~0.4	0.7D~0.1D	●	○
P	Pre-hardened steel	NAK80	P21 (Improved)	-	400 (43)	PC5300	100~160	0.5~0.7	~0.4	0.7D~0.1D	○	-
P	Pre-hardened steel	NAK80	P21 (Improved)	-	400 (43)	PC5300	100~180	0.5~0.9	~0.4	0.7D~0.1D	-	●
P	Pre-hardened steel	STAVAX	420	X30Cr13	510 (52)	PC2510 new (PC5300)	80~150	0.3~0.6	~0.4	0.7D~0.1D	●	-
P	Alloy tool steel	STD11 STD61	D2 H13	X155CrVMo12-1 X40CrMoV5-1	- (40~50)	PC2510 new (PC2505) new	80~130	0.3~0.55	~0.3	0.7D~0.1D	-	●
P	Alloy tool steel	STD11 (Cold forging)	D2	X155CrVMo12-1	630 (60)	PC2505 new	30~75	0.3~0.5	~0.2	0.7D~0.1D	-	●
M	Stainless steel	STS316	316	X5CrNiMo17-12-2	Under 270	PC5400 (PC5300)	70~150	0.5~0.7	~0.5	0.7D~0.1D	●	-
K	Gray cast iron, Ductile cast iron	GCD450	65-45-12	GGG40.3	Tensile Strength Over 450Mpa	PC5300	130~220	0.6~0.8	~0.5	0.7D~0.1D	●	-
S	HRSA Fe series	Incoloy901	N09901	- (WS 2.4662)	- (25~35)	PC5300 (PC5400)	30~100	0.3~0.5	~0.3	0.4D~0.7D	●	○
S	HRSA Ni or Co series	Inconel718	N07718	NiCr19FeNbMo (WS 2.4668)	- (35~45)	PC5300 (PC5400)	20~50	0.3~0.6	~0.3	0.4D~0.7D	●	○
S	Titanium	Ti-6Al-4V	R56400	TiAl6V4	- (40~45)	PC5300	30~50	0.4~1.0	~0.3	0.7D~0.1D	●	-

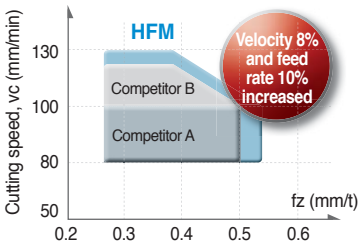
Performance evaluation

High speed machining

■ Workpiece
STD11 (HRC40~45)

■ Insert
LPM(E)W0402□□R

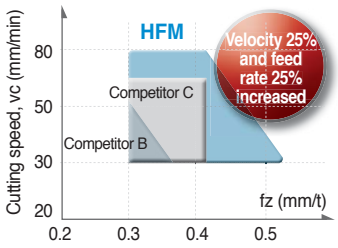
■ Recommended grade
PC2505 (1st), PC2510 (2nd)



■ Workpiece
STD11(Over HRC60)

■ Insert
LPM(E)W0402□□R

■ Recommended grade
PC2505 (1st), PC2510 (2nd)

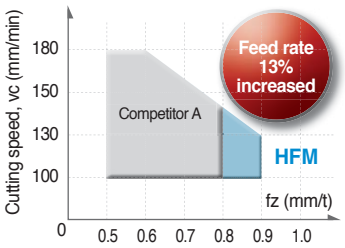


High feed machining

■ Workpiece
KP4M (HRC32), NAK80 (HRC43)

■ Insert
LPMT0402□□R-MF

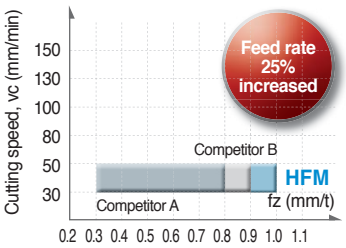
■ Recommended grade
PC5300 (1st), PC2510 (2nd)



■ Workpiece
Ti-6AL-4V (HRC40~45)

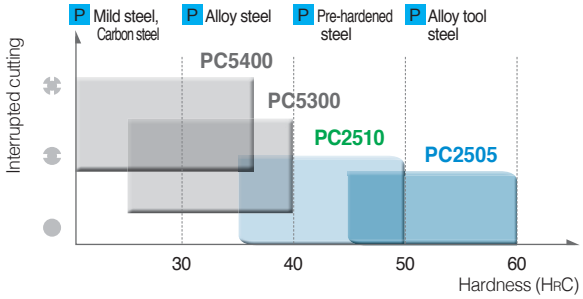
■ Insert
LPMT0402□□R-MF

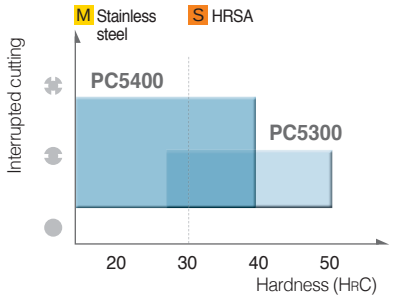
■ Recommended grade
PC5300 (1st), PC5400 (2nd)



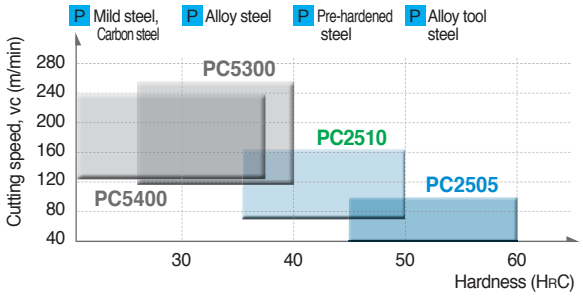
High hardness machining

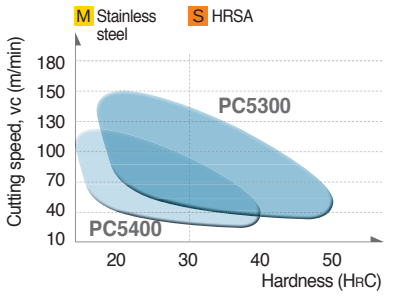
• Recommended grades according to interruption





• Recommended grades according to velocity

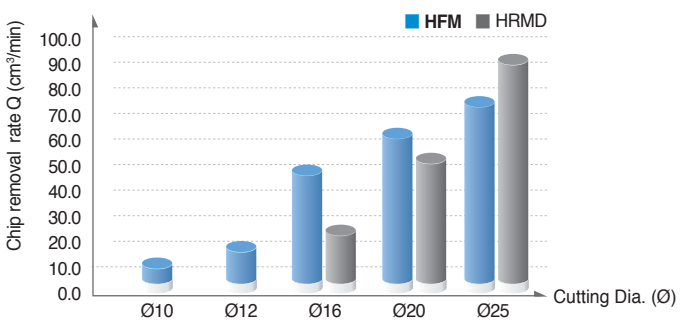




Effective machining

• **Machining center**
- BT40 and under, HFM recommended
- BT50 and above, HRM(D) recommended

• **Chip removal rate Q (cm³/min)**
- Ø8~Ø20, HFM recommended
- Ø20 and above, HRM(D) recommended

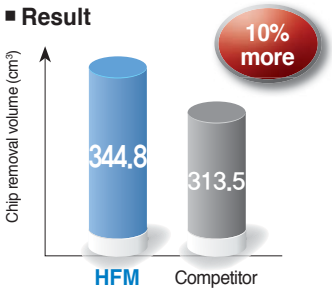


Performance evaluation

P Carbon steel [C45 (DIN)/1045 (AISI)/SM45C (KS), HB200]

- **Workpiece** Mold
- **Cutting conditions** vc (m/min) = 150, fz (mm/t) = 0.6
  ap (mm) = 0.4, ae (mm) = 5
  dry
- **Tools** **Insert** LPMT040210R-MF (PC5300)
  Holder HFMS1010HR-2S10

■ Result



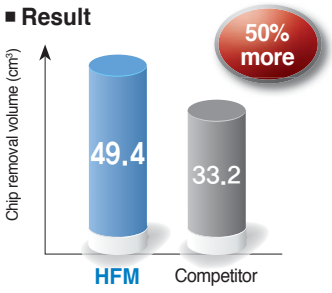


- Chip removal rate Q (cm^3/min): 11.5
- Cutting time (min): 30

P Pre-hardened steel [P21 (Improved) (AISI)/NAK80 (KS), HRC40~41]

- **Workpiece** Mold
- **Cutting conditions** vc (m/min) = 100, fz (mm/t) = 1.26
  ap (mm) = 0.3, ae (mm) = 10
  dry
- **Tools** **Insert** LPMT040210R-MF (PC5300)
  Holder HFMS1016HR-4S16

■ Result



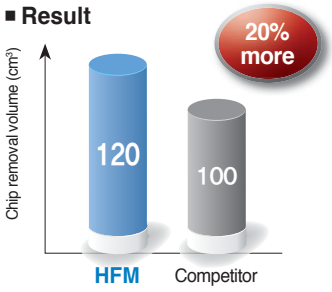


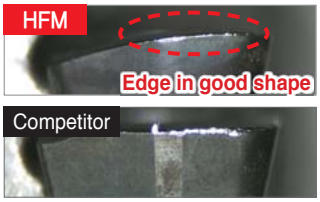
- Chip removal rate Q (cm^3/min): 15
- Cutting time (min): 3.29

P Alloy tool steel [X155CrVMo12-1 (DIN)/D2 (AISI)/STD11 (KS), HRC40~45]

- **Workpiece** Mold
- **Cutting conditions** vc (m/min) = 80, fz (mm/t) = 0.5
  ap (mm) = 0.3, ae (mm) = 10
  dry
- **Tools** **Insert** LPMW040210R (PC2510)
  Holder HFMS1016HR-4S16

■ Result



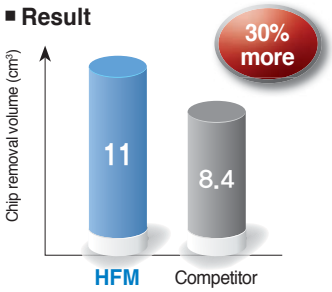


- Chip removal rate Q (cm^3/min): 4.8
- Cutting time (min): 25

P Alloy tool steel [X155CrVMo12-1 (DIN)/D2 (AISI)/STD11 (KS), HRC60]

- **Workpiece** Mold
- **Cutting conditions** vc (m/min) = 75, fz (mm/t) = 0.4
  ap (mm) = 0.15, ae (mm) = 5
  dry
- **Tools** **Insert** LPMW040210R (PC2505)
  Holder HFMS1010HR-2S10

■ Result



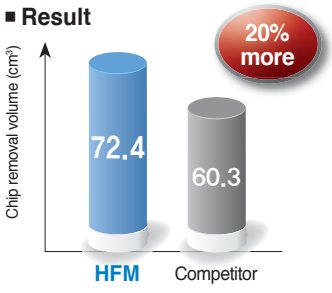


- Chip removal rate Q (cm^3/min): 1.4
- Cutting time (min): 7.85

S HRSA [TiAl6V4 (DIN)/R56400 (AISI)/Ti-6Al-4V (KS), HRC48]

- **Workpiece** Aviation parts
- **Cutting conditions** vc (m/min) = 50, fz (mm/t) = 1.2
  ap (mm) = 0.3, ae (mm) = 10
  wet
- **Tools** **Insert** LPMT040210R-MF (PC5300)
  Holder HFMS1016HR-4S16

■ Result

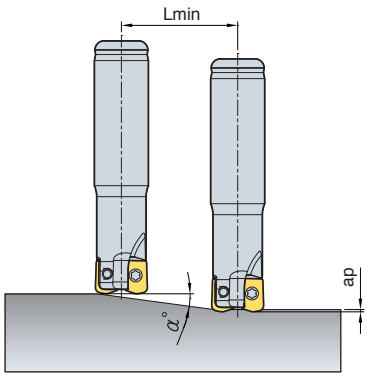




- Chip removal rate Q (cm^3/min): 7.2
- Cutting time (min): 10.05

Ramping and helical cutting

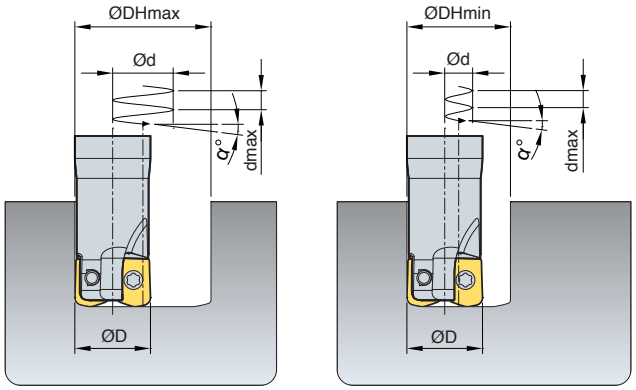
Ramping



$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

※ Lmin: Min. inclination cutting length
α°: Max. ramping angle
ap: Depth of cut

Helical cutting



- ØD = Tool dia. (mm)
- Ød = Tool path (mm) = ØDH Min, Max - ØD
- ØDH Min (Min diameter, mm) = ØD × 2 - 5.4
- ØDH Max (Max diameter, mm) = ØD×2 - 2

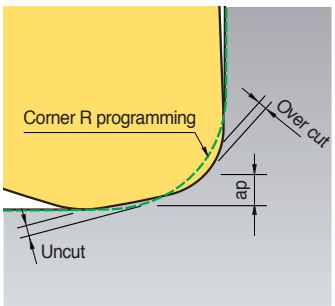
(mm)

Designation	Tool dia. ØD	Depth of cut ap	Ramping		Helical cutting		
			Max ramping angle α (°)	Lmin	Max diameter ØDH Max	Min diameter ØDH Min	Max pitch dmax
HFMS1010HR	10	0.4~0.5	3.5	7	18	15	0.4
HFMS1011HR	11	0.4~0.5	3.1	8	20	17	0.4
HFMS1012HR	12	0.4~0.5	2.7	9	22	19	0.4
HFMS1013HR	13	0.4~0.5	2.4	10	24	21	0.4
HFMS1014HR	14	0.4~0.5	2.2	11	26	23	0.4
HFMS1015HR	15	0.4~0.5	2.0	12	28	25	0.4
HFMS1016HR	16	0.4~0.5	1.8	13	30	27	0.4
HFMS1017HR	17	0.4~0.5	1.7	14	32	29	0.4
HFMS1018HR	18	0.4~0.5	1.6	15	34	31	0.4
HFMS1019HR	19	0.4~0.5	1.5	16	36	33	0.4
HFMS1020HR	20	0.4~0.5	1.4	17	38	35	0.4
HFMS1021HR	21	0.4~0.5	1.3	18	40	37	0.4
HFMM1025HR	25	0.4~0.5	1.1	22	48	45	0.4
HFMM1026HR	26	0.4~0.5	1.0	23	50	47	0.4
HFMM1030HR	30	0.4~0.5	0.9	27	58	55	0.4
HFMM1032HR	32	0.4~0.5	0.8	29	62	59	0.4
HFMM1033HR	33	0.4~0.5	0.8	30	64	61	0.4

- Adjust feed to under 70% of recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- In ramping, max. cutting depth per 1 ramping process of cutter should not exceed max. depth of cut as per used insert size

Corner R programming

(mm)

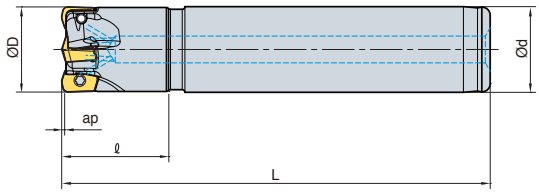


Insert	Corner R programming	Cutting conditions		Over Cut	Uncut
		Nose R	Max. ap		
LPMT040210R-MF **LPMW040210R** **LPEW040210R**	R1.0 (Standard)	1.0	0.4	0	0.17
	R1.5			0.10	0.08
	R2.0			0.31	0
LPMT040220R-MF **LPMW040220R** **LPEW040220R**	R1.0	2.0	0.5	0	0.41
	R1.5			0	0.2
	R2.0 (Standard)			0	0

- When using CNC program, overcut & uncut occurs on the corner processing site if entering the correct program corner R value for each insert
- To prevent overcut, you will need to complete a CNC program considering the above overcut

HFMS1000 new





AA 13°

- AR: -4°
- RR: -14°~ -7°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
HFMS	1008HR-1S10	1	8	10	20	80	0.4~0.5	0.03
	1008HR-1M10	1	8	10	25	100	0.4~0.5	0.03
	1008HR-1L10	1	8	10	35	120	0.4~0.5	0.03
	1010HR-2S08	2	10	8	20	80	0.4~0.5	0.03
	1010HR-2M08	2	10	8	25	100	0.4~0.5	0.04
	1010HR-2L08	2	10	8	35	120	0.4~0.5	0.04
	1010HR-2S10	2	10	10	20	80	0.4~0.5	0.04
	1010HR-2M10	2	10	10	25	105	0.4~0.5	0.05
	1010HR-2L10	2	10	10	35	120	0.4~0.5	0.06
	1011HR-2S10	2	11	10	20	80	0.4~0.5	0.04
	1011HR-2M10	2	11	10	25	105	0.4~0.5	0.06
	1011HR-2L10	2	11	10	35	120	0.4~0.5	0.07
	1012HR-3S10	3	12	10	20	80	0.4~0.5	0.05
	1012HR-3M10	3	12	10	25	105	0.4~0.5	0.06
	1012HR-3L10	3	12	10	35	120	0.4~0.5	0.07
	1012HR-3S12	3	12	12	20	80	0.4~0.5	0.06
	1012HR-3M12	3	12	12	25	105	0.4~0.5	0.08
	1012HR-3L12	3	12	12	35	120	0.4~0.5	0.09
	1013HR-3S12	3	13	12	20	80	0.4~0.5	0.06
	1013HR-3M12	3	13	12	25	105	0.4~0.5	0.09
	1013HR-3L12	3	13	12	40	120	0.4~0.5	0.10
	1014HR-3S12	3	14	12	20	80	0.4~0.5	0.07
	1014HR-3M12	3	14	12	25	105	0.4~0.5	0.09
	1014HR-3L12	3	14	12	40	120	0.4~0.5	0.10

Available inserts

LPMT-MF



LPMW



LPEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LPMT	040210R-MF							●					●	●				
	040220R-MF							●					●	●				
LPMW	040210R						●	●					●					E11
	040220R						●	●					●					E12
LPEW	040210R						●	●					●					
	040220R						●	●					●					

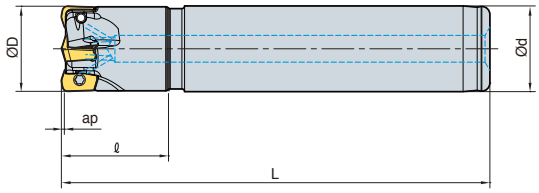
Parts

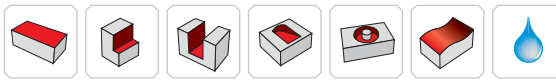
Specification	Screw	Wrench
Ø8~Ø10 Ø11~Ø14	FTKA01840 FTKA01842	TW06S-A

Available inserts E11, E12

HFMS1000 new







AA 13°

- AR: -4°
- RR: -6°~ -3°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
HFMS	1015HR-4S12	4	15	12	20	80	0.4~0.5	0.07
	1015HR-4M12	4	15	12	25	105	0.4~0.5	0.09
	1015HR-4L12	4	15	12	40	120	0.4~0.5	0.11
	1016HR-4S16	4	16	16	20	80	0.4~0.5	0.11
	1016HR-4M16	4	16	16	25	105	0.4~0.5	0.14
	1016HR-4L16	4	16	16	40	120	0.4~0.5	0.16
	1017HR-4S16	4	17	16	20	80	0.4~0.5	0.11
	1017HR-4M16	4	17	16	25	105	0.4~0.5	0.15
	1017HR-4L16	4	17	16	40	120	0.4~0.5	0.17
	1018HR-4S16	4	18	16	20	80	0.4~0.5	0.11
	1018HR-4M16	4	18	16	25	105	0.4~0.5	0.15
	1018HR-4L16	4	18	16	40	120	0.4~0.5	0.17
	1019HR-4S16	4	19	16	20	80	0.4~0.5	0.12
	1019HR-4M16	4	19	16	25	105	0.4~0.5	0.16
	1019HR-4L16	4	19	16	40	120	0.4~0.5	0.18
	1020HR-4S20	4	20	20	20	80	0.4~0.5	0.17
	1020HR-4M20	4	20	20	25	105	0.4~0.5	0.22
	1020HR-4L20	4	20	20	40	120	0.4~0.5	0.26
	1020HR-5S20	5	20	20	20	80	0.4~0.5	0.17
	1020HR-5M20	5	20	20	25	105	0.4~0.5	0.23
	1020HR-5L20	5	20	20	40	120	0.4~0.5	0.27
	1021HR-5S20	5	21	20	20	80	0.4~0.5	0.17
	1021HR-5M20	5	21	20	25	105	0.4~0.5	0.23
	1021HR-5L20	5	21	20	40	120	0.4~0.5	0.27

Available inserts

LPMT-MF LPMW LPEW



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LPMT	040210R-MF							●					●	●				E11 E12
	040220R-MF							●					●	●				
LPMW	040210R						●	●					●					
	040220R						●	●					●					
LPEW	040210R						●	●					●					
	040220R						●	●					●					

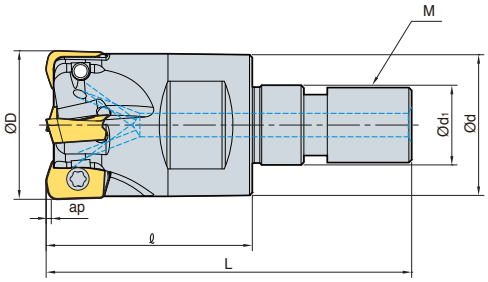
Parts

Specification	Screw	Wrench
Ø15~Ø21	FTKA01842	TW06S-A

Available inserts E11, E12

HFMM new













AA 13°

- AR: -4°
- RR: -14°~ -3°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	kg
HFMM	1008HR-M06	1	8	9.5	6.5	17	32	M06	0.4~0.5	0.01
	1010HR-M06	2	10	9.5	6.5	17	32	M06	0.4~0.5	0.01
	1011HR-M06	2	11	9.5	6.5	17	32	M06	0.4~0.5	0.01
	1012HR-M06	3	12	11	6.5	19	34	M6B	0.4~0.5	0.01
	1013HR-M06	3	13	11	6.5	19	34	M6B	0.4~0.5	0.01
	1016HR-M08	4	16	14.5	8.5	22	39	M08	0.4~0.5	0.03
	1017HR-M08	4	17	14.5	8.5	22	39	M08	0.4~0.5	0.03
	1020HR-M10	5	20	18	10.5	25	46	M10	0.4~0.5	0.06
	1021HR-M10	5	21	18	10.5	25	46	M10	0.4~0.5	0.06
	1025HR-M12	6	25	23	12.5	27	51	M12	0.4~0.5	0.11
	1026HR-M12	6	26	23	12.5	27	51	M12	0.4~0.5	0.11
	1030HR-M16	7	30	29	17	30	60	M16	0.4~0.5	0.17
	1032HR-M16	8	32	29	17	30	60	M16	0.4~0.5	0.18
	1033HR-M16	8	33	29	17	30	60	M16	0.4~0.5	0.18

Available inserts

LPMT-MF new LPMW new LPEW new

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LPMT	040210R-MF							●					●	●				
	040220R-MF							●					●	●				
LPMW	040210R						●	●					●					E11
	040220R						●	●					●					E12
LPEW	040210R						●	●					●					
	040220R						●	●					●					

Parts

Specification	Screw	Wrench
Ø8~Ø10 Ø11~Ø33	FTKA01840 FTKA01842	TW06S-A

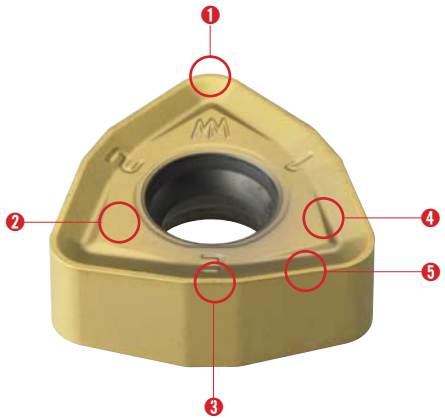
Available inserts E11, E12 Available adaptor E342~E343

HRMD is more economical due to the use of 6 cutting-edges compared to HRM tool with a 3-edge positive insert

HRMDouble

- HRMD is more economical due to the use of 6 cutting-edges compared to HRM tool with a 3-edge positive insert
- High-rake angle cutting-edge and chip breaker reduces cutting load
- Negative geometry has been designed for rigidity of cutting-edge and double-sided function
- Screw on system and stable support achieves strong clamping force
- Unique insert design for high feed and multifunctional machining
- HRMD insert with symmetrical cutting-edge is applicable for both R and L type machining

Features of insert



1 Nose-R

- Security of rigid edge in ramping pocket machining
- Round edge suitable for high feed rates insert geometry
- Possible to use R/L type machining

2 Clamping surface

- Design for stable clamping
- Prevention of friction by chip

3 Minor cutting-edge

- Improvement of surface roughness in high feed machining
- Special design for decreasing thrust force
- Symmetrical insert design for R/L type tool

4 Chip breaker

- Reduction of cutting load due to High-rake angle
- Improvement of chip flow and evacuation in various applications
- Prevention of damage on clamping face of insert

5 Major cutting-edge

- Symmetrical design insert for R/L type tool
- Superior cutting performance due to high rake angle cutting-edge
- Low cutting resistance in high feed
- Special design for decreasing thrust force

Features of cutter



Inner coolant system

- Improvement of chip control and evacuation
- Longer tool life due to reduced cutting temperature

3-surface constrained system

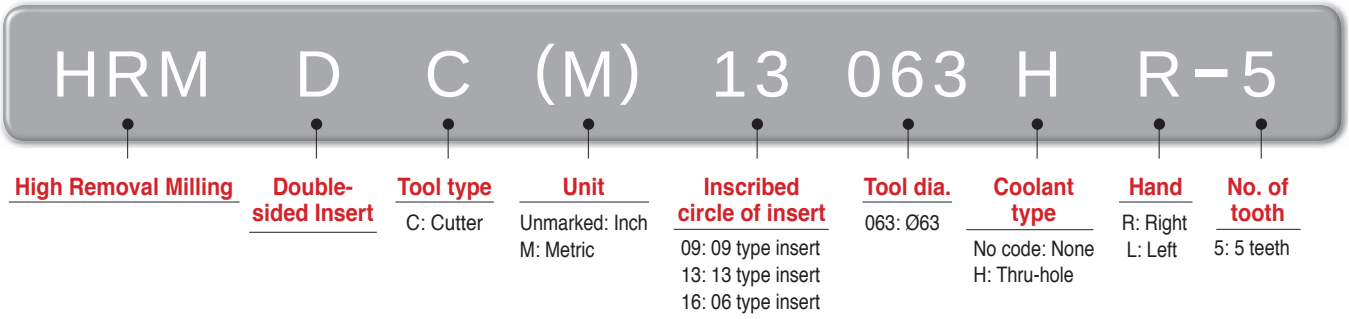
- Strong clamping system
- Stable clamping system against different cutting resistances in various machining applications

Simple screw on system

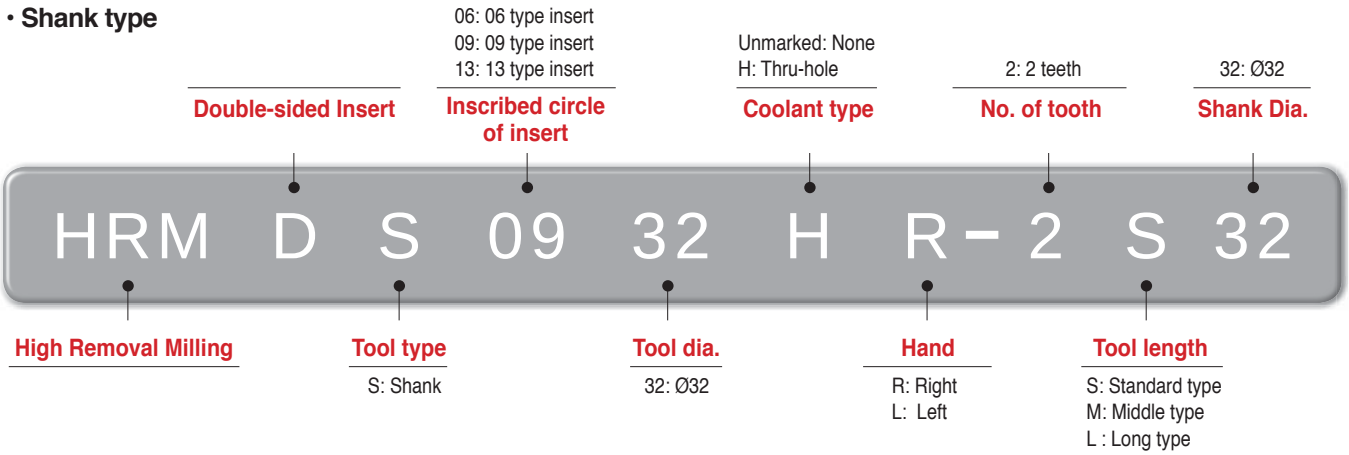
- Strong clamping of screw on system
- Convenient clamping system
- Wide chip pocket for better chip evacuation

Code system

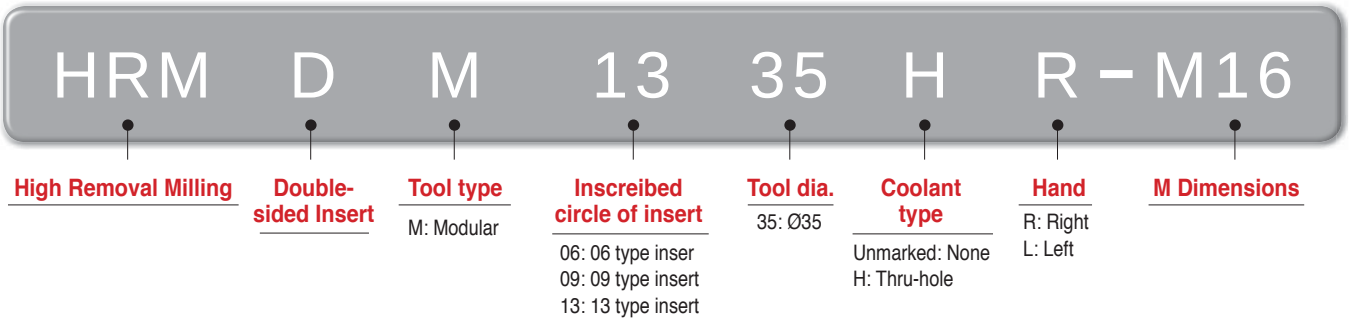
• Cutter type



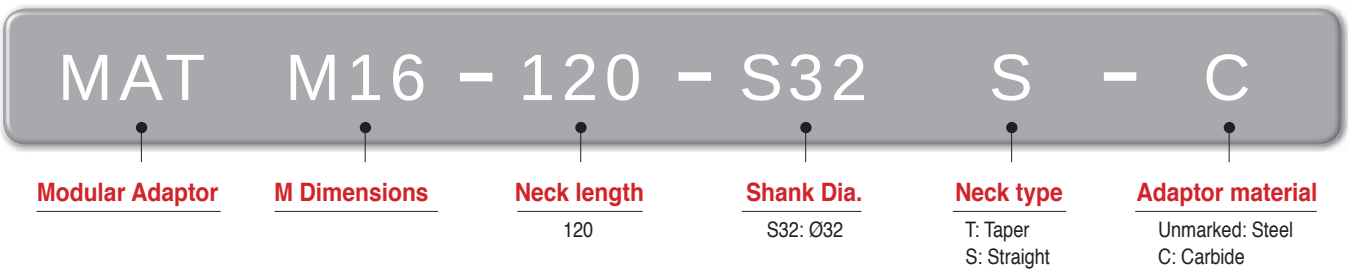
• Shank type



• Modular head



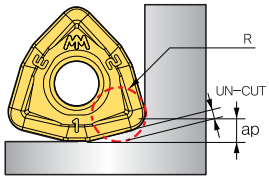
• Modular adaptor



Corner R programming

Designation	Cutting condition		Approx. R (mm)	
	Max.ap (mm)	Max.fz (mm/t)	Input. R	Uncut
WNMX060312ZNN-□□	1.0	1.2	1.8	0.4
WNMX09T316ZNN-□□	1.5	2.0	2.5	0.6
WNMX130520ZNN-□□	2.0	3.0	3.0	0.8
WNMX160720ZNN-□□	2.5	3.5	3.5	1.2

·Information for uncut part by using "Input.R" for CAM program

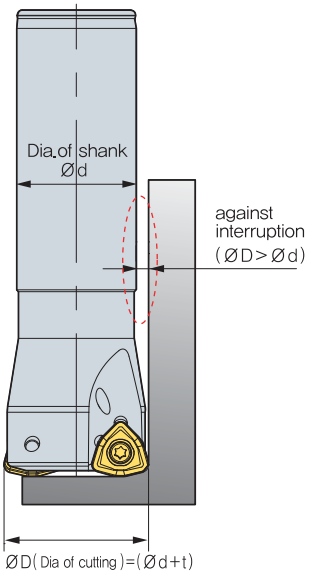


· Uncut part can be changed by poor machine condition or weak clamp of workpiece, etc

Interference prevent system

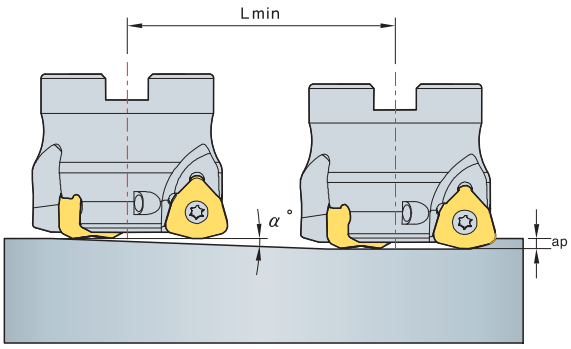
Designation	ØD (mm)	Ød (mm)	t (mm)
HRMDS0617HR-2□16	17	16	1
HRMDS0618HR-2□16	18	16	2
HRMDS0621HR-2□20	21	20	1
HRMDS0626HR-3□25	26	25	1
HRMDS0633HR-4□32	33	32	1
HRMDS0926HR-2□25	26	25	1
HRMDS0933HR-3□32	33	32	1
HRMDS0935HR-4□32	35	32	3
HRMDS0940HR-4□32	40	32	8
HRMDS0950HR-5□32	50	32	18
HRMDS0950HR-5□40	50	40	10
HRMDS0950HR-5□42	50	42	8
HRMDS1333HR-3□32	33	32	1
HRMDS1335HR-4□32	35	32	3
HRMDS1340HR-4□30	40	30	8
HRMDS1350HR-4□32	50	32	18
HRMDS1350HR-4□40	50	40	10
HRMDS1350HR-4□42	50	42	8
HRMDS1363HR-5□32	63	32	31
HRMDS1363HR-5□40	63	40	23
HRMDS1363HR-5□42	63	42	21

• The side clearance prevents to interference between tool and workpiece even in deep hole machining

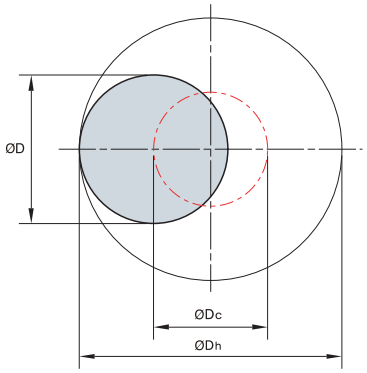


Ramping & helical cutting technical data

Ramping



Helical cutting



$$L_{min} = \frac{ap}{\tan \alpha^{\circ}} \ (mm)$$

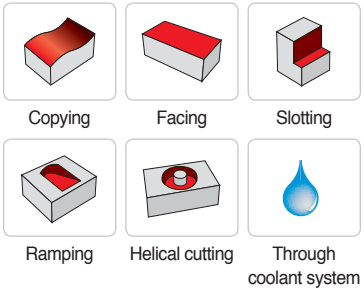
ØDc = ØDh–ØD

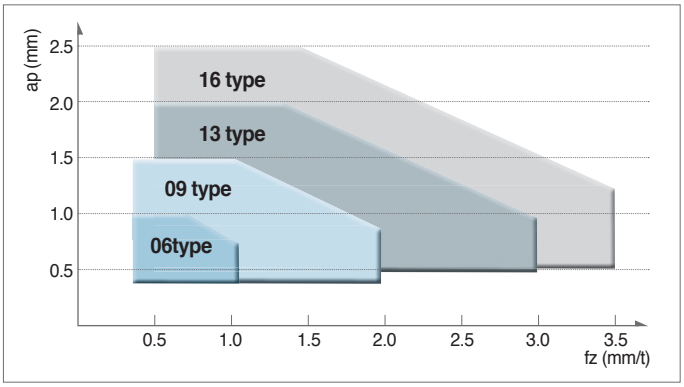
ØDc = Tool pass of tool center
ØDh = Desirable hole diameter on workpiece
ØD = Tool dia.

- Adjust feed to under 70% of Recommended cutting condition when ramping & helical cutting
- In helical ramping, max. cutting depth per 1 helical revolution of cutter should not exceed max. cutting depth as per insert size
- in ramping, max. cutting depth for 1 ramping process should not exceed max. depth of cut as per used insert size

Designation	Tool dia. ØD (mm)	Efficient cutting diameter ØDe (mm)	Ramping			Helical ramping	
			Max. ap (mm)	Max. angle α°	Cutting Length Lmin (mm)	Dh Min. Cutting diameter (mm)	Dh Max. Cutting diameter (mm)
HRMDS0616HR	16	9.5	1	4.8	11	23.8	29.6
HRMDS0617HR	17	10.5	1	4.1	13	25.8	31.6
HRMDS0618HR	18	11.5	1	3.5	16	27.8	33.6
HRMDS0620HR	20	13.5	1	2.5	22	31.8	37.6
HRMDS0621HR	21	14.5	1	2.2	26	33.8	39.6
HRMDS0625HR	25	18.5	1	1.3	44	41.8	47.6
HRMDS0626HR	26	19.5	1	1.2	47	43.8	49.6
HRMDS0632HR	32	25.5	1	0.6	95	55.8	61.6
HRMDS0633HR	33	26.5	1	0.5	114	57.8	63.6
HRMDS0925HR	25	15.4	1.5	5.4	15.8	37.6	46.8
HRMDS0926HR	26	16.4	1.5	5.0	17.0	39.6	48.8
HRMDS0930HR	30	20.4	1.5	3.9	22.0	47.6	56.8
HRMDS0932HR	32	22.3	1.5	3.5	24.5	51.6	60.8
HRMDS0933HR	33	23.3	1.5	3.3	25.8	53.6	62.8
HRMDS0935HR	35	25.4	1.5	3.0	28.3	57.6	66.8
HRMDS0940HR	40	30.2	1.5	2.5	34.5	67.6	76.8
HRMDS0950HR	50	40.2	1.5	1.8	47.0	87.6	96.8
HRMDS1332HR	32	19.3	2	5.7	20.0	47	60
HRMDS1333HR	33	20.3	2	5.4	21.3	49	62
HRMDS1335HR	35	22.3	2	4.8	24.0	53	66
HRMDS1340HR	40	27.2	2	3.7	30.7	63	76
HRMDS1350HR	50	37	2	2.6	44.0	83	96
HRMDS1363HR	63	50	2	1.9	61.3	109	122
HRMDCM09040HR	40	30.2	1.5	2.5	34.5	67.6	76.8
HRMDCM09050HR	50	40.2	1.5	1.8	47.0	87.6	96.8
HRMDCM09063HR	63	53.1	1.5	1.4	63.3	113.6	122.8
HRMDC(M)09080HR	80	70.1	1.5	1.0	84.5	147.6	156.8
HRMDC(M)09100HR	100	90	1.5	0.8	109.5	187.6	196.8
HRMDCM13050HR	50	37	2	2.6	44.0	83	96
HRMDCM13063HR	63	50	2	1.9	61.3	109	122
HRMDC(M)13080HR	80	66.9	2	1.4	84.0	143	156
HRMDC(M)13100HR	100	86.9	2	1.0	110.7	183	196
HRMDC(M)13125HR	125	111.9	2	0.8	144.0	233	246
HRMDC(M)16080HR	80	63.3	2.5	1.4	102	138	156
HRMDC(M)16100HR	100	83.3	2.5	1	143	178	196
HRMDC(M)16125HR	125	108.3	2.5	0.7	204	228	246
HRMDC(M)16160R	160	143.3	2.5	0.5	286	298	316
HRMDC(M)16200R	200	183.3	2.5	0.3	477	378	396
HRMDC(M)16250R	250	233.3	2.5	0.2	716	478	496
HRMDC(M)16315R	315	298.3	2.5	0.1	1432	608	626

Application area





Recommended cutting condition

ISO	Workpiece		Material	Grades	Cutting speed, vc (m/min)
P	Carbon steel	Low carbon steel	SUM22, C = 0.1~25	PC5300	280
				PC5400	245
		General carbon steel	C = 0.30~55	PC5300	255
				PC5400	220
		High carbon steel	C = 0.55~80	PC5300	240
				PC5400	205
	Low alloy steel (Alloy constituent < 5%)	-	SCM415(H), SCM420, SCM440	PC5300	195
				PC5400	170
		Hardened		PC5300	115
				PC5400	100
	High alloy steel (Alloy constituent > 5%)	Annealed	SKD61	PC5300	150
				PC5400	130
		Hardened	SKH51, SKH55	PC5300	120
				PC5400	105
M	Stainless steel	Ferritic/Martensitic	SUS410, SUS420, SUS430	PC5300	160
				PC5400	135
		Austenitic	SUS303, SUS304, SUS316	PC5300	130
				PC5400	110
		Duplex (Austenitic/Ferritic)	F51	PC5300	100
				PC5400	85
K	Gray cast iron	Low tensile	GC200, GC250	PC5300	170
				PC5400	150
		Hight tensile	GC300, GC350	PC5300	150
				PC5400	130
	Ductile cast iron	Ferric	GCD400, GCD500	PC5300	170
				PC5400	150
		Pearlitic	GCD600, GCD700	PC5300	150
				PC5400	130
S	Fe Base	-	Incoloy	PC5300	60
				PC5400	50
	Ni Base	-	Inconel, Nimonic, Hastelloy	PC5300	55
				PC5400	45
	Co Base	-	stelite	PC5300	25
				PC5400	20
	Titanium alloys	-	pure Ti	PC5300	130
				PC5400	105
			alloy (TiAl6V4)	PC5300	65
				PC5400	55

Machining example



Working condition

- **Work piece** SM45C (H_RC22)
- **Cutting speed** vc = 283 m/min (1,803^{-1})
  fz = 1.4 mm/tooth
  vf = 10,097 mm/min
  ap = 0.8 mm
  ae = 35 mm
  Coolant: Dry, Machining: Copying
  Machine: Horizontal MCT
  Overhang of tool: 250 mm
- **Tool information** HRMDCM13050HR-4
  WNMX130520ZNN-MM (PC3500)

40% Increased productivity
80% Reduced tool cost

Test result In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 40% and the tool life was increased to over 60%. HRMD is economically more efficient due to the use of 6 cutting-edges compared to EDNW type with positive insert



Working condition

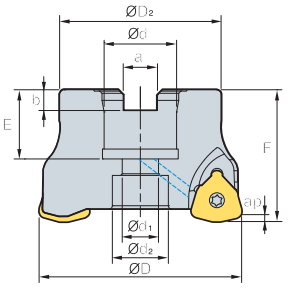
- **Work piece** STS304
- **Cutting speed** vc = 130 m/min (414-1)
  fz = 1.2 mm/tooth
  vf = 2,981 mm/min
  ap = 1.0 mm
  ae = 80 mm
  Coolant: Wet, Machining: Facing and Slotting
  Machine: Vertical MCT
  Overhang of tool: 250 mm
- **Tool information** HRMDCM13100HR-6
  WNMX130520ZNN-MM (PC3545)

80% Increased productivity
25% Reduced tool cost

Test result In comparing HRMD with our competitor using the same cutting conditions, the cutting speed of HRMD was higher with the same depth of cut (ap×ae), the cycle time was reduced by 80% and the tool life was same, but HRMD is economically more efficient due to the use of 6 cutting-edges compared to SDKN type with positive insert

HRMDC(M)09





AA 14°

- AR: -7°
- RR: -12°~ -18°

(mm)

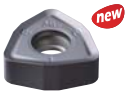
Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Bolt
HRMDCM	09040HR-3	3	40	34	16	9	14	8.4	5.6	19	40	1.5	0.2	SB0825
	09040HR-4	4	40	34	16	9	14	8.4	5.6	19	40	1.5	0.2	
	09050HR-4	4	50	42	22	11	18	10.4	6.3	21	40	1.5	0.3	SB1025
	09050HR-5	5	50	42	22	11	18	10.4	6.3	21	40	1.5	0.3	
	09063HR-5	5	63	49	22	11	18	10.4	6.3	21	40	1.5	0.5	SB1025
	09063HR-6	6	63	49	22	11	18	10.4	6.3	21	40	1.5	0.5	
	09080HR-6	6	80	57	27	14	20	12.4	7	23	50	1.5	1.1	SB1230
	09080HR-7	7	80	57	27	14	20	12.4	7	23	50	1.5	1.1	
	09100HR-7	7	100	67	32	18	26	14.4	8	25	50	1.5	1.7	SB1630
	09100HR-8	8	100	67	32	18	26	14.4	8	25	50	1.5	1.7	
HRMDC	09080HR-6	6	80	57	25.4	14	20	9.5	6	24	50	1.5	1.1	SB1230
	09080HR-7	7	80	57	25.4	14	20	9.5	6	24	50	1.5	1.1	
	09080HR-31.75-6	6	80	67	31.75	18	26	12.7	8	32	63	1.5	1.5	SB1630
	09080HR-31.75-7	7	80	67	31.75	18	26	12.7	8	32	63	1.5	1.5	
	09100HR-7	7	100	67	31.75	18	26	12.7	8	32	63	1.5	2.1	SB1630
	09100HR-8	8	100	67	31.75	18	26	12.7	8	32	63	1.5	2.1	

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM

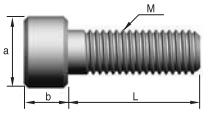


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML												●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

Available arbors

Designation		NC arbors
HRMDCM	09040HR-□	BT□□-FMC16-□□
		SK□□-FMC16-□□
	09050HR-□	BT□□-FMC22-□□
	09063HR-□	SK□□-FMC22-□□
	09080HR-□	BT□□-FMC27-□□
		SK□□-FMC27-□□
	09100HR-□	BT□□-FMC32-□□
		SK□□-FMC32-□□
HRMDC	09080HR-□	BT□□-FMA25.4-□□
		SK□□-FMA25.4-□□
	09080HR-31.75-□	BT□□-FMA31.75-□□
	09100HR-□	SK□□-FMA31.75-□□

Bolt



Designation	Dimensions (mm)				
	M	a	b	L	pitch
SB0825	M08	13	8	25	1.25
SB1025	M10	16	10	25	1.5
SB1230	M12	18	12	30	1.75
SB1630	M16	24	16	30	2.0

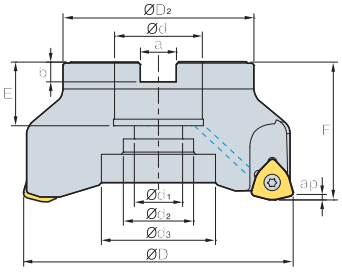
Parts

Specification	Screw	Wrench
Ø40~Ø100	FTKA0307	TW09S

Available inserts E28 Available arbors and bolt E371~E373

HRMDC(M)13





AA 14°

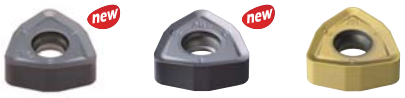
- AR: -7°
- RR: -12°~ -4°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg	Bolt
HRMDCM	13050HR-3	3	50	42	22	11	17	-	10.4	6.3	21	40	2	0.3	SB1025
	13050HR-4	4	50	42	22	11	17	-	10.4	6.3	21	40	2	0.3	
	13063HR-4	4	63	49	22	11	18	-	10.4	6.3	21	40	2	0.5	SB1025
	13063HR-5	5	63	49	22	11	18	-	10.4	6.3	21	40	2	0.5	
	13080HR-5	5	80	57	27	14	20	-	12.4	7	23	50	2	1	SB1230
	13080HR-6	6	80	57	27	14	20	-	12.4	7	23	50	2	1	
	13100HR-6	6	100	67	32	18	26	-	14.4	8	25	50	2	1.6	SB1630
	13100HR-7	7	100	67	32	18	26	-	14.4	8	25	50	2	1.6	
	13125HR-7	7	125	87	40	22	32	52	16.4	9	29	63	2	3.2	SB2040
	13125HR-8	8	125	87	40	22	32	52	16.4	9	29	63	2	3.2	MBA-M20
HRMDC	13080HR-5	5	80	57	25.4	14	20	-	9.5	6	24	50	2	1	SB1230
	13080HR-6	6	80	57	25.4	14	20	-	9.5	6	24	50	2	1	
	13080HR-31.75-5	5	80	67	31.75	18	26	-	12.7	8	32	63	2	1.4	SB1630
	13080HR-31.75-6	6	80	67	31.75	18	26	-	12.7	8	32	63	2	1.4	
	13100HR-6	6	100	67	31.75	18	26	-	12.7	8	32	63	2	2.1	SB1630
	13100HR-7	7	100	67	31.75	18	26	-	12.7	8	32	63	2	2.1	
	13125HR-7	7	125	87	38.1	22	32	52	15.9	10	35	63	2	3.3	SB2040
	13125HR-8	8	125	87	38.1	22	32	52	15.9	10	35	63	2	3.3	MBA-M20

Available inserts

WNMX-MF | WNMX-ML | WNMX-MM



Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF						●	●	●	●	●		●	●				E28
	130520ZNN-ML												●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

Available arbors

Designation		NC arbors
HRMDCM	13050HR-□	BT□□-FMC22-□□
		SK□□-FMC22-□□
	13063HR-□	BT□□-FMC22-□□
	13080HR-□	SK□□-FMC27-□□
	13100HR-□	BT□□-FMC32-□□
		SK□□-FMC32-□□
	13125HR-□	BT□□-FMC40-□□
		SK□□-FMC40-□□
HRMDC	13080HR-□	BT□□-FMA25.4-□□
	13080HR-31.75-□	SK□□-FMA25.4-□□
	13100HR-□	BT□□-FMA31.75-□□
		SK□□-FMA31.75-□□
	13125HR-□	BT□□-FMA38.1-□□
		SK□□-FMA38.1-□□

Bolt

Fig. 1

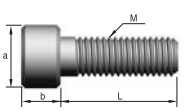
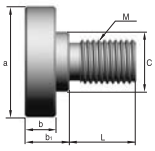


Fig. 2



Designation	Dimensions (mm)							Fig.
	M	a	b	b1	C	L	pitch	
SB1025	M10	16	10	-	-	25	1.5	1
SB1230	M12	18	12	-	-	30	1.75	1
SB1630	M16	24	16	-	-	30	2.0	1
SB2040	M20	30	20	-	-	40	2.5	1
MBA-M20	M20	50	14	20	27	30	2.5	2

Parts

Specification	Screw	Wrench
Ø50~Ø125	FTKA0412B	TW15S

Available inserts E28 Available arbors and bolt E371~E373

HRMDC(M)16 new



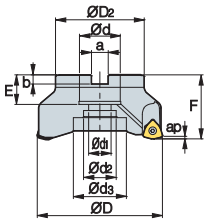


Fig. 1

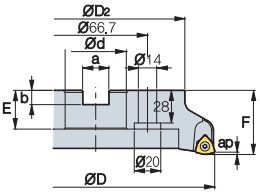


Fig. 2

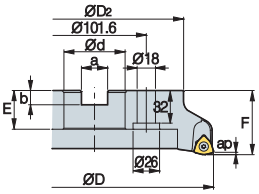


Fig. 3

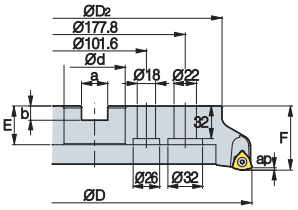


Fig. 4








AA 14°

- AR: -7°
- RR: -12°~ -4°

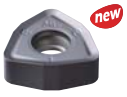
(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg	Bolt	Fig.
HRMDC (HRMDCM)	16080HR-4	4	80	65	25.4 (27)	14	20	-	9.5 (12.4)	6 (7)	25 (23)	50	2.5	0.99	SB1230	1
	16080HR-5	5	80	65	25.4 (27)	14	20	-	9.5 (12.4)	6 (7)	25 (23)	50	2.5	0.91		
	16100HR-5	5	100	85	31.75 (32)	18	26	-	12.7 (14.4)	8	33 (25)	63 (50)	2.5	1.68	SB1630	1
	16100HR-6	6	100	85	31.75 (32)	18	26	-	12.7 (14.4)	8	33 (25)	63 (50)	2.5	1.64		
	16125HR-6	6	125	100	38.1 (40)	22	32	52	15.9 (16.4)	10 (9)	36 (29)	63	2.5	3.23	SB2040 MBA-M20	1
	16125HR-7	7	125	100	38.1 (40)	22	32	52	15.9 (16.4)	10 (9)	36 (29)	63	2.5	3.24		
	16160R-7	7	160	107	50.8 (40)	-	90	-	19 (16.4)	11 (9)	38 (32)	63	2.5	3.73	MBA-M24	2
	16160R-8	8	160	107	50.8 (40)	-	90	-	19 (16.4)	11 (9)	38 (32)	63	2.5	3.77		
	16200R-8	8	200	145	47.625 (60)	-	132	-	25.4 (25.7)	14	38	63	2.5	6.48	-	3
	16200R-10	10	200	145	47.625 (60)	-	132	-	25.4 (25.7)	14	38	63	2.5	6.61		
	16250R-10	10	250	190	47.625 (60)	-	190	-	25.4 (25.7)	14	38	63	2.5	11.01	-	3
	16250R-12	12	250	190	47.625 (60)	-	190	-	25.4 (25.7)	14	38	63	2.5	11.04		
	16315R-12	12	315	250	47.625 (60)	-	238	-	25.4 (25.7)	14	38	63	2.5	18.34	-	4
	16315R-14	14	315	250	47.625 (60)	-	238	-	25.4 (25.7)	14	38	63	2.5	18.35		

( )Metric size

Available inserts

WNMX-MF new | WNMX-ML new | WNMX-MM


Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	160720ZNN-MF									●			●	●				E28
	160720ZNN-ML												●	●				
	160720ZNN-MM									●			●	●				

Available arbors

Designation		HRMDC	HRMDCM
HRMDCM	16080HR-4	BT□□-FMA25.4-□□	BT□□-FMC27-□□
	16080HR-5		
	16100HR-5	BT□□-FMA31.75-□□	BT□□-FMC32-□□
	16100HR-6		
	16125HR-6	BT□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□
	16125HR-7		
	16160R-7	BT□□-FMA50.8-□□	
	16160R-8		
	16200R-8	BT□□-FMA47.625-□□	BT□□-FMB60-□□
	16200R-10		
	16250R-10		
	16250R-12		
	16315R-12		
	16315R-14		

Bolt

Fig. 1

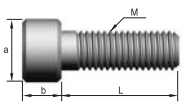
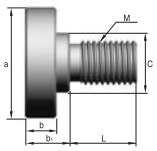


Fig. 2



Designation	Dimensions (mm)							Fig.
	M	a	b	b1	C	L	pitch	
SB1025	M10	16	10	-	-	25	1.5	1
SB1230	M12	18	12	-	-	30	1.75	1
SB1630	M16	24	16	-	-	30	2.0	1
SB2040	M20	30	20	-	-	40	2.5	1
MBA-M20	M20	50	14	20	27	30	2.5	2
MBA-M24	M24	65	14	24	37	36	3.0	2

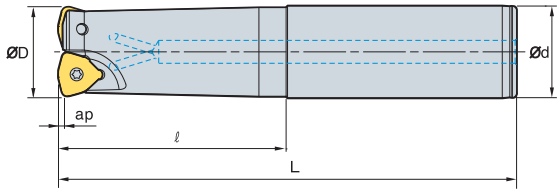
Parts

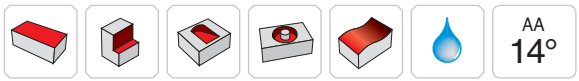
Specification	Screw	Wrench
Ø80~Ø315	FTGA0513-P	TW20-100

Available inserts E28 Available arbors and bolt E371~E373

HRMDS06 new







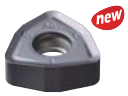
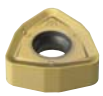
AA 14°

- AR: -7°
- RR: -17°~ -25°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
HRMDS	0616HR-2S16	2	16	16	30	110	1.0	0.15
	0616HR-2M16	2	16	16	70	150	1.0	0.20
	0616HR-2L16	2	16	16	100	200	1.0	0.26
	0617HR-2S16	2	17	16	20	110	1.0	0.15
	0617HR-2M16	2	17	16	20	150	1.0	0.21
	0617HR-2L16	2	17	16	20	200	1.0	0.28
	0618HR-2S16	2	18	16	20	110	1.0	0.15
	0618HR-2M16	2	18	16	20	150	1.0	0.21
	0618HR-2L16	2	18	16	20	200	1.0	0.28
	0620HR-2S20	2	20	20	50	130	1.0	0.28
	0620HR-2M20	2	20	20	100	180	1.0	0.38
	0620HR-2L20	2	20	20	130	250	1.0	0.53
	0621HR-2S20	2	21	20	20	130	1.0	0.29
	0621HR-2M20	2	21	20	20	180	1.0	0.40
	0621HR-2L20	2	21	20	20	250	1.0	0.57
	0625HR-3S25	3	25	25	60	140	1.0	0.44
	0625HR-3M25	3	25	25	80	180	1.0	0.57
	0625HR-3L25	3	25	25	120	250	1.0	0.80
	0626HR-3S25	3	26	25	30	140	1.0	0.46
	0626HR-3M25	3	26	25	30	180	1.0	0.60
	0626HR-3L25	3	26	25	30	250	1.0	0.84
	0632HR-4S32	4	32	32	70	150	1.0	0.82
	0632HR-4M32	4	32	32	100	200	1.0	1.10
	0632HR-4L32	4	32	32	180	300	1.0	1.66
	0633HR-4S32	4	33	32	40	200	1.0	1.14
	0633HR-4M32	4	33	32	40	250	1.0	1.43
	0633HR-4L32	4	33	32	40	300	1.0	1.73

Available inserts

	WNMX-MF	WNMX-ML	WNMX-MM
			

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	060312ZNN-MF									●			●	●				E28
	060312ZNN-ML												●	●				
	060312ZNN-MM						●	●		●			●	●				

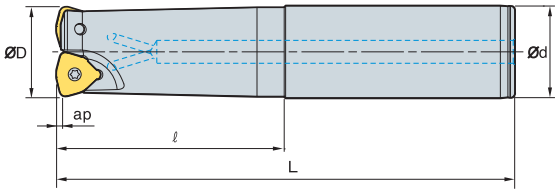
Parts

Specification	Screw	Wrench
Ø16~Ø33	ETNA02506	TW07S

Available inserts E28

HRMDS09





AA 14°
• AR: -7°
• RR: -17°~ -25°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
HRMDS	0925HR-2S25	2	25	25	60	140	1.5	0.5
	0925HR-2M25	2	25	25	120	200	1.5	0.6
	0925HR-2L25	2	25	25	180	300	1.5	1
	0926HR-2S25	2	26	25	60	140	1.5	0.5
	0926HR-2M25	2	26	25	60	200	1.5	0.7
	0926HR-2L25	2	26	25	60	300	1.5	1
	0930HR-3S32	3	30	32	70	150	1.5	0.8
	0930HR-3M32	3	30	32	120	200	1.5	1
	0930HR-3L32	3	30	32	180	300	1.5	1.5
	0932HR-3S32	3	32	32	70	150	1.5	0.8
	0932HR-3M32	3	32	32	120	200	1.5	1.1
	0932HR-3L32	3	32	32	180	300	1.5	1.7
	0933HR-3S32	3	33	32	70	150	1.5	0.8
	0933HR-3M32	3	33	32	70	200	1.5	1.1
	0933HR-3L32	3	33	32	70	300	1.5	1.7
	0935HR-4S32	4	35	32	50	150	1.5	0.9
	0935HR-4M32	4	35	32	50	200	1.5	1.1
	0935HR-4L32	4	35	32	50	300	1.5	1.7
	0940HR-4S32	4	40	32	50	150	1.5	0.9
	0940HR-4M32	4	40	32	50	250	1.5	1.5
	0940HR-4L32	4	40	32	50	300	1.5	1.8
	0940HR-4S40	4	40	40	60	150	1.5	1.3

Available inserts

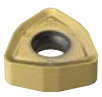
WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML												●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

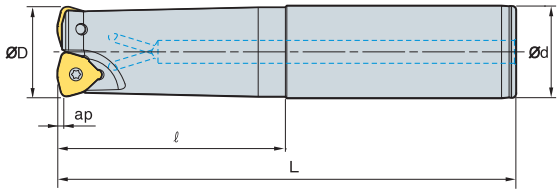
Parts

Specification	Screw	Wrench
Ø25~Ø40	FTKA0307	TW09S

Available inserts E28

HRMDS09





AA 14°

- AR: -7°
- RR: -17°~ -25°

(mm)

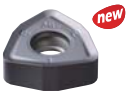
Designation			ØD	Ød	ℓ	L	ap	kg
HRMDS	0940HR-4M40	4	40	40	130	250	1.5	2.2
	0940HR-4L40	4	40	40	180	300	1.5	2.7
	0940HR-4S42	4	40	42	60	150	1.5	1.4
	0940HR-4M42	4	40	42	130	250	1.5	2.3
	0940HR-4L42	4	40	42	180	300	1.5	2.8
	0950HR-4S32	4	50	32	40	150	1.5	1.1
	0950HR-4M32	4	50	32	40	250	1.5	1.6
	0950HR-4L32	4	50	32	40	300	1.5	2
	0950HR-4S40	4	50	40	40	150	1.5	1.4
	0950HR-4M40	4	50	40	40	250	1.5	2.4
	0950HR-4L40	4	50	40	40	300	1.5	2.9
	0950HR-4S42	4	50	42	40	150	1.5	1.6
	0950HR-4M42	4	50	42	40	250	1.5	2.6
	0950HR-4L42	4	50	42	40	300	1.5	3.1
	0950HR-5S32	5	50	32	40	150	1.5	1.1
	0950HR-5M32	5	50	32	40	250	1.5	1.6
	0950HR-5L32	5	50	32	40	300	1.5	2
	0950HR-5S40	5	50	40	40	150	1.5	1.4
	0950HR-5M40	5	50	40	40	250	1.5	2.4
	0950HR-5L40	5	50	40	40	300	1.5	2.9
	0950HR-5S42	5	50	42	40	150	1.5	1.6
	0950HR-5M42	5	50	42	40	250	1.5	2.6
	0950HR-5L42	5	50	42	40	300	1.5	3.1

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML												●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

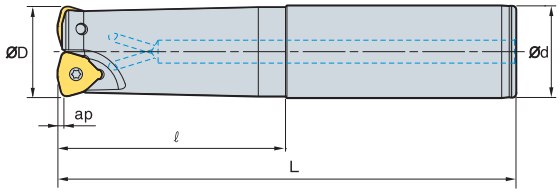
Parts

Specification	Screw	Wrench
Ø40~Ø50	FTKA0307	TW09S

Available inserts E28

HRMDS13





AA 14°

- AR: -7°
- RR: -14°~ -16°

(mm)

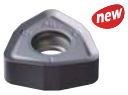
Designation			ØD	Ød	ℓ	L	ap	kg
HRMDS	1332HR-2S32	2	32	32	70	150	2	0.8
	1332HR-2M32	2	32	32	120	200	2	1
	1332HR-2L32	2	32	32	180	300	2	1.6
	1333HR-2S32	2	33	32	70	150	2	0.8
	1333HR-2M32	2	33	32	70	200	2	1.1
	1333HR-2L32	2	33	32	70	300	2	1.7
	1335HR-2S32	2	35	32	50	150	2	0.8
	1335HR-2M32	2	35	32	50	200	2	1.1
	1335HR-2L32	2	35	32	50	300	2	1.7
	1340HR-3S32	3	40	32	50	150	2	0.8
	1340HR-3M32	3	40	32	50	250	2	1.4
	1340HR-3L32	3	40	32	50	300	2	1.7
	1340HR-3S40	3	40	40	60	150	2	1.2
	1340HR-3M40	3	40	40	130	250	2	2.1
	1340HR-3L40	3	40	40	180	300	2	2.6
	1340HR-3S42	3	40	42	60	150	2	1.4
	1340HR-3M42	3	40	42	130	250	2	2.3
	1340HR-3L42	3	40	42	180	300	2	2.7
	1350HR-3S32	3	50	32	50	150	2	1.1
	1350HR-3M32	3	50	32	50	250	2	1.7
	1350HR-3L32	3	50	32	50	300	2	2
	1350HR-3S40	3	50	40	50	150	2	1.5
	1350HR-3M40	3	50	40	50	250	2	2.4
	1350HR-3L40	3	50	40	50	300	2	2.9
	1350HR-3S42	3	50	42	50	150	2	1.6
	1350HR-3M42	3	50	42	50	250	2	2.6
	1350HR-3L42	3	50	42	50	300	2	3.1

Available inserts

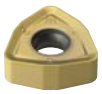
WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF									●			●	●				E28
	130520ZNN-ML												●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

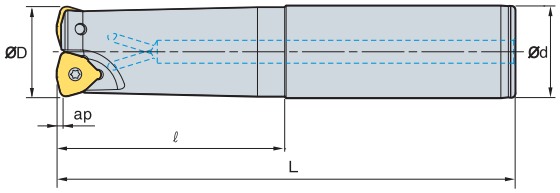
Parts

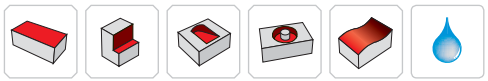
Specification	Screw	Wrench
Ø32~Ø50	FTKA0412B	TW15S

Available inserts E28

HRMDS13







AA 14°

- AR: -7°
- RR: -14°~ -16°

(mm)

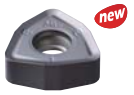
Designation			ØD	Ød	ℓ	L	ap	kg
HRMDS	1350HR-4S32	4	50	32	50	150	2	1.1
	1350HR-4M32	4	50	32	50	250	2	1.7
	1350HR-4L32	4	50	32	50	300	2	2
	1350HR-4S40	4	50	40	50	150	2	1.5
	1350HR-4M40	4	50	40	50	250	2	2.4
	1350HR-4L40	4	50	40	50	300	2	2.9
	1350HR-4S42	4	50	42	50	150	2	1.6
	1350HR-4M42	4	50	42	50	250	2	2.6
	1350HR-4L42	4	50	42	50	300	2	3.1
	1363HR-4S32	4	63	32	50	150	2	1.4
	1363HR-4M32	4	63	32	50	250	2	2.1
	1363HR-4L32	4	63	32	50	300	2	2.4
	1363HR-4S40	4	63	40	50	150	2	1.8
	1363HR-4M40	4	63	40	50	250	2	2.8
	1363HR-4L40	4	63	40	50	300	2	3.2
	1363HR-4S42	4	63	42	50	150	2	1.9
	1363HR-4M42	4	63	42	50	250	2	3
	1363HR-4L42	4	63	42	50	300	2	3.5
	1363HR-5S32	5	63	32	50	150	2	1.5
	1363HR-5M32	5	63	32	50	250	2	2
	1363HR-5L32	5	63	32	50	300	2	2.3
	1363HR-5S40	5	63	40	50	150	2	1.8
	1363HR-5M40	5	63	40	50	250	2	2.8
	1363HR-5L40	5	63	40	50	300	2	3.2
	1363HR-5S42	5	63	42	50	150	2	1.9
	1363HR-5M42	5	63	42	50	250	2	3
	1363HR-5L42	5	63	42	50	300	2	3.5

Available inserts

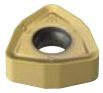
WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF									●			●	●				E28
	130520ZNN-ML												●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

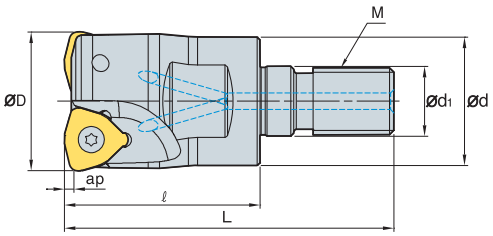
Parts

Specification	Screw	Wrench
Ø50~Ø63	FTKA0412B	TW15S

Available inserts E28

HRMDM06 new





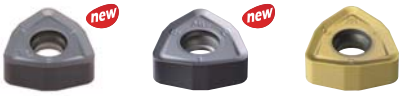
AA 14°
- AR: -7°
- RR: -18°~ -25°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	kg
HRMDM	0616HR-M08	2	16	14.5	8.5	25	42	M08	1.0	0.03
	0617HR-M08	2	17	14.5	8.5	25	42	M08	1.0	0.03
	0618HR-M08	2	18	14.5	8.5	25	42	M08	1.0	0.03
	0620HR-M10	2	20	18	10.5	30	51	M10	1.0	0.06
	0621HR-M10	2	21	18	10.5	30	51	M10	1.0	0.07
	0625HR-M12	3	25	23	12.5	35	59	M12	1.0	0.10
	0626HR-M12	3	26	23	12.5	35	59	M12	1.0	0.11
	0632HR-M16	4	32	29	17	40	67	M16	1.0	0.21
	0633HR-M16	4	33	29	17	40	67	M16	1.0	0.22

Available inserts

WNMX-MF (new) WNMX-ML (new) WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	060312ZNN-MF									●			●	●				E28
	060312ZNN-ML									●			●	●				
	060312ZNN-MM						●	●		●			●	●				

Available adaptor

Designation		Available adaptor
HRMDM	0616HR-M08	MAT- M08
	0617HR-M08	MAT- M08
	0618HR-M08	MAT- M08
	0620HR-M10	MAT- M10
	0621HR-M10	MAT- M10

Designation		Available adaptor
HRMDM	0625HR-M12	MAT- M12
	0626HR-M12	MAT- M12
	0632HR-M16	MAT- M16
	0633HR-M16	MAT- M16

Designation: HRMDM0625HR-M12
Modular head threading measure size (M12)

II

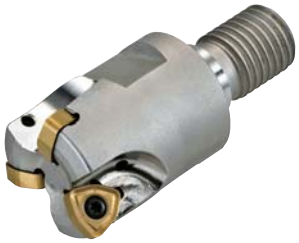
Adaptor spec.: MAT-M12-030-S20S
Adaptor threading measure (M12)

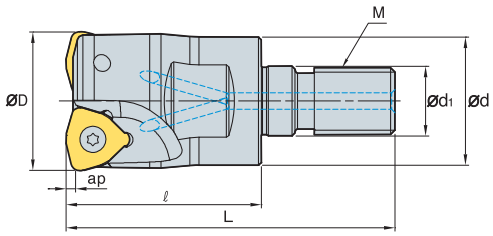
Parts

Specification	Screw	Wrench
Ø16~Ø33	ETNA02506	TW07S

Available inserts E28 Available adaptor E342~E343

HRMDM09





AA 14°

- AR: -7°
- RR: -18°~ -25°

(mm)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	kg
HRMDM	0925HR-M12	2	25	23	12.5	35	59	M12	1.5	0.10
	0926HR-M12	2	26	23	12.5	35	59	M12	1.5	0.11
	0930HR-M16	3	30	29	17	40	67	M16	1.5	0.19
	0932HR-M16	3	32	29	17	40	67	M16	1.5	0.20
	0933HR-M16	3	33	29	17	40	67	M16	1.5	0.21
	0935HR-M16	4	35	29	17	40	67	M16	1.5	0.22
	0940HR-M16	4	40	29	17	40	67	M16	1.5	0.25

Available inserts

WNMX-MF



WNMX-ML



WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	09T316ZNN-MF									●			●	●				E28
	09T316ZNN-ML									●			●	●				
	09T316ZNN-MM						●	●	●	●	●		●	●				

Available adaptor

Designation		Available adaptor
HRMDM	0925HR-M12	MAT- M12
	0926HR-M12	
	0930HR-M16	MAT- M16
	0932HR-M16	
	0933HR-M16	
	0935HR-M16	
	0940HR-M16	

Designation: HRMDM0932HR-M16
Modular head threading measure size (M16)

II

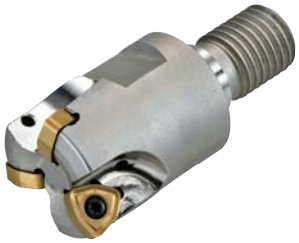
Adaptor spec.: MAT-M16-035-S32S
Adaptor threading measure (M16)

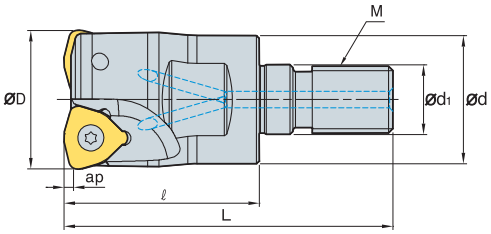
Parts

Specification	Screw	Wrench
Ø25~Ø40	FTKA0307	TW09S

Available inserts E28 Available adaptor E342~E343

HRMDM13





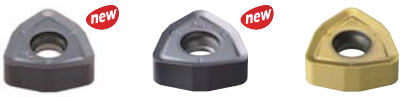
AA 14°
• AR: -7°
• RR: -18°~ -25°

(mm)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	kg
HRMDM	1332HR-M16	2	32	29	17	40	67	M16	2	0.20
	1333HR-M16	2	33	29	17	40	67	M16	2	0.20
	1335HR-M16	2	35	29	17	40	67	M16	2	0.22
	1340HR-M16	3	40	29	17	45	72	M16	2	0.26

Available inserts

WNMX-MF WNMX-ML WNMX-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WNMX	130520ZNN-MF									●			●	●				E28
	130520ZNN-ML												●	●				
	130520ZNN-MM						●	●	●	●	●		●	●				

Available adaptor

Designation		Available adaptor
HRMDM	1332HR-M16	MAT-M16
	1333HR-M16	
	1335HR-M16	
	1340HR-M16	

Designation: HRMDM0932HR-M16
Modular head threading measure size (M16)

II

Adaptor spec.: MAT-M16-120-S32T
Adaptor threading measure (M16)

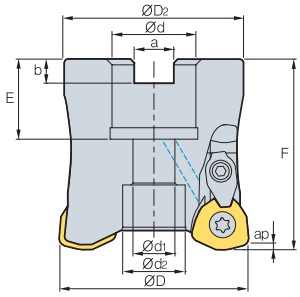
Parts

Specification	Screw	Wrench
Ø32~Ø40	FTKA0412B	TW15S

Available inserts E28 Available adaptor E342~E343

HRMC(M)13





AA 15°

- AR: 7°
- RR: -15°~ -5°

(mm)

Designation			ØD	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Bolt
HRMC(M)	13050HR-3	3	50	47	22.225 (22)	11	16.4	8.0 (10.4)	5 (6.3)	20 (21)	50	2.0	0.4	SB1035
	13050HR-4	4	50	47	22.225 (22)	11	16.4	8.0 (10.4)	5 (6.3)	20 (21)	50	2.0	0.4	SB1035
	13063HR-4	4	63	60	22.225 (22)	11	17	8.0 (10.4)	5 (6.3)	20 (21)	50	2.0	0.7	SB1035
	13080HR-5	5	80	76	31.75 (27)	18 (13)	26 (20)	12.7 (12.4)	8 (7)	32 (23)	70	2.0	1.6	SB16 (12)45

( )Metric size

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	130520ZDSR-MH						●	●	●	●	●	●	●	●				E27

Available arbors

Designation		HRMDC	HRMDCM
HRMC(M)	13050HR-3	BT□□-FMA22.225-□□	BT□□-FMC22-□□ SK□□-FMC22-□□
	13050HR-4		
	13063HR-4		
	13080HR-5	BT□□-FMA31.75-□□ SK□□-FMA31.75-□□	BT□□-FMC27-□□ SK□□-FMC27-□□

Bolt

Fig. 1

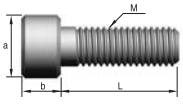
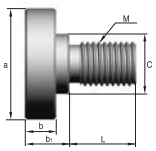


Fig. 2



Designation	Dimensions (mm)							Fig
	M	a	b	b1	C	L	pitch	
SB1035	M10	16	10	-	-	35	1.5	1
SB1245	M12	18	12	-	-	45	1.75	1
SB1645	M16	24	16	-	-	45	2.0	1
SB2040	M20	30	20	-	-	40	2.5	1
MBA-M20	M20	50	14	20	27	30	2.5	2
MBA-M24	M24	65	14	24	37	36	3.0	2

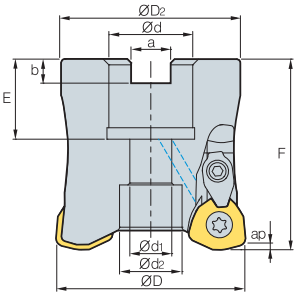
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø50~Ø80	FTGA0513-P	CHH4.5R1	CTX04513H	CR03	TW20-100

Available inserts E27 Available arbors and bolt E371~E373

HRMC(M)15





AA 15°

- AR: 7°
- RR: -15°~ -5°

(mm)

Designation			ØD	ØD	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Bolt
HRMC(M)	15063HR-3	3	63	60	22.225 (22)	11	17	8.0 (10.4)	5 (6.3)	20 (21)	50	2.5	0.7	SB1035
	15080HR-4	4	80	76	31.75 (27)	18 (13)	26 (20)	12.7 (12.4)	8 (7)	32 (23)	70	2.5	1.7	SB16 (12)45
	15100HR-5	5	100	96	31.75 (32)	18	26	12.7 (14.4)	8 (8)	32 (26)	70	2.5	2.8	SB1645
	15100HR-6	6	100	96	31.75 (32)	18	26	12.7 (14.4)	8 (8)	32 (26)	70	2.5	3.2	SB1645
	15125HR-6	6	125	98	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (29)	63	2.5	3.3	SB2040
	15160R-7	7	160	100	50.8 (40)	-	72	19.0 (16.4)	11 (9)	38 (35)	63	2.5	4.3	MBA-M24 (M20)

( )Metric size

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	150625ZDSR-MH								●	●	●	●	●	●				E27

Available arbors

Designation		HRMDC	HRMDCM
HRMC(M)	15063HR-3	BT□□-FMA22.225-□□	BT□□-FMC22-□□ SK□□-FMC22-□□
	15080HR-4	BT□□-FMA31.75-□□ SK□□-FMA31.75-□□	BT□□-FMC27-□□ SK□□-FMC27-□□
	15100HR-5 15100HR-6		BT□□-FMC32-□□ SK□□-FMC32-□□
	15125HR-6	BT□□-FMA38.1-□□ SK□□-FMA38.1-□□	BT□□-FMB40-□□ BT□□-FMC40-□□ SK□□-FMC40-□□
	15160R-7	BT□□-FMA50.8-□□	

Bolt

Fig. 1

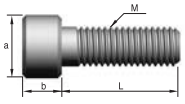
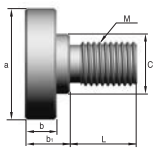


Fig. 2



Designation	Dimensions (mm)							Fig.
	M	a	b	b1	C	L	Pitch	
SB1035	M10	16	10	-	-	35	1.5	1
SB1245	M12	18	12	-	-	45	1.75	1
SB1645	M16	24	16	-	-	45	2.0	1
SB2040	M20	30	20	-	-	40	2.5	1
MBA-M20	M20	50	14	20	27	30	2.5	2
MBA-M24	M24	65	14	24	37	36	3.0	2

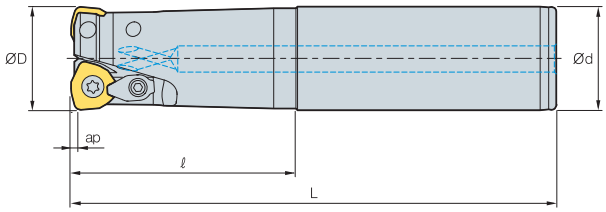
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø63~Ø160	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20-100

Available inserts E27 Available arbors and bolt E371~E373

HRMS08/10





AA 15°

- AR: 7°
- RR: -11°~ -5°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
HRMS	0820HR-2S20	2	20	20	50	130	1.0	0.3
	0820HR-2M20	2	20	20	100	180	1.0	0.4
	0820HR-2L20	2	20	20	130	250	1.0	0.5
	0821HR-2S20	2	21	20	50	130	1.0	0.3
	0821HR-2M20	2	21	20	50	180	1.0	0.4
	0821HR-2L20	2	21	20	50	250	1.0	0.5
	1025HR-2S25	2	25	25	60	140	1.5	0.4
	1025HR-2M25	2	25	25	120	200	1.5	0.6
	1025HR-2L25	2	25	25	180	300	1.5	0.9
	1026HR-2S25	2	26	25	60	140	1.5	0.4
	1026HR-2M25	2	26	25	60	200	1.5	0.6
	1026HR-2L25	2	26	25	60	300	1.5	1.0
	1030HR-2S32	2	30	32	70	150	1.5	0.8
	1030HR-2M32	2	30	32	120	200	1.5	1.0
	1030HR-2L32	2	30	32	180	300	1.5	1.5

Available inserts

WDKT-MH



Type	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
08 type	WDKT	080316ZDSR-MH						●	●	●	●	●	●	●	●				E27
10 type	WDKT	10T320ZDSR-MH						●	●	●	●	●	●	●	●				

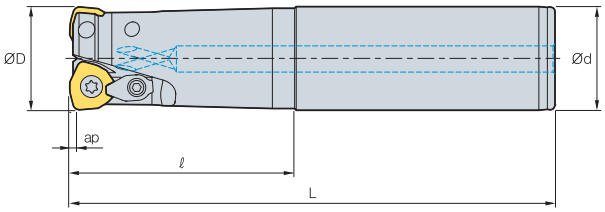
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø20~Ø21 (08 type)	FTNA0306	-	-	-	TW09P
Ø25~Ø30 (10 type)	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S

Available inserts E27

HRMS13





AA 15°

- AR: 7°
- RR: -11°~ -5°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
HRMS	1332HR-2S32	2	32	32	70	150	2.0	0.8
	1332HR-2M32	2	32	32	120	200	2.0	1.0
	1332HR-2L32	2	32	32	180	300	2.0	1.6
	1333HR-2S32	2	33	32	70	150	2.0	0.8
	1333HR-2M32	2	33	32	70	200	2.0	1.1
	1333HR-2L32	2	33	32	70	300	2.0	1.7
	1335HR-2S32	2	35	32	50	150	2.0	0.8
	1335HR-2M32	2	35	32	50	200	2.0	1.1
	1335HR-2L32	2	35	32	50	300	2.0	1.7
	1340HR-3S32	3	40	32	50	150	2.0	0.8
	1340HR-3M32	3	40	32	50	250	2.0	1.4
	1340HR-3L32	3	40	32	50	300	2.0	1.7
	1340HR-3S40	3	40	40	60	150	2.0	1.2
	1340HR-3M40	3	40	40	130	250	2.0	2.1
	1340HR-3L40	3	40	40	180	300	2.0	2.6
	1340HR-3S42	3	40	42	60	150	2.0	1.4
	1340HR-3M42	3	40	42	130	250	2.0	2.3
	1340HR-3L42	3	40	42	180	300	2.0	2.7

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	130520ZDSR-MH						●	●	●	●	●	●	●	●				E27

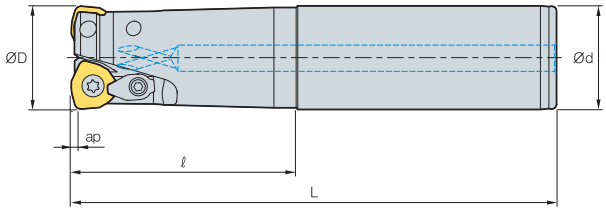
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø32,33,35	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	TW20
Ø40	FTGA0512-P	CHH5.5R1	CTX04513H	CR03	TW20

Available inserts E27

HRMS15





AA 15°

- AR: 7°
- RR: -8°~ -6°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
HRMS	1550HR-3S32	3	50	32	50	150	2.5	1.0
	1550HR-3M32	3	50	32	50	250	2.5	1.6
	1550HR-3L32	3	50	32	50	300	2.5	1.9
	1550HR-3S40	3	50	40	50	150	2.5	1.4
	1550HR-3M40	3	50	40	50	250	2.5	2.3
	1550HR-3L40	3	50	40	50	300	2.5	2.8
	1550HR-3S42	3	50	42	50	150	2.5	1.5
	1550HR-3M42	3	50	42	50	250	2.5	2.5
	1550HR-3L42	3	50	42	50	300	2.5	3.0
	1563HR-4S32	4	63	32	50	150	2.5	1.3
	1563HR-4M32	4	63	32	50	250	2.5	1.9
	1563HR-4L32	4	63	32	50	300	2.5	2.2
	1563HR-4S40	4	63	40	50	150	2.5	1.7
	1563HR-4M40	4	63	40	50	250	2.5	2.6
	1563HR-4L40	4	63	40	50	300	2.5	3.1
	1563HR-4S42	4	63	42	50	150	2.5	1.8
	1563HR-4M42	4	63	42	50	250	2.5	2.8
	1563HR-4L42	4	63	42	50	300	2.5	3.3

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	150625ZDSR-MH								●	●	●	●	●	●				E27

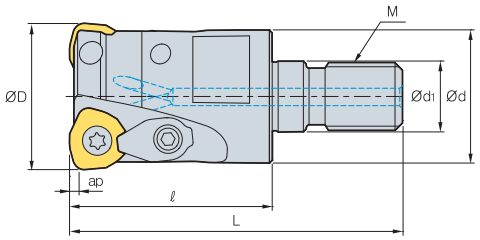
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench
Ø50~Ø63	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20

Available inserts E27

HRMM08





AA 15°

- AR: 7°
- RR: -11°~ -5°

(mm)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	kg
HRMM	0820HR-M10	2	20	18	10.5	30	51	M10	1	0.06
	0821HR-M10	2	21	18	10.5	30	51	M10	1	0.06
	0825HR-M12	3	25	23	12.5	35	59	M12	1	0.11
	0826HR-M12	3	26	23	12.5	35	59	M12	1	0.11
	0828HR-M12	3	28	23	12.5	35	59	M12	1	0.12
	0832HR-M16	4	32	29	17	40	67	M16	1	0.21
	0833HR-M16	4	33	29	17	40	67	M16	1	0.21
	0835HR-M16	4	35	29	17	40	67	M16	1	0.23
	0840HR-M16	5	40	29	17	40	67	M16	1	0.25

Available inserts

WDKT-MH



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
WDKT	080316ZDSR-MH						●	●	●	●	●	●	●	●				E27

Available adaptor

Designation		Available adaptor
HRMM	0820HR-M10	MAT-M10
	0821HR-M10	
	0825HR-M12	MAT-M12
	0826HR-M12	
	0828HR-M12	
	0832HR-M16	MAT-M16
	0833HR-M16	
	0835HR-M16	
	0840HR-M16	

Designation: HRMM0820HR-M10
Modular head threading measure size (M10)

II

Adaptor spec.: MAT-M10-030-S20S
Adaptor threading measure (M10)

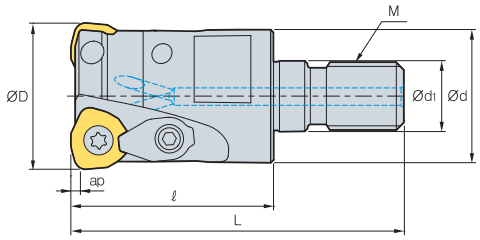
Parts

Specification	Screw	Clamp	Clamp screw	C-ring	Wrench	Wrench
Ø20~Ø40	FTNA0306	-	-	-	-	-

Available inserts E27 Available adaptor E342~E343

HRMM10/13












AA 15°

- AR: 7°
- RR: -11°~ -5°

(mm)

Designation			ØD	Ød	ød1	ℓ	L	M	ap	kg
HRMM	1025HR-M12	2	25	23	12.5	35	59	M12	1.5	0.1
	1026HR-M12	2	26	23	12.5	35	59	M12	1.5	0.1
	1030HR-M16	2	30	29	17	40	67	M16	1.5	0.2
	1032HR-M16	3	32	29	17	45	72	M16	1.5	0.26
	1035HR-M16	3	35	29	17	45	72	M16	1.5	0.23
	1040HR-M16	4	40	29	17	45	72	M16	1.5	0.27
HRMM	1332HR-M16	2	32	29	17	40	67	M16	2	0.17
	1333HR-M16	2	33	29	17	40	67	M16	2	0.17
	1335HR-M16	2	35	29	17	40	67	M16	2	0.19
	1340HR-M16	3	40	29	17	45	72	M16	2	0.24

Available inserts

WDKT-MH



Type	Designation	Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
10 type	WDKT 10T320ZDSR-MH						●	●	●	●	●	●	●	●				E27
13 type	WDKT 130520ZDSR-MH						●	●	●	●	●	●	●	●				

Available adaptor

Designation		Available adaptor
HRMM	1025HR-M12	MAT-M12
	1026HR-M12	
	1030HR-M16	MAT-M16
	1032HR-M16	
	1035HR-M16	
	1040HR-M16	
	1332HR-M16	MAT-M16
	1333HR-M16	
	1335HR-M16	
	1340HR-M16	

Designation: HRMM0820HR-M10
Modular head threading measure size (M10)

II

Adaptor spec.: MAT-M10-030-S20S
Adaptor threading measure (M10)

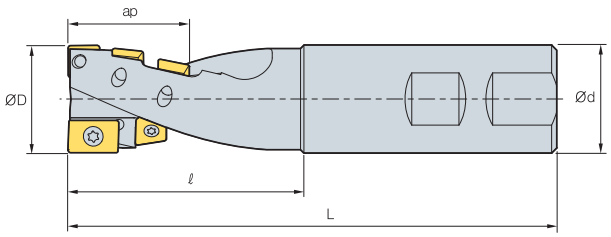
Parts

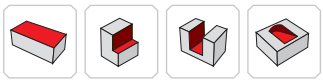
Specification	Screw	Clamp	Clamp screw	C-ring	Wrench	Wrench
Ø25~Ø40 (10 type)	FTKA0408	CHH3.5R1	CTX03510	CR03	TW15S	-
Ø32, 33, 35 (13 type)	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	-	TW20
Ø40 (13 type)	FTGA0512-P	CHH5.5R1	CTX04513H	CR03	-	TW20

Available inserts E27 Available adaptor E342~E343

THE







- AR: 5°, 10°
- RR: -5°

(mm)

Designation		ØD	Ød	ℓ	L	ap	No. of flute	kg	Available inserts	
									Lower cutting-edge	External cutting-edge
THE	25R	25	25	55	120	25	2	0.4	APLT070304R 1z	SPMT060304 4z
	32R	32	32	70	145	40	2	0.5	ADLT150308R 1z	SDMT090308-MM 5z
	40R	40	42	88	175	54	2	1.3	ZPMT1504PPSR-MM 1z	SPMT120408-MM 5z
	50R	50	42	85	175	54	4	1.4	ZPMT1504PPSR-MM 2z	SPMT120408-MM 10z

Available inserts

ADLT APLT SPMT-MM SPMT SDMT-MM ZPMT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPMT	060304			●														E04 E05 E18 E25 E31
SDMT	090308-MM								●				●					
SPMT	120408-MM								●				●					
APLT	070304R												●					
ADLT	150308R			●									●					
ZPMT	1504PPSR-MM								●				●					

Recommended cutting condition

- Grooving

Workpiece	Cutting Condition		Grades
	vc (m/min)	fz (mm/t)	
P	90~140	0.05~0.2	PC5300
M	50~90	0.05~0.2	PC5300
K	70~120	0.05~0.25	PC5300

- Side cutting

Workpiece	Cutting Condition		Grades
	vc (m/min)	fz (mm/t)	
P	150 ~240	0.05~0.2	PC5300
M	90~150	0.05~0.2	PC5300
K	120~200	0.10~0.25	PC5300

Parts

Specification	Screw	Wrench	Wrench
Ø25	ETNA02506	TW07P	-
Ø32	ETNA0408	-	TW15S
Ø40	ETNA0511	-	TW20S
Ø50	ETNA0511	-	TW20S

Available inserts E04, E05, E18, E25, E31

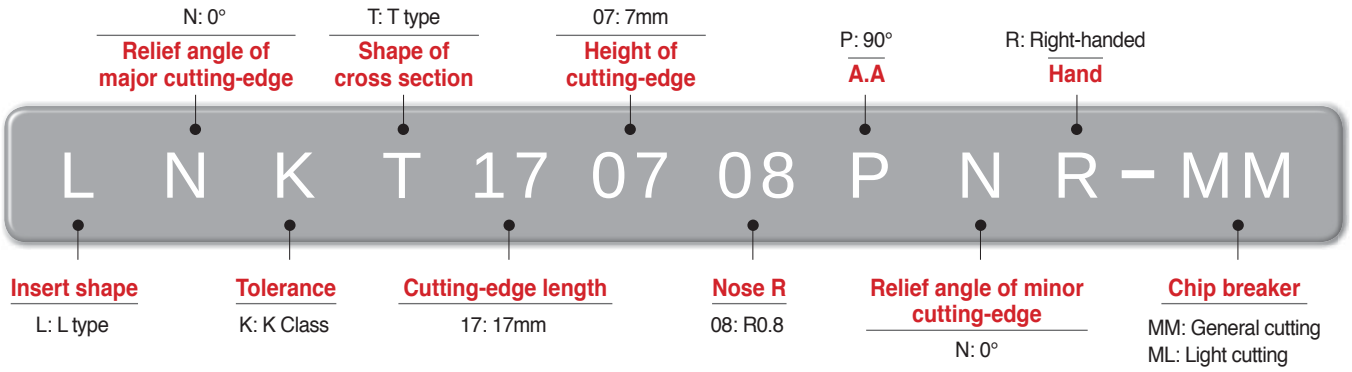
This milling tool series with its tangential clamping system increases stable machining and productivity, while improving perpendicularity

Tangen-Pro TP2P new

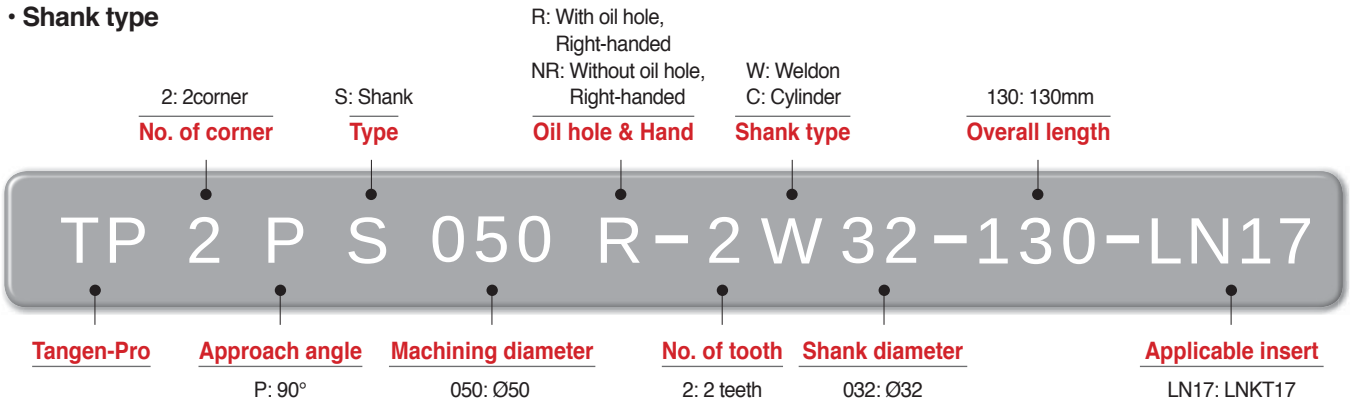
- Clamping stability gained through tangential clamping system and wedge-shaped inserts
- Excellent surface finish nearly perfect perpendicularity, and highly even flank surface compared to competitors' designs
- Improved productivity due to High-rake angles and sharp cutting-edges which lead to lower cutting resistance → Ideally suited for high speed and high feed machining

Code system

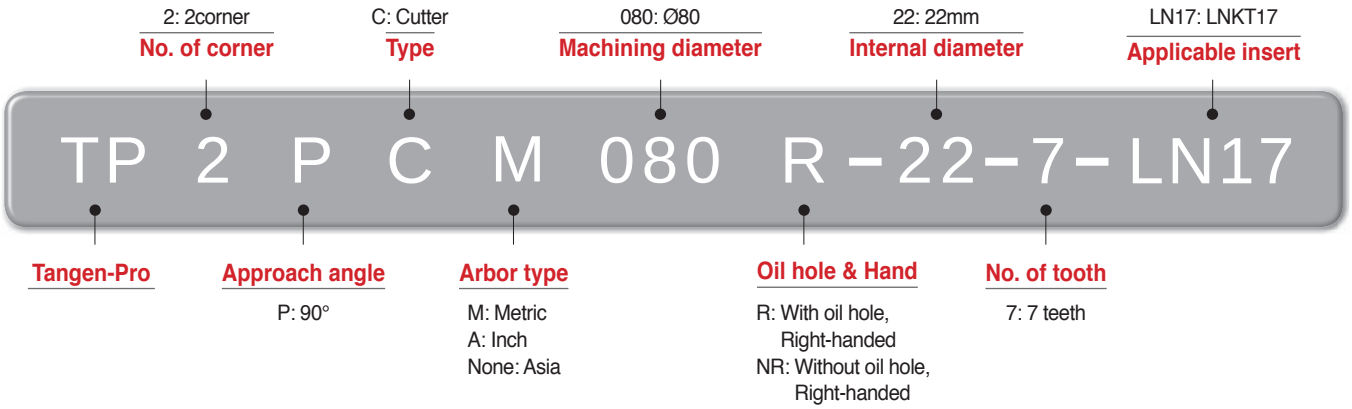
• Insert



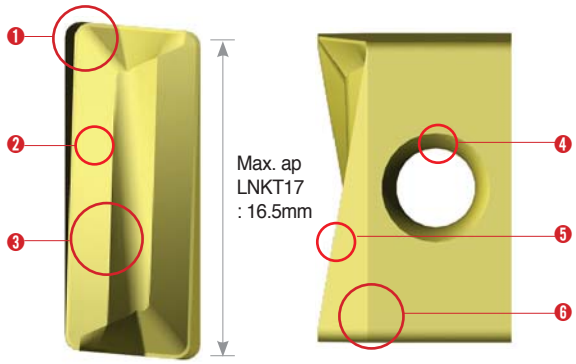
• Shank type



• Cutter type



Features of insert



1 Wedge type clamping area

- Clamping in wedge form on seats
  → Creates strong clamping force

2 High-rake angle chip breaker

- High-rake angle applied
- Produces smooth chip flow
  → Extended insert life

3 Convex projection

- Improved chip evacuation
- Enhances rigidity

4 Side hole (tangential type)

- Higher clamping stability

5 High-rake angle cutting-edges

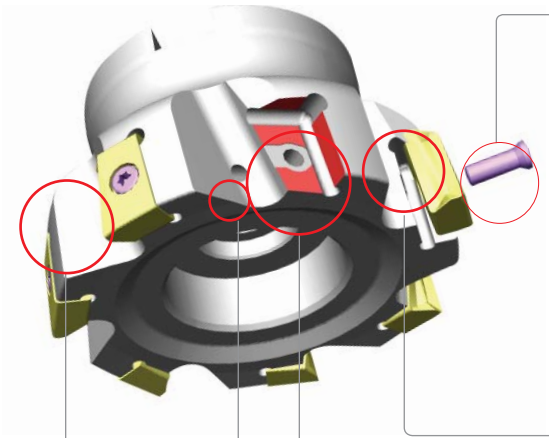
- Improves cutting performance while reducing cutting load

6 2-level flank relief surface

- 1st reverse positive relief surface enhances rigidity
- 2nd negative relief surface enables stable clamping
  → Improved chipping resistance and surface finish

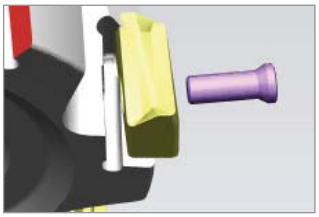
Features of cutter

- Tangential clamping system, wedge-shaped inserts and wide seat area
  → Higher clamping stability
  → Lower vibrations and cutting resistance during machining
- Optimized H/D design with curved surface for smooth chip flow
  → Excellent chip evacuation in ramping or deep shouldering



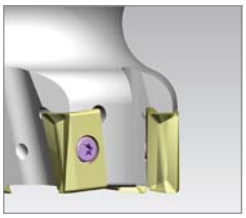
Tangential clamping

- Multi-corner use
  → High feed machining availability



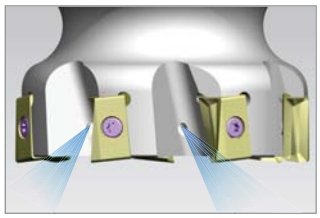
Efficient holder design

- Smoother chip evacuation in slotting or deep shouldering



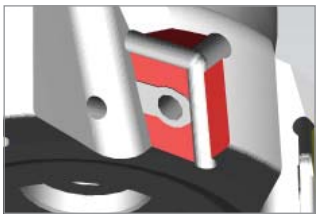
Through coolant system

- Improved chip evacuation
- Longer tool life due to insert cooling



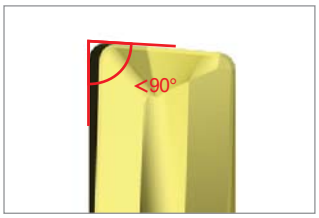
Wide seat area

- Strong clamping force



Wedge type clamping

- Stable insert life



Features of chip breaker

Chip breaker	Cutting-edge	Application	Features
ML		Light cutting	Chip breaker design for low cutting resistance that provides excellent tool life and quality surface finishes in light cutting and hard-to-cut materials
MM		General cutting	Universal design for general shoulder milling operations, highly suitable in most applications

Application guideline for grade

Workpiece		P		K
		Carbon steel	Alloy steel	Cast iron
Grades	High speed cutting	PC5300	PC5300	PC6510
	General cutting	PC5400	PC5300	PC6510
	Interrupted cutting	PC5400	PC5400	PC5300

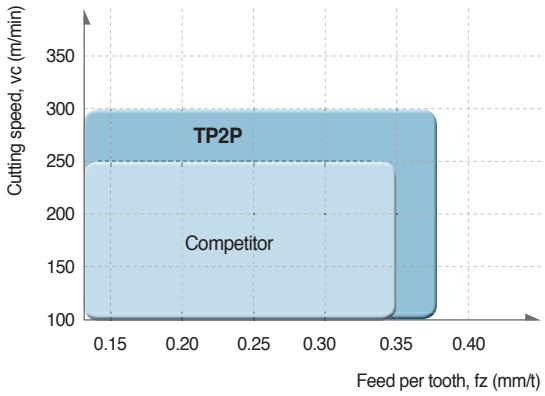
Recommended cutting condition

Workpiece		Grades	vc (m/min)	fz (mm/t)	Max. ap (mm)	Applicable insert
P	Steel	PC5300	150~240	0.25~0.05	16.5	LNKT170708PNR-MM
		PC5400	130~210	0.25~0.05	16.5	
K	Cast iron	PC6510	100~250	0.25~0.05	16.5	LNKT170708PNR-ML

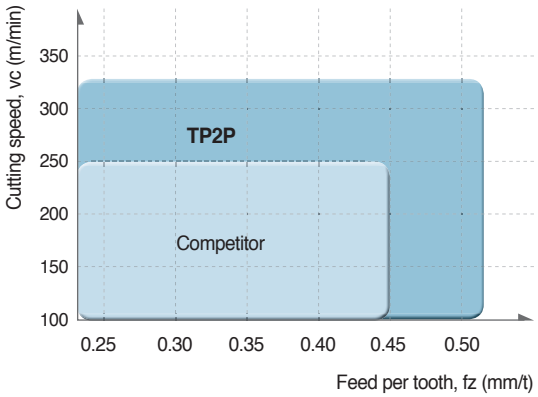
※ The above data refer to general cutting conditions and can be adjustable to the speed of 300m/min and the feed per tooth of 0.5mm/t depending on user environment.

Application area

Application area: ap (mm) = 14, ae (mm) = 10

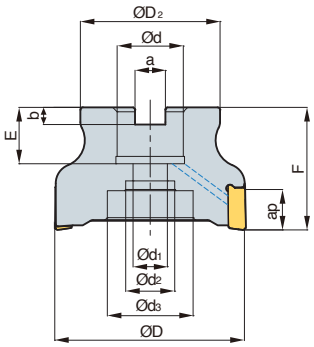


Application area: ap (mm) = 8, ae (mm) = 10



TP2PC(M) new





AA 90°

- AR: -6°
- RR: -21°~ -14°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	Ød3	a	b	E	F	ap	kg
TP2PCM	040R-16-3-LN17	3	40	35	16	9	14	-	8.4	5.6	16	40	16.5	0.17
	040R-16-4-LN17	4	40	35	16	9	14	-	8.4	5.6	16	40	16.5	0.17
	050R-22-4-LN17	4	50	41	22	11	18	-	10.4	6.3	20	40	16.5	0.27
	050R-22-5-LN17	5	50	41	22	11	18	-	10.4	6.3	20	40	16.5	0.26
	063R-22-6-LN17	6	63	49	22	11	18	-	10.4	6.3	20	40	16.5	0.46
	063R-22-7-LN17	7	63	49	22	11	18	-	10.4	6.3	20	40	16.5	0.47
	080R-27-7-LN17	7	80	57	27	14	20	35	12.4	7.0	23	50	16.5	0.89
	080R-27-8-LN17	8	80	57	27	14	20	35	12.4	7.0	23	50	16.5	0.91
	100R-32-8-LN17	8	100	67	32	18	28	45	14.4	8.0	25	63	16.5	1.68
	100R-32-9-LN17	9	100	67	32	18	28	45	14.4	8.0	25	63	16.5	1.75
	125R-40-10-LN17	10	125	90	40	22	32	52	16.4	10.0	30	63	16.5	2.88
	125R-40-11-LN17	11	125	90	40	22	32	52	16.4	10.0	30	63	16.5	2.88
TP2PC	080R-25.4-7-LN17	7	80	57	25.4	14	20	35	9.5	6.0	25	50	16.5	0.92
	080R-25.4-8-LN17	8	80	57	25.4	14	20	35	9.5	6.0	25	50	16.5	0.93
	100R-31.75-8-LN17	8	100	67	31.75	18	28	45	12.7	8.0	32	63	16.5	1.73
	100R-31.75-9-LN17	9	100	67	31.75	18	28	45	12.7	8.0	32	63	16.5	1.73
	125R-38.1-10-LN17	10	125	90	38.1	22	32	52	15.9	9.0	35	63	16.5	3.06
	125R-38.1-11-LN17	11	125	90	38.1	22	32	52	15.9	9.0	35	63	16.5	2.91

Available inserts

LNKT-MM



LNKT-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNKT	170708PNR-MM												●	●				E10
	170708PNR-ML											●	●	●				

Available arbors

Designation		Available arbors
TP2PCM	040R-16-3-LN17	BT□□-FMC16-□□
	040R-16-4-LN17	
	050R-22-4-LN17	BT□□-FMC22-□□
	050R-22-5-LN17	
	063R-22-6-LN17	
	063R-22-7-LN17	
	080R-27-7-LN17	BT□□-FMC27-□□
	080R-27-8-LN17	
	100R-32-8-LN17	BT□□-FMC32-□□
	100R-32-9-LN17	

Designation		Available arbors
TP2PCM	125R-40-10-LN17	BT□□-FMC40-□□
	125R-40-11-LN17	
TP2PC	080R-25.4-7-LN17	BT□□-FMA25.4-□□
	080R-25.4-8-LN17	
	100R-31.75-8-LN17	BT□□-FMA31.75-□□
	100R-31.75-9-LN17	
	125R-38.1-10-LN17	BT□□-FMA38.1-□□
	125R-38.1-11-LN17	

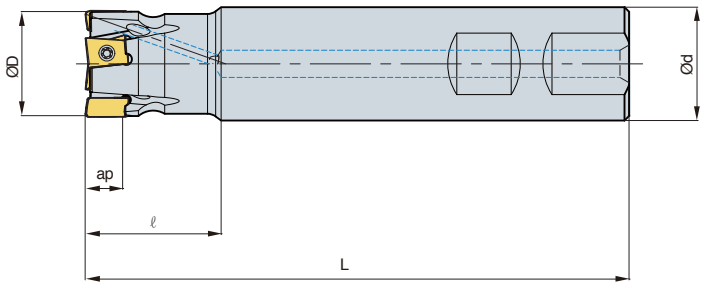
Parts

Specification	Screw	Wrench
Ø40~Ø125	FTKA0412B	TW15S

Available inserts E10 Available arbors and bolt E371~E373

TP2PS new













AA 90°

- AR: -6°
- RR: -32°~ -21°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
TP2PS	032R-2W32-130-LN17	2	32	32	40	130	16.5	0.68
	032R-3W32-130-LN17	3	32	32	40	130	16.5	0.67
	040R-3W32-130-LN17	3	40	32	40	130	16.5	0.73
	040R-4W32-130-LN17	4	40	32	40	130	16.5	0.73
	050R-4W32-130-LN17	4	50	32	40	130	16.5	0.83
	050R-5W32-130-LN17	5	50	32	40	130	16.5	0.83

Available inserts

LNKT-MM



LNKT-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNKT	170708PNR-MM												●	●				E10
	170708PNR-ML											●	●	●				

Parts

Specification	Screw	Wrench
Ø32~Ø50	FTKA0412B	TW15S

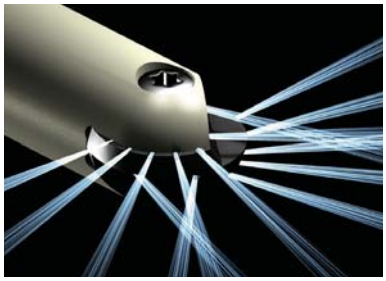
Available inserts E10

Longer tool life is achieved due to the excellent insert grades' cutting performance

Laser Mill

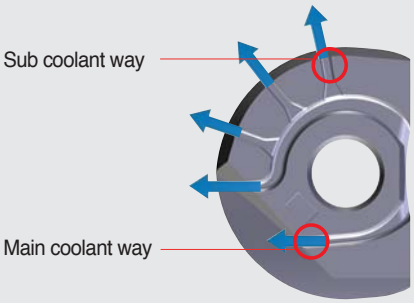
- Long tool life has been achieved due to the excellent cutting performance of the insert grade
- Optimum machining of molds has been achieved with the MQL available system
- Easy clamping with simple screw on system
- Various holder line up: steel shank, carbide shank, modular type
- High accuracy indexable endmills for mold finishing

MQL System

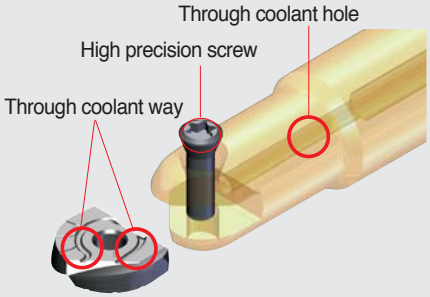


- Environmental friendly system
- Decreased coolant cost
- Lubrication of cutting-edge
- Improved chip control property
- Increased tool life & improved surface quality

Clamping system



- High precision (ground internal diameter) Run-out: 0.02 mm Accuracy of 'R part: below 0.01
- Through coolant system



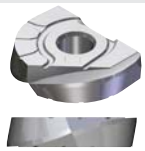
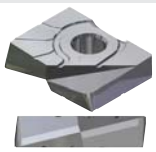
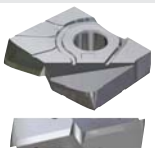
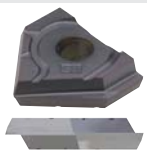
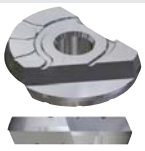
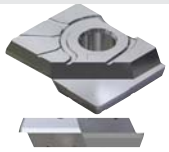
Features

LBE



- Six types of inserts are available with one holder
- Single screw for clamping of insert: Easy clamping system
- Various types of holders (Steel shank, Carbide shank, Modular type)
- MQL applicable- environmentally responsible with longer tool life & improved surface quality.

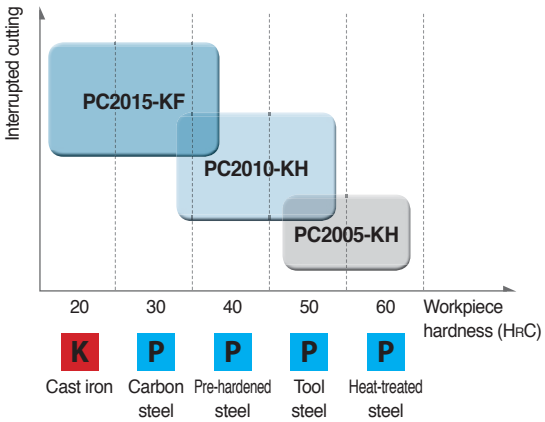
LBS, LR Order-made items

LBH-Ball	LRH-Corner radius	LFH-High feed	LCF-Chamfer	LBS-Ball type	LR-Corner R type
					
• Helical cutting-edge • Suitable for harder material with high feed	• Helical cutting-edge • Variety of nose -R	• Helical cutting-edge • Suitable for high feed	• Straight cutting-edge • Center drilling and chamfering	• Straight cutting-edge • Suitable for precise	• Straight cutting-edge • Variety of nose-R

Features of Laser Mill grades

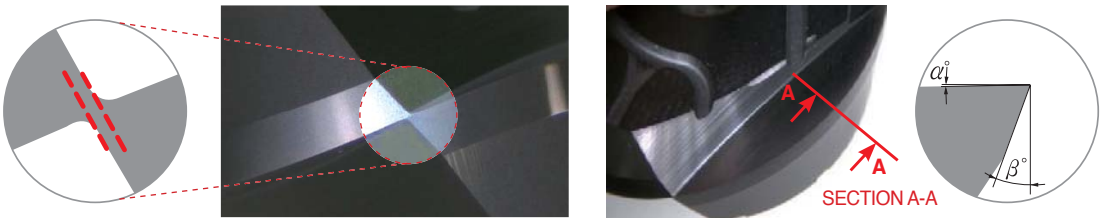
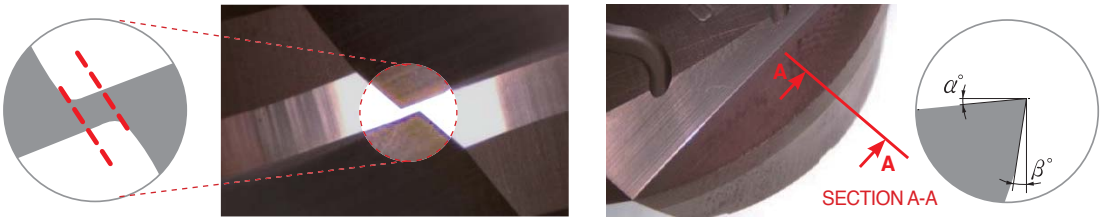
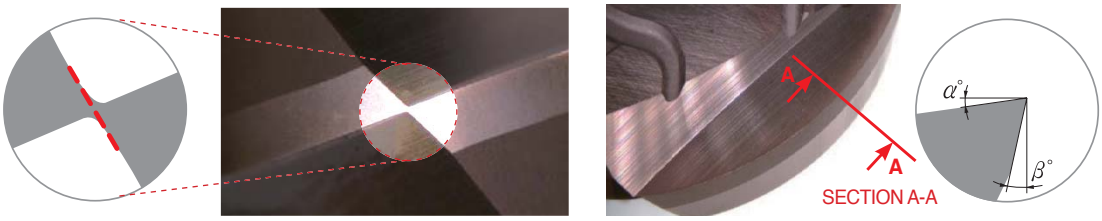
PC2005	• Extremely high hardness grade • The harmony between improved blade design and strong chip breaker • Optimized for machining heat-treated steel and high hardness steel
PC2010	• High wear resistance and excellent toughness • The harmony between excellent thermal shock resistance and strong cutting-edges. • Optimized for machining tool steel and pre-hardened steel
PC2015	• High welding resistance and excellent toughness • The harmony between tough grade and excellent cutting-edge design • Optimized for machining carbon steel

Application guideline per workpiece



Features of KF/KH chip breaker

- KF: Exclusive chip breaker for stable machining of carbon steel with its characteristics of high wear resistance at center part and improved blade design
- KH: Stronger insert with the combination of rake angle and relief angle that are ideal for machining high hardness workpiece

Type	Shape comparison
Standard (For general cutting)	 • Proper to general cutting • Insert shape for uniform performance
KH (For high hardness steel)	 • Center shaper proper for machining high hardness workpiece and uniformed tool life at center part • Improved cutting-edge design by higher rake angle (α°) • Lower relief angle (ß°) increases strength of cutting-edges than universal inserts.
KF (For carbon steel)	 • Smaller chisel improves wear resistance at center for machining carbon steel. • Improved cutting-edge design by higher rake angle (α°) • Longer tool life and better cutting performance with the use of excellent blade design

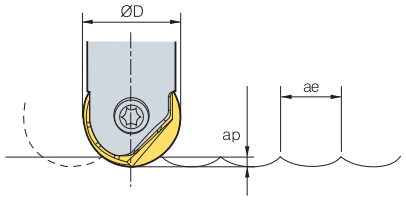
Recommended cutting condition

Workpiece				Grades	Chip breaker	Recommended cutting conditions			
ISO		Material	HB (HRC)			vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
K	Gray cast iron	GC250	180 (8)	PC2015 PC2010 PC2005	KF	130~210	0.2~0.5	0.07D	0.07D
K	Ductile cast iron	GCD600	250 (24)						
P	Carbon steel	S20C~S50C	150			170~250	0.2~0.5	0.07D	0.07D
P	Alloy steel	SCM21~SCM5H	270 (28)	PC2010 PC2015 PC210F	KH	130~210	0.1~0.3	0.7D	0.7D
P	Pre-hardened steel	KP4M	300 (32)			100~160	0.1~0.3	0.5D	0.5D
P	Pre-hardened steel	NIMAX	370 (40)						
P	Pre-hardened steel	CENA1	370 (40)						
P	Pre-hardened steel	NAK80	400 (43)						
P	Pre-hardened steel	STAVAX	510 (52)						
P	High speed tool steel	SKH51~SKH59	550 (55)	PC2005 PC2010	KH	80~130	0.1~0.2	0.3D	0.3D
P	Alloy tool steel	STD61 (Hot forging)	630 (60)			70~120	0.1~0.2	0.3D	0.3D
P	Alloy tool steel	STD11 (Cold forging)							

Overhang	vc (m/min)	fz (mm/t)
Under 3D	100%	100%
3D~5D	70%	70%
5D~8D	60%	60%
8D~10D	50%	50%

Cutting condition formula for milling

Practical cutting speed	RPM
$vce = \frac{\pi \times De \times n}{1000}$ (m/min)	$n = \frac{vce \times 1000}{\pi \times De}$ (min^{-1})
Feed per tooth	**Feed per minute**
$fz = \frac{vf}{z \times n}$ (mm/t)	$vf = fz \times z \times n$ (mm/min)
Chip removal amount	**Power requirement**
$Q = \frac{ap \times ae \times vf}{1000}$ (cm^3/min)	$Pkw = \frac{Q \times kc}{60 \times 102 \times \eta}$ (kW) $Php = \frac{Pc}{0.75}$ (hp)



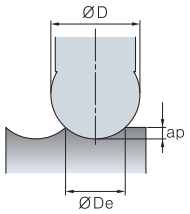
vc = Cutting speed (m/min)	Pkw = Power requirement (kW)
vce = Practical cutting speed (m/min)	Php = Horsepower requirement (hp)
n = Revolution per Minute (min^{-1})	Q = Chip removal amount (cm^3/min)
D = Cutting diameter (mm)	ap = Depth of cut (mm)
De = Actual diameter (mm)	ae = Width of cut (mm)
vf = Feed per minute (mm/min)	kc = Specific cutting resistance (kg/mm^2)
fz = Feed per tooth (mm/t)	η = Mechanical efficiency (%)
z = Number of tooth	

Practical cutting speed calculation formulas

1. Formula of actual diameter

• **Formula**
: Actual diameter

$De = 2\sqrt{ap\ (D - ap)}$



2. θ°Using: Calculating cutting speed at P point
(Cutting speed according to depth of cut when ramping)

• **Formula**
: Practical cutting speed

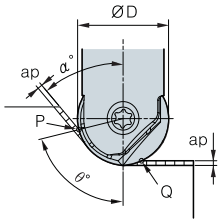
$vce = \frac{\pi\ Dsin\theta \times n}{1000}$ (m/min)

$\theta = \cos^{-1}\left(\frac{D - 2ap}{D}\right) + (90 - \alpha°)$

3. In case of using ap: Calculating cutting speed at Q point

• **Formula**
: Pratical cutting speed

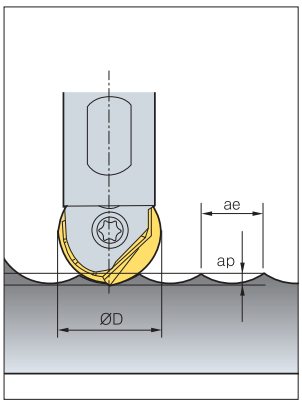
$vce = \frac{2\pi n\sqrt{ap\ (D - ap)}}{1000}$



Practical cutting speed calculation formulas

ae (mm) / R (mm)	h (surface roughness) (μm)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5	0.3	1.0	2.3	4.0	6.3	9.0	12.3	16.0	20.3	25.0
6	0.2	0.8	1.9	3.3	5.2	7.5	10.2	13.3	16.9	20.8
8	0.2	0.6	1.4	2.5	3.9	5.6	7.7	10.0	12.7	15.6
10	0.1	0.5	1.1	2.0	3.1	4.5	6.1	8.0	10.1	12.5
12.5	0.1	0.4	0.9	1.6	2.5	3.6	4.9	6.4	8.1	10.0
15	0.1	0.3	0.8	1.3	2.1	3.0	4.1	5.3	6.8	8.3
16	0.1	0.3	0.7	1.3	2.0	2.8	3.8	5.0	6.3	7.8

• Formula of surface roughness: h (surface finish) = $\frac{(ae)^2}{8R} \times 1000$ (μm)

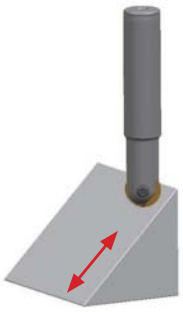


Actual diameter data

ap \ ØD	Ø08	Ø10	Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
0.1	1.8	2.0	2.2	2.5	2.8	3.2	3.5	3.6
0.2	2.5	2.8	3.1	3.6	4.0	4.5	4.9	5.0
0.3	3.0	3.4	3.7	4.3	4.9	5.4	6.0	6.2
0.5	3.9	4.4	4.8	5.6	6.2	7.0	7.7	7.9
1.0	5.3	6.0	6.6	7.7	8.7	9.8	10.8	11.1
1.5	6.2	7.1	7.9	9.3	10.5	11.9	13.1	13.5
2.0	6.9	8.0	8.9	10.6	12.0	13.6	15.0	15.5
2.5	7.4	8.7	9.7	11.6	13.2	15.0	16.6	17.2
3.0	7.7	9.2	10.4	12.5	14.3	16.2	18.0	18.7
3.5	7.9	9.5	10.9	13.2	15.2	17.3	19.3	20.0
4.0	8.0	9.8	11.3	13.9	16.0	18.3	20.4	21.2
5.0			11.8	14.8	17.3	20.0	22.4	23.2
6.0			12.0	15.5	18.3	21.4	24.0	25.0
7.0				15.9	19.1	22.4	25.4	26.5
8.0				16.0	19.6	23.3	26.5	27.7
10.0					20.0	24.5	28.3	29.7

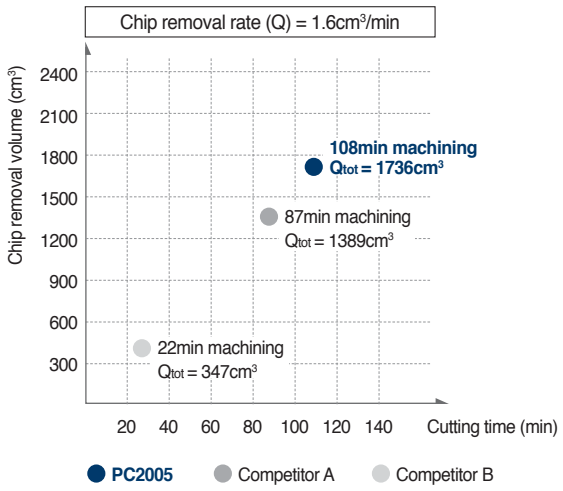
Performance evaluation

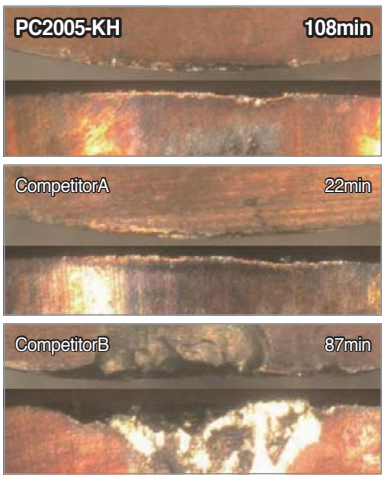
PC2005 tool life test — High hardness heat-treated steel (X100CrMoV5 1, heat-treated HRC60)



■ **Cutting conditions**
vc = 140m/min
fz = 0.15mm/t
ap = 2mm 1.
ae = 1.2mm
Coolant (Air)

■ **Tools**
Insert LBH120-KH (PC2005)



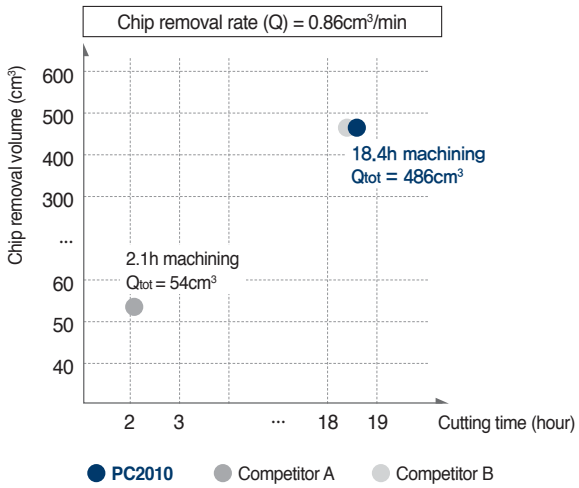


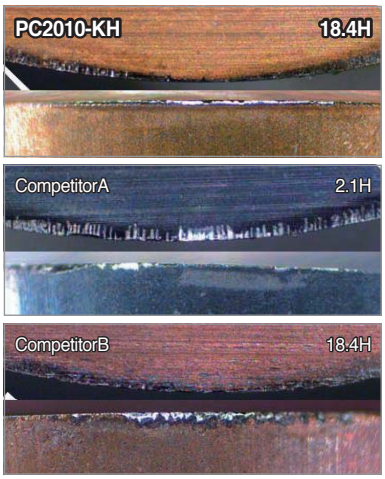
PC2010 tool life test — Pre-hardened steel (X40CrMnNiMo8-6-4)



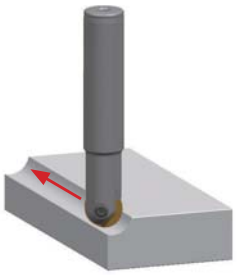
■ **Cutting conditions**
vc = 276m/min
fz = 0.15mm/t
ap = 0.3mm
ae = 1.2mm
Wet

■ **Tools**
Insert LBH120-KH (PC2010)



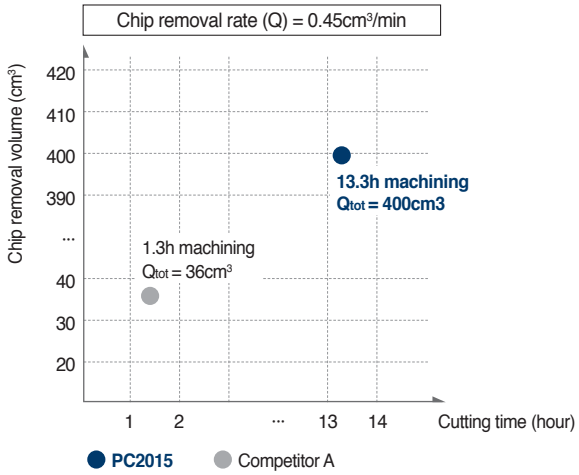


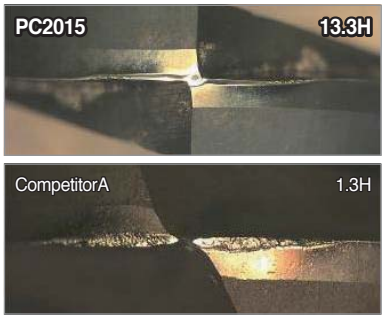
PC2015 tool life test — Carbon steel (C45)



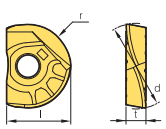
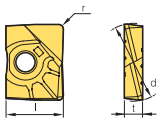
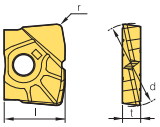
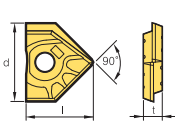
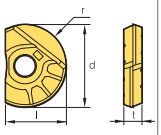
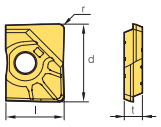
■ **Cutting conditions**
vc = 250m/min
fz = 0.35mm/t
ap = 0.3mm
ae = 0.3mm
Coolant (MQL)

■ **Tools**
Insert LBH120 (PC2015)





Available inserts

Holders	LBH (Ball type)	LRH (Corner radius type)	LFH (High feed type)	LCF (Chamfer type)	LBS (Ball type)	LR (Corner radius type)
	 R accuracy ±0.005	 Corner R ±0.015			 R accuracy ±0.005	 Corner R ±0.015
LBE080	LBH080 LBH090 LBH080-KF LBH090-KF LBH080-KH LBH090-KH				LBS080 LBS090	
LBE100 **LRE100**	LBH100 LBH110 LBH100-KF LBH110-KF LBH100-KH LBH110-KH	LRH100-R05 LRH100-R20 LRH100-R10 LRH110-R05	LFH100		LBS100 LBS110	LR100-R05 LR100-R20 LR100-R10 LR110-R05
LBE120 **LRE120**	LBH120 LBH130 LBH120-KF LBH130-KF LBH120-KH LBH130-KH	LRH120-R05 LRH120-R20 LRH120-R10 LRH130-R05	LFH120		LBS120 LBS130	LR120-R05 LR120-R20 LR120-R10 LR130-R05
LBE160 **LRE160**	LBH160 LBH170 LBH160-KF LBH170-KF LBH160-KH LBH170-KH	LRH160-R05 LRH160-R30 LRH160-R10 LRH170-R05 LRH160-R20	LFH160	LCF160-D90	LBS160 LBS170	LR160-R05 LR160-R30 LR160-R10 LR170-R05 LR160-R20
LBE200 **LRE200**	LBH200 LBH210 LBH200-KF LBH210-KF LBH200-KH LBH210-KH	LRH200-R05 LRH200-R30 LRH200-R10 LRH210-R05 LRH200-R20	LFH200	LCF200-D90	LBS200 LBS210	LR200-R05 LR200-R30 LR200-R10 LR210-R05 LR200-R20
LBE250 **LRE250**	LBH250 LBH260 LBH250-KF LBH260-KF LBH250-KH LBH260-KH	LRH250-R05 LRH250-R30 LRH250-R10 LRH260-R05 LRH250-R20	LFH250	LCF250-D90	LBS250 LBS260	LR250-R05 LR250-R30 LR250-R10 LR260-R05 LR250-R20
LBE300 **LRE300**	LBH300 LBH310 LBH300-KF LBH310-KF LBH300-KH LBH310-KH	LRH300-R10 LRH300-R30 LRH300-R20 LRH310-R05	LFH300		LBS300 LBS310	LR300-R10 LR300-R30 LR300-R20 LR310-R05
LBE320 **LRE320**	LBH320 LBH320-KF LBH320-KH	LRH320-R10 LRH320-R30 LRH320-R20	LFH320		LBS320	LR320-R10 LR320-R30 LR320-R20

* LBH for general cutting, LBH-KF for carbon steel, and LBH-KH for high hardened steel.

Available inserts **E08, E09**

Long tool life due to high hardness grade

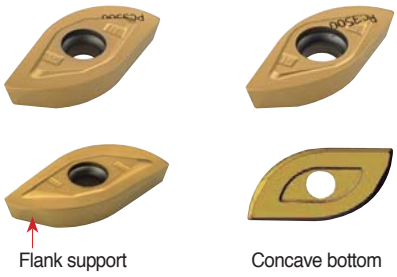
GBE

- Indexable Ball nose Endmill for Molds in medium & roughing applications
- Long tool life with high hardness grade
- Helical high accuracy cutting-edge
- Optimized mold machining process with our internal coolant system
- Able to adjust to medium processing in middle & big roughing mold process
- Wide variety of holders in normal & long style holders

Holder code system

GBE	300	–	S	32
Product Name	**Machining Dia.**		**Type**	**Shank Dia.**
General Indexable Ball Endmill	Ø16, Ø18, Ø20, Ø22, Ø25, Ø26, Ø28, Ø30, Ø32, Ø40, Ø50		S: Standard shank L: Long shank	32: Ø32

Internal | **External**



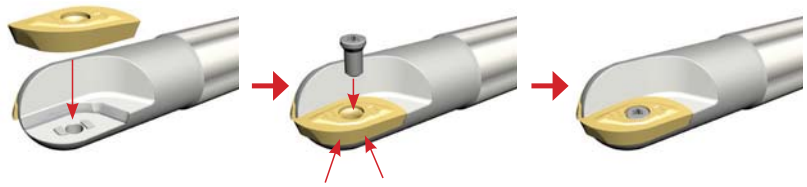
- Ability to handle high accuracy & large depth of cut applications
  - Run-out: within 0.05 mm
  - R accuracy: within 0.05 mm
- Various diameters (Ø16, 20, 25, 30, 32, 40, 50)
- Minimal cutting resistance due to Helical cutting-edge
- Anti-rotation of insert due to concave bottom & stable setting by flank support
- Long tool life & better processing due to 2 cutting inserts
- Better tool life with new grade



Multi-edge type | **Single-edge type** | **Modular type**

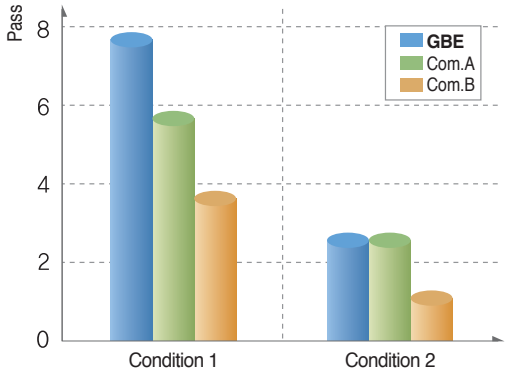
- Various diameters (Ø16, 20, 25, 30, 32, 40, 50)
- Improved chip treatment with internal coolant (cutting-edge portion)
- Long tool life & better processing
- Easy insert setting with projection part to prevent vibration during processing

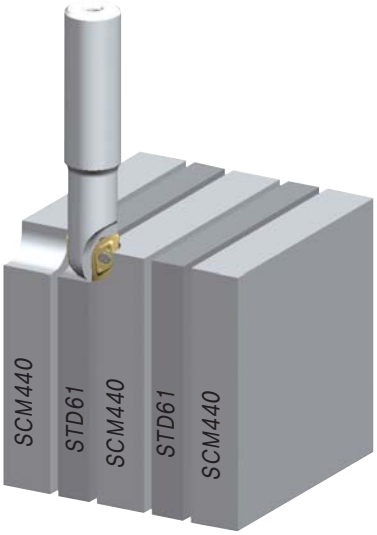
How to set insert



1. Set the insert to the holder projection seat
2. Push the insert into the pocket as shown by red arrows and screw down with wrench

Performance evaluation





Cutting condition

Class.	Cutting speed (vc)	Feed (fz)	Depth of cut (ap)	Depth of cut (ae)	Workpiece	Etc.
Condition 1	150 m/min	0.15 mm/t	5 mm	8 mm	STD61 (HRC50) + SCM440 (HRC20)	Dry
Condition 2	100 m/min	0.1 mm/t	8 mm	8 mm		

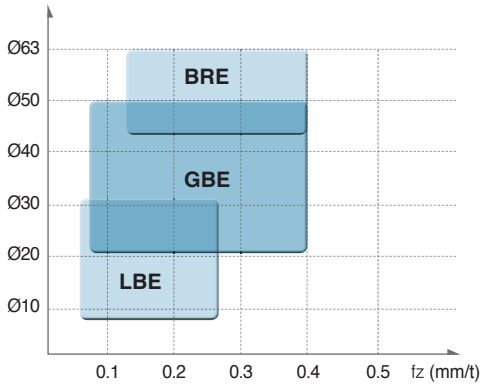
Inserts/parts

Type	Insert			Parts			
							
Dia.	**Internal I/S**	**External I/S**	**External main I/S**	**Screw**		**Wrench**	
				Int./Ext. type	**Ext. main type**	**Int./Ext. type**	**Ext. main type**
Ø16	ZPET080M-MM	ZPET080S-MM	-	FTKA02555S	-	TW08S	-
Ø18	ZPET090M-MM	ZPET090S-MM	-	FTKA0307	-	TW09S	-
Ø20	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P
Ø22	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P
Ø25	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P
Ø26	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S
Ø28	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S
Ø30	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø32	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø40	ZPET200M-MM	ZPET200S-MM	SPMT120408-MM	FTGA0614	ETNA0511	TW20-100	TW20S
Ø50	ZPET250M-MM	ZPET250S-MM	SPMT120408-MM	FTGA0818	ETNA0511	TW25S	TW20S

Recommended cutting condition

Workpiece	Machining type	Hardness (HRC)	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
Carbon, Alloy steel	Flank Groove Deep flank	Under 25	160~250 120~200 160~250	0.1~0.5 0.1~0.5 0.1~0.5	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D - 0.1~0.2D
Carbon, Alloy steel	Flank Groove Deep flank	Under 45	120~200 120~160 120~200	0.1~0.5 0.1~0.5 0.1~0.5	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D - 0.1~0.2D
Mold Alloy steel	Flank Groove Deep flank	30~40	120~200 120~160 120~200	0.1~0.3 0.1~0.3 0.1~0.3	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D - 0.1~0.2D
Cast iron (GC, GCD)	Flank Groove Deep flank	20~30	150~300 150~300 150~300	0.2~0.7 0.2~0.7 0.2~0.7	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D - 0.1~0.2D
Heat-treated steel	Flank Groove Deep flank	50~60	40~100 40~100 40~100	0.1~0.3 0.1~0.3 0.1~0.3	0.3~0.5D 0.3~0.5D 1.0~1.5D	0.2~0.3D - 0.1~0.2D

Line-up for indexable ball endmill

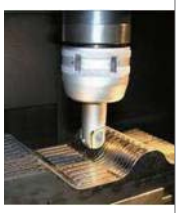


Type	Application				
	Machining Dignity	Machining Efficiency	Machining Dia. Equivalence	Economical	Flank Machining with LongEdge
Laser Mill	●	○	◐	○	○
GBE	◐	●	◐	◐	●
BRE	○	●	●	●	●

●: Very Good ◐: Good ○: Normal

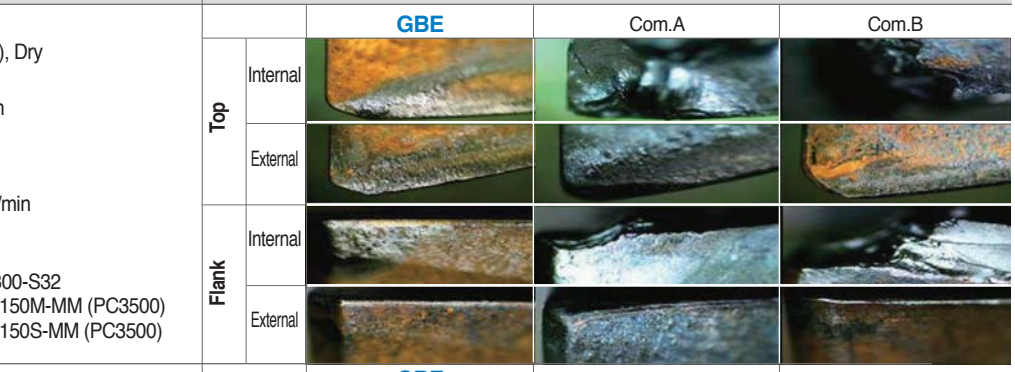
Test result for wear resistance

Cutting condition	Wear resistance photos



Cutting time : 4 Pass

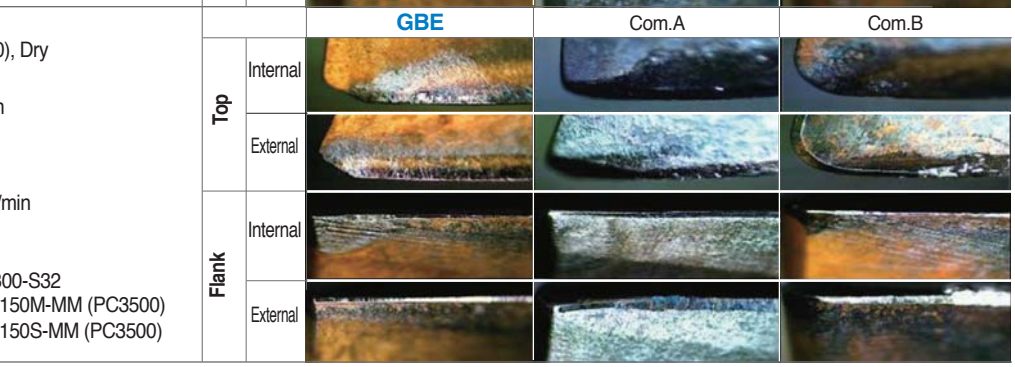
■ **Workpiece**
KP4M (HRC33), Dry
■ **Condition**
vc = 280 m/min
fz = 0.25 mm/t
ap = 5~10 mm
ae = 5~10 mm
vf = 1,486 mm/min
n = 2,971 rpm
■ **Tool**
Holder: GBE300-S32
Insert: ZPET150M-MM (PC3500)
ZPET150S-MM (PC3500)





Cutting time : 4 Pass

■ **Workpiece**
STD11 (HRC20), Dry
■ **Condition**
vc = 250 m/min
fz = 0.2 mm/t
ap = 5 mm
ae = 5 mm
vf = 1,062 mm/min
n = 2,653 rpm
■ **Tool**
Holder: GBE300-S32
Insert: ZPET150M-MM (PC3500)
ZPET150S-MM (PC3500)



Better tool life and anti-breakage with special surface treatment on the holder

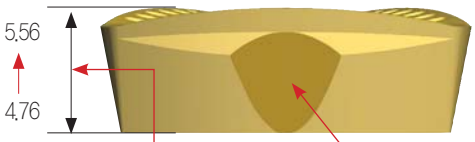
BRE

- Cutting performance: Good chip control & Superior cutting performance with optimal cutting-edge line
- High rigidity body: Better tool life and special surface treatment to strengthen the holder
  Easy to set and good durability with TCRX screw
  Good chip control with our 3D flute design & improved external quality
- Insert: Able to apply in high speed & feed applications due to special grade which has wear & breakage resistance and stable cutting performance with high cutting-edge toughness & high rake angle chip breaker

Multi-edge holder ISO View



• Good chip flow
• Good heat emission



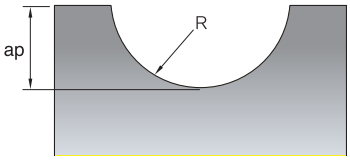
• Wider insert ensures cutting-edge strength

• Better setting force by recess



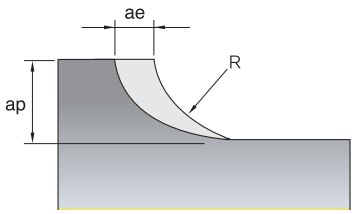
BRE machining type for roughing & Recommended cutting condition

Machining type 1



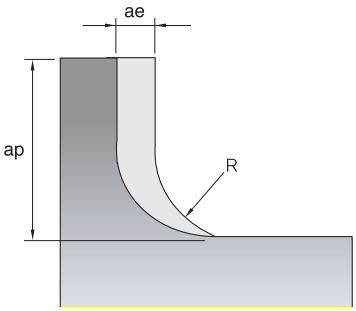
ap = 0.3D-0.5D

Machining type 2



ae = 0.2D-0.3D ap = 0.3D-0.5D

Machining type 3



ae = 0.1D-0.5D ap = 1.2D-1.5D

Workpiece	Machining type	Cutting speed (m/min)	Feed (mm/t)	Grades
Carbon/alloy steel	1 2 3	120~220 120~220 100~180	0.1~0.4 0.2~0.4 0.1~0.3	**NCM325** **NCM325** **NCM325**
Alloy steel	1 2 3	100~200 100~200 80~160	0.1~0.4 0.2~0.4 0.1~0.3	**NCM325** **NCM325** **NCM325**
Tool steel	1 2 3	80~150 80~150 60~120	0.1~0.3 0.15~0.35 0.1~0.3	**NCM325** **NCM325** **NCM325**
High hardness material (HRC35~45)	1 2 3	60~120 60~120 50~80	0.1~0.3 0.1~0.3 0.1~0.2	**NCM325** **NCM325** **NCM325**
Cast iron	1 2 3	100~180 100~180 80~160	0.2~0.5 0.2~0.5 0.15~0.4	**NCM325** **NCM325** **NCM325**

LBE 08/10/12/16/20/25/30/32

Straight type

Carbide Shank (Ball type)



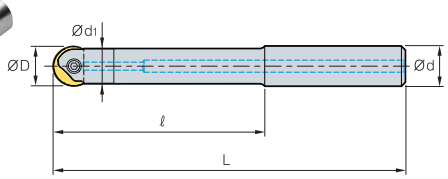


Fig. 1

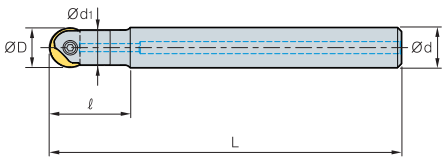
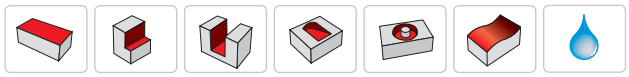


Fig. 2



(mm)

Designation		Dimensions					Parts		Available inserts (Ø)	Fig.
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench		
LBE	080080S-S08C	8, 9	8	7.5	80	136	ETND02506F	TWP07S	8,9	1
	080100S-S08C	8, 9	8	7.5	100	156				
	080020S-S08C-130	8, 9	8	7.5	20	130	ETND02506F	TWP07S	8,9	2
	080020S-S08C-150	8, 9	8	7.5	20	150				
	100080S-S10C	10, 11	10	9.5	80	136	ETND0307F	TWP08S	10, 11	1
	100120S-S10C	10, 11	10	9.5	120	176				
	100023S-S10C-130	10, 11	10	9.5	23	130	ETND0307F	TWP08S	10, 11	2
	100023S-S10C-170	10, 11	10	9.5	23	170				
	120100S-S12C	12, 13	12	11.5	100	156	ETND03509	TWP10S	12,13	1
	120150S-S12C	12, 13	12	11.5	150	206				
	120025S-S12C-150	12, 13	12	11.5	25	150	ETND03509	TWP10S	12,13	2
	120025S-S12C-200	12, 13	12	11.5	25	200				
	160100S-S16C	16, 17	16	15.5	100	160	ETND0413	TWP15S	16,17	1
	160150S-S16C	16, 17	16	15.5	150	210				
	160030S-S16C-160	16, 17	16	15.5	30	160	ETND0413	TWP15S	16,17	2
	160030S-S16C-210	16, 17	16	15.5	30	210				
	200120S-S20C	20, 21	20	19.5	120	190	ETKD0516	TWP20	20,21	1
	200170S-S20C	20, 21	20	19.5	170	240				
	200035S-S20C-190	20, 21	20	19.5	35	190	ETKD0516	TWP20	20,21	2
	200035S-S20C-240	20, 21	20	19.5	35	240				
	250140S-S25C	25, 26	25	24.5	140	220	ETKD0620	TWP25	25,26	1
	250170S-S25C	25, 26	25	24.5	170	250				
	250040S-S25C-220	25, 26	25	24.5	40	220	ETKD0620	TWP25	25,26	2
	250040S-S25C-250	25, 26	25	24.5	40	250				
	300140S-S32C	30, 31	32	29.5	140	230	ETGD0825	TWP40	30,31	1
	300170S-S32C	30, 31	32	29.5	170	260				
	300050S-S32C-230	30, 31	32	29.5	50	230	ETGD0825	TWP40	30,31	2
	300050S-S32C-260	30, 31	32	29.5	50	260				
	320140S-S32C	32	32	31.5	140	230	ETGD0825	TWP40	32	1
	320170S-S32C	32	32	31.5	170	260				
	320050S-S32C-230	32	32	31.5	50	230	ETGD0825	TWP40	32	2
	320050S-S32C-260	32	32	31.5	50	260				

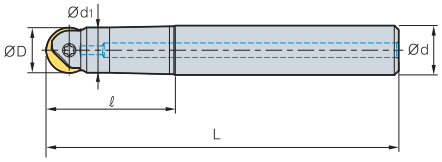
Available inserts **E08, E09**

LBE 08/10/12/16/20/25/30/32

Taper type

Steel Shank (Ball type)





(mm)

Designation		Dimensions					Parts		Available inserts (Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench	
LBE	080035T-S12	8, 9	12	7.5	35	91	ETND02506F	TWP07S	8, 9
	080055T-S12	8, 9	12	7.5	55	111			
	080075T-S12	8, 9	12	7.5	75	131			
	100035T-S12	10, 11	12	9.5	35	91	ETND0307F	TWP08S	10, 11
	100055T-S12	10, 11	12	9.5	55	111			
	100075T-S12	10, 11	12	9.5	75	131			
	120055T-S12	12, 13	12	10.4	55	111	ETND03509	TWP10S	12, 13
	120085T-S16	12, 13	16	11.5	85	145			
	160065T-S16	16, 17	16	14	65	125	ETND0413	TWP15S	16, 17
	160100T-S20	16, 17	20	15.5	100	170			
	200075T-S20	20, 21	20	17.5	75	145	ETKD0516	TWP20	20, 21
	200115T-S25	20, 21	25	19.5	115	195			
	250090T-S25	25, 26	25	22	90	170	ETKD0620	TWP25	25, 26
	250135T-S32	25, 26	32	24.5	135	225			
	300105T-S32	30, 31	32	29.5	105	195	ETGD0825	TWP40	30, 31
	300160T-S32	30, 31	32	29.5	160	250			
	320105T-S32	32	32	29	105	195	ETGD0825	TWP40	32
	320160T-S32	32	32	29	160	250			

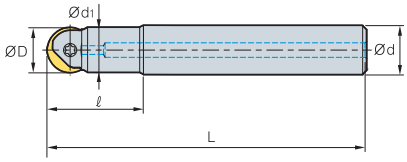
Available inserts **E08, E09**

LBE12/16/20/25/30/32

Straight type

Steel Shank (Ball type)





(mm)

Designation		Dimensions					Parts		Available inserts (Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench	
LBE	120035S-S12	12, 13	12	11.5	35	91	ETND03509	TWP10S	12,13
	160035S-S16	16, 17	16	15.5	35	95	ETND0413	TWP15S	16,17
	200040S-S20	20, 21	20	19.5	40	110	ETKD0516	TWP20	20,21
	250045S-S25	25, 26	25	24.5	40	125	ETKD0620	TWP25	25,26
	300055S-S32	30, 31	32	29.5	55	145	ETGD0825	TWP40	30,31
	320055S-S32	32	32	31.5	55	145	ETGD0825	TWP40	32

Available inserts **E08, E09**

LRE 10/12/16/20/25/30/32

Carbide Shank (Corner R type)

Straight type



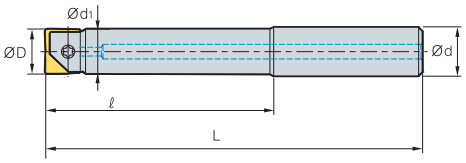


Fig. 1

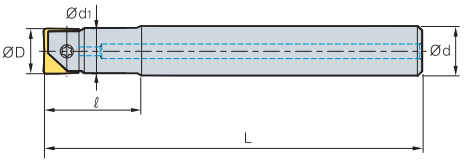
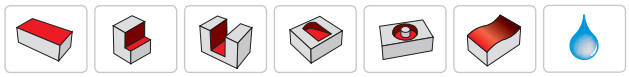


Fig. 2



(mm)

Designation		Dimensions					Parts		Available inserts (Ø)	Fig.
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench		
LRE	100080S-S10C	10, 11	10	9.5	80	136	ETND0307F	TWP08S	10, 11	1
	100120S-S10C	10, 11	10	9.5	120	176				
	100023S-S10C-130	10, 11	10	9.5	23	130	ETND0307F	TWP08S	10, 11	2
	100023S-S10C-170	10, 11	10	9.5	23	170				
	120100S-S12C	12, 13	12	11.5	100	156	ETND03509	TWP10S	12,13	1
	120150S-S12C	12, 13	12	11.5	150	206				
	120025S-S12C-150	12, 13	12	11.5	25	150	ETND03509	TWP10S	12,13	2
	120025S-S12C-200	12, 13	12	11.5	25	200				
	160100S-S16C	16, 17	16	15.5	100	160	ETND0413	TWP15S	16,17	1
	160150S-S16C	16, 17	16	15.5	150	210				
	160030S-S16C-160	16, 17	16	15.5	30	160	ETND0413	TWP15S	16,17	2
	160030S-S16C-210	16, 17	16	15.5	30	210				
	200120S-S20C	20, 21	20	19.5	120	190	ETKD0516	TWP20	20,21	1
	200170S-S20C	20, 21	20	19.5	170	240				
	200035S-S20C-190	20, 21	20	19.5	35	190	ETKD0516	TWP20	20,21	2
	200035S-S20C-240	20, 21	20	19.5	35	240				
	250140S-S25C	25, 26	25	24.5	140	220	ETKD0620	TWP25	25,26	1
	250170S-S25C	25, 26	25	24.5	170	250				
	250040S-S25C-220	25, 26	25	24.5	40	220	ETKD0620	TWP25	25,26	2
	250040S-S25C-250	25, 26	25	24.5	40	250				
	300140S-S32C	30, 31	32	29.5	140	230	ETGD0825	TWP40	30,31	1
	300170S-S32C	30, 31	32	29.5	170	260				
	300050S-S32C-230	30, 31	32	29.5	50	230	ETGD0825	TWP40	30,31	2
	300050S-S32C-260	30, 31	32	29..5	50	260				
	320140S-S32C	32	32	31.5	140	230	ETGD0825	TWP40	32	1
	320170S-S32C	32	32	31.5	170	260				
	320050S-S32C-230	32	32	31.5	50	230	ETGD0825	TWP40	32	2
	320050S-S32C-260	32	32	31.5	50	260				

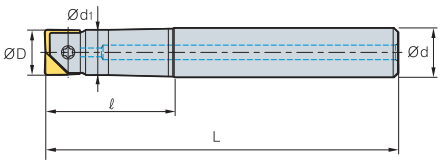
Available inserts **E08, E09**

LRE 10/12

Taper type

Steel Shank (Corner R type)





(mm)

Designation		Dimensions					Parts		Available inserts (Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench	
LRE	100025T-S12	10, 11	12	9.5	25	111	ETND0307F	TWP08S	10,11
	100050T-S12	10, 11	12	9.5	50	150			
	120060T-S16	12, 13	16	11.5	60	160	ETND03509	TWP10S	12,13

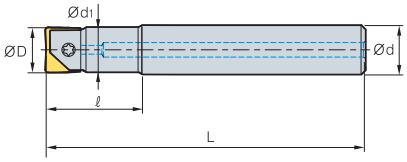
Available inserts **E08, E09**

LRE 12/16/25/30/32

Straight type

Steel Shank (Corner R type)





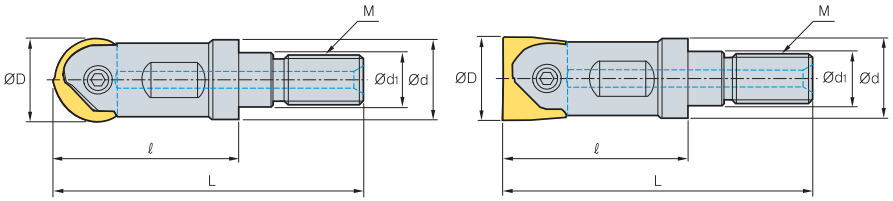
(mm)

Designation		Dimensions					Parts		Available inserts (Ø)
		ØD	Ød	Ød1	ℓ	L	Clamp screw	Wrench	
LRE	120030S-S12	12, 13	12	11.5	30	111	ETND03509	TWP10S	12, 13
	160050S-S16	16, 17	16	15.5	50	131	ETND0413	TWP15S	16, 17
	160060S-S16	16, 17	16	15.5	60	160			
	200060S-S20	20, 21	20	19.5	60	145	ETKD0516	TWP20	20, 21
	200080S-S20	20, 21	20	19.5	80	180			
	250070S-S25	25, 26	25	24.5	70	145	ETKD0620	TWP25	25, 26
	250100S-S25	25, 26	25	24.5	100	225			
	300070S-S32	30, 31	32	29.5	70	160	ETGD0825	TWP40	30, 31
	300100S-S32	30, 31	32	29.5	100	225			
	320080S-S32	32	32	31.5	80	160	ETGD0825	TWP40	32
	320100S-S32	32	32	31.5	100	225			

Available inserts **E08, E09**

LBE-MHD





(mm)

Designation		Dimensions						Parts		Available inserts (Ø)
		M	ØD	L	ℓ	Ød	Ød1	Clamp screw	Wrench	
LBE	100-MHD-M06	M06	10, 11	40	25	9.5	6.5	ETND0307F	TWP08S	10, 11
	120-MHD-M06	M06	12, 13	40	25	11	6.5	ETND03509	TWP10S	12, 13
	160-MHD-M08	M08	16, 17	47	30	14.5	8.5	ETND0413	TWP15S	16, 17
	200-MHD-M10	M10	20, 21	56	35	18	10.5	ETKD0516	TWP20	20, 21
	250-MHD-M12	M12	25, 26	69	45	22.5	12.5	ETKD0620	TWP25	25, 26
	300-MHD-M16	M16	30, 31	77	50	28	17	ETGD0825	TWP40	30, 31
	320-MHD-M16	M16	32	77	50	29	17	ETGD0825	TWP40	32

Available inserts **E08, E09** Available adaptors **E342~E343**

Designation: LBE320-MHD-M16
Modular head threading measure size (M16)

=

Adaptor spec.: MAT-M16-035-S32S
Adaptor threading measure (M16)

BFE



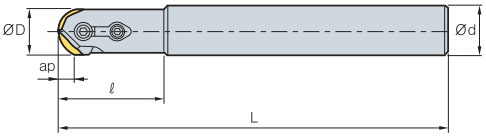


Fig. 1

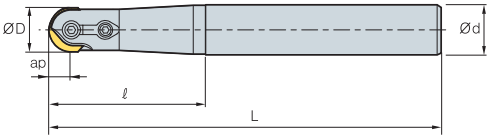
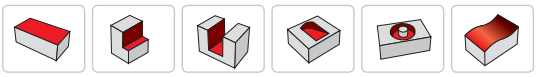


Fig. 2

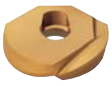


(mm)

Designation		ØD	Ød	ℓ	L	ap	kg	Fig.	Available inserts
BFE	16-S	16	16	36	140	8.0	0.2	1	RC16
	16-M	16	20	65	170	8.0	0.3	2	
	16-L	16	25	65	200	8.0	0.5	2	
	20-S	20	20	45	160	10.0	0.4	1	RC20
	20-M	20	25	80	200	10.0	0.6	2	
	20-L	20	25	80	250	10.0	0.8	2	
	25-S	25	25	45	160	12.5	0.7	1	RC25
	25-M	25	32	90	210	12.5	1.1	2	
	25-L	25	32	90	300	12.5	1.7	2	
	30-S	30	32	65	175	15.0	0.9	2	RC30
	30-M	30	32	100	250	15.0	1.4	2	
	30-L	30	32	100	350	15.0	2.0	2	
	32-S	32	32	56	175	16.0	0.9	1	RC32
	32-M	32	32	100	250	16.0	1.4	1	
	32-L	32	32	100	350	16.0	2.0	1	

Available inserts

RC



Designation		Coated PC210F	page
RC	16	●	E15
	20	●	
	25	●	
	30		
	32	●	

Recommended cutting condition

Workpiece		Cutting condition vc (m/min)	fz (mm/t)
P	General steel (SS41, SM25C) Over HB180	150~250	0.10~0.30
M	Alloy steel (SM55C, SCM) Under HB300	100~200	0.10~0.20
K	Cast iron Under HB300	100~200	0.10~ 0.30

Parts

Specification	Screw	Clamp	Clamp screw	Stopper Ring	Wrench
Ø16	FTGA0513	CBH4.5R1	CTX04513	ER03	TW20
Ø20	FTGA0517	CBH4.5R2	CTX04513	ER03	TW20
Ø25	FTGA0621	CBH5R1	CTX0517	ER04	TW20
Ø30, 32	FTGA0826	CBH6R1	CTX0621	ER05	TW25

Available inserts E15

GBE (Single-edge)



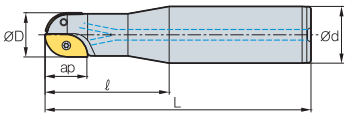


Fig. 1

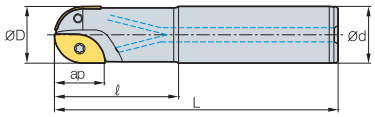


Fig. 2

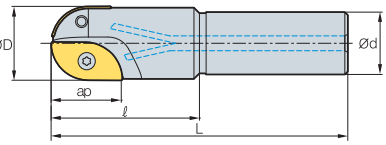
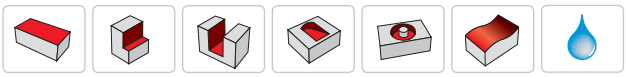


Fig. 3



(mm)

Designation		Dimensions					Available inserts		Parts		Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Screw Int./Ext. type	Wrench Ext. main type	
GBE	160-S20	16	20	50	130	15	ZPET080M-MM	ZPET080S-MM	FTKA02555S	TW08S	1
	160-L20	16	20	90	200	15	ZPET080M-MM	ZPET080S-MM	FTKA02555S	TW08S	
	180-S20	18	20	60	130	17	ZPET090M-MM	ZPET090S-MM	FTKA0307	TW09S	
	180-L20	18	20	80	200	17	ZPET090M-MM	ZPET090S-MM	FTKA0307	TW09S	
	200-S25	20	25	60	140	18	ZPET100M-MM	ZPET100S-MM	FTKA0307	TW09S	
	200-L25	20	25	80	250	18	ZPET100M-MM	ZPET100S-MM	FTKA0307	TW09S	
	220-S25	22	25	70	140	21	ZPET110M-MM	ZPET110S-MM	FTKA0408	TW15S	
	220-L25	22	25	100	250	21	ZPET110M-MM	ZPET110S-MM	FTKA0408	TW15S	
	250-S32	25	32	70	150	23	ZPET125M-MM	ZPET125S-MM	FTKA0409	TW15S	
	250-L32	25	32	100	300	23	ZPET125M-MM	ZPET125S-MM	FTKA0409	TW15S	
	260-S32	26	32	70	150	24.5	ZPET130M-MM	ZPET130S-MM	FTKA0409	TW15S	
	260-L32	26	32	100	300	24.5	ZPET130M-MM	ZPET130S-MM	FTKA0409	TW15S	
	280-S32	28	32	70	150	26	ZPET140M-MM	ZPET140S-MM	FTGA0511-P	TW20	
	280-L32	28	32	120	300	26	ZPET140M-MM	ZPET140S-MM	FTGA0511-P	TW20	
	300-S32	30	32	70	160	27	ZPET150M-MM	ZPET150S-MM	FTGA0511-P	TW20-100	2
	300-L32	30	32	120	350	27	ZPET150M-MM	ZPET150S-MM	FTGA0511-P	TW20-100	
	320-S32	32	32	70	160	28	ZPET160M-MM	ZPET160S-MM	FTGA0511-P	TW20-100	
	320-L32	32	32	120	350	28	ZPET160M-MM	ZPET160S-MM	FTGA0511-P	TW20-100	
	400-S42	40	42	100	200	37	ZPET200M-MM	ZPET200S-MM	FTGA0614	TW20-100	
	400-L42	40	42	150	350	37	ZPET200M-MM	ZPET200S-MM	FTGA0614	TW20-100	
	500-S42	50	42	100	200	47	ZPET250M-MM	ZPET250S-MM	FTGA0818	TW25-100	3
	500-L42	50	42	100	350	47	ZPET250M-MM	ZPET250S-MM	FTGA0818	TW25-100	

Available inserts **E31**

GBE-M (Multi-edge)



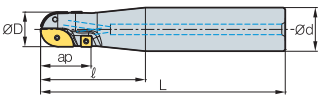


Fig. 1

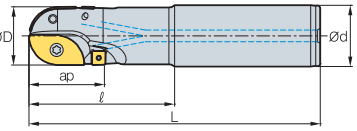


Fig. 2

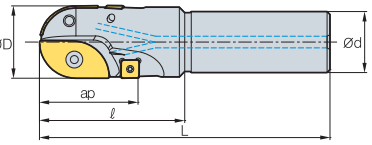
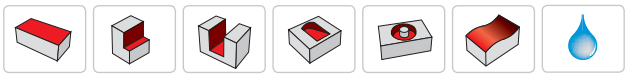


Fig. 3



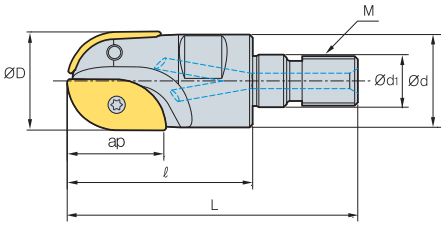
(mm)

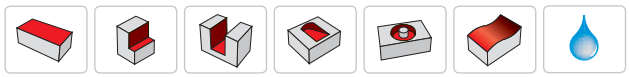
Designation		Dimensions					Available inserts			Parts				Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Ext. main	Screw		Wrench		
										Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type	
GBE	200M-S25	20	25	70	150	28	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P	1
	200M-L25	20	25	70	250	28	ZPET100M-MM	ZPET100S-MM	SPMT060304	FTKA0307	ETNA02506	TW09S	TW07P	
	220M-S25	22	25	80	150	31	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P	
	220M-L25	22	25	80	250	31	ZPET110M-MM	ZPET110S-MM	SPMT060304	FTKA0408	ETNA02506	TW15S	TW07P	
	250M-S32	25	32	80	180	33	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P	
	250M-L32	25	32	80	300	33	ZPET125M-MM	ZPET125S-MM	SPMT060304	FTKA0409	ETNA02506	TW15S	TW07P	
	260M-S32	26	32	80	180	39	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S	
	260M-L32	26	32	80	300	39	ZPET130M-MM	ZPET130S-MM	SDMT090308-MM	FTKA0409	ETNA0408	TW15S	TW15S	
	280M-S32	28	32	80	180	41	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S	
	280M-L32	28	32	80	300	41	ZPET140M-MM	ZPET140S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20	TW15S	
	300M-S32	30	32	100	200	41	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	
	300M-L32	30	32	100	350	41	ZPET150M-MM	ZPET150S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	
	320M-S32	32	32	100	200	42	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	2
	320M-L32	32	32	100	350	42	ZPET160M-MM	ZPET160S-MM	SDMT090308-MM	FTGA0511-P	ETNA0408	TW20-100	TW15S	
	400M-S42	40	42	100	200	56	ZPET200M-MM	ZPET200S-MM	SPMT120408-MM	FTGA0614	ETNA0511	TW20-100	TW20S	
	400M-L42	40	42	100	350	56	ZPET200M-MM	ZPET200S-MM	SPMT120408-MM	FTGA0614	ETNA0511	TW20-100	TW20S	
	500M-S42	50	42	100	200	67	ZPET250M-MM	ZPET250S-MM	SPMT120408-MM	FTGA0818	ETNA0511	TW25-100	TW20S	3
	500M-L42	50	42	100	350	67	ZPET250M-MM	ZPET250S-MM	SPMT120408-MM	FTGA0818	ETNA0511	TW25-100	TW20S	

Available inserts **E25, E31**

GBEM







(mm)

Designation		Dimensions							Available inserts	
		ØD	Ød	Ød1	ℓ	L	M	ap	Internal	External
GBEM	160-M08	16	15	8.5	30	47	M08	15	ZPET080M-MM	ZPET080S-MM
	200-M10	20	18.6	10.5	35	56	M10	18	ZPET100M-MM	ZPET100S-MM
	250-M12	25	23.2	12.5	45	69	M12	23	ZPET125M-MM	ZPET125S-MM
	300-M16	30	27.8	17	50	77	M16	27	ZPET150M-MM	ZPET150S-MM
	320-M16	32	29.8	17	50	77	M16	28	ZPET160M-MM	ZPET160S-MM

Available inserts

ZPET-M


Internal

ZPET-S


External

SPMT


Ext. main

SPMT-MM


Ext. main

Designation		Coated				Page	Designation		Coated				Page
		NCM325	PC3500	PC5300	PC3545				NCM325	PC3500	PC5300	PC3545	
SPMT	060304	●				E25	ZPET	080S-MM					E31
	120408-MM		●	●	●	E25		090S-MM					
SDMT	090308-MM	●	●	●		E18		100S-MM		●	●		
ZPET	080M-MM					E31		110S-MM					
	090M-MM							125S-MM		●	●		
	100M-MM		●	●				130S-MM					
	110M-MM							140S-MM					
	125M-MM		●	●				150S-MM		●	●		
	130M-MM							160S-MM		●	●		
	140M-MM							200S-MM		●			
	150M-MM		●	●				250S-MM					
	160M-MM		●	●									
	200M-MM		●										
	250M-MM												

Parts

Specification	Screw		Wrench	
	Int./Ext. type	Ext. main type	Int./Ext. type	Ext. main type
Ø16	FTKA02555	-	TW08S	-
Ø20	FTKA0307	ETNA02506	TW09S	TW07P
Ø25	FTKA0409	ETNA02506	TW15S	TW07P
Ø30	FTGA0511-P	ETNA0408	TW20-100	TW15S
Ø32	FTGA0511-P	ETNA0408	TW20-100	TW15S

Designation: GBEM320-M16
Modular head threading measure size (M16)

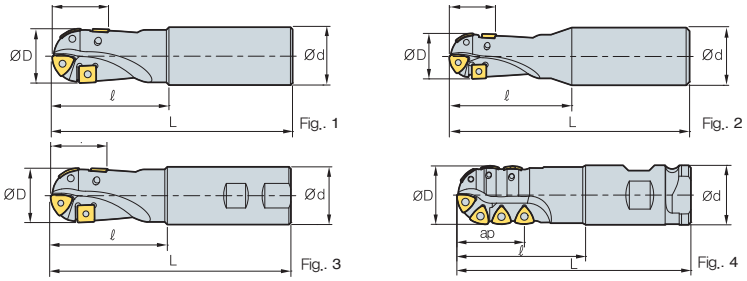
"

Adaptor spec.: MAT-M16-035-S32S
Adaptor threading measure (M16)

Available inserts E18, E25, E31 Available adaptors E342~E343

BRE







• AR: 0°~10°
• RR: -3°~0°

(mm)

Designation		Dimensions					Available inserts		Parts		kg	Fig.
		ØD	Ød	ℓ	L	ap	Internal	External	Screw	Wrench		
BRE	20R-S	20	20	50	125	20	ZDMT080310R-MM	SPMT060304	ETNA02506	TW07P	0.3	1
	20R-M	20	20	75	150	20						2
	20R-L	20	25	100	200	20						3
	20R-SL	20	25	65	125	20						
	25R-S	25	25	70	150	23	ZDMT110312.5R-MM	SPMT060304	ETNA02506	TW07P	0.5	1
	25R-M	25	25	95	175	23						
	25R-L	25	32	100	200	23					0.4	2
	25R-SL	25	25	75	135	23						3
	32R-S	32	32	85	175	31	ZDMT130416R-MM	SDMT090308-MM	ETNA0408	TW15S	0.9	1
	32R-M	32	32	100	200	31						
	32R-L	32	32	150	250	31					0.7	
	32R-SL	32	32	75	150	31						3

Available inserts

SDMT-MM SPMT ZDMT-R-MM



Designation		Coated						page
		NCM325	PC3500	PC5300	PC3525	PC3545	PC6510	
SDMT	090308-MM		●	●				E18
SPMT	060304	●						E25
ZDMT	080310R-MM		●	●				E30
	110312.5R-MM		●	●				
	130416R-MM		●	●				

Parts

Specification	Screw	Wrench	Wrench
Ø20~Ø25	ETNA02506	-	TW07P
Ø32	ETNA0408	TW15S	-

Available inserts **E18, E25, E30**

BRE



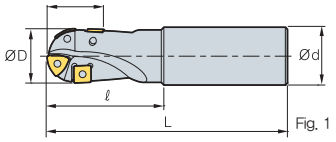


Fig. 1

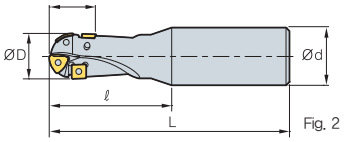


Fig. 2

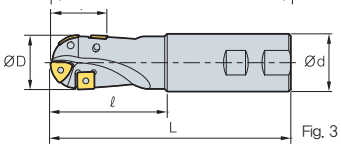


Fig. 3

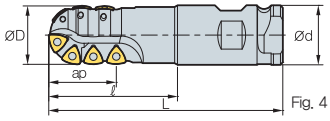


Fig. 4



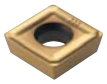

• AR: 0°~10°
• RR: -3°~0°

(mm)

Designation		Dimensions					Available inserts		Parts		kg	Fig.
		ØD	Ød	ℓ	L	ap	Main	Ext. main	Screw	Wrench		
BRE	40R-S	40	42	85	175	41	ZPMT160520R-MM	SPMT120408-MM SPMT120508-MMN	ETNA0511	TW20-100	1.3	1
	40R-S-40	40	42	85	175	41						
	40R-M	40	42	100	200	41						
	40R-M-40	40	42	100	200	41						
	40R-L	40	42	150	250	41						
	40R-L-40	40	42	150	250	41						
	40R-SL	40	42	80	160	41						3
	40R-SL-40	40	42	80	160	41						
	50R-S	50	42	100	200	45	ZPMT160525R-MM	SPMT120408-MM SPMT120508-MMN	ETNA0511	TW20-100	2.6	1
	50R-S-40	50	42	100	200	45						
	50R-L	50	42	100	300	45						
	50R-L-40	50	42	100	300	45						
	50R-SL	50	42	100	250	45						3
	50R-SL-40	50	42	100	250	45						
	63R-S	63	42	100	200	52	ZPMT160531.5R-MM	SPMT120408-MM SPMT120508-MMN	ETNA0511	TW20-100	3.0	1
	63R-S-40	63	42	100	200	52						
	63R-L	63	42	100	300	52						
	63R-L-40	63	42	100	300	52						
	63R-SL	63	42	100	250	52						3
	63R-SL-40	63	42	100	250	52						
	40XR-SC40	40	40	110	200	54	ZPMT160520R-MM		ETNA0511	TW20-100	1.4	4
	40XR-LC40	40	40	150	250	54					1.9	
	50XR-SC50.8	50	50.8	110	200	57	ZPMT160525R-MM ZPMT160525R-MR		ETNA0511	TW20-100	2.3	4
	50XR-LC50.8	50	50.8	150	250	57					3.0	

Available inserts

SPMT-MM



ZPMT-R-MM



ZPMT-R-MR



Designation		Coated						page
		NCM325	PC3500	PC5300	PC3525	PC3545	PC6510	
SPMT	120408-MM		●	●		●		E25
	120508-MMN							
ZPMT	160520R-MM		●	●				E31
	160525R-MM		●	●				
	160525R-MR							
	160531.5R-MM			●				

Parts

Specification	Screw	Wrench
Ø20~Ø63	ETNA0511	TW20-100

Available inserts **E25, E31**

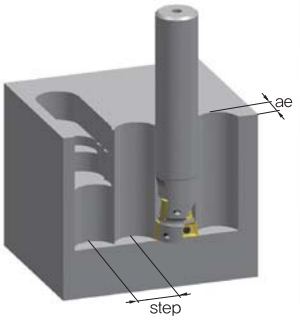
Multifunctional milling tool for mold making

HAVE

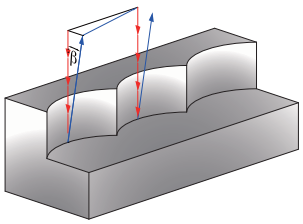
- Tools for Z-axis feed plunge machining to cut faster and more effectively in vertical machining
- Machining with whole diameter

Maximum step in vertical machining

ae	Diameter										
	16	17	20	21	25	26	32	33	35	40	50
	max step (mm)										
1	7.7	8	8.7	8.9	9.7	10	11.1	11.3	11.6	12.4	14
2	10.5	10.9	12	12.3	13.5	13.8	15.4	15.7	16.2	17.4	19.5
3	12.4	12.9	14.2	14.6	16.2	16.6	18.6	18.9	19.5	21	23.7
4	13.8	14.4	16	16.4	18.3	18.7	21.1	21.5	22.2	24	27.1
5	14.8	15.4	17.3	17.8	20	20.4	23.2	23.6	24.4	26.4	30
6	15.4	16.2	18.3	18.9	21.3	21.9	24.9	25.4	26.3	28.5	32.4
7	15.8	16.7	19	19.7	22.4	23	26.4	26.9	28	30.3	34.6
8	16	16.9	19.5	20.3	23.3	24	27.7	28.2	29.3	32	36.6
9	15.8	16.9	19.9	20.7	24	24.7	28.7	29.3	30.5	33.4	38.4
10	15.4	16.7	20	20.9	24.4	25.2	29.6	30.3	31.6	34.6	40
11	14.8	16.2	19.9	20.9	24.8	25.6	30.3	31.1	32.4	35.7	41.4
12	13.8	15.4	19.5	20.7	24.9	25.9	30.9	31.7	33.2	36.6	42.7
13	12.4	14.4	19	20.3	24.9	26	31.4	32.2	33.8	37.4	43.8
14	10.5	12.9	18.3	19.7	24.8	25.9	31.7	32.6	34.2	38.1	44.9
15	7.7	10.9	17.3	18.9	24.4	25.6	31.9	32.8	34.6	38.7	45.8
16	-	8	16	17.8	24	25.2	32	32.9	34.8	39.1	46.6
17	-	-	14.2	16.4	23.3	24.7	31.9	32.9	34.9	39.5	47.3
18	-	-	12	14.6	22.4	24	31.7	32.8	34.9	39.7	48
19	-	-	8.7	12.3	21.3	23	31.4	32.6	34.8	39.9	48.5
20	-	-	-	8.9	20	21.9	30.9	32.2	34.6	40	48.9
21	-	-	-	-	18.3	20.4	30.3	31.7	34.2	39.9	49.3
22	-	-	-	-	16.2	18.7	29.6	31.1	33.8	39.7	49.6
23	-	-	-	-	13.5	16.6	28.7	30.3	33.2	39.5	49.8
24	-	-	-	-	9.7	13.8	27.7	29.3	32.4	39.1	49.9
25	-	-	-	-	-	10	26.4	28.2	31.6	38.7	50



Programming in vertical cutting



------ Vertical machining route
——— Rapid feed
β Angle between tool and Workpiece ($\beta \geq 1°$)

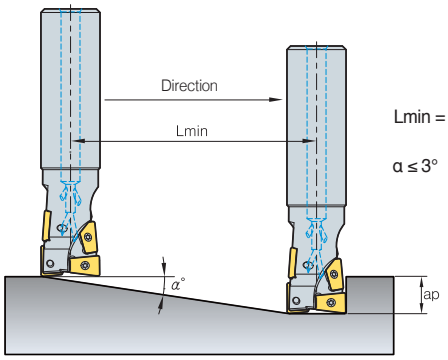
- Reduce 30% of feed till 3 mm machining
- Have the tool be away from the workpiece more than 1° (b) after finishing the machining or when moving the tool to the next step.

Cutting condition

Designation		Hardness	Grades	Cutting condition	Ø16,17		Ø20,21		Ø25,26		Ø32,33		Ø35		Ø40		Ø50	
				vc (m/min)	Feed (mm/rev)	Step (mm)	Feed (mm/rev)	Step (mm)	Feed (mm/rev)	Step (mm)	Feed (mm/rev)	Step (mm)	Feed (mm/rev)	Step (mm)	Feed (mm/rev)	Step (mm)	Feed (mm/rev)	Step (mm)
P	Mild steel, Low Carbon steel (SS400)	Under 200HB	PC3500	200 (150~250)	0.03	0.20	0.04	0.30	0.05	0.30	0.05	0.30	0.06	0.30	0.06	0.30	0.07	0.30
P	Carbon steel, Alloy Steel (SM50C, SCM440)	Under 100HRC	PC3500	180 (120~220)	0.03	0.20	0.04	0.30	0.05	0.30	0.05	0.30	0.05	0.30	0.06	0.30	0.06	0.30
M	Stainless steel (STS)	Under 270HB	PC5300	160 (120~200)	0.03	0.15	0.04	0.25	0.05	0.25	0.05	0.25	0.05	0.25	0.06	0.25	0.06	0.25
K	Cast iron (GC, GCD)	350N/mm²	PC5300	200 (150~250)	0.04	0.40	0.05	0.50	0.06	0.50	0.06	0.50	0.06	0.50	0.07	0.50	0.07	0.50
H	Hardened steel	40~55HRC	PC5300	80 (50~120)	0.03	0.15	0.03	0.25	0.04	0.25	0.04	0.25	0.04	0.25	0.04	0.25	0.05	0.25

※ Please note- Step machining is required for aspect ratio under 0.5D or initial drilling

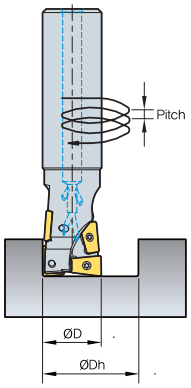
1. Ramping

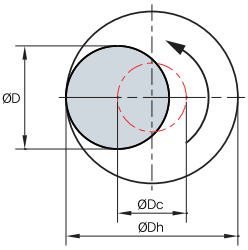


$$L_{min} = \frac{ap}{\tan \alpha} \text{ (mm)}$$

$\alpha \leq 3°$

2. Helical cutting





ØDc = ØDh-ØD

ØDc = Tool pass of tool center
ØDh = Desirable hole diameter on workpiece
ØD = Tool diameter

Cutting condition for ramping and helical operation

Designation		Hardness	Grades	Cutting Speed	Ø16, 17				Ø20, 21				Ø25, 26				Ø32, 33				Ø35				Ø40				Ø50			
				vc (m/min)	ØDh (mm)	ap (mm/t)	fz (mm/t)	max pitch (mm)	ØDh (mm)	ap (mm/t)	fz (mm/t)	max pitch (mm)	ØDh (mm)	ap (mm/t)	fz (mm/t)	max pitch (mm)	ØDh (mm)	ap (mm/t)	fz (mm/t)	max pitch (mm)	ØDh (mm)	ap (mm/t)	fz (mm/t)	max pitch (mm)	ØDh (mm)	ap (mm/t)	fz (mm/t)	max pitch (mm)	ØDh (mm)	ap (mm/t)	fz (mm/t)	max pitch (mm)
P	Mild steel, Low Carbon steel (SS400)	≤ 200HB	PC3500	200 (150~250)	19 ~30	0.5D ~1D	0.15 ~0.12	0.35 ~1.61	23 ~28	0.5D ~1D	0.18 ~0.12	0.35 ~2.07	29 ~47	0.5D ~1D	0.2 ~0.15	0.46 ~2.53	37 ~60	0.5D ~1D	0.25 ~0.2	0.58 ~3.23	41 ~65	0.5D ~1D	0.28 ~0.2	0.69 ~3.46	47 ~75	0.5D ~1D	0.3 ~0.2	0.81 ~4.03	58 ~95	0.5D ~1D	0.35 ~0.25	0.92 ~5.18
P	Carbon steel, Alloy Steel (SM50C,SCM440)	≤ 100HB	PC3500	180 (120~220)	19 ~30	0.5D ~1D	0.15 ~0.1	0.26 ~1.23	23 ~28	0.5D ~1D	0.16 ~0.12	0.26 ~1.58	29 ~47	0.5D ~1D	0.18 ~0.12	0.35 ~1.93	37 ~60	0.5D ~1D	0.2 ~0.15	0.44 ~2.46	41 ~65	0.5D ~1D	0.22 ~0.17	0.53 ~2.63	47 ~75	0.5D ~1D	0.25 ~0.2	0.61 ~3.07	58 ~95	0.5D ~1D	0.28 ~0.25	0.70 ~3.95
M	Stainless steel (STS)	≤ 270HB	PC5300	160 (120~200)	19 ~30	0.2D ~0.5D	0.13 ~0.1	0.18 ~0.84	23 ~28	0.2D ~0.5D	0.15 ~0.12	0.18 ~1.09	29 ~47	0.2D ~0.5D	0.18 ~0.12	0.24 ~1.33	37 ~60	0.2D ~0.5D	0.2 ~0.15	0.24 ~1.33	41 ~65	0.2D ~0.5D	0.22 ~0.17	0.36 ~1.81	47 ~75	0.2D ~0.5D	0.25 ~0.2	0.42 ~2.11	58 ~95	0.2D ~0.5D	58 ~95	0.48 ~2.71
K	Cast iron (GC, GCD)	≤ 350N/mm²	PC5300	200 (150~250)	19 ~30	0.7D ~1D	0.17 ~0.12	0.43 ~2.0	23 ~28	0.7D ~1D	0.2 ~0.12	0.42 ~2.57	29 ~47	0.7D ~1D	0.2 ~0.15	0.57 ~3.14	37 ~60	0.7D ~1D	0.25 ~0.2	0.71 ~3.99	41 ~65	0.7D ~1D	0.28 ~0.2	0.86 ~4.28	47 ~75	0.7D ~1D	0.3 ~0.2	1.0 ~4.99	58 ~95	0.7D ~1D	0.35 ~0.25	1.14 ~6.42
H	Hardened steel	40~55HRC	PC5300	80 (50~120)	19 ~30	0.2D ~0.5D	0.1 ~0.05	0.18 ~0.84	23 ~28	0.2D ~0.5D	0.12 ~0.07	0.18 ~1.09	29 ~47	0.2D ~0.5D	0.13 ~0.1	0.24 ~1.33	37 ~60	0.2D ~0.5D	0.15 ~0.12	0.30 ~1.69	41 ~65	0.2D ~0.5D	0.17 ~0.13	0.36 ~1.81	47 ~75	0.2D ~0.5D	0.18 ~0.15	0.42 ~2.11	58 ~95	0.2D ~0.5D	0.2 ~0.15	0.48 ~2.71

Recommended cutting condition in shouldering

Designation		Hardness	Grades	Cutting Speed	Ø16,17			Ø20,21			Ø25,26			Ø32,33			Ø35			Ø40			Ø50		
				vc (m/min)	max ap (mm)	max ae (mm)	max fz (mm/t)	max ap (mm)	max ae (mm)	max fz (mm/t)	max ap (mm)	max ae (mm)	max fz (mm/t)	max ap (mm)	max ae (mm)	max fz (mm/t)	max ap (mm)	max ae (mm)	max fz (mm/t)	max ap (mm)	max ae (mm)	max fz (mm/t)	max ap (mm)	max ae (mm)	max fz (mm/t)
P	Mild steel, Low Carbon steel (SS400)	≤ 200HB	PC3500	200 (150~250)	17	8	0.25	22	10	0.3	27	13	0.35	35	16	0.4	40	18	0.45	44	20	0.5	55	25	0.6
P	Carbon steel, Alloy Steel (SM50C,SCM440)	≤ 100HB	PC3500	180 (120~220)	17	8	0.2	22	10	0.25	27	13	0.3	35	16	0.35	40	18	0.4	44	20	0.4	55	25	0.5
M	Stainless steel (STS)	≤ 270HB	PC5300	160 (120~200)	17	8	0.2	22	10	0.25	27	13	0.3	35	16	0.35	40	18	0.4	44	20	0.4	55	25	0.5
K	Cast iron (GC, GCD)	≤ 350N/mm²	PC5300	200 (150~250)	17	8	0.25	22	10	0.3	27	13	0.35	35	16	0.4	40	18	0.45	44	20	0.5	55	25	0.6
H	Hardened steel	40~55HRC	PC5300	80 (50~120)	17	5	0.15	22	6	0.2	27	7	0.22	35	8	0.25	40	9	0.3	44	10	0.3	55	14	0.35

Recommended cutting condition in grooving

Designation		Hardness	Grades	Cutting Speed	Ø16,17		Ø20,21		Ø25,26		Ø32,33		Ø35		Ø40		Ø50	
				vc (m/min)	max ap (mm)	max fz (mm/t)	max ap (mm)	max fz (mm/t)	max ap (mm)	max fz (mm/t)	max ap (mm)	max fz (mm/t)	max ap (mm)	max fz (mm/t)	max ap (mm)	max fz (mm/t)	max ap (mm)	max fz (mm/t)
P	Mild steel, Low Carbon steel (SS400)	≤ 200HB	PC3500	200 (150~250)	17	0.15	22	0.18	27	0.2	35	0.25	40	0.27	44	0.3	55	0.35
P	Carbon steel, Alloy Steel (SM50C,SCM440)	≤ 100HB	PC3500	180 (120~220)	17	0.15	22	0.15	27	0.18	35	0.2	40	0.22	44	0.25	55	0.3
M	Stainless steel (STS)	≤ 270HB	PC5300	160 (120~200)	17	0.15	22	0.15	27	0.18	35	0.2	40	0.22	44	0.25	55	0.3
K	Cast iron (GC, GCD)	≤ 350N/mm²	PC5300	200 (150~250)	17	0.15	22	0.18	27	0.2	35	0.25	40	0.27	44	0.3	55	0.35
H	Hardened steel	40~55HRC	PC5300	80 (50~120)	12	0.1	14	0.12	17	0.15	22	0.15	25	0.18	28	0.18	35	0.22

HAVE (Multi-edge)



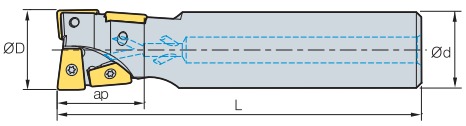


Fig. 1

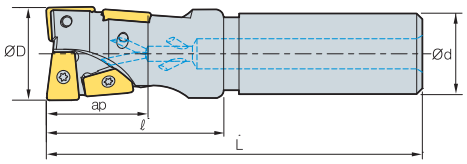
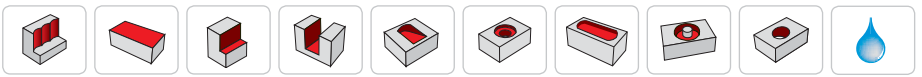


Fig. 2



AA
90°

- AR: 7°~12°
- RR: -12°~ -4°

(mm)

Designation			ØD	Ød	ℓ	L	ap	Available inserts	kg	Fig.
HAVE	0816HR-S16M	4	16	16	30	120	17.6	XPMT0802ER-MM	0.15	1
	0816HR-L16M	4	16	16	30	200	17.6		0.26	
	0817HR-S16M	4	17	16	30	120	17.6		0.18	2
	0817HR-L16M	4	17	16	30	200	17.6		0.27	
	1020HR-S20M	4	20	20	35	130	22	XPMT1003ER-MM	0.26	1
	1020HR-L20M	4	20	20	35	210	22		0.44	
	1021HR-S20M	4	21	20	35	130	22		0.26	2
	1021HR-L20M	4	21	20	35	210	22		0.45	
	1325HR-S25M	4	25	25	45	140	27	XPMT13T3ER-MM	0.41	1
	1325HR-L25M	4	25	25	45	220	27		0.71	
	1326HR-S25M	4	26	25	45	140	27		0.45	2
	1326HR-L25M	4	26	25	45	220	27		0.68	
	1632HR-S32M	4	32	32	50	150	35.2	XPMT1604ER-MM	0.72	1
	1632HR-L32M	4	32	32	50	250	35.2		1.32	
	1633HR-S32M	4	33	32	50	150	35.2		0.76	2
	1633HR-L32M	4	33	32	50	250	35.2		1.27	
	1835HR-S32M	4	35	32	50	150	40	XPMT1805ER-MM	0.75	1
	1835HR-L32M	4	35	32	50	230	40		1.23	
	2040HR-S32M	4	40	32	55	160	44	XPMT2006ER-MM	0.74	2
	2040HR-L32M	4	40	32	55	240	44		1.35	
	2550HR-S42M	4	50	42	70	170	55	XPMT2507ER-MM	1.53	2
	2550HR-L42M	4	50	42	70	250	55		2.60	

Available inserts

XPMT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XPMT	0802ER-MM								●				●					E30
	1003ER-MM								●				●					
	13T3ER-MM								●				●					
	1604ER-MM								●				●					
	1805ER-MM								●				●					
	2006ER-MM								●				●					
	2507ER-MM								●				●					

Parts

Specification	Screw	Wrench
Ø16~Ø17	FTNA0204	TW06S
Ø20~Ø21	FTNA02205	
Ø25~Ø26	FTKA0307	TW09S
Ø32~Ø33	FTKA0408	TW15S
Ø35		
Ø40	FTGA0511-P	TW20S
Ø50	FTNA0615	

Available inserts E30

HAVE (Single-edge)



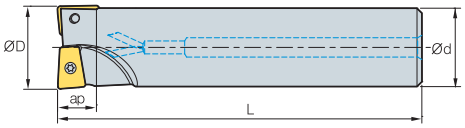


Fig. 1

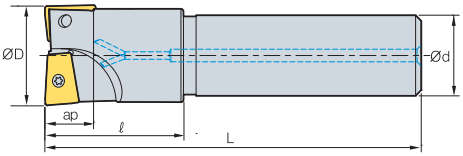


Fig. 2



AA 90°

- AR: 7°~12°
- RR: -12°~ -4°

(mm)

Designation			ØD	Ød	ℓ	L	ap	Available inserts	kg	Fig.
HAVE	0816HR-S16	2	16	16	30	120	7.5	XPMT0802ER-MM	0.16	1
	0816HR-L16	2	16	16	30	200	7.5		0.27	
	0817HR-S16	2	17	16	30	120	7.5		0.16	2
	0817HR-L16	2	17	16	30	200	7.5		0.27	
	1020HR-S20	2	20	20	35	130	9.5	XPMT1003ER-MM	0.28	1
	1020HR-L20	2	20	20	35	210	9.5		0.46	
	1021HR-S20	2	21	20	35	130	9.5		0.28	2
	1021HR-L20	2	21	20	35	210	9.5		0.46	
	1325HR-S25	2	25	25	45	140	12	XPMT13T3ER-MM	0.44	1
	1325HR-L25	2	25	25	45	220	12		0.76	
	1326HR-S25	2	26	25	45	140	12		0.47	2
	1326HR-L25	2	26	25	45	220	12		0.76	
	1632HR-S32	2	32	32	50	150	15.4	XPMT1604ER-MM	0.77	1
	1632HR-L32	2	32	32	50	250	15.4		1.36	
	1633HR-S32	2	33	32	50	150	15.4		0.81	2
	1633HR-L32	2	33	32	50	250	15.4		1.41	
	1835HR-S32	2	35	32	50	150	16.7	XPMT1805ER-MM	0.81	1
	1835HR-L32	2	35	32	50	230	16.7		1.28	
	2040HR-S32	2	40	32	55	160	19.3	XPMT2006ER-MM	0.95	2
	2040HR-L32	2	40	32	55	240	19.3		1.45	
	2550HR-S42	2	50	42	70	170	24	XPMT2507ER-MM	1.68	2
	2550HR-L42	2	50	42	70	250	24		2.54	

Available inserts

XPMT-MM



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XPMT	0802ER-MM								●				●					E30
	1003ER-MM								●				●					
	13T3ER-MM								●				●					
	1604ER-MM								●				●					
	1805ER-MM								●				●					
	2006ER-MM								●				●					
	2507ER-MM								●				●					

Parts

Specification	Screw	Wrench
Ø16~Ø17	FTNA0204	TW06S
Ø20~Ø21	FTNA02205	
Ø25~Ø26	FTKA0307	TW09S
Ø32~Ø33	FTKA0408	TW15S
Ø35		
Ø40	FTGA0511-P	TW20S
Ø50	FTNA0615	

Available inserts **E30**

High productivity with optimized grade for high speed machining

O-ring Cutter

- Optimized for grooving the seat of an O-ring in a plastic mold
- Guarantees superior surface roughness compared to HSS and brazed tool
- High productivity with optimized grade for high speed machining
- Reduced time for regrinding and tool alignment
- Special types are available for quotation

Holder code system

ORC – P30

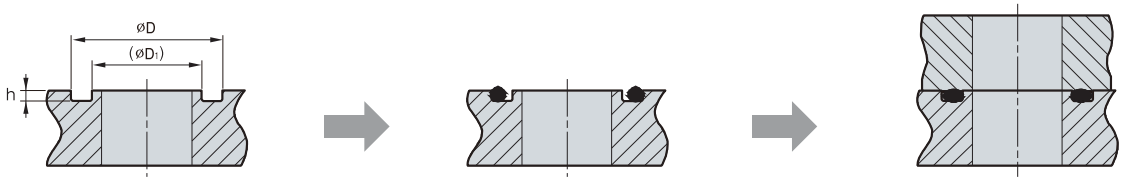
- ORC: O-ring Cutter
- P30: O-ring size

Insert code system

ORG – 325

- ORG: O-ring Groove (Grooving insert)
- 325: Width of groove (325: 3.25)

Grooving and assembly of O-ring



Grooving seat for O-ring (O-ring cutter) → O-ring on the seat → Engaging the upper punch and lower punch of a plastic mold

(mm)

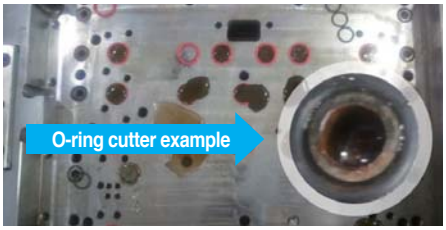
O-ring size	ØD	(ØD1)	h ± 0.05
P08	11.0	5.8	1.40
P09	12.0	6.8	
P10	13.0	7.8	
P11	15.0	8.5	1.80
P12	16.0	9.5	
P14	18.0	11.5	
P15	19.0	12.5	
P16	20.0	13.5	
P18	22.0	15.5	
P20	24.0	17.5	
P21	25.0	18.5	
P22	26.0	19.5	
P24	30.0	20.6	2.70
P25	31.0	21.6	

O-ring size	ØD	(ØD1)	h ± 0.05
P26	32.0	22.6	2.70
P28	34.0	24.6	
P29	35.0	25.6	
P30	36.0	26.6	
P31	37.0	27.6	
P32	38.0	28.6	
P34	40.0	30.6	
P35	41.0	31.6	
P38	44.0	34.6	
G40	46.0	36.6	
G25	30.0	21.8	2.40
G30	35.0	26.8	
G35	40.0	31.8	
G40	45.0	36.8	

Recommended cutting condition

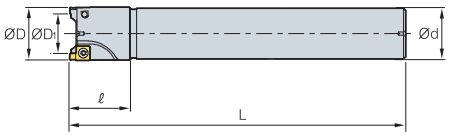
Workpiece	fz (mm/t)	vc (m/min)
		Coating
		PC3500
Stainless Steel (STS304)	0.03~0.12	60~130
Carbon Steel (SM□□C)	0.05~0.15	80~150
Alloy Steel (SCM)	0.05~0.15	80~150
Hardened Steel (STD, NAK)	0.03~0.12	60~130

Machining Example



ORC



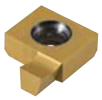


(mm)

Designation			ØD	Ød1	Ød	ℓ	L	Available Inserts	O-Ring size
ORC -	P08	1	11.0	5.7	16	30	150	ORG265	P08
	P09	1	12.0	6.7	16	30	150	ORG265	P09
	P10	1	13.0	7.7	16	30	150	ORG265	P10
	P11	1	15.0	8.5	16	30	150	ORG325	P11
	P12	2	16.0	9.5	16	30	200	ORG325	P12
	P14	2	18.0	11.5	20	30	200	ORG325	P14
	P15	2	19.0	12.5	20	30	200	ORG325	P15
	P16	2	20.0	13.5	20	30	200	ORG325	P16
	P18	2	22.0	15.5	20	30	200	ORG325	P18
	P20	2	24.0	17.5	25	30	200	ORG325	P20
	P21	2	25.0	18.5	25	30	200	ORG325	P21
	P22	2	26.0	19.5	25	30	200	ORG325	P22
	P24	2	30.0	20.6	32	40	250	ORG470	P24
	P25	2	31.0	21.6	32	40	250	ORG470	P25
	P26	2	32.0	22.6	32	40	250	ORG470	P26
	P28	2	34.0	24.6	32	40	250	ORG470	P28
	P29	2	35.0	25.6	32	40	250	ORG470	P29
	P30	2	36.0	26.6	32	40	250	ORG470	P30
	P31	2	37.0	27.6	32	40	250	ORG470	P31
	P32	2	38.0	28.6	32	40	250	ORG470	P32
	P34	2	40.0	30.6	42	40	250	ORG470	P34
	P35	2	41.0	31.6	42	40	250	ORG470	P35
	P38	2	44.0	34.6	42	40	250	ORG470	P38
	P40	2	46.0	36.6	42	40	250	ORG470	P40
ORC -	G25	2	30.0	21.9	32	40	250	ORG405	G25
	G30	2	35.0	26.9	32	40	250	ORG405	G30
	G35	2	40.0	31.9	42	40	250	ORG405	G35
	G40	2	45.0	36.9	42	40	250	ORG405	G40

Available inserts

ORG



Cutter Designation	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
ORC-P08~P10	ORG	265																	E14
ORC-P11~P22		325								●									
ORC-P24~P40		470								●									
ORC-G25~G40		405																	

Parts

Specification	Screw	Wrench
Ø11~Ø26	FTKA0307	TW09S
Ø30~Ø46	FTGA03508	TW15S
Ø30~Ø45		

Available inserts E14

All applications for chamfers

Chamfer Tool

- All chamfer applications
- Chamfer angles 15°, 30°, 45°, 60° for a variety of customer's needs
- The long cutting-edge provides a wide chamfering range



Back & Front Chamfer Tools



Long Chamfer Tools

Code system

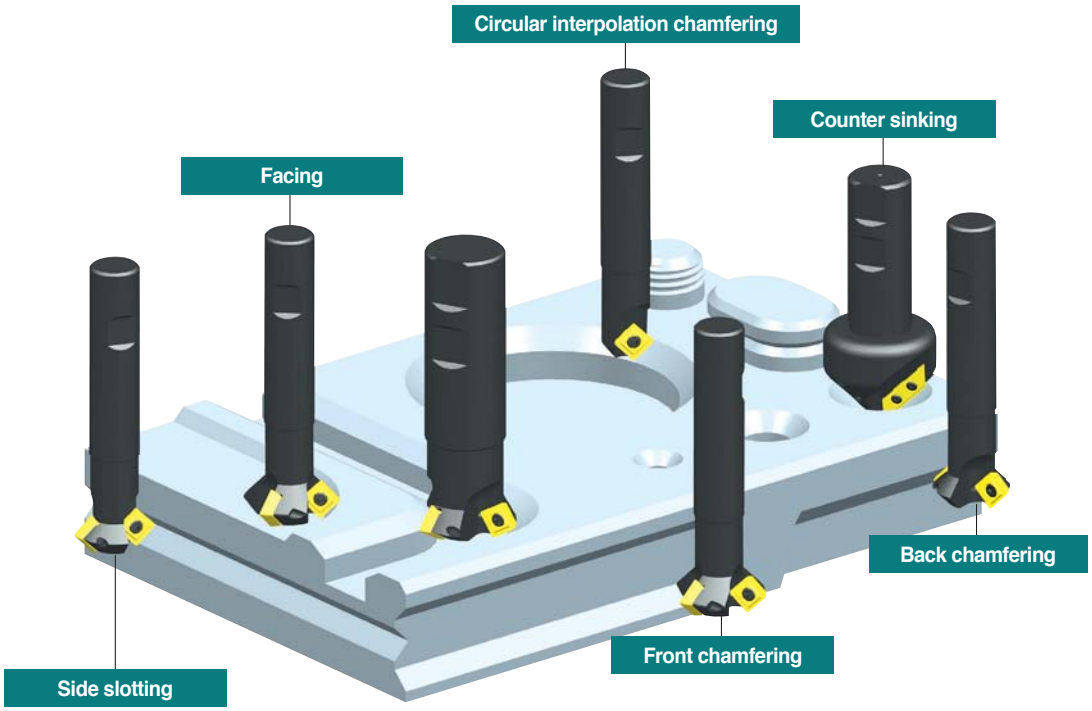
CE 45 – 11 25 R – S 20

Chamfer Endmill	Chamfer angle	Inscribed circle of insert	Min. Cutting Dia.	Hand	Overall length	Shank Dia.
	45°	11: SPMT110408-KC 12: SPMN120308 31: XCET310404ER-KC	Ø25	R: Right L: Left	S: Standard M: Middle L: Long	Ø20

Recommended cutting condition

Workpiece	Grades	ØD (Ø5~Ø20)		ØD (Ø25~Ø35)	
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
P	PC3500	160~270	0.05~0.25	160~270	0.05~0.25
	PC5300	190~310		190~310	
	ST30A	60~100		60~100	
M	PC5300	100~160	0.05~0.20	100~160	0.10~0.30
	PC5400	70~120		70~~120	
K	PC5300	110~180	0.10~0.30	110~180	0.30~0.50
	G10	50~90		50~90	

Application example



Multi-functional Chamfer Tool

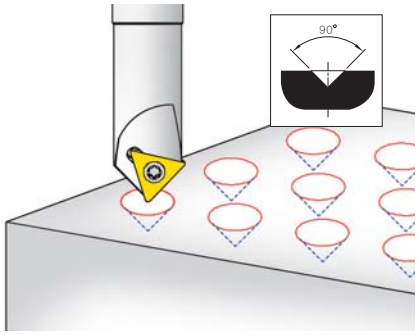
Code system

CE 45 – 16 00 R – S 20

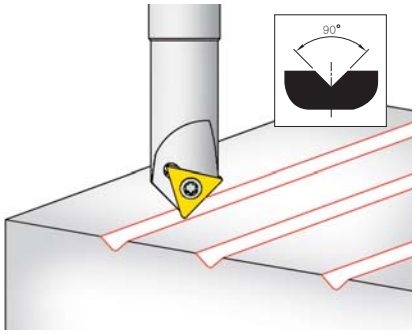
Chamfer Endmill	Chamfer angle	Inscribed circle of insert	Min. Cutting Dia.	Hand	Overall length	Shank Dia.
	45°	16: TWX16R-KC 22: TWX22R-KC	Ø0	R: Right L: Left	S: 90,110 L: 200	Ø12 Ø20 Ø25

Application area and recommended cutting condition

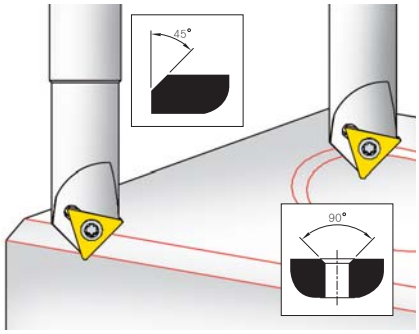
Centering



Grooving



Chamfering



Workpiece	Hardness (HRC)	Centering, Grooving		Chamfering	
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
Mild steel, Carbon steel, Alloy steel	Under HRC 30	80~200	0.01~0.04	100~250	0.04~0.06
High Carbon steel, Alloy steel	HRC 30, 40	150~250	0.02~0.06	150~300	0.05~0.10
Aluminum, Copper	-	150~300	0.04~0.08	150~350	0.05~0.10
Cast iron	-	80~150	0.02~0.06	100~250	0.05~0.10
Stainless steel	-	60~120	0.01~0.03	60~150	0.03~0.06
HRSA		60~80	0.01~0.03	60~100	0.03~0.06

Note) Please keep fz. backtouch & chipping one caused by wrong fz

Machining example

Chamfering



Grooving



Centering



Solid Chamfer Tool

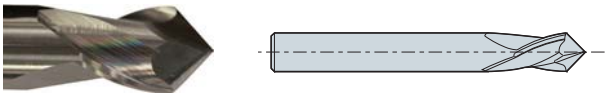
Code system

CCT 090 T – 080 L

Type	Chamfer angle	Cutting-edge	Diameter	Tool length
CCT: Centering & Chamfering Tool CET: Centering & Chamfering Endmill Tool	060: 60° 090: 90° 120: 120°	None: Single T: Twin	080: Ø8.0	None: Standard L: Long

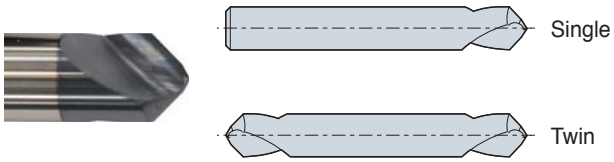
Features

CET (Centering & Chamfering Endmill Tool)



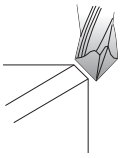
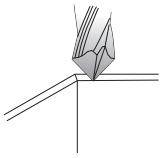
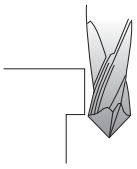
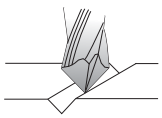
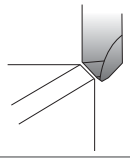
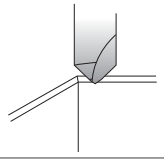
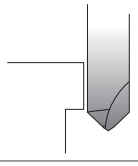
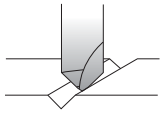
- For internal chamfering up to 0.5 mm
- Can be applied to side milling and easy to regrinding

CCT (Centering & Chamfering Tool)



- Chipping resistance realizes machining in high speed due to double point angle
- Lowers cutting load due to web thinning

CET/CCT Application example

	Centering	Hole Chamfering	Chamfering (External)	Chamfering (Internal)	Side milling	Slot milling
Applications (CET)						
60°	×	●	●	●~▲	●	×
90°	▲	●	●	●	●	●~▲
120°	●	●	●	●	●	●
Applications (CCT)						
60°	●	●	●~▲	▲~×	×	×
90°	●	●	●~▲	▲~×	×	×
120°	●	●	●	●	×	●

CE (Back & Front)



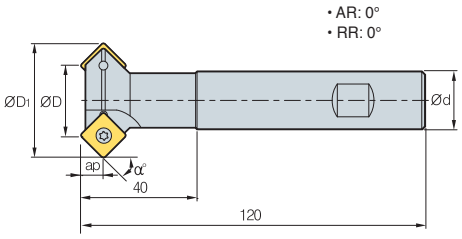


Fig. 1

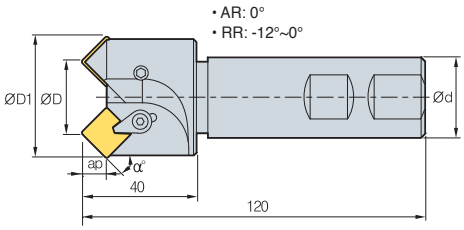


Fig. 2



(mm)

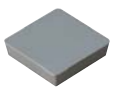
Designation			ØD	ØD1	Ød	ap	Fig.	Available inserts	α° (Chamfer angle)		Machining range (Min~Max)	Uses
									Front	Back		
CE	15-1125R-S20	2	25	30.5	20	9.5	1	SPMT110408-KC	15°	-	Ø25~Ø30	Front chamfering
	30-1125R-S20	2	25	35.5	20	8.5	1		30°	60°	Ø25~Ø35	Front, Back chamfering
	45-1107R-S20	1	7	21.9	20	7.0	1		45°	-	Ø7~Ø21	Front chamfering
	45-1119R-S20	2	19	33.9	20	7.0	1		45°	45°	Ø19~Ø33	Front, Back chamfering
	45-1125R-S20	3	25	39.9	20	7.0	1		45°	45°	Ø25~Ø39	Front, Back chamfering
	60-1125R-S32	3	25	43.3	32	5.0	1		60°	30°	Ø25~Ø42	Front, Back chamfering
	45-1207R-S32	1	7	23.3	32	7.8	2	SPMN120308	45°	-	Ø7~Ø22	Front chamfering
	45-1220R-S32	2	20	37.3	32	7.8	2		45°	-	Ø21~Ø36	Front chamfering
	45-1225R-S32	2	25	42.3	32	7.8	2		45°	-	Ø26~Ø41	Front chamfering
	45-1235R-S32	2	35	52.3	32	7.8	2		45°	-	Ø36~Ø51	Front chamfering

Available inserts

SPMT-KC



SPMN



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPMT	110408-KC								●						●	●		E25
SPMN	120308														●			

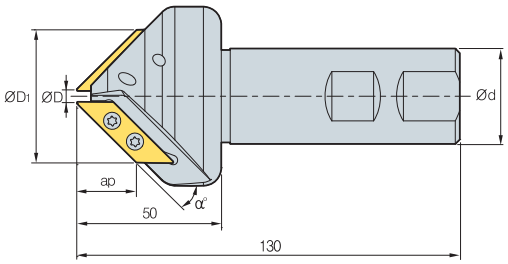
Parts

Specification	Screw	Clamp	C-Ring	Wrench	Wrench
Ø7~Ø25 (1100 type)	FTKA0408	-	-	TW15S	-
Ø7~Ø35 (1200 type)	CHX0617L	CH6R2	CR05	-	HW30L

Available inserts **E25**

CE (Long chamfer)







• AR: -5°~1°
• RR: 0°

(mm)

Designation			ØD	ØD1	Ød	ap	α° (Chamfer angle)	Machining range (Min~Max)	Uses
CE	30-3105R-S32	1	5	35	32	26	30°	Ø5~Ø35	Front Chamfering
	45-3105R-S32	2	5	48	32	21	45°	Ø5~Ø48	Front Chamfering
	60-3105R-S32	2	5	57	32	15	60°	Ø5~Ø57	Front Chamfering

Available inserts

XCET-KC



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
XCET	310404ER-KC								●						●	●		E29

Parts

Specification	Screw	Wrench
Ø5	FTKA03510	TW15S

Available inserts E29

CE (Multi-functional)



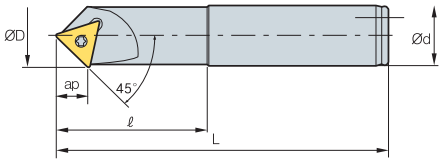


Fig. 1

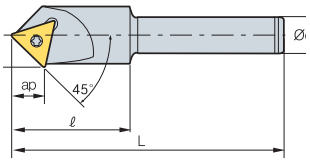
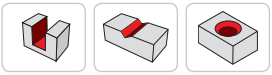


Fig. 2



• AR: -12°~15°
• RR: 0°

(mm)

Designation		ØD	Ød	ℓ	L	ap	Fig.	Available Inserts	Machining range (Min~Max)	Uses
CE	45-1600R-S12	22	12	40	90	10	2	TWX16R-KC	Ø0~Ø20	Centering Grooving Chamfering
	45-1600R-S20	22	20	50	110	10	1	TWX16R-KC	Ø0~Ø20	
	45-1600R-L20	22	20	60	200	10	1	TWX16R-KC	Ø0~Ø20	
	45-2200R-S12	29	12	40	90	14	2	TWX22R-KC	Ø0~Ø27	
	45-2200R-S25	29	25	50	110	14	1	TWX22R-KC	Ø0~Ø27	
	45-2200R-L25	29	25	60	200	14	1	TWX22R-KC	Ø0~Ø27	

Available inserts

TWX-KC



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
TWX	16R-KC								●									E27
	22R-KC								●									

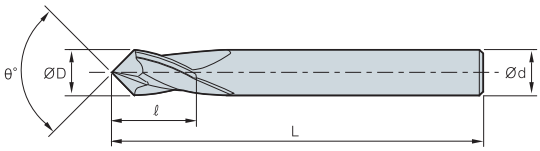
Parts

Specification	Screw	Wrench
Ø22~Ø29	FTNA0408	TW15L

Available inserts E27

CET





(mm)

Designation		ØD	Ød	ℓ	L	θ°
CET060 -	030	3	3	5.5	50	60°
	040	4	4	7	50	
	060	6	6	10	60	
	080	8	8	13	70	
	100	10	10	16	70	
	120	12	12	18	80	
	160	16	16	24	100	
CET090 -	030	3	3	5.5	50	90°
	040	4	4	7	50	
	060	6	6	10	60	
	080	8	8	13	70	
	100	10	10	16	70	
	120	12	12	18	80	
	160	16	16	24	100	
CET120 -	030	3	3	5.5	50	120°
	040	4	4	7	50	
	060	6	6	10	60	
	080	8	8	13	70	
	100	10	10	16	70	
	120	12	12	18	80	
	160	16	16	24	100	

CCT



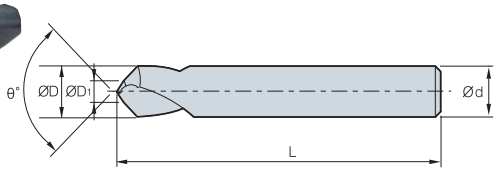


Fig. 1

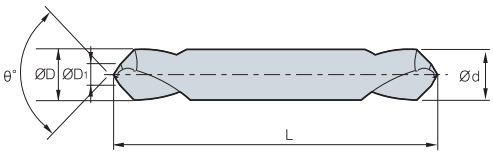


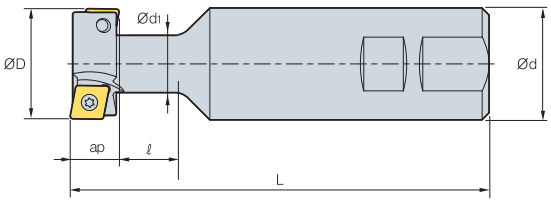
Fig. 2

(mm)

Designation		ØD = Ød	ØD1	L	θ°	Fig
CCT060 -	030	3	1.0	40	60°	1
	040	4	1.5	40		
	060	6	2.0	50		
	080	8	2.5	60		
	100	10	3.0	70		
	120	12	4.0	80		
	160	16	5.0	100		
CCT060T -	030	3	1.0	40		2
	040	4	1.5	40		
	060	6	2.0	50		
	080	8	2.5	60		
	100	10	3.0	70		
	120	12	4.0	80		
	160	16	5.0	100		
CCT060T -	030L	3	1.0	100		
	040L	4	1.5	100		
	060L	6	2.0	100		
	080L	8	2.5	120		
	100L	10	3.0	120		
	120L	12	4.0	150		
CCT090 -	030	3	1.0	40	90°	1
	040	4	1.5	40		
	060	6	2.0	50		
	080	8	2.5	60		
	100	10	3.0	70		
	120	12	4.0	80		
	160	16	5.0	100		
CCT090T -	030	3	1.0	40		2
	040	4	1.5	40		
	060	6	2.0	50		
	080	8	2.5	60		
	100	10	3.0	70		
	120	12	4.0	80		
	160	16	5.0	100		
CCT090T -	030L	3	1.0	100		
	040L	4	1.5	100		
	060L	6	2.0	100		
	080L	8	2.5	120		
	100L	10	3.0	120		
	120L	12	4.0	150		
CCT120 -	030	3	1.0	40	120°	1
	040	4	1.5	40		
	060	6	2.0	50		
	080	8	2.5	60		
	100	10	3.0	70		
	120	12	4.0	80		
	160	16	5.0	100		
CCT120T -	030	3	1.0	40		2
	040	4	1.5	40		
	060	6	2.0	50		
	080	8	2.5	60		
	100	10	3.0	70		
	120	12	4.0	80		
	160	16	5.0	100		
CCT120T -	030L	3	1.0	100		
	040L	4	1.5	100		
	060L	6	2.0	100		
	080L	8	2.5	120		
	100L	10	3.0	120		
	120L	12	4.0	150		

TFE







AA
90°

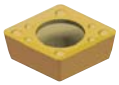
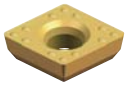
- AR: 5°
- RR: -5°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	ap	Available inserts
TFE	2125R/L	2	21	25	10.5	20	109	9	CPMT06
	2525R/L	2	25	25	12.5	21	112	11	CPMT08
	3232R/L	2	32	32	16.5	26	120	14	CPMT09
	4032R/L	2	40	32	20.5	32	130	18	CPMH12
	5032R/L	4	50	32	26.5	38	140	22	CPMH12

Available inserts

CPMT CPMH

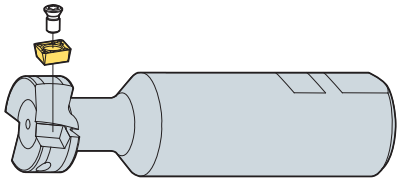



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
CPMT	060204-MM								●									E07
	080308-MM								●									
	09T308-MM								●									
CPMH	120408-MM								●									

Parts

Specification	Screw	Wrench
Ø21	FTNA02555	TW08S
Ø25	FTNA0306	TW09S
Ø32	FTNA0407	TW15S
Ø40	PTMA0511A	TW15S
Ø50		

Assembling



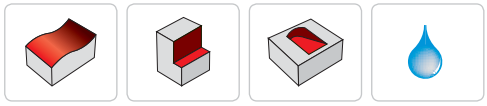
Available inserts E07

Buffed on top face of insert ensure good chip control and reduces built-up edge

Pro-A Mill

- Buffed top face of insert ensures good chip control and reduces built-up edge
- Small size modular type for aluminum machining
- Various line up of modular system for aluminum machining
- For shouldering, curved surface and ramping
- High rake angle chip breaker ensures excellent surface roughness, improved cooling effects, and chip control by through coolant system, even in deep pocket machining

Uses



Copying | Shouldering | Ramping | Through coolant system

Applied products

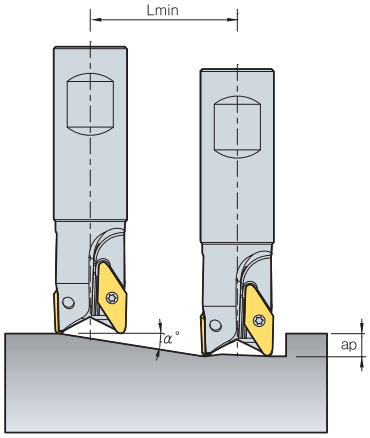
Type		Applied products	Through coolant system
Application of small-sized Aluminum machining	**Pro-A 2000**	 • Modular: Ø12~Ø42 • Shank: Ø12~Ø42 • Insert: VDKT11T210N-MA VDKT11T220N-MA	O
General application of Aluminum machining	**Pro-A 4000**	 • cutter: Ø40~Ø100 • Shank: Ø32~Ø40 • Insert: VCKT220530N-MA	O

Recommended cutting condition

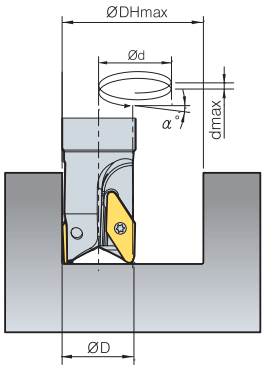
Workpiece		Cutting speed vc (m/min)
Aluminum alloy	Rm < 280 MPa	1000
	Rm > 280 MPa	800
Copper alloy	Long chip	250
Thermo plastic	-	300
Aluminum alloy	Si < 12%	800
Copper alloy	Short chip	400
Magnesium alloy	-	400
Duroplastics	-	150

Pro-A Mill ramping & helical cutting technical data

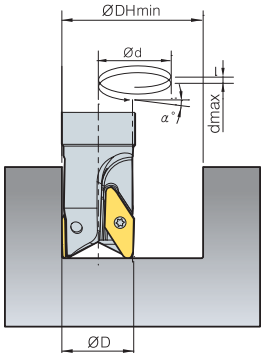
1. Ramping



2. Blind hole helical cutting



3. Thru hole helical cutting



Designation	ØD (mm)	Ramping		Blind hole helical cutting				Thru hole helical cutting	
		α° (max)	Lmin (mm)	ØDH Max (mm)	dmax (mm)	ØDH Min (mm)	dmax (mm)	ØDH Min (mm)	dmax (mm)
PAS2012HR	12	11.9	38	23	4.8	21	4.4	19	4.0
PAS2016HR	16	12.5	36	31	6.9	29	6.4	27	6.0
PAS2020HR	20	9.7	47	39	6.7	37	6.3	35	6.0
PAS2025HR	25	7.6	60	49	6.5	47	6.3	45	6.0
PAS2032HR	32	5.8	79	63	6.4	61	6.2	59	6.0
PAS2042HR	42	4.3	105	83	6.3	81	6.2	79	6.0
PAS4032HR	32	24.4	22	59	26.8	54	15.0	40	15.0
PAS4040HR	40	18.4	30	75	25.0	70	15.0	56	15.0
PAS4050HR	50	14.0	40	95	23.8	90	15.0	76	15.0
PAS4063HR	63	10.7	53	121	22.8	116	15.0	102	15.0
PAC(M)4080HR	80	8.1	70	155	22.1	150	15.0	136	15.0
PAC(M)4100HR	100	6.3	90	195	21.7	190	15.0	176	15.0

- Lmin: When ap = 8mm
- Lmin: Minimum inclination cutting length

$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

α°: Max. rampig angle

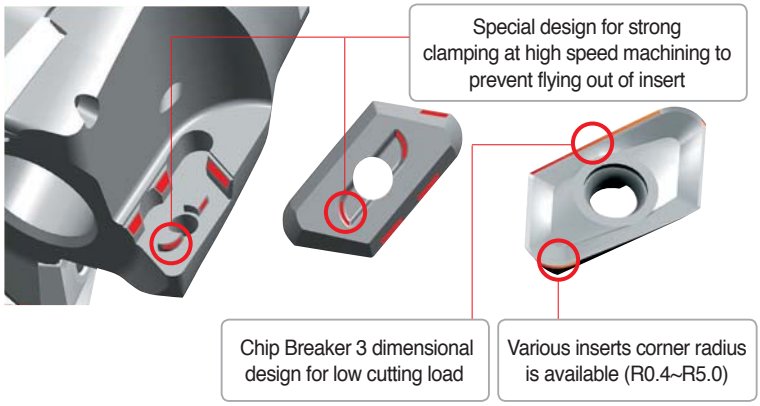
ap: Depth of cut

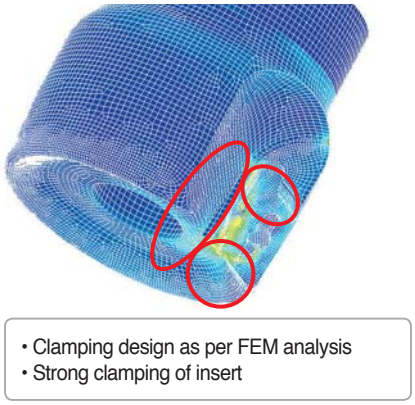
Strong clamping due to the concave design of insert bottom

Pro-X Mill

- Strong clamping due to the concave design of insert bottom
- Good chip flow and less build up edge achieved with the buffed surface of insert
- High rake angle of insert provides good surface finish and low cutting load
- Specially designed for high speed machining of aluminum
- Suitable for square shouldering and curved surface machining

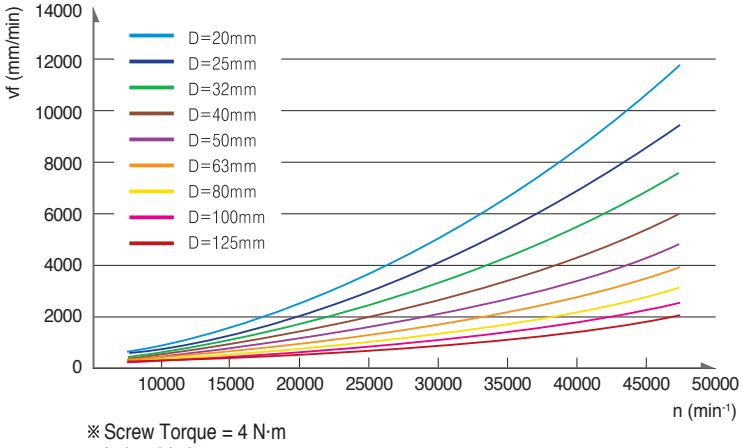
Clamping system for high speed





• Clamping design as per FEM analysis
• Strong clamping of insert

Centrifugal force as per RPM



※ Screw Torque = 4 N·m
※ Indexable insert: 6.8g

Marking [· Designation · Max. RPM]



Max. RPM as per cutting diameter

Cutting diameter ØD (mm)	5000 type		6000 type	
	n (min^{-1})	vc (m/min)	n (min^{-1})	vc (m/min)
20	14,000	879	-	-
25	28,000	2,199	15,000	1,178
32	25,000	2,513	23,000	2,312
40	22,000	2,764	20,000	2,513
50	20,000	3,141	18,000	2,827
63	18,000	3,562	16,000	3,166
80	16,000	4,021	14,000	3,518
100	14,000	4,398	13,000	4,084
125	13,000	5,105	11,000	4,319

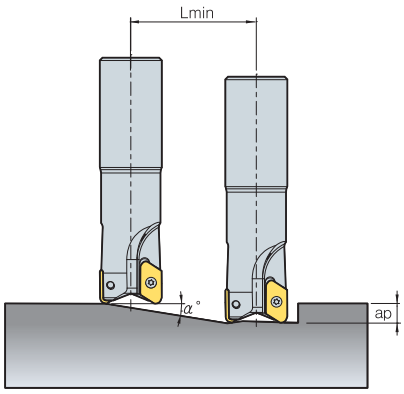
※ In case of actual machining accidental breakage of insert or tool could happen even under the written RPM special cover or door is necessary to prevent damage from broken insert or broken tool

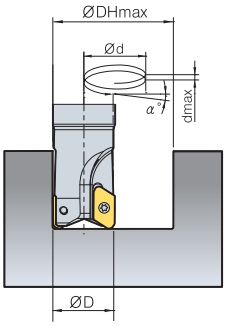
Recommended cutting condition

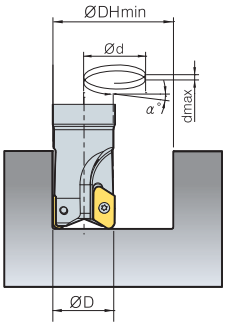
Workpiece		Cutting Speed vc (m/min)	Feed fz (mm/t)
Aluminum alloy	Rm280 < MPa Rm280 > MPa	1200 1000	0.30 0.25
Copper alloy **Thermo plastic**	Long chipping -	400 350	0.20 0.15
Aluminum alloy	Si < 12% Si ≥ 12%	1000 300	0.25 0.23
Copper alloy	Short chipping	500	0.20
Magnesium alloy	-	450	0.20
Duroplastics	-	200	0.15

Pro-X Mill ramping & helical cutting technical data

1. Ramping	2. Blind hole helical cutting	3. Thru hole helical cutting





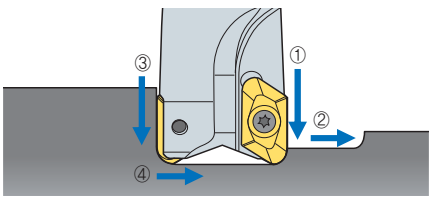


Designation	ØD (mm)	Ramping		Blind hole Helical cutting				Thru hole Helical cutting	
		α° (max)	Lmin (mm)	ØDH Max (mm)	dmax (mm)	ØDH Max (mm)	dmax (mm)	ØDH Max (mm)	dmax (mm)
PAXS5020HR	20	8.4	68	34	5.0	32	4.7	27	4.0
PAXS5025HR	25	13.2	43	44	10.4	42	9.9	34	8.0
PAXS5032HR	32	9.5	60	58	9.7	56	9.3	48	8.0
PAXS5040HR	40	7.1	80	74	9.3	72	9.0	64	8.0
PAXCM5050HR	50	5.4	105	94	9.0	92	8.8	84	8.0
PAXCM5063HR	63	4.2	138	120	8.7	118	8.6	110	8.0
PAXC(M)5080HR	80	3.2	180	154	8.6	152	8.4	144	8.0
PAXC(M)5100HR	100	2.5	230	194	8.4	192	8.3	184	8.0
PAXC(M)5125HR	125	2.0	293	244	8.3	242	8.3	234	8.0
PAXS6025HR	25	9.0	63	44	6.9	42	6.6	38	6.0
PAXS6032HR	32	6.6	87	58	6.7	56	6.5	52	6.0
PAXS6040HR	40	12.1	47	74	15.9	72	15.4	56	12.0
PAXCM6050HR	50	9.0	63	94	14.8	92	14.5	76	12.0
PAXCM6063HR	63	6.7	85	120	14.1	118	13.9	102	12.0
PAXC(M)6080HR	80	5.0	113	154	13.6	152	13.4	136	12.0
PAXC(M)6100HR	100	3.9	147	194	13.2	192	13.1	176	12.0
PAXC(M)6125HR	125	3.0	188	244	13.0	242	12.8	226	12.0

• Lmin: When ap = 10mm
• Lmin: Minimum inclination cutting length
α°: Max. rampig angle
ap: Depth of cut

$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

Plunging, slotting, drilling technical data



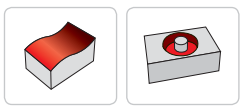
1. When drilling, grooving machining sequence is
① → ② → ③ → ④
2. When drilling, grooving, decrease the feed and cutting speed 30%~50% from the recommended data

• Cutting condition for drilling

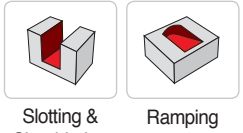
Holder	ap (mm)	
	5000 type	6000 type
Ø20	8	-
Ø25	4	11
Ø32	4	6
Ø40~125	4	6

Insert	ap (mm)
XETK19	4
XETK25	6

Uses



Copying | Helical cutting



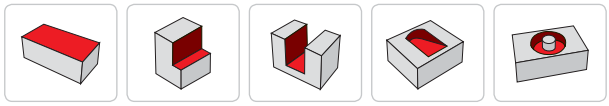
Slotting & Shouldering | Ramping

New indexable milling tool for the machining of high quality workpieces

Pro-L Mill

- Improved perpendicularity and lower cutting resistance by composition of clearance face and high helix edge
- Productivity increase due to more than half as much of depth of cut comparing to existing product
- Strong clamping design by adaption of double screw on system
- Improved chip flow due to helical type design of chip pocket and application of coolant system

Uses



Facing | Shouldering | Slotting | Ramping | Helical cutting

Features



Enhanced chip flow and increased tool life by inner coolant system

Set of various Nose-R

Strong clamping by 2 screw on system

Improved perpendicularity and decreased cutting resistance due to application of high helix

Code system

• Shank type

PAL	S	050	H	R	–	3	S	40
Pro-L Mill	Tool type	Tool Dia.	Coolant type	Hand		No. of tooth	Tool length	Shank Dia.
	S: Shank	050: Ø50	Unmarked: None H: Thru-hole	R: Right L: Left		3: 3 teeth	S: Standard type M: Middle type L: Long type	40: Ø40

• Cutter type

PAL	C	M	063	H	R
Pro-L Mill	Tool type	Unit	Tool Dia.	Coolant type	Hand
	C: Cutter	M: Metric	063: Ø63	Unmarked: None H: Thru-hole	R: Right M: Multi-edge

Chip breakers

Usage	Insert's type		Edge type	Features
Al	MA			Application of the edge optimized for Aluminum machining and buffed finish ensure excellent machining quality
Hard-to-cut material	ML			Design of Low cutting resistance Chip Breaker ensures excellent machining quality for light cutting and Hard-to-cut material

Selection of grades and chip breaker

Category	M (Stainless steel)	N (Aluminum alloy)	S (HRSA)
Grades	PC5300/PC5400	H01	PC5300/PC5400
MA	-	○	-
ML	○	-	○

Application examples

N Al6061 (HRC30)

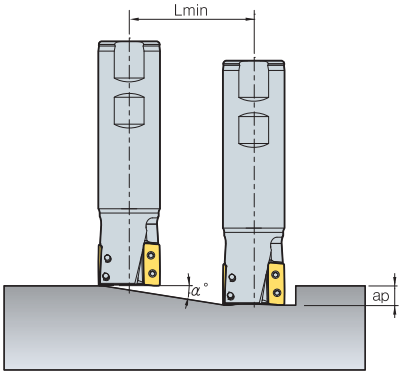
■ **Cutting condition**

vc = 500 m/min, fz = 0.2 mm/t,
ap = 30~60 mm,
ae = 1~5 mm (finishing: 1 mm, roughing: 5 mm)
z = 3

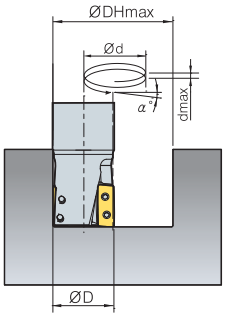


Pro-L Mill ramping & helical cutting technical data

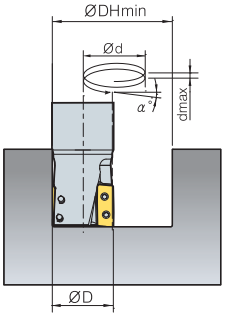
1. Ramping



2. Blind hole helical cutting



3. Thru hole helical cutting



Designation	ØD (mm)	Ramping		Blind hole helical cutting				Thru hole helical cutting	
		α° (max)	Lmin (mm)	ØDH Max (mm)	dmax (mm)	ØDH Min (mm)	dmax (mm)	ØDH Min (mm)	dmax (mm)
PALS032HR-2S20	32	3.37	170	62	3.6	60	3.5	55	3.2
PALS032HR-2S25	32	3.37	170	62	3.6	60	3.5	55	3.2
PALS032HR-2S32	32	3.37	170	62	3.6	60	3.5	55	3.2
PALS040HR-2S32	40	2.12	270	78	2.9	76	2.8	71	2.6
PALS040HR-2S40	40	2.12	270	78	2.9	76	2.8	71	2.6
PALS040HR-2S42	40	2.12	270	78	2.9	76	2.8	71	2.6
PALS040HR-3S32	40	2.12	270	78	2.9	76	2.8	71	2.6
PALS040HR-3S40	40	2.12	270	78	2.9	76	2.8	71	2.6
PALS040HR-3S42	40	2.12	270	78	2.9	76	2.8	71	2.6
PALS050HR-3S32	50	2.08	275	98	3.6	96	3.5	91	3.3
PALS050HR-3S40	50	2.08	275	98	3.6	96	3.5	91	3.3
PALS050HR-3S42	50	2.08	275	98	3.6	96	3.5	91	3.3
PALS063HR-4S32	63	1.76	325	124	3.8	122	3.8	117	3.6
PALS063HR-4S40	63	1.76	325	124	3.8	122	3.8	117	3.6
PALS063HR-4S42	63	1.76	325	124	3.8	122	3.8	117	3.6
PALS063HM-4S32	63	1.76	325	124	3.8	122	3.8	117	3.6
PALS063HM-4S40	63	1.76	325	124	3.8	122	3.8	117	3.6
PALS063HM-4S42	63	1.76	325	124	3.8	122	3.8	117	3.6
PALCM063HR	63	1.76	325	124	3.8	122	3.8	117	3.6

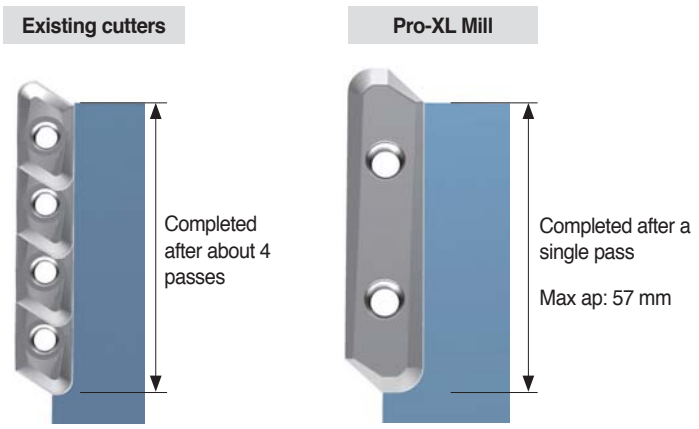
• Lmin: When ap = 10mm
• Lmin: Minimum inclination cutting length $\quad L_{min} = \frac{ap}{\tan \alpha^\circ}$ (mm)
α° : Max. rampig angle
ap : Depth of cut

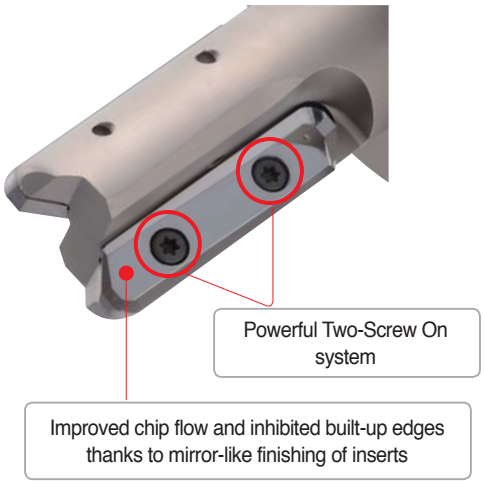
Deep cutting milling tools to maximize productivity in aluminum machining

Pro-XL Mill new

- **Productivity**- Cutting time is shortened by finishing the process with a single pass of deep shouldering in aluminum machining
- **High quality**- The single pass of shouldering enables perpendicular side faces without unevenness
- **Clamping stability**- Two-Screw On system secures clamping stability

Features of Pro-XL Mill





- 4 times shorter cutting time
- Satisfactory surface finish of side faces with no need for further processing

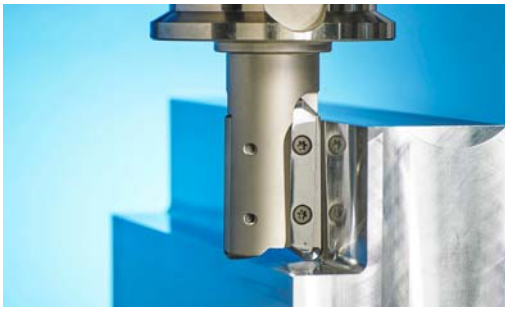
Application examples

N Al7075

■ **Cutting condition**
vc = 500 m/min, fz = 0.25 mm/t
ap = 56 mm, ae = 1 mm
z = 2

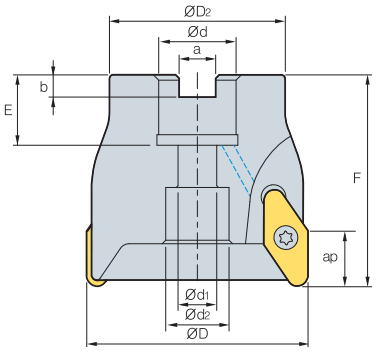
■ **Tools**
Insert LDET650550PPFR-MA
Grades H01
Holder BT50-PXL04090HR-2F (ØD = 40 mm)





PAC(M)2000/4000





AA 90°
• AR: 0°
• RR: -3°

(mm)

Designation		⚙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg
PACM	2040HR	3	40	34	16	9	14	8.4	5.6	18	40	8.7	0.2
	2050HR	4	50	42	22	11	18	10.4	6.3	22	50	8.7	0.4
	2063HR	5	63	49	22	11	18	10.4	6.3	22	50	8.7	0.6
	2080HR	5	80	57	27	14	20	12.4	7.0	25	50	8.7	0.9
	2100HR	6	100	67	32	18	26	14.4	8.0	30	63	8.7	1.9
	4040HR	3	40	32	16	9	11.5	8.4	5.6	20	55	15	0.2
	4050HR	3	50	40	22	11	18	10.4	6.3	20	55	15	0.3
	4063HR	4	63	50	22	11	18	10.4	6.3	20	60	15	0.6
	4080HR	4	80	60	27	14	20	12.4	7.0	25	60	15	1.0
	4100HR	5	100	80	32	18	26	14.4	8.0	26	60	15	1.6
PAC	2080HR	5	80	57	25.4	14	20	9.5	6.0	25	50	8.7	0.9
	2100HR	6	100	67	31.75	-	44	12.7	8.0	37	63	8.7	1.9
	4080HR	4	80	60	25.4	14	20	9.5	6.0	25	60	15	1.0
	4100HR	5	100	80	31.75	-	44	12.7	8.0	37	60	15	1.6

Available inserts

VCKT-MA



Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
VCKT	220530N-MA																●	E27

Available arbors

Designation		Ød	Available arbors
PACM	2040HR	16	BT□□-FMC16-□□
	2050HR	22	BT□□-FMC22-□□
	2063HR	22	BT□□-FMC22-□□
PAC	2080HR	25.4	BT□□-FMC25.4-□□
		27	BT□□-FMC27-□□
	2100HR	31.75	BT□□-FMC31.75-□□
		32	BT□□-FMC32-□□

Designation		Ød	NC arbors
PACM	4040HR	16	BT□□-FMC16-□□
	4050HR	22	BT□□-FMC22-□□
	4063HR	22	BT□□-FMC22-□□
PAC	4080HR	25.4	BT□□-FMC25.4-□□
		27	BT□□-FMC27-□□
	4100HR	31.75	BT□□-FMC31.75-□□
		32	BT□□-FMC32-□□

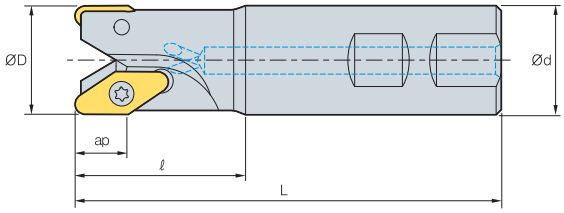
Parts

Specification	Screw	Wrench	Arbor Bolt
Ø40~Ø100	FTNC04509 (Ø40) FTNC04511	TW 20S	PHMA0834 (Ø40)

Available inserts E27 Available arbors and bolt E371~E373

PAS2000/4000





AA 90°

- AR: 0°~7°
- RR: -21°~ -3°

(mm)

Designation			⚙	ØD	Ød	ℓ	L	ap	kg
PAS		2012HR	1	12	16	25	85	8	0.1
		2016HR	2	16	16	25	90	8	0.11
	*	2016HR-R2.0	2	16	16	25	90	6	0.11
		2020HR	2	20	20	30	100	8	0.2
	*	2020HR-R2.0	2	20	20	30	100	6	0.2
		2025HR	3	25	25	35	115	8	0.36
		2032HR	4	32	32	40	125	8	0.66
		2042HR	5	42	32	42	130	8	0.84
		4032HR	2	32	32	50	125	15	0.6
		4040HR	3	40	32	50	140	15	0.8
		4040HR-S40	3	40	40	60	150	15	1.2
		4040HR-S42	3	40	42	60	150	15	1.2

Holders marked with an asterisk (*) are only for VDKT11T220N-MA.

Available inserts

VDKT-MA VCKT-MA





Type	Designation		Cermet		Coated											Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
2000 type	VDKT	11T210N-MA																●	E27
		11T220N-MA																	
4000 type	VCKT	220530N-MA																●	

Parts

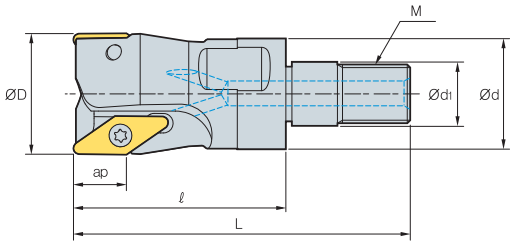
Specification	Screw	Wrench
Ø12~Ø42 (2000 type)	ETNA02505*	TW 07S
	ETNA02506	
Ø32~Ø40 (4000 type)	FTNC04509	TW 20S

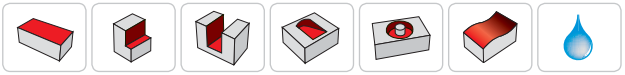
Available inserts E27

* For PAS2012·2016

PAM2000







AA 90°

- AR: 7°~10°
- RR: -21°~ -9°

(mm)

Designation			ØD	Ød	Ød1	ℓ	L	M	ap	kg
PAM	2012HR-M06	1	12	11.0	6.5	33	48	M06	8	0.02
	2016HR-M08	2	16	14.5	8.5	36	53	M08	8	0.04
	2020HR-M10	2	20	18.0	10.5	36	57	M10	8	0.06
	2025HR-M12	3	25	22.5	12.5	41	65	M12	8	0.1
	2032HR-M16	4	32	28.5	17.0	45	72	M16	8	0.18
	2042HR-M16	5	42	28.5	17.0	45	72	M16	8	0.27

Available inserts

VDKT-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
VDKT	11T210N-MA																●	E27

Available adaptors

Designation		Available adaptors
PAM	2012HR-M06	MAT-M06
	2016HR-M08	MAT-M08
	2020HR-M10	MAT-M10
	2025HR-M12	MAT-M12
	2032HR-M16	MAT-M16
	2042HR-M16	MAT-M16

Designation: PAM2012HR-M06
Modular head threading measure size (M06)

II

Adaptor spec.: MAT-M06-030-S20S
Adaptor threading measure (M06)

Parts

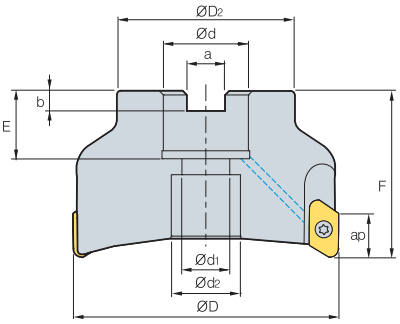
Specification	Screw	Wrench
Ø12~Ø42	ETNA02505* ETNA02506	TW 07S

* For PAS2012·2016

Available inserts E27 Available adaptors E342~E343

PAXC(M)5000





AA 90°

- AR: 8°~17.5°
- RR: -9.5°~ -5°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	kg
PAXCM	5040HR-A,B	3	40	34	16	9	14	8.4	5.6	19	40	25,800	17	0.15
	5050HR-A,B	4	50	42	22	11	18	10.4	6.3	21	50	23,000	17	0.3
	5063HR-A,B	5 (4)	63	49	22	11	18	10.4	6.3	21	50	20,500	17	0.56
PAXC (PAXCM)	5080HR-A,B	5	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	24 (23)	50	18,200	17	1.0
	5100HR-A,B	6	100	67	31.75 (32)	18	26	12.7 (14.4)	8 (8)	32 (26)	63	16,300	17	2.3
	5125HR-A,B	7	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (29)	63	14,600	17	3.2

• A type: Insert NoseR 0.4~3.2, B type: Insert NoseR 4.0~5.0

( )Metric size

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet CN2000	Cermet CN30	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC5300	Coated PC5400	Coated PD2000	Uncoated ST30A	Uncoated G10	Uncoated H01	page
XEKT	19M504FR-MA												●		●			E29
	19M508FR-MA												●		●			
	19M512FR-MA												●		●			
	19M516FR-MA														●			
	19M518FR-MA																	
	19M520FR-MA												●		●			
	19M530FR-MA														●			
	19M532FR-MA												●		●			
	19M540FR-MA												●		●			
	19M550FR-MA												●		●			

Designation		Cermet CN2000	Cermet CN30	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC5300	Coated PC5400	Coated PD2000	Uncoated ST30A	Uncoated G10	Uncoated H01	page
XEKT	19M504ER-ML																	E29
	19M508ER-ML																	
	19M512ER-ML																	
	19M516ER-ML																	
	19M518ER-ML																	
	19M520ER-ML																	
	19M530ER-ML																	
	19M532ER-ML																	
	19M540ER-ML																	
	19M550ER-ML																	

Available arbors

Designation		Ød	Available arbors
PAXC(M)	5040HR-A,B	16	BT□□-FMC16-□□
	5050HR-A,B 5063HR-A,B	22	BT□□-FMC22-□□
	5080HR-A,B	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	5100HR-A,B	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	5125HR-A,B	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□

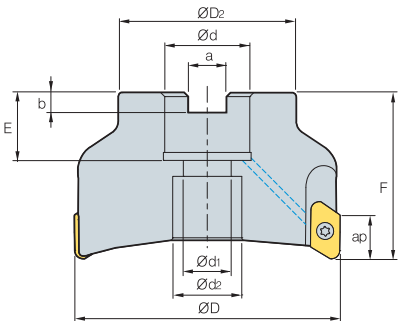
Parts

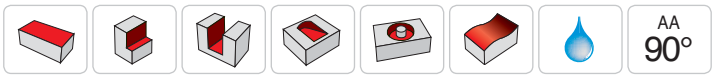
Specification	Screw	Wrench
Ø40~Ø125	PTKA0408	TW 15S

Available inserts E29 Available arbors and bolt E371~E373

PAXC(M)6000







AA 90°

- AR: 8°~17.5°
- RR: -9.5°~ -5°

(mm)

Designation			ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	Max rpm	ap	kg
PAXCM	6050HR-A,B	2	50	42	16	9	14	8.4	5.6	18	50	23,000	23	0.32
	6063HR-A,B	3	63	49	22	11	18	10.4	6.3	21	50	20,500	23	0.53
PAXC (PAXCM)	6080HR-A,B	4	80	57	25.4 (27)	14	20	9.5 (12.4)	6 (7)	25 (23)	50	18,200	23	0.73
	6100HR-A,B	5	100	67	31.75 (32)	18	26	12.7 (14.4)	8 (8)	32.5 (26)	63	16,300	23	1.7
	6125HR-A,B	6	125	87	38.1 (40)	22	32	15.9 (16.4)	10 (9)	35 (29)	63	14,600	23	3.06

• A type: Insert NoseR 0.4~3.2, B type: Insert NoseR 4.0~5.0

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604FR-MA																●	E29
	250608FR-MA																●	
	250612FR-MA																●	
	250616FR-MA																	
	250620FR-MA																●	
	250630FR-MA																	
	250632FR-MA																●	
	250640FR-MA																	
	250650FR-MA																●	

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604ER-ML																	E29
	250608ER-ML																	
	250612ER-ML																	
	250616ER-ML																	
	250620ER-ML																	
	250630ER-ML																	
	250632ER-ML																	
	250640ER-ML																	
	250650ER-ML																	

Available arbors

Designation		Ød	Available adaptor
PAXC(M)	6050HR-A,B	16	BT□□-FMC16-□□
	6063HR-A,B	22	BT□□-FMC22-□□
	6080HR-A,B	25.4	BT□□-FMA25.4-□□
		27	BT□□-FMC27-□□
	6100HR-A,B	31.75	BT□□-FMA31.75-□□
		32	BT□□-FMC32-□□
	6125HR-A,B	38.1	BT□□-FMA38.1-□□
		40	BT□□-FMC40-□□

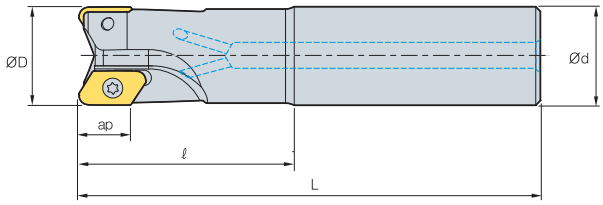
Parts

Specification	Screw	Wrench
Ø50~Ø125	FTGA0513-P	TW 20-100

Available inserts E29 Available arbors and bolt E371~E373

PAXS5000





AA 90°

- AR: 5°~10°
- RR: -14°~ -5°

(mm)

Designation			ØD	Ød	ℓ	L	Max rpm	ap	kg
PAXS	5020HR-A,B	1	20	20	60	130	15,000	17	0.24
	5025HR-A,B	2	25	25	60	140	32,600	17	0.4
	5025HR-A,B-L200	2	25	25	60	200	32,600	17	0.63
	5032HR-A,B	2	32	32	70	150	28,800	17	0.74
	5032HR-A,B-L220	2	32	32	70	220	28,800	17	1.2
	5040HR-A,B-S32	3	40	32	70	160	25,800	17	1.0
	5040HR-A,B-L220	3	40	32	70	220	25,800	17	1.4
	5040HR-A,B-S40	3	40	40	70	160	25,800	17	1.3
	5040HR-A,B-S42	3	40	42	70	160	25,800	17	1.4

• A type: Insert NoseR 0.4~3.2, B type: Insert NoseR 4.0~5.0

( )Metric size

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504FR-MA												●			●		E29
	19M508FR-MA												●			●		
	19M512FR-MA												●			●		
	19M516FR-MA															●		
	19M518FR-MA																	
	19M520FR-MA												●			●		
	19M530FR-MA															●		
	19M532FR-MA												●			●		
	19M540FR-MA												●			●		
	19M550FR-MA												●			●		

Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504ER-ML																	E29
	19M508ER-ML																	
	19M512ER-ML																	
	19M516ER-ML																	
	19M518ER-ML																	
	19M520ER-ML																	
	19M530ER-ML																	
	19M532ER-ML																	
	19M540ER-ML																	
	19M550ER-ML																	

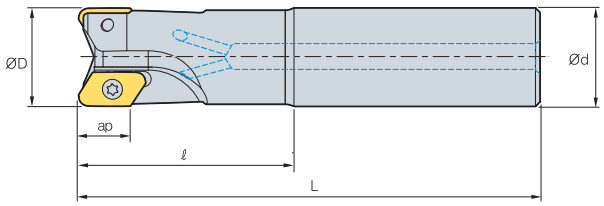
Parts

Specification	Screw	Wrench
Ø20	PTKA0407	TW 15S
Ø25~Ø40	PTKA0408	

Available inserts E29

PAXS6000













AA
90°

- AR: 5°~10°
- RR: -14°~ -5°

(mm)

	Designation		ØD	Ød	ℓ	L	Max rpm	ap	kg
PAXS	6025HR-A,B	1	25	25	60	140	32,600	23	0.42
	6025HR-A,B-L200	1	25	25	60	200	32,600	23	0.63
	6032HR-A,B	1	32	32	70	150	28,800	23	0.72
	6032HR-A,B-L220	1	32	32	70	220	28,800	23	1.14
	6040HR-A,B-S32	2	40	32	70	160	25,800	23	0.88
	6040HR-A,B-L220	2	40	32	70	220	25,800	23	1.23
	6040HR-A,B-S40	2	40	40	70	160	25,800	23	1.2
	6040HR-A,B-S42	2	40	42	70	160	25,800	23	1.3

- A type: Insert NoseR 0.4~3.2, B type: Insert NoseR 4.0~5.0

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604FR-MA																●	E29
	250608FR-MA																●	
	250612FR-MA																●	
	250616FR-MA																	
	250620FR-MA																	
	250630FR-MA																	
	250632FR-MA																●	
	250640FR-MA																	
	250650FR-MA																●	

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	250604ER-ML																	E29
	250608ER-ML																	
	250612ER-ML																	
	250616ER-ML																	
	250620ER-ML																	
	250630ER-ML																	
	250632ER-ML																	
	250640ER-ML																	
	250650ER-ML																	

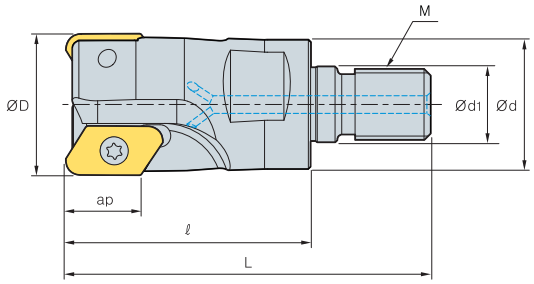
Parts

Specification	Screw	Wrench
Ø25~Ø32	FTGA0510-P	TW 20-100
Ø40	FTGA0513-P	

Available inserts E29

PAXM5000





AA 90°

- AR: 6°~8°
- RR: -7°~ -5°

(mm)

	Designation		ØD	Ød	Ød1	ℓ	L	M	ap	kg
PAXM	5025HR-A,B-M12	2	25	23	12.5	55	79	M12	17	0.12
	5032HR-A,B-M16	2	32	29	17.0	55	82	M16	17	0.2
	5040HR-A,B-M16	3	40	29	17.0	55	82	M16	17	0.4

- A type: Insert NoseR 0.4~3.2, B type: Insert NoseR 4.0~5.0

Available inserts

XEKT-MA



XEKT-ML



Designation		Cermet CN2000	Cermet CN30	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC5300	Coated PC5400	Coated PD2000	Uncoated ST30A	Uncoated G10	Uncoated H01	page
XEKT	19M504FR-MA												●			●		E29
	19M508FR-MA												●			●		
	19M512FR-MA												●			●		
	19M516FR-MA															●		
	19M518FR-MA																	
	19M520FR-MA												●			●		
	19M530FR-MA															●		
	19M532FR-MA												●			●		
	19M540FR-MA												●			●		
	19M550FR-MA												●			●		

Designation		Cermet CN2000	Cermet CN30	Coated NC5330	Coated NC5340	Coated NC5350	Coated PC2505	Coated PC2510	Coated PC3500	Coated PC3600	Coated PC9530	Coated PC5300	Coated PC5400	Coated PD2000	Uncoated ST30A	Uncoated G10	Uncoated H01	page
XEKT	19M504ER-ML																	E29
	19M508ER-ML																	
	19M512ER-ML																	
	19M516ER-ML																	
	19M518ER-ML																	
	19M520ER-ML																	
	19M530ER-ML																	
	19M532ER-ML																	
	19M540ER-ML																	
	19M550ER-ML																	

Available adaptor

Designation		Available adaptor
PAXM	5025HR-A,B-M12	MAT-M12
	5032HR-A,B-M16	MAT-M16
	5040HR-A,B-M16	

Designation: PAXM5025HR-M12
Modular head threading measure size (M12)

II

Adaptor spec.: MAT-M12-030-S25S
Adaptor threading measure (M12)

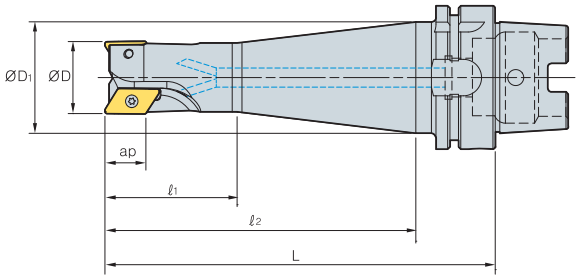
Parts

Specification	Screw	Wrench
Ø25~Ø40	PTKA0408	TW 15S

Available inserts E29 Available adaptors E342~E343

HSK63A/100A PAX5000





AA 90°

- AR: 5°~17.5°
- RR: -14°~ -5°

(mm)

Designation			ØD	ØD1	ℓ1	ℓ2	L	ap	kg
HSK63A	PAX5032HR-A, B	2	32	53	58	137	163	17	1.14
HSK100A	PAXCM5080HR-A, B	5	80	-	-	66	95	17	4
	PAXCM5100HR-A, B	6	100	-	-	66	95	17	4.6

- A type: Insert NoseR 0.4~3.2, B type: Insert NoseR 4.0~5.0
- For the maximum rake angle and the rpm limit, please refer to technical information on pp. E323~E324.

Available inserts

XEKT-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
XEKT	19M504FR-MA													●			●	E29
	19M508FR-MA													●			●	
	19M512FR-MA													●			●	
	19M516FR-MA																●	
	19M518FR-MA																	
	19M520FR-MA													●			●	
	19M530FR-MA																●	
	19M532FR-MA													●			●	
	19M540FR-MA													●			●	
	19M550FR-MA													●			●	

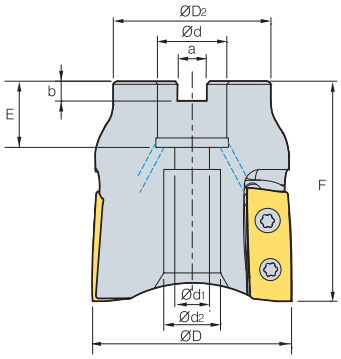
Parts

Specification	Screw	Wrench
Ø32~Ø100	PTKA0407 PTKA0408	TW 15S

Available inserts E29

PALCM







AA 90°

- AR: 16°
- RR: -8°

(mm)

Designation		ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg
PALCM	063HR	4	63	50	22	11	21	10	6.3	20	70	34	0.57

Available inserts


LXET-MA


LXET-ML

Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC5300	PC5400	PD2000	ST30A	G10	H01	
LXET	340504PEFR-63-MA																●	E12
	3405PEFR-63-MA																●	
	340512PEFR-63-MA																	
	340516PEFR-63-MA																	
	340504PEER-63-ML																	
	3405PEER-63-ML																	
	340512PEER-63-ML																	
	340516PEER-63-ML																	

Available arbors

Designation		Ød	Available arbors
PALCM	063HR	22	BT□□-FMC22-□□

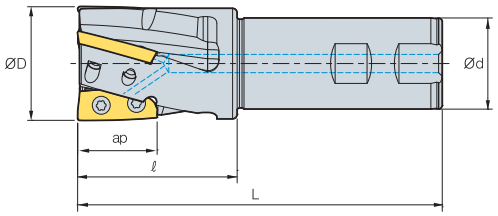
Parts

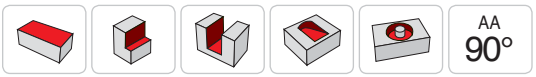
Specification	Screw	Wrench
Ø63	FTGA0511-P	TW20-100

Available inserts E12 Available arbors and bolt E371~E373

PALS (Single-edge)







AA 90°

- AR: 12°~16°
- RR: -5°~ -9°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
PALS	032HR-2S20	2	32	20	50	140	25	0.36
	032HR-2S25	2	32	25	50	140	25	0.48
	032HR-2S32	2	32	32	50	140	25	0.71
	040HR-2S32	2	40	32	50	140	25	0.85
	040HR-2S40	2	40	40	50	140	25	1.16
	040HR-2S42	2	40	42	50	140	25	1.26
	040HR-3S32	3	40	32	50	140	25	0.80
	040HR-3S40	3	40	40	50	140	25	1.10
	040HR-3S42	3	40	42	50	140	25	1.20

Available inserts

LXET-MA LXET-ML



Type	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
Ø32	LXET	250404PEFR-32-MA																	E12
		2504PEFR-32-MA																●	
		250412PEFR-32-MA																	
		250416PEFR-32-MA																	
		250404PEER-32-ML																	
		2504PEER-32-ML																	
		250412PEER-32-ML																	
		250416PEER-32-ML																	
Ø40	LXET	250404PEFR-40-MA																	
		2504PEFR-40-MA																	
		250412PEFR-40-MA																	
		250416PEFR-40-MA																	
		250404PEER-40-ML																	
		2504PEER-40-ML																	
		250412PEER-40-ML																	
		250416PEER-40-ML																	

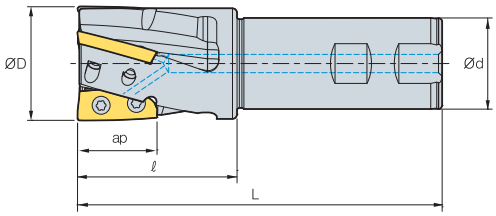
Parts

Specification	Screw	Wrench
Ø32	FTKA0408	TW15S
Ø40	FTKA0410	TW15S

Available inserts E12

PALS (Single-edge)







AA 90°

- AR: 12°~16°
- RR: -5°~ -9°

(mm)

Designation			ØD	Ød	ℓ	L	ap	kg
PALS	050HR-3S32	3	50	32	70	160	34	1.10
	050HR-3S40	3	50	40	70	160	34	1.40
	050HR-3S42	3	50	42	70	160	34	1.50
	063HR-4S32	4	63	32	70	160	34	1.60
	063HR-4S40	4	63	40	70	160	34	1.92
	063HR-4S42	4	63	42	70	160	34	2.00

Available inserts

LXET-MA LXET-ML



Type	Designation		Cermet		Coated										Uncoated			page
			CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
Ø50	LXET	340504PEFR-50-MA																	E12
		3405PEFR-50-MA																●	
		340512PEFR-50-MA																	
		340516PEFR-50-MA																	
		340504PEER-50-ML																	
		3405PEER-50-ML																	
		340512PEER-50-ML																	
		340516PEER-50-ML																	
Ø63	LXET	340504PEFR-63-MA																●	
		3405PEFR-63-MA																●	
		340512PEFR-63-MA																	
		340516PEFR-63-MA																	
		340504PEER-63-ML																	
		3405PEER-63-ML																	
		340512PEER-63-ML																	
		340516PEER-63-ML																	

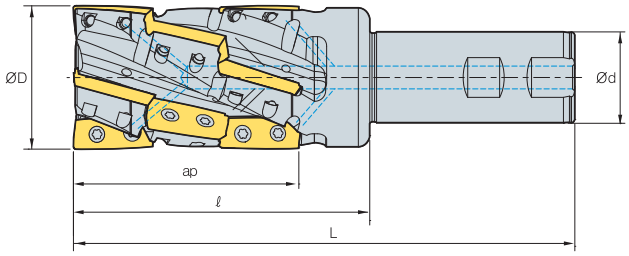
Parts

Specification	Screw	Wrench
Ø50	FTGA0510-P	TW20-100
Ø63	FTGA0511-P	TW20-100

Available inserts E12

PALS (Multi-edge)







AA 90°

- AR: 16°
- RR: -8°

(mm)

Designation			Ød	Ød1	ℓ	L	ap	kg
PALS	063HM-4S32	12	63	32	130	220	96	1.60
	063HM-4S40	12	63	40	130	220	96	1.92
	063HM-4S42	12	63	42	130	220	96	2.00

Available inserts

LXET-MA LXET-ML



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LXET	340504PEFR-63-MA																●	E12
	3405PEFR-63-MA																●	
	340512PEFR-63-MA																	
	340516PEFR-63-MA																	
	340504PEER-63-ML																	
	3405PEER-63-ML																	
	340512PEER-63-ML																	
	340516PEER-63-ML																	

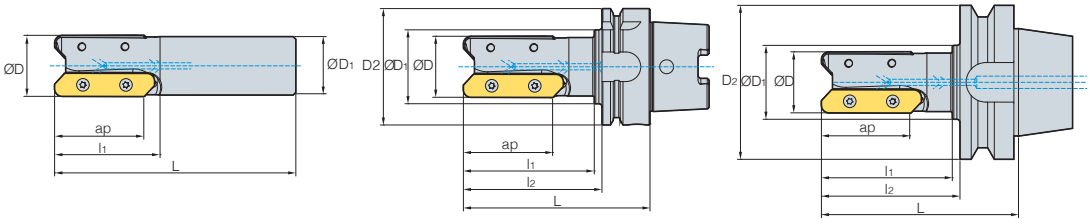
Parts

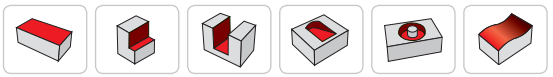
Specification	Screw	Wrench
Ø63	FTGA0511-P	TW20-100

Available inserts E12

PXL(S) new







AA 90°

- AR: 5°~17.5°
- RR: -14°~ -5°

(mm)

Designation			ØD	ØD1	ØD2	l1	l2	L	ap	kg	Fig.
PXLS	040HR-2S40	2	40	40	-	85	-	175	57	1.23	1
	040HR-3S40	3	40	40	-	85	-	175	57	1.11	1
	050HR-3S40	3	50	40	-	85	-	185	57	1.51	1
HSK63A	PXL04090HR-2F	2	40	48	63	85	90	116	57	1.13	2
HSK100A	PXL04090HR-3F	3	40	70	100	90	100	129	57	2.74	2
	PXL08090HR-5F	5	80	77	100	-	90	119	57	4.29	2
BT50	PXL04090HR-2F	2	40	48	100	85	90	128	57	4.13	3

Available inserts

LDET-MA



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LDET	650540PPFR-MA																	E09
	650550PPFR-MA																	

Parts

Specification	Screw	Wrench
Ø40~80	FTGA0511-P	TW20-100

Available inserts E09

MAT (Steel shank type)



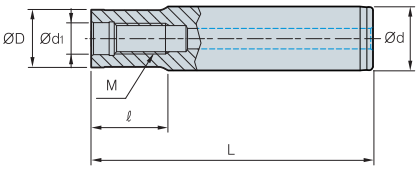


Fig. 1

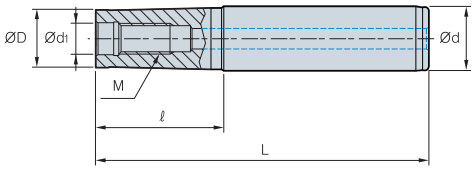


Fig. 2

(mm)

Designation		ØD	Ød	Ød1	ℓ	L	M	Fig.
MAT-	M06-020-S10S	9.5	10	6.5	20	70	M06	1
	M6B-020-S12S	11.0	12	6.5	20	76	M06	1
	M6B-040-S12S	11.0	12	6.5	40	96	M06	1
	M08-020-S16S	14.5	16	8.5	20	80	M08	1
	M10-030-S20S	18.0	20	10.5	30	100	M10	1
	M12-030-S25S	22.5	25	12.5	29	110	M12	1
	M16-035-S32S	28.5	32	17.0	35	125	M16	1
	M06-040-S12T	9.5	12	6.5	40	96	M06	2
	M06-065-S16T	9.5	16	6.5	65	125	M06	2
	M6B-065-S16T	11.0	16	6.5	65	125	M06	2
	M6B-080-S16T	11.0	16	6.5	80	140	M06	2
	M08-040-S16T	14.5	16	8.5	40	100	M08	2
	M08-065-S16T	14.5	16	8.5	65	125	M08	2
	M08-080-S20T	14.5	20	8.5	80	150	M08	2
	M08-110-S25T	14.5	25	8.5	110	190	M08	2
	M10-050-S20T	18.0	20	10.5	50	120	M10	2
	M10-070-S20T	18.0	20	10.5	70	140	M10	2
	M10-090-S25T	18.0	25	10.5	90	170	M10	2
	M10-110-S25T	18.0	25	10.5	110	190	M10	2
	M10-130-S32T	18.0	32	10.5	130	220	M10	2
	M12-050-S25T	22.5	25	12.5	50	130	M12	2
	M12-070-S25T	22.5	25	12.5	70	150	M12	2
	M12-090-S25T	22.5	25	12.5	90	170	M12	2
	M12-110-S32T	22.5	32	12.5	110	200	M12	2
	M12-175-S40T	22.5	40	12.5	175	300	M12	2
	M16-055-S32T	28.5	32	17.0	55	145	M16	2
	M16-080-S32T	28.5	32	17.0	80	170	M16	2
	M16-120-S32T	28.5	32	17.0	120	210	M16	2
	M16-175-S40T	28.5	40	17.0	175	300	M16	2

• S: straight neck adaptor • T: taper neck adaptor

FMRM type



E234 236, 245

LBE-MHD type



E299

PAM/PAXM type



E330, 335

AMM type



E169, 170, 171

RM3PM type



E91

RM4PM type



E103

RM4ZM type



E105

HFMM type



E256

HRMM type



E278

HRMDM type



E270, 271

GBEM type



E303

Applicable Modular **E41** (FMRM, LBE, PAM, AMM, RM4PM, HFMM, RM4ZM, HRMM, PAXM)

MAT-C (Carbide shank type)



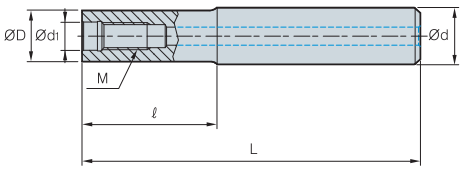


Fig. 1

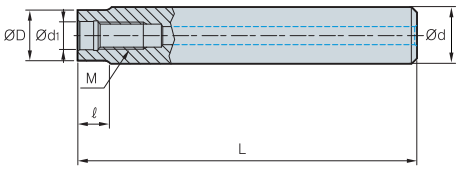


Fig. 2

(mm)

	Designation	ØD	Ød	Ød1	ℓ	L	M	Fig.
MAT-	M06-030-S10S-C-80	9.5	10	6.5	30	80	M06	1
	M06-050-S10S-C-100	9.5	10	6.5	50	100	M06	1
	M06-080-S10S-C-130	9.5	10	6.5	80	130	M06	1
	M6B-030-S10S-C-80	11	10	6.5	30	80	M06	1
	M6B-050-S10S-C-100	11	10	6.5	50	100	M06	1
	M6B-080-S10S-C-130	11	10	6.5	80	130	M06	1
	M08-080-S16S-C	14.5	16	8.5	80	150	M08	1
	M08-110-S16S-C	14.5	16	8.5	110	180	M08	1
	M08-150-S16S-C	14.5	16	8.5	150	250	M08	1
	M08-010-S16S-C-150	14.5	16	8.5	10	150	M08	2
	M08-010-S16S-C-180	14.5	16	8.5	10	180	M08	2
	M08-010-S16S-C-250	14.5	16	8.5	10	250	M08	2
	M10-090-S20S-C	18	20	10.5	90	170	M10	1
	M10-110-S20S-C	18	20	10.5	110	200	M10	1
	M10-175-S20S-C	18	20	10.5	175	300	M10	1
	M10-010-S20S-C-170	18	20	10.5	10	170	M10	2
	M10-010-S20S-C-200	18	20	10.5	10	200	M10	2
	M10-010-S20S-C-300	18	20	10.5	10	300	M10	2
	M12-090-S25S-C	22.5	25	12.5	90	170	M12	1
	M12-110-S25S-C	22.5	25	12.5	110	200	M12	1
	M12-175-S25S-C	22.5	25	12.5	175	300	M12	1
	M12-015-S25S-C-170	22.5	25	12.5	15	170	M12	2
	M12-015-S25S-C-200	22.5	25	12.5	15	200	M12	2
	M12-015-S25S-C-300	22.5	25	12.5	15	300	M12	2
	M16-090-S32S-C	28.5	32	17	90	180	M16	1
	M16-120-S32S-C	28.5	32	17	120	210	M16	1
	M16-175-S32S-C	28.5	32	17	175	300	M16	1
	M16-020-S32S-C-180	28.5	32	17	20	180	M16	2
	M16-020-S32S-C-210	28.5	32	17	20	210	M16	2
	M16-020-S32S-C-300	28.5	32	17	20	300	M16	2

FMRM type



E234 236, 245

LBE-MHD type



E299

PAM/PAXM type



E330, 335

AMM type



E169, 170, 171

RM3PM type



E91

RM4PM type



E103

RM4ZM type



E105

HFMM type



E256

HRMM type



E278

HRMDM type



E270, 271

GBEM type



E303

Applicable Modular **E41** (FMRM, LBE, PAM, AMM, RM4PM, HFMM, RM4ZM, HRMM, PAXM)

Adjusting side cutter

Code system

P: Plane type



B: Boss type



A: Adjusting side cutter

Adjusting

Cutter type

For half side cutter, minimum width of the cutter will be written only

Max. width of cutter

R A FC B 125 14 18 – R

Insert clamping way



R: Radial type (Using SDXT)



T: Tangential type (Using CNHQ)

Insert configuration



FC Full side cutter



HC Half side cutter

Cutter Dia.

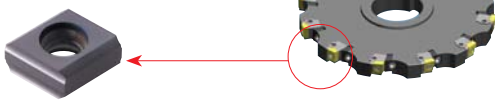
Min. width of cutter

Hand

Unmarked	R	L
Neutral	Right	Left
Full side cutter (Plane type)	Half side cutter (Boss type)	

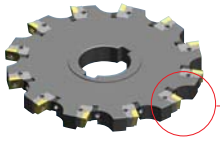
Tangential type (High rigidity)

• CNHQ

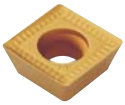


- Medium/Roughing
- Excellent performance at medium to roughing range (14~30mm) table operation due to the strong rigidity of the cutter
- Good performance in heavy interruption and deep depth of cut application

Radial type (Low cutting load)



• SDXT



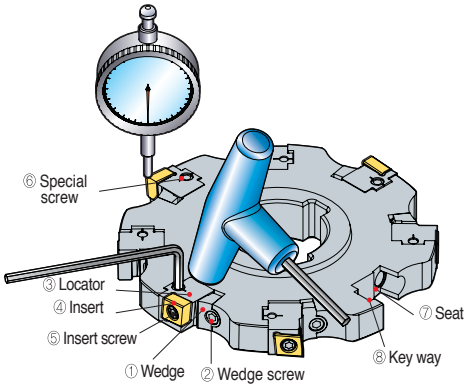
4 Corners Available

- Medium/Finishing
- Suitable for small width cutting operation (12~24mm)
- 3 dimensional chip breaker provides smooth cutting operation
- Several chip breakers as per applications are available (MF, MM, FA)
- Economical insert using 4 cutting-edges per insert

Insert features

- Precise adjustable side cutter can control the width of the cutter by 5㎛ unit
- Since the width of the cutter is adjustable up to ±1.5mm, single cutter can cover various cutting width
- Specially designed clamping system of the locator provides excellent rigidity by using elastic deformation of the locator
- Tangential type clamping system of insert provides enough strength can withstand large width cutting operations
- 3-dimensional chip breaker of insert provides smooth cutting with low cutting load at medium to finishing range

Operating manual



• How to assemble the adjusting side cutter

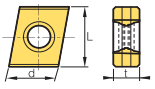
1. Clamp ①wedge slightly on ⑦locator-wedge pocket by using ②wedge screw
2. Put ③locator on ⑦locator-wedge pocket along with the ⑧key-way
3. Tighten the ⑥taper screw little bit to set proper position of locator
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. After, put the ④insert on insert pocket of ③locator, clamp it with ⑤insert screw by using 40~50N.m torque

• How to adjust Run-out & cutting width

1. Settle the adjusting side cutter after cleaning to the jig for measurement
2. Un-screw the ②Wedge screw first, then tighten ①wedge slightly again by using 8N.m torque
3. Adjusting the height of cutting-edge by using a dial gauge to set the width of the cutter
4. Tighten the ②wedge screw tightly by using 70~80N.m torque
5. To finish the setting, tighten the ⑥taper screw for strong clamp

Tangential type

Cutting width per insert & type of cutter

CNHQ  

(mm)

Designation		Coated		Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	L	d	t
		NCM325	PC6510					
CNHQ1005	- C0.5			9.0	14~18	10	10	5.4
	- R0.5							
	- C1.0			8.5	14~17			
	- R1.0							
CNHQ1305	- C0.5			12	18~21/21~24	12.7	10	5.4
	- R0.5							
	- C1.0			11.5	18~21/21~23			
	- R1.0							
	- C1.5			11	18~21/21~22			
	- R1.5							
CNHQ1606	- C0.5			15	24~27/27~30	16	12	6.4
	- R0.5							
	- C1.0			14.5	24~27/27~29			
	- R1.0							
	- C1.5			14	24~27/27~28			
	- R1.5							
	- C2.0			13.5	24~27			
	- R2.0							

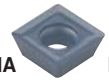
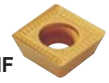
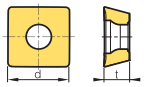
Applicable holder **E346, E347** Available arbors and bolt **E371~E373**

Recommended cutting condition

ISO	Grades	vc (m/min)	fz (mm/t)
P	NCM325	190~310	0.10~0.30
	PC3500	160~270	
M	PC5300	90~150	0.10~0.30
	NCM335	180~290	
K	PC6510	140~230	0.10~0.30

Radial type

Cutting width as per insert & type of cutter

MA  MF  MM  

(mm)

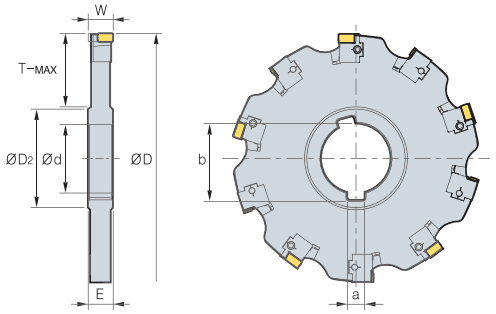
Designation		Coated										Uncoated	Cutting width for half side cutter (ap)	Cutting width for full side cutter (ap)	d	t
		NCM325	NCM335	NC5330	NC5340	NC5350	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	H01				
SDXT	09M405R-MA												●	8	12~14 14~16	9.525	4
	09M405L-MA																
	09M405R-MF	●						●	●	●	●	●					
	09M405L-MF																
	09M405R-MM	●	●				●	●	●	●	●	●					
	09M405L-MM							●		●							
	130508R-MA												●	10.5	16~18 18~20 20~22 22~24	13.5	5.56
	130508L-MA																
	130508R-MF	●						●	●	●	●	●					
	130508L-MF																
	130508R-MM	●	●				●	●	●	●	●	●					
	130508L-MM																

Applicable holder **E346, E347** Available arbors and bolt **E371~E373**

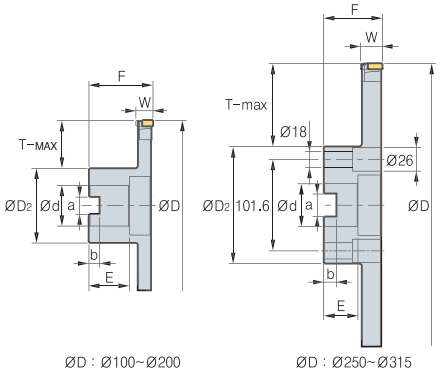
Recommended cutting condition

ISO	Grades	vc (m/min)	fz (mm/t)
P	NCM325	190~310	0.08~0.30
	NCM335	180~290	0.08~0.25
	PC3500	160~270	0.10~0.25
M	PC9530	90~150	0.10~0.25
	PC5300	90~150	
K	PC8110	140~230	0.10~0.25
	PC6510	140~230	

Tangential type (Full side cutter)



• TAFCP(M)



• TAFCB(M)

(mm)

Designation		Ød	E	ØD2	a	b	T-MAX
TAFCP (M)	1001418	31.75 (32)	14	48	7.92 (8)	35.2	24
	1251418	38.1 (40)	14	56	9.52 (10)	42.3	32
	1601418	38.1 (40)	14	56	9.52 (10)	42.3	50
	2001418	50.8 (50)	14	72	12.7 (12)	55.8	61
	2501418	50.8 (50)	14	72	12.7 (12)	55.8	86
	3151418	50.8 (50)	14	72	12.7 (12)	55.8	118
TAFCP (M)	1001821	31.75 (32)	18	48	7.92 (8)	35.2	24
	1251821	38.1 (40)	18	56	9.52 (10)	42.3	32
	1601821	38.1 (40)	18	56	9.52 (10)	42.3	50
	2001821	50.8 (50)	18	72	12.7 (12)	55.8	61
	2501821	50.8 (50)	18	72	12.7 (12)	55.8	86
	3151821	50.8 (50)	18	72	12.7 (12)	55.8	118
TAFCP (M)	1002124	31.75 (32)	21	48	7.92 (8)	35.2	24
	1252124	38.1 (40)	21	56	9.52 (10)	42.3	32
	1602124	38.1 (40)	21	56	9.52 (10)	42.3	50
	2002124	50.8 (50)	21	72	12.7 (12)	55.8	61
	2502124	50.8 (50)	21	72	12.7 (12)	55.8	86
	3152124	50.8 (50)	21	72	12.7 (12)	55.8	118
TAFCP (M)	1252427	38.1 (40)	24	56	9.52 (10)	42.3	32
	1602427	38.1 (40)	24	56	9.52 (10)	42.3	50
	2002427	50.8 (50)	24	72	12.7 (12)	55.8	61
	2502427	50.8 (50)	24	72	12.7 (12)	55.8	86
	3152427	50.8 (50)	24	72	12.7 (12)	55.8	118
TAFCP (M)	1252730	38.1 (40)	27	56	9.52 (10)	42.3	32
	1602730	38.1 (40)	27	56	9.52 (10)	42.3	50
	2002730	50.8 (50)	27	72	12.7 (12)	55.8	61
	2502730	50.8 (50)	27	72	12.7 (12)	55.8	86
	3152730	50.8 (50)	27	72	12.7 (12)	55.8	118

Designation		Ød	F	ØD2	a	b	E	T-MAX
TAFCB (M)	1001418R/L	31.75 (32)	50	54	12.7 (14.4)	8	28	21
	1251418R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1601418R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2001418R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2501418R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3151418R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAFCB (M)	1001821R/L	31.75 (32)	50	50	12.7 (14.4)	8	28	21
	1251821R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1601821R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2001821R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2501821R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3151821R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAFCB (M)	1002124R/L	31.75 (32)	50	54	12.7 (14.4)	8	28	21
	1252124R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1602124R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2002124R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2502124R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3152124R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAFCB (M)	1252427R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1602427R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2002427R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2502427R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3152427R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAFCB (M)	1252730R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1602730R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2002730R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2502730R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3152730R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90

Dimensions		
ØD	W	No. of tooth
100	14-18	6
125	14-18	8
160	14-18	10
200	14-18	12
250	14-18	16
315	14-18	20
100	18-21	6
125	18-21	8
160	18-21	10
200	18-21	12
250	18-21	16
315	18-21	20
100	21-24	6
125	21-24	8
160	21-24	10
200	21-24	12
250	21-24	16
315	21-24	20
125	24-27	8
160	24-27	10
200	24-27	12
250	24-27	16
315	24-27	20
125	27-30	8
160	27-30	10
200	27-30	12
250	27-30	16
315	27-30	20

Available inserts and Recommended cutting condition E345 • The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

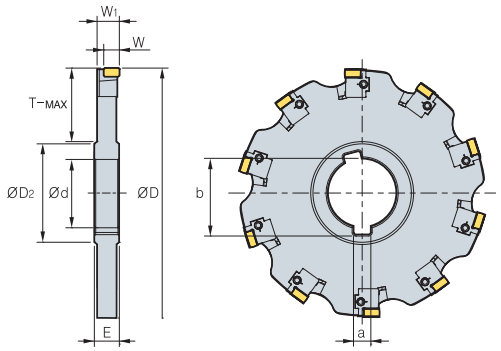
( )Metric size

Parts

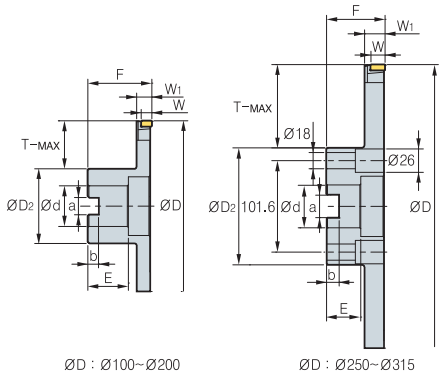
Specification Edge width (TAHCP/B)	Insert	Locator	Wedge	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge Wrench	Locator Wrench
□□□1418R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□1821R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□2124R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□2427R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□2730R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

• Note) The Wedge screw for 1001821, 1002124 cutter is DHA0818F

Tangential type (Half side cutter)



• TAHCP(M)



• TAHCB(M)

(mm)

Designation		Ød	E	ØD2	a	b	T-MAX
TAHCP (M)	10014R/L	31.75 (32)	14	48	7.92 (8)	35.2	24
	12514R/L	38.1 (40)	14	56	9.52 (10)	42.3	32
	16014R/L	38.1 (40)	14	56	9.52 (10)	42.3	50
	20014R/L	50.8 (50)	14	72	12.7 (12)	55.8	61
	25014R/L	50.8 (50)	14	72	12.7 (12)	55.8	86
	31514R/L	50.8 (50)	14	72	12.7 (12)	55.8	118
TAHCP (M)	10018R/L	31.75 (32)	18	48	7.92 (8)	35.2	24
	12518R/L	38.1 (40)	18	56	9.52 (10)	42.3	32
	16018R/L	38.1 (40)	18	56	9.52 (10)	42.3	50
	20018R/L	50.8 (50)	18	72	12.7 (12)	55.8	61
	25018R/L	50.8 (50)	18	72	12.7 (12)	55.8	86
	31518R/L	50.8 (50)	18	72	12.7 (12)	55.8	118
TAHCP (M)	10021R/L	31.75 (32)	21	48	7.92 (8)	35.2	24
	12521R/L	38.1 (40)	21	56	9.52 (10)	42.3	32
	16021R/L	38.1 (40)	21	56	9.52 (10)	42.3	50
	20021R/L	50.8 (50)	21	72	12.7 (12)	55.8	61
	25021R/L	50.8 (50)	21	72	12.7 (12)	55.8	86
	31521R/L	50.8 (50)	21	72	12.7 (12)	55.8	118
TAHCP (M)	12524R/L	38.1 (40)	24	56	9.52 (10)	42.3	32
	16024R/L	38.1 (40)	24	56	9.52 (10)	42.3	50
	20024R/L	50.8 (50)	24	72	12.7 (12)	55.8	61
	25024R/L	50.8 (50)	24	72	12.7 (12)	55.8	86
	31524R/L	50.8 (50)	24	72	12.7 (12)	55.8	118
TAHCP (M)	12527R/L	38.1 (40)	27	56	9.52 (10)	42.3	32
	16027R/L	38.1 (40)	27	56	9.52 (10)	42.3	50
	20027R/L	50.8 (50)	27	72	12.7 (12)	55.8	61
	25027R/L	50.8 (50)	27	72	12.7 (12)	55.8	86
	31527R/L	50.8 (50)	27	72	12.7 (12)	55.8	118

Designation		Ød	F	ØD2	a	b	E	T-MAX
TAHCB (M)	10014R/L	31.75 (32)	50	54	12.7 (14.4)	8	28	21
	12514R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	16014R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	20014R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	25014R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	31514R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAHCB (M)	10018R/L	31.75 (32)	50	50	12.7 (14.4)	8	28	21
	12518R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	16018R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	20018R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	25018R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	31518R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAHCB (M)	10021R/L	31.75 (32)	50	54	12.7 (14.4)	8	28	21
	12521R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	16021R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	20021R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	25021R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	31521R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAHCB (M)	12524R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	16024R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	20024R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	25024R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	31524R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
TAHCB (M)	12527R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	16027R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	20027R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	25027R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	31527R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90

Dimensions			
ØD	W	W1	No. of tooth
100	9	13.25	6
125	9	13.25	8
160	9	13.25	10
200	9	13.25	12
250	9	13.25	16
315	9	13.25	20
100	12	16.75	6
125	12	16.75	8
160	12	16.75	10
200	12	16.75	12
250	12	16.75	16
315	12	16.75	20
100	12	19.75	6
125	12	19.75	8
160	12	19.75	10
200	12	19.75	12
250	12	19.75	16
315	12	19.75	20
125	15	22.75	8
160	15	22.75	10
200	15	22.75	12
250	15	22.75	16
315	15	22.75	20
125	15	25.75	8
160	15	25.75	10
200	15	25.75	12
250	15	25.75	16
315	15	25.75	20

Available inserts and Recommended cutting condition **E345** • The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

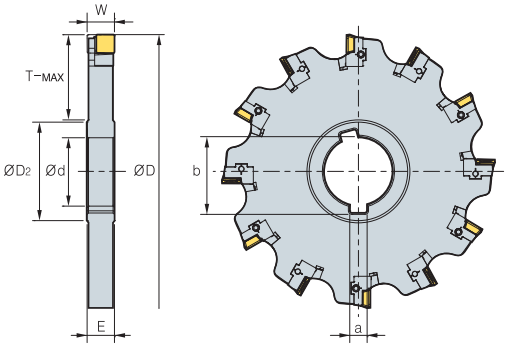
( )Metric size

Parts

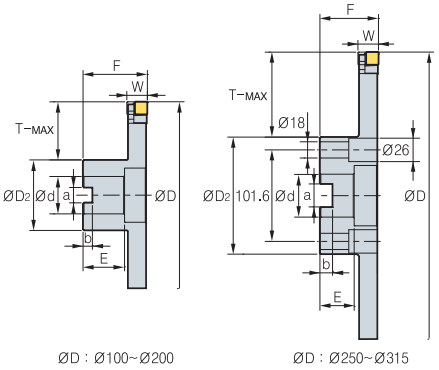
Specification Edge width (TAHCP/B)	Insert	Locator	Wedge	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge Wrench	Locator Wrench
□□□1418R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□1821R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□2124R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□2427R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□2730R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

• Note) The Wedge screw for 10018, 10021 cutter is DHA0818F

Radial type (Full side cutter)



• RAFCP(M)



• RAFCB(M)

(mm)

Designation		Ød	E	ØD2	a	b	T-MAX
RAFCP (M)	1001214	31.75 (32)	12	48	7.92 (8)	35.2	24
	1251214	38.1 (40)	12	56	9.52 (10)	42.3	32
	1601214	38.1 (40)	12	56	9.52 (10)	42.3	50
	2001214	50.8 (50)	12	72	12.7 (12)	55.8	61
	2501214	50.8 (50)	12	72	12.7 (12)	55.8	86
	3151214	50.8 (50)	12	72	12.7 (12)	55.8	118
RAFCP (M)	1001416	31.75 (32)	14	48	7.92 (8)	35.2	24
	1251416	38.1 (40)	14	56	9.52 (10)	42.3	32
	1601416	38.1 (40)	14	56	9.52 (10)	42.3	50
	2001416	50.8 (50)	14	72	12.7 (12)	55.8	61
	2501416	50.8 (50)	14	72	12.7 (12)	55.8	86
	3151416	50.8 (50)	14	72	12.7 (12)	55.8	118
RAFCP (M)	1251618	38.1 (40)	16	56	9.52 (10)	42.3	32
	1601618	38.1 (40)	16	56	9.52 (10)	42.3	50
	2001618	50.8 (50)	16	72	12.7 (12)	55.8	61
	2501618	50.8 (50)	16	72	12.7 (12)	55.8	86
	3151618	50.8 (50)	16	72	12.7 (12)	55.8	118
RAFCP (M)	1251820	38.1 (40)	18	56	9.52 (10)	42.3	32
	1601820	38.1 (40)	18	56	9.52 (10)	42.3	50
	2001820	50.8 (50)	18	72	12.7 (12)	55.8	61
	2501820	50.8 (50)	18	72	12.7 (12)	55.8	86
	3151820	50.8 (50)	18	72	12.7 (12)	55.8	118
RAFCP (M)	1252022	38.1 (40)	20	56	9.52 (10)	42.3	32
	1602022	38.1 (40)	20	56	9.52 (10)	42.3	50
	2002022	50.8 (50)	20	72	12.7 (12)	55.8	61
	2502022	50.8 (50)	20	72	12.7 (12)	55.8	86
	3152022	50.8 (50)	20	72	12.7 (12)	55.8	118
RAFCP (M)	1252224	38.1 (40)	22	56	9.52 (10)	42.3	32
	1602224	38.1(40)	22	56	9.52 (10)	42.3	50
	2002224	50.8 (50)	22	72	12.7 (12)	55.8	61
	2502224	50.8 (50)	22	72	12.7 (12)	55.8	86
	3152224	50.8 (50)	22	72	12.7 (12)	55.8	118

Designation		Ød	F	ØD2	a	b	E	T-MAX
RAFCB (M)	1001214R/L	31.75 (32)	50	54	12.7 (14.4)	8	28	21
	1251214R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1601214R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2001214R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2501214R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3151214R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAFCB (M)	1001416R/L	31.75 (32)	50	50	12.7 (14.4)	8	28	21
	1251416R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1601416R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2001416R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2501416R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3151416R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAFCB (M)	1251618R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1601618R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2001618R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2501618R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3151618R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAFCB (M)	1251820R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1601820R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2001820R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2501820R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3151820R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAFCB (M)	1252022R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1602022R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2002022R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2502022R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3152022R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAFCB (M)	1252224R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
	1602224R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
	2002224R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
	2502224R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
	3152224R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90

Dimensions		
ØD	W	No. of tooth
100	12-14	6
125	12-14	8
160	12-14	10
200	12-14	12
250	12-14	16
315	12-14	20
100	14-16	6
125	14-16	8
160	14-16	10
200	14-16	12
250	14-16	16
315	14-16	20
125	16-18	8
160	16-18	10
200	16-18	12
250	16-18	16
315	16-18	20
125	18-20	8
160	18-20	10
200	18-20	12
250	18-20	16
315	18-20	20
125	20-22	8
160	20-22	10
200	20-22	12
250	20-22	16
315	20-22	20
125	22-24	8
160	22-24	10
200	22-24	12
250	22-24	16
315	22-24	20

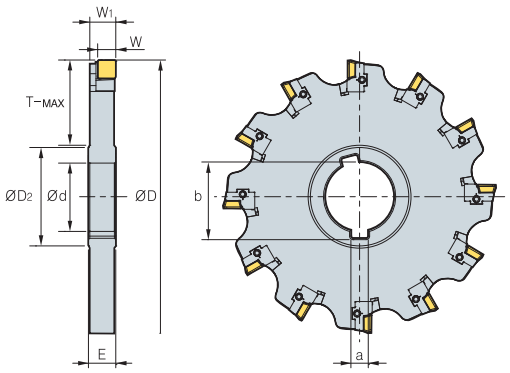
Available inserts and Recommended cutting condition E345 • The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

( )Metric size

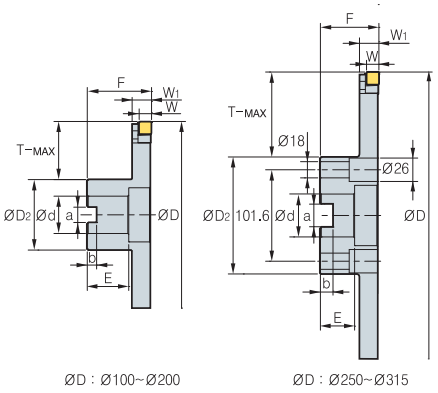
Parts

Specification Edge width (TAHCP/B)	Insert	Locator	Wedge (WSD09N / WSA10N)	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge, locator wrench
□□□1214R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□1416R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□1618R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□1820R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□2022R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□2224R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30

Radial type (Half side cutter)



• RAHCP(M)



ØD : Ø100~Ø200 ØD : Ø250~Ø315

• RAHCB(M)

(mm)

Designation	Ød	E	ØD2	a	b	T-MAX
RAHCP(M) 10012R/L	31.75 (32)	12	48	7.92 (8)	35.2	24
12512R/L	38.1 (40)	12	56	9.52 (10)	42.3	32
16012R/L	38.1 (40)	12	56	9.52 (10)	42.3	50
20012R/L	50.8 (50)	12	72	12.7 (12)	55.8	61
25012R/L	50.8 (50)	12	72	12.7 (12)	55.8	86
31512R/L	50.8 (50)	12	72	12.7 (12)	55.8	118
RAHCP(M) 10014R/L	31.75 (32)	14	48	7.92 (8)	35.2	24
12514R/L	38.1 (40)	14	56	9.52 (10)	42.3	32
16014R/L	38.1 (40)	14	56	9.52 (10)	42.3	50
20014R/L	50.8 (50)	14	72	12.7 (12)	55.8	61
25014R/L	50.8 (50)	14	72	12.7 (12)	55.8	86
31514R/L	50.8 (50)	14	72	12.7 (12)	55.8	118
RAHCP(M) 12516R/L	38.1 (40)	16	56	9.52 (10)	42.3	32
16016R/L	38.1 (40)	16	56	9.52 (10)	42.3	50
20016R/L	50.8 (50)	16	72	12.7 (12)	55.8	61
25016R/L	50.8 (50)	16	72	12.7 (12)	55.8	86
31516R/L	50.8 (50)	16	72	12.7 (12)	55.8	118
RAHCP(M) 12518R/L	38.1 (40)	18	56	9.52 (10)	42.3	32
16018R/L	38.1 (40)	18	56	9.52 (10)	42.3	50
20018R/L	50.8 (50)	18	72	12.7 (12)	55.8	61
25018R/L	50.8 (50)	18	72	12.7 (12)	55.8	86
31518R/L	50.8 (50)	18	72	12.7 (12)	55.8	118
RAHCP(M) 12520R/L	38.1 (40)	20	56	9.52 (10)	42.3	32
16020R/L	38.1 (40)	20	56	9.52 (10)	42.3	50
20020R/L	50.8 (50)	20	72	12.7 (12)	55.8	61
25020R/L	50.8 (50)	20	72	12.7 (12)	55.8	86
31520R/L	50.8 (50)	20	72	12.7 (12)	55.8	118
RAHCP(M) 12522R/L	38.1 (40)	22	56	9.52 (10)	42.3	32
16022R/L	38.1 (40)	22	56	9.52 (10)	42.3	50
20022R/L	50.8 (50)	22	72	12.7 (12)	55.8	61
25022R/L	50.8 (50)	22	72	12.7 (12)	55.8	86
31522R/L	50.8 (50)	22	72	12.7 (12)	55.8	118

Designation	Ød	F	ØD2	a	b	E	T-MAX
RAHCB(M) 10012R/L	31.75 (32)	50	54	12.7 (14.4)	8	28	21
12512R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
16012R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
20012R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
25012R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
31512R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAHCB(M) 10014R/L	31.75 (32)	50	50	12.7 (14.4)	8	28	21
12514R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
16014R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
20014R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
25014R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
31514R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAHCB(M) 12516R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
16016R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
20016R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
25016R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
31516R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAHCB(M) 12518R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
16018R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
20018R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
25018R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
31518R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAHCB(M) 12520R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
16020R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
20020R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
25020R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
31520R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90
RAHCB(M) 12522R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	25
16022R/L	38.1 (40)	60	70	15.9 (16.4)	10	30	43
20022R/L	50.8 (40)	65	90	19.0 (16.4)	11	30	53
25022R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	58
31522R/L	47.625 (60)	65	130	25.4 (25.7)	14	38	90

Dimensions			
ØD	W	W1	No. of tooth
100	8	11.1	6
125	8	11.1	8
160	8	11.1	10
200	8	11.1	12
250	8	11.1	16
315	8	11.1	20
100	8	13.1	6
125	8	13.1	8
160	8	13.1	10
200	8	13.1	12
250	8	13.1	16
315	8	13.1	20
125	10.5	15	8
160	10.5	15	10
200	10.5	15	12
250	10.5	15	16
315	10.5	15	20
125	10.5	17	8
160	10.5	17	10
200	10.5	17	12
250	10.5	17	16
315	10.5	17	20
125	10.5	19	8
160	10.5	19	10
200	10.5	19	12
250	10.5	19	16
315	10.5	19	20
125	10.5	21	8
160	10.5	21	10
200	10.5	21	12
250	10.5	21	16
315	10.5	21	20

Available inserts and Recommended cutting condition **E345**

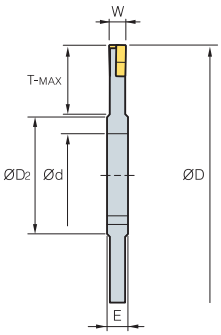
• The ap (Maximum width of cutter) size written above is the number when using insert having corner size R0.5. The ap is subject to change as per insert corner size
• The ap (Maximum width of cutter) size written above is the number when using SDXT09M405R-MM. The ap is subject to change as per insert corner size
( )Metric size

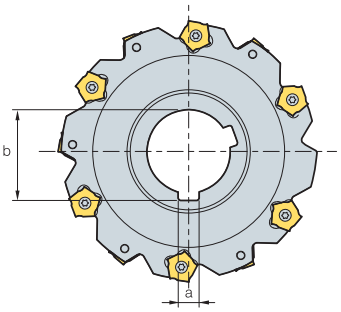
Parts

Specification Edge width (TAHCP/B)	Insert	Locator	Wedge (WSD09N / WSA10N)	Insert screw	Wedge screw	Locator screw	Insert wrench	Wedge, locator wrench
□□□1214R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□1416R/L	SDXT09M40□R/L	LSD09R/L	WSD09N	FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□1618R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□1820R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□2022R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□2224R/L	SDXT13050□R/L	LSD13R/L	WSA10N	FTNC04509	DHA0617	SHGA0411	TW20S	HW30

SPP(M)









•AR: -2°
•RR: -28°

(mm)

Designation			ØD	W	T-MAX	Ød	a	b	E	ØD2	Insert	Screw	Wrench
SPP (SPPM)	080-04	8	80	4	20	25.4 (27)	6.35 (7)	28.04 (29.8)	8	40	PNEJ1223N	PTMA0403F	TW15S
	080-05	8	80	5	20	25.4 (27)	6.35 (7)	28.04 (29.8)	8	40	PNEJ1230N	PTMA0404F	TW15S
	080-06	8	80	6	20	25.4 (27)	6.35 (7)	28.04 (29.8)	8	40	PNEJ1235N	PTMA0405F	TW15S
	100-04	10	100	4	24	31.75 (32)	7.94 (8)	35.18 (34.8)	8	47	PNEJ1223N	PTMA0403F	TW15S
	100-05	10	100	5	24	31.75 (32)	7.94 (8)	35.18 (34.8)	8	47	PNEJ1230N	PTMA0404F	TW15S
	100-06	10	100	6	25	31.75 (32)	7.94 (8)	35.18 (34.8)	8	47	PNEJ1235N	PTMA0405F	TW15S
	100-07	10	100	7	25	31.75 (32)	7.94 (8)	35.18 (34.8)	10	47	PNEJ1240N	PTMA0406F	TW15S
	100-08	10	100	8	25	31.75 (32)	7.94 (8)	35.18 (34.8)	10	47	PNEJ1245N	PTKA0407F	TW15S
	100-09	10	100	9	25	31.75 (32)	7.94 (8)	35.18 (34.8)	12	47	PNEJ1250N	PTKA0408F	TW15S
	100-10	10	100	10	25	31.75 (32)	7.94 (8)	35.18 (34.8)	12	47	PNEJ1255N	PTKA0409F	TW15S
	125-04	12	125	4	30	38.1 (40)	9.53 (10)	42.32 (43.5)	8	56	PNEJ1223N	PTMA0403F	TW15S
	125-05	12	125	5	32	38.1 (40)	9.53 (10)	42.32 (43.5)	8	56	PNEJ1230N	PTMA0404F	TW15S
	125-06	12	125	6	32	38.1 (40)	9.53 (10)	42.32 (43.5)	8	56	PNEJ1235N	PTMA0405F	TW15S
	125-07	12	125	7	32	38.1 (40)	9.53 (10)	42.32 (43.5)	10	56	PNEJ1240N	PTMA0406F	TW15S
	125-08	12	125	8	32	38.1 (40)	9.53 (10)	42.32 (43.5)	10	56	PNEJ1245N	PTKA0407F	TW15S
	125-09	12	125	9	32	38.1 (40)	9.53 (10)	42.32 (43.5)	12	56	PNEJ1250N	PTKA0408F	TW15S
	125-10	12	125	10	32	38.1 (40)	9.53 (10)	42.32 (43.5)	12	56	PNEJ1255N	PTKA0409F	TW15S
	160-04	16	160	4	45	38.1 (40)	9.53 (10)	42.32 (43.5)	8	66	PNEJ1223N	PTMA0403F	TW15S
	160-05	16	160	5	45	38.1 (40)	9.53 (10)	42.32 (43.5)	8	66	PNEJ1230N	PTMA0404F	TW15S
	160-06	16	160	6	45	38.1 (40)	9.53 (10)	42.32 (43.5)	8	66	PNEJ1235N	PTMA0405F	TW15S
	160-07	16	160	7	45	38.1 (40)	9.53 (10)	42.32 (43.5)	10	66	PNEJ1240N	PTMA0406F	TW15S
	160-08	16	160	8	45	38.1 (40)	9.53 (10)	42.32 (43.5)	10	66	PNEJ1245N	PTKA0407F	TW15S
	160-09	16	160	9	45	38.1 (40)	9.53 (10)	42.32 (43.5)	12	66	PNEJ1250N	PTKA0408F	TW15S
	160-10	16	160	10	45	38.1 (40)	9.53 (10)	42.32 (43.5)	12	66	PNEJ1255N	PTKA0409F	TW15S
	160-11	16	160	11	45	38.1 (40)	9.53 (10)	42.32 (43.5)	14	66	PNEJ1260N	PTKA0410F	TW15S
	160-12	16	160	12	45	38.1 (40)	9.53 (10)	42.32 (43.5)	14	66	PNEJ1265N	PTKA0411F	TW15S
	160-13	16	160	13	45	38.1 (40)	9.53 (10)	42.32 (43.5)	16	66	PNEJ1270N	PTKA0412F	TW15S
	160-14	16	160	14	45	38.1 (40)	9.53 (10)	42.32 (43.5)	16	66	PNEJ1275N	PTKA0413F	TW15S
	200-06	18	200	6	60	50.8 (50)	12.7 (12)	55.83 (53.5)	8	70	PNEJ1235N	PTMA0405F	TW15S
	200-07	18	200	7	60	50.8 (50)	12.7 (12)	55.83 (53.5)	10	70	PNEJ1240N	PTMA0406F	TW15S
	200-08	18	200	8	60	50.8 (50)	12.7 (12)	55.83 (53.5)	10	70	PNEJ1245N	PTKA0407F	TW15S
	200-09	18	200	9	60	50.8 (50)	12.7 (12)	55.83 (53.5)	12	70	PNEJ1250N	PTKA0408F	TW15S
	200-10	18	200	10	60	50.8 (50)	12.7 (12)	55.83 (53.5)	12	70	PNEJ1255N	PTKA0409F	TW15S
	200-11	18	200	11	60	50.8 (50)	12.7 (12)	55.83 (53.5)	14	70	PNEJ1260N	PTKA0410F	TW15S
	200-12	18	200	12	60	50.8 (50)	12.7 (12)	55.83 (53.5)	14	70	PNEJ1265N	PTKA0411F	TW15S
	200-13	18	200	13	60	50.8 (50)	12.7 (12)	55.83 (53.5)	16	70	PNEJ1270N	PTKA0412F	TW15S
	200-14	18	200	14	60	50.8 (50)	12.7 (12)	55.83 (53.5)	16	70	PNEJ1275N	PTKA0413F	TW15S

( )Metric size

Available arbors

Designation		NC arbors		
		BT30	BT40	BT50
SPP	080-04~06	BT30-SCA25.4-60	BT40-SCA25.4-75/120	BT50-SCA25.4-90/135
	100-04~10	-	BT40-SCA31.75-105	BT50-SCA31.75-90/135
	125-04~09	-	-	BT50-SCA38.1-90/135
	160-04~14	-	-	BT50-SCA38.1-90/135
	200-06~14	-	-	-
SPPM	080-04~06	-	BT40-SCA27-75/120	BT50-SCA27-90/135
	100-04~10	-	BT40-SCA32-105	BT50-SCA32-90/135
	125-04~09	-	-	BT50-SCA40-90/135
	160-04~14	-	-	BT50-SCA40-90/135
	200-06~14	-	-	-

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~310	0.10~0.25	NCM325
	160~270	0.10~0.30	PC3500
	60~100	0.10~0.25	ST30A
M	90~150	0.10~0.25	PC9530
	80~150	0.10~0.30	ST30A
K	140~230	0.10~0.35	PC6510
	50~90	0.10~0.40	G10

Code system

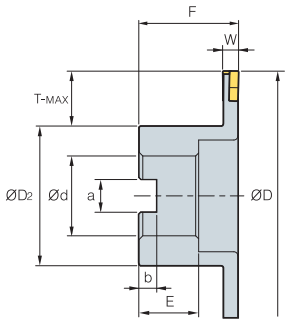
S P P 160 - 06 R

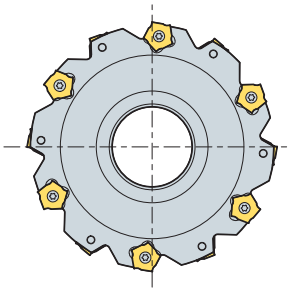
- S: Cutter use (S - Side cutter)
- P: Insert Shape (P - Pentagonal Insert)
- P: Cutter type (P - Plane type, B - Boss type)
- 160: Cutter diameter (ØD)
- 06: Width of cut (W)
- R: Hand of tool (R/L)

Available inserts E15 Available arbors and bolt E371~E373

SPB(M)









•AR: -2°
•RR: 28°

(mm)

Designation			ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
SPB (SPBM)	080-04R/L	8	80	4	18	40	25.4 (27)	9.5 (12.4)	6 (7)	50	25 (22)	PNEJ1223N	PTMA0403F	TW15S
	080-05R/L	8	80	5	18	40	25.4 (27)	9.5 (12.4)	6 (7)	50	25 (22)	PNEJ1230N	PTMA0404F	TW15S
	080-06R/L	8	80	6	18	40	25.4 (27)	9.5 (12.4)	6 (7)	50	25 (22)	PNEJ1235N	PTMA0405F	TW15S
	100-04R/L	10	100	4	21	54	31.75 (32)	12.7 (14.4)	8 (8)	50	32 (28)	PNEJ1223N	PTMA0403F	TW15S
	100-05R/L	10	100	5	21	54	31.75 (32)	12.7 (14.4)	8 (8)	50	32 (28)	PNEJ1230N	PTMA0404F	TW15S
	100-06R/L	10	100	6	21	54	31.75 (32)	12.7 (14.4)	8 (8)	50	32 (28)	PNEJ1235N	PTMA0405F	TW15S
	100-07R/L	10	100	7	21	54	31.75 (32)	12.7 (14.4)	8 (8)	50	32 (28)	PNEJ1240N	PTMA0406F	TW15S
	100-08R/L	10	100	8	21	54	31.75 (32)	12.7 (14.4)	8 (8)	50	32 (28)	PNEJ1245N	PTMA0407F	TW15S
	100-09R/L	10	100	9	21	54	31.75 (32)	12.7 (14.4)	8 (8)	50	32 (28)	PNEJ1250N	PTMA0408F	TW15S
	100-10R/L	10	100	10	21	54	31.75 (32)	12.7 (14.4)	8 (8)	50	32 (28)	PNEJ1255N	PTMA0409F	TW15S
	125-04R/L	12	125	4	25	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1223N	PTMA0403F	TW15S
	125-05R/L	12	125	5	25	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1230N	PTMA0404F	TW15S
	125-06R/L	12	125	6	25	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1235N	PTMA0405F	TW15S
	125-07R/L	12	125	7	25	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1240N	PTMA0406F	TW15S
	125-08R/L	12	125	8	25	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1245N	PTKA0407F	TW15S
	125-09R/L	12	125	9	25	70	38. (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1250N	PTKA0408F	TW15S
	125-10R/L	12	125	10	25	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1255N	PTKA0409F	TW15S
	160-04R/L	16	160	4	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1223N	PTMA0403F	TW15S
	160-05R/L	16	160	5	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1230N	PTMA0404F	TW15S
	160-06R/L	16	160	6	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1235N	PTMA0405F	TW15S
	160-07R/L	16	160	7	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1240N	PTMA0406F	TW15S
	160-08R/L	16	160	8	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1245N	PTKA0407F	TW15S
	160-09R/L	16	160	9	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1250N	PTKA0408F	TW15S
	160-10R/L	16	160	10	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1255N	PTKA0409F	TW15S
	160-11R/L	16	160	11	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1260N	PTKA0410F	TW15S
	160-12R/L	16	160	12	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1265N	PTKA0411F	TW15S
	160-13R/L	16	160	13	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1270N	PTKA0412F	TW15S
	160-14R/L	16	160	14	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60 (50)	38 (30)	PNEJ1275N	PTKA0413F	TW15S
	200-06R/L	18	200	6	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1235N	PTMA0405F	TW15S
	200-07R/L	18	200	7	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1240N	PTMA0406F	TW15S
	200-08R/L	18	200	8	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1245N	PTKA0407F	TW15S
	200-09R/L	18	200	9	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1250N	PTKA0408F	TW15S
	200-10R/L	18	200	10	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1255N	PTKA0409F	TW15S
	200-11R/L	18	200	11	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1260N	PTKA0410F	TW15S
	200-12R/L	18	200	12	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1265N	PTKA0411F	TW15S
	200-13R/L	18	200	13	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1270N	PTKA0412F	TW15S
	200-14R/L	18	200	14	53	90	50.8 (40)	19 (16.4)	11 (9)	65	38 (30)	PNEJ1275N	PTKA0413F	TW15S

( )Metric size

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	190~310 160~270 60~100	0.10~0.25 0.10~0.30 0.10~0.25	**NCM325** **PC3500** **ST30A**
M	90~150 80~150	0.10~0.25 0.10~0.30	**PC9530** **ST30A**
K	140~230	0.10~0.35 0.10~0.40	**PC6510** **G10**

Available inserts **E15** Available arbors and bolt **E371~E373**

Notice (When mounting inserts)

- Insert chip breaker should face chip pocket of the cutter
- Fasten screw after insert contacts securely on its seat
- If there is a gap between insert and its seat after mounting it may cause tool troubles

SPS



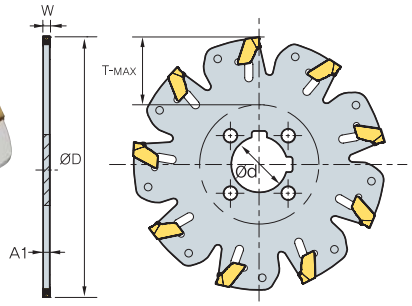


Fig. 1

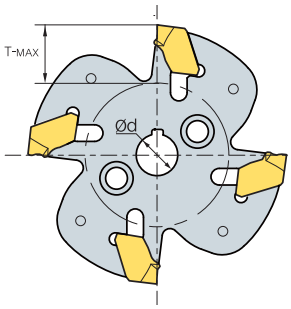


Fig. 2

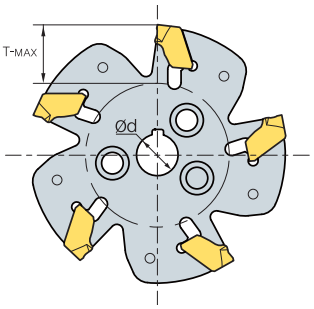


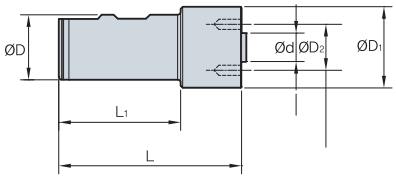
Fig. 3

(mm)

Designation		⌀	ØD	W	T-MAX	Ød	A_1	Fig.	Insert	Adaptor		Wrench
										WS	DF	
SPS	050-0204-08R	4	50	2.2	11	8	1.8	2	SPFN 200 - ( )	WS2528-M4	-	SW17P (separately ordered)
	063-0205-10R	5	63	2.2	15.5	10	1.8	3		WS2532-M5	-	
	080-0207-22R/F	7	80	2.2	20 (17)	22	1.8	1		WS3240-M5	DF22-46	
	100-0209-22R/F	9	100	2.2	30 (27)	22	1.8	1		WS3240-M5	DF22-46	
	125-0211-32F	11	125	2.2	35	32	1.8	1		-	DF32-55	
	160-0214-32F	14	160	2.2	52.5	32	1.8	3		-	DF32-55	
	063-0305-10R	5	63	3	15.5	10	2.55	1	SPFN 300 - ( )	WS2532-M5	-	
	080-0307-22R/F	7	80	3	20 (17)	22	2.55	1		WS3240-M5	DF22-46	
	100-0309-22R/F	9	100	3	30 (27)	22	2.55	1		WS3240-M5	DF22-46	
	125-0311-32F	11	125	3	35	32	2.55	1		-	DF32-55	
	160-0314-32F	14	160	3	52.5	32	2.55	1		-	DF32-55	
	200-0318-40F	18	200	3	60	40	2.55	1	SPFN 400 - ( )	-	DF40-80	
	080-0406-22R/F	6	80	4	20 (17)	22	3.4	1		WS3240-M5	DF22-46	
	100-0408-22R/F	8	100	4	30 (27)	22	3.4	1		WS3240-M5	DF22-46	
	125-0410-32F	10	125	4	35	32	3.4	1		-	DF32-55	
	160-0413-32F	13	160	4	52.5	32	3.4	1		-	DF32-55	
	200-0417-40F	17	200	4	60	40	3.4	1		-	DF40-80	

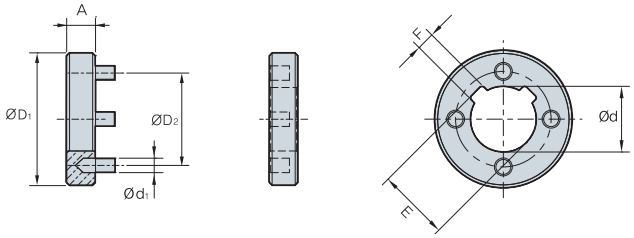
( )Metric size

WS( )-( ) (Weldon shank)



Designation	L	L_1	D	D_1	D_2	d	Screw
WS2528-M4	110	85	25	28	18	8	PTKA0408
WS2532-M5	110	85	25	32	22	10	PTKA0515
WS3240-M5	120	90	32	40	32	22	PTKA0515

DF( )-( ) (Drive flange set)



Designation	D_1	D_2	d	d_1	A	E	F
DF22-46	46	32	22	5	10	24.1	6
DF32-55	55	45	32	6	10	34.8	8
DF40-80	80	63	40	11	12	43.5	10
DF50-110	110	80	50	14	14	53.6	12

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
P	160~270	0.13~0.25	PC3500
M	90~150	0.10~0.22	PC5300
K	110~180	0.10~0.25	PC6510

Available inserts E25 Available arbors and bolt E371~E373

For slotting workpieces with corner radii of varying sizes and widths

Wind Mill

- Optimal machining for slotting applications
- A unique recess design on the minor cutting-edge reduces cutting load and improves tool life
- Special clamping system prevents incorrect clamping and fracture

Item description

• Insert



• Cutter



WFSP(M) - Plane type



WFSB(M) - Boss type

Cutter code system

W	FS	P(B)	100	–	T04
Wind Mill	Insert arrangement	Cutter type	ØD		W
	FS: Full side HS: Half side	P: Plane type B: Boss type			

Insert code system

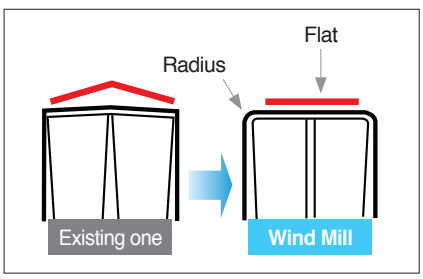
S	N	H	T	12	045	08	R/L	–	WX
Insert shape	Relief angle of major cutting-edge	tolerance	Shape of cross section	Ød	Height of cutting-edge	Nose R	R/L		Chip breaker

Features

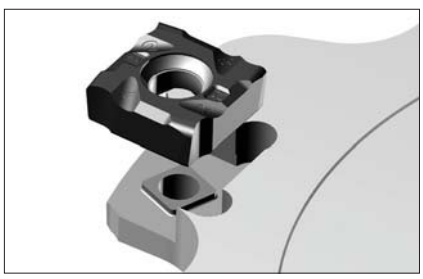
• Ideal geometry for superior surface roughness and extended tool life



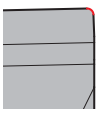
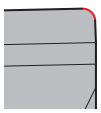
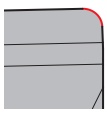
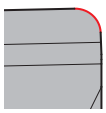
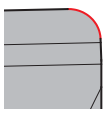
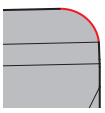
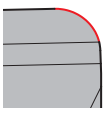
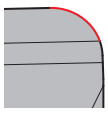
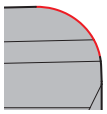
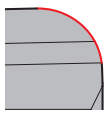
• Perpendicular slot



• Protruded part on tip seat prevents wrong clamping and fracture



• Workpieces with corner radii of varying size and width (R0.2~R2.0)

R0.2	R0.4	R0.6	R0.8	R1.0	R1.2	R1.4	R1.6	R1.8	R2.0
									

Application example

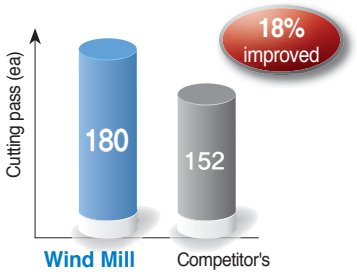
■ **Use** Carriers for Motor Vehicles

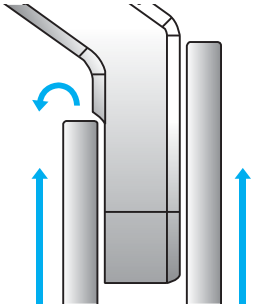
■ **Workpiece** FCD500K

■ **Cutting conditions**
vc (m/min) = 200
fz (mm/t) = 0.2
vf (mm/min) = 600
ap (mm) = 2~3

■ **Tool** KSF140R-T14-HM-2
SNHT1205408R/L-WX (PC5300)

■ **Test result**





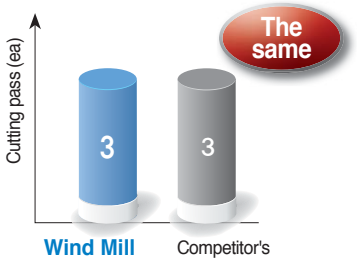
■ **Use** Lug for Vessel

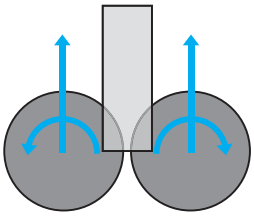
■ **Workpiece** Mild steel

■ **Cutting conditions**
vc (m/min) = 560
fz (mm/t) = 0.09
vf (mm/min) = 750
ap (mm) = 6

■ **Tool** WFSP178R/L-T06
SNHT1203508R/L-WX (PC5300)

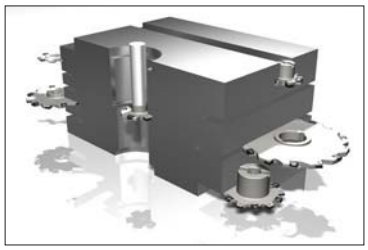
■ **Test result**





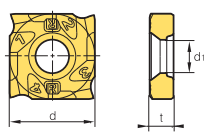
Recommended cutting condition

Workpiece	Cutting conditions		Grades
	vc (m/min)	fz (mm/t)	
P	150~250	0.10~0.25	PC5300
M	120~200	0.10~0.30	PC5300
K	100~150	0.10~0.30	PC5300



List of inserts

Designation		Coated	Dimensions (mm)				Nose R	Configuration
		PC5300	Ød	Ød1	t	W		
SNHT	11023□□R/L-WX	●	11.0	4	2.30	4.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6	
	1103□□R/L-WX	●	11.0	4	3.00	5.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6	
	1203□□R/L-WX		12.7	5	3.25	5.5	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	12035□□R/L-WX	●	12.7	5	3.54	6.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	1204□□R/L-WX		12.7	5	4.00	7.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	12045□□R/L-WX	●	12.7	5	4.54	8.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	1205□R/L-WX	●	12.7	5	5.00	9.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	12054□R/L-WX	●	12.7	5	5.47	10.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	1206□□R/L-WX		12.7	5	6.00	11.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	12065□□R/L-WX		12.7	5	6.50	12.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	1207□□R/L-WX		12.7	5	7.00	13.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	
	12075□□R/L-WX		12.7	5	7.50	14.0	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0	



• Inserts with various nose R sizes can be supplied in 2~3 weeks
• Available cutter stock requires to be asked separately

WFSB(M) (Boss type)



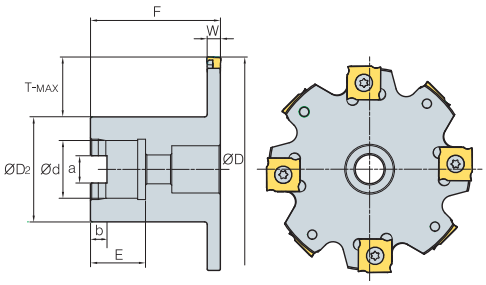


Fig. 1

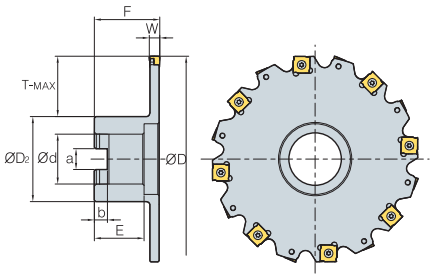


Fig. 2

•AR: -2°
•RR:-12°

(mm)

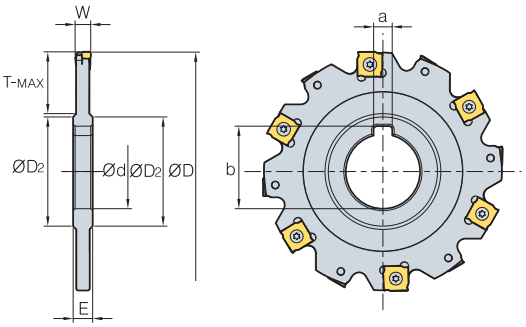
Designation		⚙	ØD	W	T-MAX	ØD2	Ød	a	b	F	E	Insert	Screw	Wrench
WFSBM	080R/L-T04	8	80	4	17	40	22	10.4	6.3	50	21	SNHT11023R/L-WX	PTMA03503	TW09S
	080R/L-T05	8	80	5	17	40	22	10.4	6.3	50	21	SNHT1103R/L-WX	PTMA03504	TW09S
	080R/L-T06	8	80	6	17	40	22	10.4	6.3	50	21	SNHT12035R/L-WX	PTMA04045F	TW15S
WFSB (WFSBM)	100R/L-T04	10	100	4	21	50 (48)	25.4 (27)	9.5 (12.4)	6 (7)	50	25	SNHT11023R/L-WX	PTMA03503	TW09S
	100R/L-T05	10	100	5	21	50 (48)	25.4 (27)	9.5 (12.4)	6 (7)	50	25	SNHT1103R/L-WX	PTMA03504	TW09S
	100R/L-T06	10	100	6	21	50 (48)	25.4 (27)	9.5 (12.4)	6 (7)	50	25	SNHT12035R/L-WX	PTMA04045F	TW15S
	100R/L-T07	10	100	7	21	50 (48)	25.4 (27)	9.5 (12.4)	6 (7)	50	25	SNHT1204R/L-WX	PTMA0405F	TW15S
	100R/L-T08	10	100	8	21	50 (48)	25.4 (27)	9.5 (12.4)	6 (7)	50	25	SNHT12045R/L-WX	PTMA0406F	TW15S
	100R/L-T09	10	100	9	21	50 (48)	25.4 (27)	9.5 (12.4)	6 (7)	50	25	SNHT1205R/L-WX	PTMA0407F	TW15S
	100R/L-T10	10	100	10	21	50 (48)	25.4 (27)	9.5 (12.4)	6 (7)	50	25	SNHT12054R/L-WX	PTMA0408F	TW15S
	125R/L-T04	12	125	4	30	60 (58)	31.75 (32)	12.7 (14.4)	8	50	32 (30)	SNHT11023R/L-WX	PTMA03503	TW09S
	125R/L-T05	12	125	5	30	60 (58)	31.75 (32)	12.7 (14.4)	8	50	32 (30)	SNHT1103R/L-WX	PTMA03504	TW09S
	125R/L-T06	12	125	6	30	60 (58)	31.75 (32)	12.7 (14.4)	8	50	32 (30)	SNHT12035R/L-WX	PTMA04045F	TW15S
	125R/L-T07	12	125	7	30	60 (58)	31.75 (32)	12.7 (14.4)	8	50	32 (30)	SNHT1204R/L-WX	PTMA0405F	TW15S
	125R/L-T08	12	125	8	30	60 (58)	31.75 (32)	12.7 (14.4)	8	50	32 (30)	SNHT12045R/L-WX	PTMA0406F	TW15S
	125R/L-T09	12	125	9	30	60 (58)	31.75 (32)	12.7 (14.4)	8	50	32 (30)	SNHT1205R/L-WX	PTM A0407F	TW15S
	125R/L-T10	12	125	10	30	60 (58)	31.75 (32)	12.7 (14.4)	8	50	32 (30)	SNHT12054R/L-WX	PTMA0408F	TW15S
	160R/L-T04	16	160	4	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT11023R/L-WX	PTMA03503	TW09S
	160R/L-T05	16	160	5	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT1103R/L-WX	PTMA03504	TW09S
	160R/L-T06	16	160	6	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT12035R/L-WX	PTMA04045F	TW15S
	160R/L-T07	16	160	7	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT1204R/L-WX	PTMA0405F	TW15S
	160R/L-T08	16	160	8	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT12045R/L-WX	PTMA0406F	TW15S
	160R/L-T09	16	160	9	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT1205R/L-WX	PTMA0407F	TW15S
	160R/L-T10	16	160	10	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT12054R/L-WX	PTMA0408F	TW15S
	160R/L-T11	16	160	11	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT1206R/L-WX	PTKA0409F	TW15S
	160R/L-T12	16	160	12	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT12065R/L-WX	PTKA0410F	TW15S
	160R/L-T13	16	160	13	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT1207R/L-WX	PTKA0411F	TW15S
	160R/L-T14	16	160	14	43	70	38.1 (40)	15.9 (16.4)	10 (9)	60	38 (32)	SNHT12075R/L-WX	PTKA0412F	TW15S
	200R/L-T06	18	200	6	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12035R/L-WX	PTMA04045F	TW15S
	200R/L-T07	18	200	7	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1204R/L-WX	PTMA0405F	TW15S
	200R/L-T08	18	200	8	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12045R/L-WX	PTMA0406F	TW15S
	200R/L-T09	18	200	9	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1205R/L-WX	PTMA0407F	TW15S
	200R/L-T10	18	200	10	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12054R/L-WX	PTMA0408F	TW15S
	200R/L-T11	18	200	11	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1206R/L-WX	PTKA0409F	TW15S
	200R/L-T12	18	200	12	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12065R/L-WX	PTKA0410F	TW15S
	200R/L-T13	18	200	13	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1207R/L-WX	PTKA0411F	TW15S
	200R/L-T14	18	200	14	53	90	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12075R/L-WX	PTKA0412F	TW15S
	250R/L-T06	20	250	6	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12035R/L-WX	PTMA04045F	TW15S
	250R/L-T07	20	250	7	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1204R/L-WX	PTMA0405F	TW15S
	250R/L-T08	20	250	8	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12045R/L-WX	PTMA0406F	TW15S
	250R/L-T09	20	250	9	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1205R/L-WX	PTMA0407F	TW15S
	250R/L-T10	20	250	10	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12054R/L-WX	PTMA0408F	TW15S
	250R/L-T11	20	250	11	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1206R/L-WX	PTKA0409F	TW15S
	250R/L-T12	20	250	12	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12065R/L-WX	PTKA0410F	TW15S
	250R/L-T13	20	250	13	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT1207R/L-WX	PTKA0411F	TW15S
	250R/L-T14	20	250	14	73 (78)	100 (90)	50.8 (40)	19.1 (16.4)	11 (9)	65	38 (32)	SNHT12075R/L-WX	PTKA0412F	TW15S

Available inserts **E23**

• Ø80: Fig.1 , Ø100~Ø250: Fig.2 ( )Metric size

WFSP(M) (Plane type)





•AR: -2°
•RR:-12°

(mm)

Designation		⊙	ØD	W	T-MAX	ØD2	Ød	a	b	E	Insert	Screw	Wrench
WFSP (WFSBM)	080-T04	8	80	4	20	40	25.4 (27)	6.35 (7)	28 (29.8)	8	SNHT11023R/L-WX	PTMA03503	TW09S
	080-T05	8	80	5	20	40	25.4 (27)	6.35 (7)	28 (29.8)	8	SNHT1103R/L-WX	PTMA03504	TW09S
	080-T06	8	80	6	20	40	25.4 (27)	6.35 (7)	28 (29.8)	8	SNHT12035R/L-WX	PTMA04045F	TW15S
	100-T04	10	100	4	24	47	31.75 (32)	7.92 (8)	35.2 (34.8)	8	SNHT11023R/L-WX	PTMA03503	TW09S
	100-T05	10	100	5	24	47	31.75 (32)	7.92 (8)	35.2 (34.8)	8	SNHT1103R/L-WX	PTMA03504	TW09S
	100-T06	10	100	6	24	47	31.75 (32)	7.92 (8)	35.2 (34.8)	8	SNHT12035R/L-WX	PTMA04045F	TW15S
	100-T07	10	100	7	24	47	31.75 (32)	7.92 (8)	35.2 (34.8)	10	SNHT1204R/L-WX	PTMA0405F	TW15S
	100-T08	10	100	8	24	47	31.75 (32)	7.92 (8)	35.2 (34.8)	10	SNHT12045R/L-WX	PTMA0406F	TW15S
	100-T09	10	100	9	24	47	31.75 (32)	7.92 (8)	35.2 (34.8)	12	SNHT1205R/L-WX	PTMA0407F	TW15S
	100-T10	10	100	10	24	47	31.75 (32)	7.92 (8)	35.2 (34.8)	12	SNHT12054R/L-WX	PTMA0408F	TW15S
	125-T04	12	125	4	32	56	38.1 (40)	9.52 (10)	42.3 (43.5)	8	SNHT11023R/L-WX	PTMA03503	TW09S
	125-T05	12	125	5	32	56	38.1 (40)	9.52 (10)	42.3 (43.5)	8	SNHT1103R/L-WX	PTMA03504	TW09S
	125-T06	12	125	6	32	56	38.1 (40)	9.52 (10)	42.3 (43.5)	8	SNHT12035R/L-WX	PTMA04045F	TW15S
	125-T07	12	125	7	32	56	38.1 (40)	9.52 (10)	42.3 (43.5)	10	SNHT1204R/L-WX	PTMA0405F	TW15S
	125-T08	12	125	8	32	56	38.1 (40)	9.52 (10)	42.3 (43.5)	10	SNHT12045R/L-WX	PTMA0406F	TW15S
	125-T09	12	125	9	32	56	38.1 (40)	9.52 (10)	42.3 (43.5)	12	SNHT1205R/L-WX	PTMA0407F	TW15S
	125-T10	12	125	10	32	56	38.1 (40)	9.52 (10)	42.3 (43.5)	12	SNHT12054R/L-WX	PTMA0408F	TW15S
	160-T04	16	160	4	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	8	SNHT11023R/L-WX	PTMA03503	TW09S
	160-T05	16	160	5	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	8	SNHT1103R/L-WX	PTMA03504	TW09S
	160-T06	16	160	6	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	8	SNHT12035R/L-WX	PTMA04045F	TW15S
	160-T07	16	160	7	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	10	SNHT1204R/L-WX	PTMA0405F	TW15S
	160-T08	16	160	8	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	10	SNHT12045R/L-WX	PTMA0406F	TW15S
	160-T09	16	160	9	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	12	SNHT1205R/L-WX	PTMA0407F	TW15S
	160-T10	16	160	10	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	12	SNHT12054R/L-WX	PTMA0408F	TW15S
	160-T11	16	160	11	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	14	SNHT1206R/L-WX	PTKA0409F	TW15S
	160-T12	16	160	12	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	14	SNHT12065R/L-WX	PTKA0410F	TW15S
	160-T13	16	160	13	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	16	SNHT1207R/L-WX	PTKA0411F	TW15S
	160-T14	16	160	14	45	66	38.1 (40)	9.52 (10)	42.3 (43.5)	16	SNHT12075R/L-WX	PTKA0412F	TW15S
	200-T06	18	200	6	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	8	SNHT12035R/L-WX	PTMA04045F	TW15S
	200-T07	18	200	7	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	10	SNHT1204R/L-WX	PTMA0405F	TW15S
	200-T08	18	200	8	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	10	SNHT12045R/L-WX	PTMA0406F	TW15S
	200-T09	18	200	9	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	12	SNHT1205R/L-WX	PTMA0407F	TW15S
	200-T10	18	200	10	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	12	SNHT12054R/L-WX	PTMA0408F	TW15S
	200-T11	18	200	11	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	14	SNHT1206R/L-WX	PTKA0409F	TW15S
	200-T12	18	200	12	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	14	SNHT12065R/L-WX	PTKA0410F	TW15S
	200-T13	18	200	13	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	16	SNHT1207R/L-WX	PTKA0411F	TW15S
	200-T14	18	200	14	60	70	50.8 (50)	12.7 (12)	55.8 (53.5)	16	SNHT12075R/L-WX	PTKA0412F	TW15S
	250-T06	20	250	6	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	8	SNHT12035R/L-WX	PTMA04045F	TW15S
	250-T07	20	250	7	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	10	SNHT1204R/L-WX	PTMA0405F	TW15S
	250-T08	20	250	8	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	10	SNHT12045R/L-WX	PTMA0406F	TW15S
	250-T09	20	250	9	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	12	SNHT1205R/L-WX	PTMA0407F	TW15S
	250-T10	20	250	10	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	12	SNHT12054R/L-WX	PTMA0408F	TW15S
	250-T11	20	250	11	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	14	SNHT1206R/L-WX	PTKA0409F	TW15S
	250-T12	20	250	12	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	14	SNHT12065R/L-WX	PTKA0410F	TW15S
	250-T13	20	250	13	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	16	SNHT1207R/L-WX	PTKA0411F	TW15S
	250-T14	20	250	14	88	70	50.8 (50)	12.7 (12)	55.8 (53.5)	16	SNHT12075R/L-WX	PTKA0412F	TW15S

( )Metric size Available inserts E23

High feed cutter with extra pitch for cast iron and light alloy steels

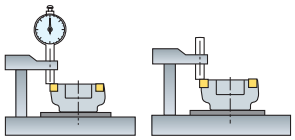
High feed Cutter

- High feed cutter employs extra pitch for cast iron and light alloy steels
- Quick change type for reduction of cutter change time
- Cutting-edge chatter is controlled
- Quick change type for cutter size under ø160, 2piece types for cutter size over ø200

Guide of insert setting

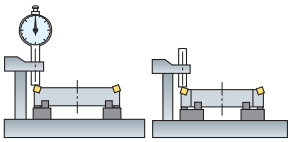
• Special equipment has to be used to get precise run out with high feed cutter.

Adaptor type



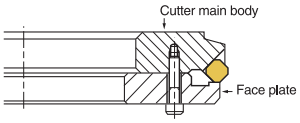
- Mainly under ø160 diameter is used in 1 piece type
- Available for fixed size of cutter and assembling & checking can be done at the same time

Roller type



- Mainly over ø200 diameter is used in 2piece type
- Due to 3 adjustable guide rollers, variety size of cutter can be assembled

Plate type



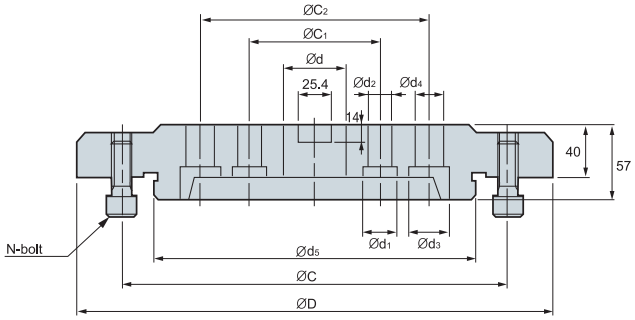
- Suitable for small size cutter due to the simple structure
- It is unnecessary to unclamp the cutter from the machine, it's possible to reassemble the cutter as it mounted on the machine
- You should make plate by yourself

• Guide of insert setting in adaptor/roller type

1. Clean the cutter and equipment
2. Pointer should be assembled with same height with cutter
3. Move to each insert on tip seat to end of pointer and tighten (torque 2N.m) wedge
4. Exchange pointer to dial gauge
5. Measure the run-out totally
6. When a insert over run-out, loosen wedge and adjust run-out. (for roughing 10~20μ, for finishing 5~10μ)
7. Tighten (torque 7-8N.m) wedge
8. Measure the final run-out by dial gauge

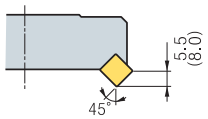
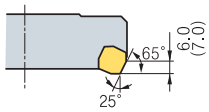
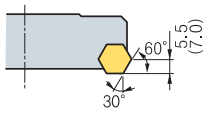
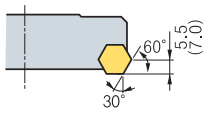
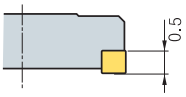
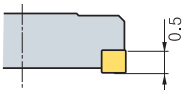
Note: When you clamp wedge too tightly, run-out will get worse due to cutter distortion.
When you clamp the wedge, use torque wrench to set precisely.

Adaptor (Ø200~Ø450)



Designation		ØD	Ød	Ød1	Ød2	Ød3	Ød4	Ød5	ØC	ØC1	ØC2	N	Cutter
APR	200	180	47.625	26	18	-	-	80	120	101.6	-	4	Ø200
	250	230	47.625	26	18	-	-	120	170	101.6	-	4	Ø250
	315	295	47.625	26	18	32	22	180	230	101.6	177.8	6	Ø315
	355	335	63.50	26	18	32	22	220	270	101.6	177.8	6	Ø355
	400	370	63.50	26	18	32	22	250	300	101.6	177.8	8	Ø400
	450	420	63.50	26	18	32	22	300	350	101.6	177.8	8	Ø450

High feed cutters type and features

Designation	Cutter diameter	Workpiece, Application range	Min. surface roughness	Approach angle and Max. cutting depth is for 5000 type	Axial rake angle	Radial rake angle	Available insert
ANH4000 ANH5000	Ø100~Ø450	Cast iron Roughing	25Z		-5°	-6°	SNCN1204ENN SNCN1504ENN
CDH4000 CDH5000	Ø100~Ø450	Cast iron Roughing Finishing	18Z		+10°	+5°	SDCN42R SDCN53R
DEH5000	Ø100~Ø450	Al alloy Roughing	20Z		+14°	+6°	HECN090408FN
DPH5000	Ø100~Ø450	Cast iron Roughing Finishing	12Z		+5°	-3°	HPEN090408 HPEN090408-WC
PNH4000 PNH5000	Ø125~Ø450	Cast iron Finishing	12Z		-5°	-6°	SNEF435 SNEF535
PPH4000	Ø125~Ø450	Cast iron Finishing	12Z		+5°	-5°	SPEN120416-WC

Recommended cutting condition

Workpiece	Cutting condition		Grades	Remark
	vc (m/min)	fz (mm/t)		
Cast iron	100~230	0.05~0.20	**PC6510**	PVD Coated
	80~150	0.05~0.20	**H01, G10**	Uncoated
Al alloy	400	0.10~0.30	**PC6510**	PVD Coated
	400	0.05~0.20	**H01, G10**	Uncoated

Special Korloy cutter for cast iron roughing

Cube Mill

- Special Korloy cutter for cast iron roughing
- 8-corner using insert (maximum 16-corner available with 2 cutter, R/L cutter)
- Excellent cutting performance with positive rake angle made by 3-dimensional chip breaker
- Excellent tool life by a wide combination of grade varieties and chip breakers to match most working conditions
- 2 different type of inserts (chamfer/nose R) are available with 1 type cutter



Roughing for cast iron

Code system

CBM E 3 250 R (2) – 28Z

Cutter	AA	Inscribed circle of Insert	Cutter Dia	Hand	Cutter shape	No. of tooth (Z)
CBM: CUBE MILL	Q: 88° C: 65° F: 85° A: 45° E: 75°	3: 9.525 4: 12.7	Ø250	R: Right L: Left	Unmarked: Normal type 2: Quick change type (2 pieces type)	

• Cube Mill and Cube Mill Couple are available by order made.

Insert (R/L type)

Chamfer type	Nose R type





Cutter body

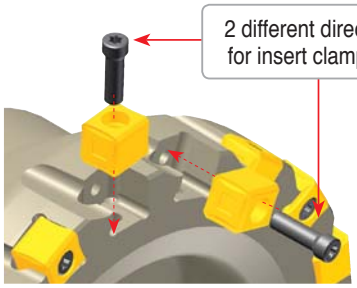
Cutter diameter (Ø)	General	Quick change
	Ø80~315 mm	Ø200~450 mm
	3 1/4~12 1/2 Inch	8~18 Inch
AA: 88°, 85°, 75°, 65°, 45°		

Cutter



Special design to make actual positive rake angle

Simple screw on system



2 different direction for insert clamping

Screw on clamping system

Parts

Cube Mill 3000	Screw	Wrench
	FTGA0417CBM	TW15-100
	ETGA0520CBM	TW20-100

Ideal combination of aluminum body with cast iron high feed cutter

Couple Mill

- Ideal combination of Aluminum body with cast iron high feed cutter
- Since the weight of the cutter has been reduced 50% vs. a steel cutter, it is very easy to handle and very effective in preventing loading accidents
- Applicable for Cube Mill, Storm Mill

Cube-couple code system

CBM E 3 355 R 28Z – CP

Cutter	AA	Inscribed circle of Insert	Cutter Dia	Hand	No. of tooth (Z)	Couple Mill
CBM: Cube MIII	Q: 88° C: 65° F: 85° A: 45° E: 75°	3: 9.525 4: 12.7	Ø355	R: Right L: Left	28Z: 28	

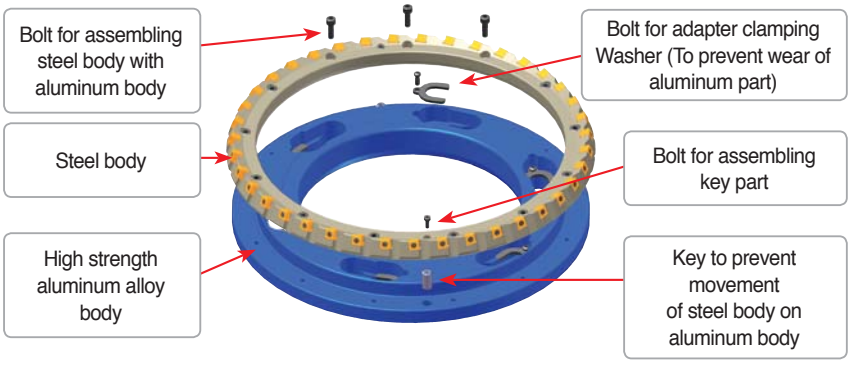
• Cube Mill and Cube Mill Couple are available by order made.

Storm-couple code system

S Q N 3 355 R 28Z – CP

Cutter	AA	Relief angle of insert	Inscribed circle of Insert	Cutter Dia	Hand	No. of tooth (Z)	Couple Mill
S: Storm Mill	Q: 88° E: 75° F: 85° A: 45°	N: Negative (0°)	3: 9.525 4: 12.7	Ø355	R: Right L: Left	28Z: 28	

Assembling structure



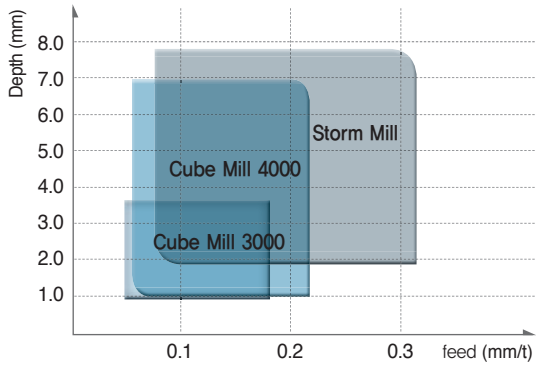
Cutter body

Cutter diameter (Ø)	Quick change	
	Metric	Ø355~450 mm
	Inch	14 1/4~18 Inch

Parts

			 Screw	 Wrench	 Wrench	 Bolt for body	 Bolt for key	 Key for body
Cube-Couple	3000 type	FTGA0417CBM	TW15-100	-		BHA0616	MHBO410	PN1019-DRV
	4000 type	ETGA0520CBM	TW20-100			BHA0620		
Storm-Couple	3000 type	FTNA0513	-	TW15S		-	-	-

Application range of high feed cutters for cast iron



Recommended cutting condition

Cube Mill		Gray cast iron		Ductile cast iron	
		vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
PVD	PC6510	150~300	0.08~0.18	100~200	0.08~0.18
Uncoated	G10	90~120	0.05~0.18	60~130	0.05~0.18

Available arbors and adaptors

Designation		Available arbors and adaptors		
		Arbors	General arbor	Adaptor
CBMQ (CBMF)	3080R/L-00Z	BT□□-FMA25.4-□□	NT*□□(M/U)-FMA25.4-25	
	3100R/L-00Z	BT□□-FMA31.75-□□	NT*□□(M/U)-FMA31.75-□□	
(CBME)	3125R/L-00Z	BT□□-FMA38.1-□□	NT*□□(M/U)-FMA38.1-□□	
	3160R/L-00Z	BT□□-FMA50.8-□□	NT*□□(M/U)-FMA50.8-□□	
(CBMC)	3200R/L-00Z	BT□□-FMA47.625-□□	NT*□□(M/U)-FMA47.625-25, KCP-8***	
	3250R/L-00Z	BT□□-FMA47.625-□□	KNT*□□(M/U)-FMA47.625-25, KCP-8***	
(CBMA)	3315R/L-00Z		KCP-8*** (Centering Plug)	
	3200R/L2-00Z			APR200
	3250R/L2-00Z			APR250
	3315R/L2-00Z			APR315
	3355R/L2-00Z			APR355
	3400R/L2-00Z			APR400
	3450R/L2-00Z			APR450
SQN (SFN)	3080R/L-00Z	BT□□-FMA25.4-□□	NT*□□(M/U)-FMA25.4-25	
	3100R/L-00Z	BT□□-FMA31.75-□□	NT*□□(M/U)-FMA31.75-□□	
(SEN)	3125R/L-00Z	BT□□-FMA38.1-□□	NT*□□(M/U)-FMA38.1-□□	
	3160R/L-00Z	BT□□-FMA50.8-□□	NT*□□(M/U)-FMA50.8-□□	
(SAN)	3200R/L-00Z	BT□□-FMA47.625-□□	NT*□□(M/U)-FMA47.625-25, KCP-8***	
	3250R/L-00Z	BT□□-FMA47.625-□□	NT*□□(M/U)-FMA47.625-25, KCP-8***	
	3315R/L-00Z		KCP-8*** (Centering Plug)	
	3200R/L2-00Z			APR200
	3250R/L2-00Z			APR250
	3315R/L2-00Z			APR315
	3355R/L2-00Z			APR355
	3400R/L2-00Z			APR400
	3450R/L2-00Z			APR450

• *□□-NT number / ** □□-BT number / ***Milling over 5
(Arbors made)
ex) BT** □□

Excellent tool life achieved by the wide variety of grades to match work conditions

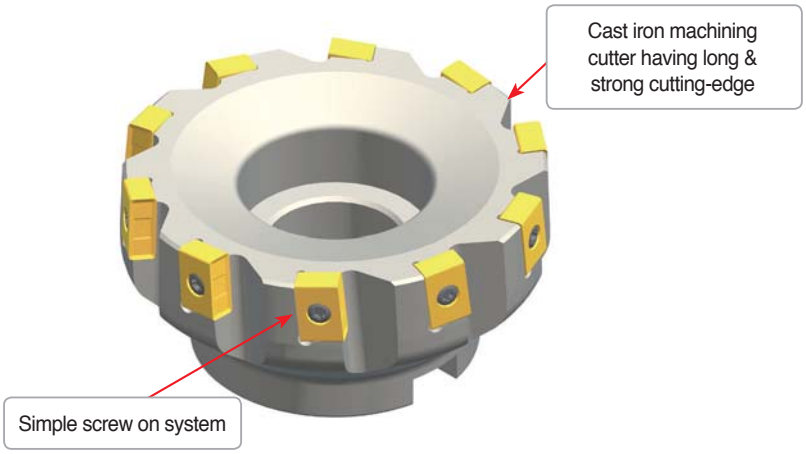
Storm Mill

- Conventional cutter with wide coverage
- Using 4 corners (Maximum 8 corner available with R/L type cutter)
- Effective on large depth of cut applications due to the long cutting-edge
- Excellent tool life guaranteed by wide variety of grades to suit any working conditions
- 2 different types of inserts (chamfer/nose R) are available with 1 type of cutter

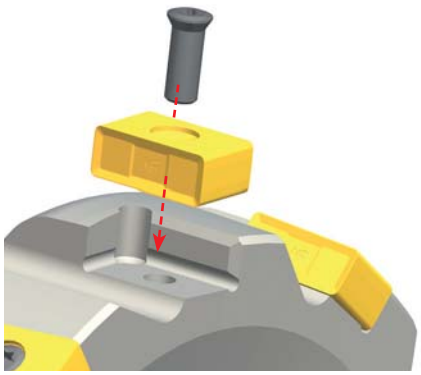
Code system

S	Q	N	3	250	R	(2) – 28Z
Cutter	**Approach angle**	**Relief angle of insert**	**Insert**	**Cutter Dia.**	**Hand**	**Cutter shape** / **No. of tooth**
S: Storm Mill	Q: 88˚ F: 85˚ A: 45˚ E: 75˚	N: Negative (0˚)	3: 9.525 mm 4: 12.7 mm	MM	R: Right L: Left	No code: Normal type 2: Quick change type (2 pieces type)

Features



Clamping of insert



Recommended cutting condition

Designation / Grades	Gray cast iron		Ductile cast iron	
	GC		GCD	
	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)
PC3500	150~250	0.08~0.28	100~180	0.08~0.28
PC6510	150~300	0.10~0.28	100~200	0.10~0.28
PC5400	150~250	0.08~0.22	100~180	0.08~0.22
H01	100~200	0.08~0.22	70~140	0.08~0.22
G10	90~120	0.08~0.28	60~130	0.08~0.28

Optimal cutter for steel and cast iron machining with easily adjustable run-out

Shave Mill

- Adjustable Range (Adjustable range: 0.1 mm, Adjustable allowance: within 2 ㎛)
- Wiper crown type 8-cornered insert reduces machining cost and realizes excellent surface roughness
- Grades with high toughness and wear resistance ensures long tool life
- The cBN grade achieves superior surface finish

Cutter code system

SVM	M	4	250	R	Z6
Shave Mill	Metric type M: Metric A: Inch	Inscribed Circle 4: 12.7mm	Cutter Dia. (Ø) Ø250	Hand of tool R: Right handed L: Left handed	No. of tooth (Z)

Insert code system

■ Carbide

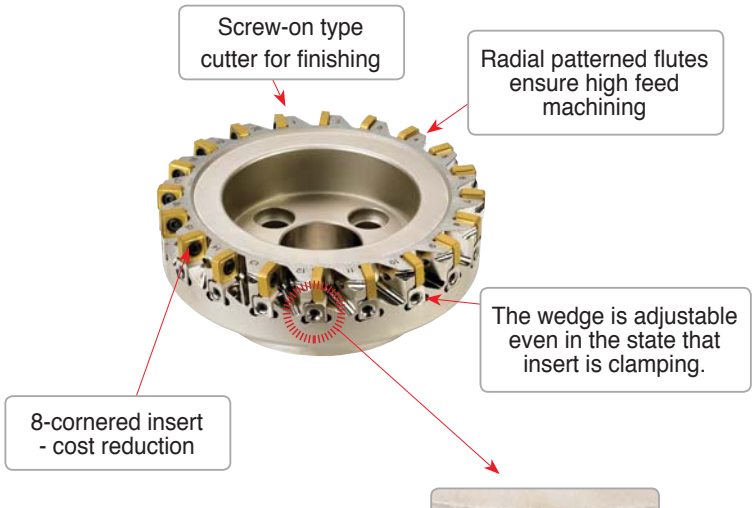
Nose R type	SNEU120420-MF
Chamfer type	SNEU1204ANN-MF
Low cutting type	SNEU1204-WMF

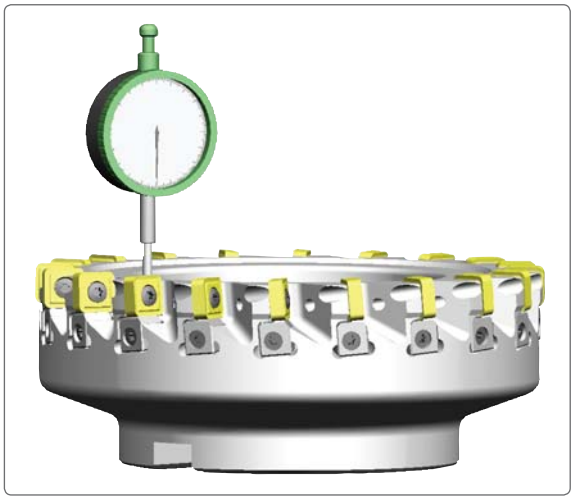
■ cBN

SNEU1204-TBW

T: Nagaland
B: cBN
W: Wiper

Features





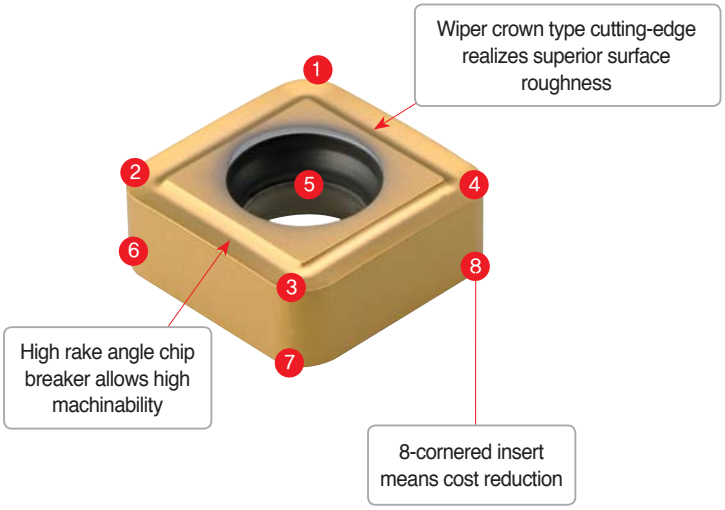


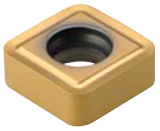
3-face constrained clamping

Adjustment

- Adjustable range: 0.1 mm
- Adjustability: below 2μ
- Operation: easy and simple

Features of insert



SNEU120420-MF	SNEU1204ANN-MF
	
Nose R type	Chamfer type
SNEU1204-WMF	**SNEU1204-TBW**
	
For low cutting load	Wiper for high speed machining

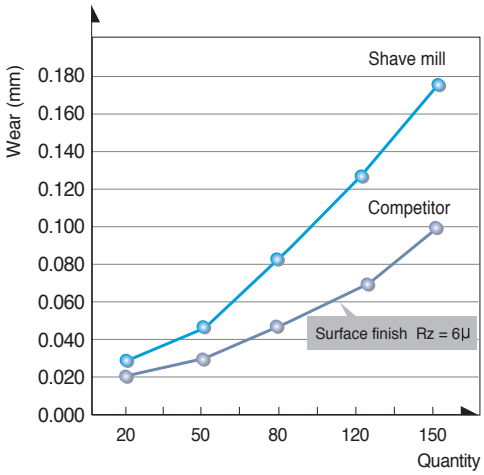
Recommended cutting condition

Workpiece	Cutting condition			Grades
	vc (m/min)	fz (mm/t)	ap (mm)	
P	160~270	0.05~0.2	~0.5	PC3500
K	140~230 600~1000	0.05~0.3 0.05~0.2	~0.5 ~0.5	PC6510 DBN920

Application example

- **Work piece** Cylinder head (facing)
- **Cutting conditions** vc = 200, fz = 0.15, ap = 0.5, Dry
- **Tools** **Cutter** SVMM4250R
  Insert PC6510 SNEU120420-MF

- **Work piece** FC25 (HB250) Cylinder head (facing)
- **Cutting conditions** vc = 700, fz = 0.1, ap = 0.5, Dry
- **Tools** **Cutter** SVMM4160R
  Insert DBN920 SNEU1204-cBN



• Results

	Tool life	Surface finish	Machinability
Shave Mill	250 pcs	Rz = 3μ	High
Competitor	180 pcs	Rz = 3.5μ	Normal

• Korloy's shave mills ensure twice the machinability, adjustability, and surface roughness than competitor's, along with twice the tool life.

Better tool life with special grade which has both toughness and wear resistance

Shave Mill-Ultra

- Superior surface roughness for this Finishing cutter when applied to heavy work pieces
- Easy to handle and good rigidity with simple screw on system
- Superior surface finishes due to the wiper crown cutting-edge
- Better tool life with special grade which has both toughness and wear resistance
- Two different types: economical normal type and adjustable run-out type 'B'

Code system of cutter

SVU	M	6	250	R	Z6	– B
Shave Mill-Ultra	Metric type	Inscribed Circle	Cutter Dia. (Ø)	Hand of tool	No. of tooth (Z)	Cutter type
	M: Metric A: Inch	6: 19.05mm	Ø250	R: Right L: Left		None: Normal B: Adjustable

Code System of Insert

L	N	C	S	1	9	0	7	– R3.0	– WC
			Shave Mill-Ultra					Corner type	Wiper Crown
								C: Chamfer R: Round	

Features

Normal type



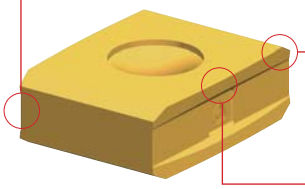
Good rigidity and economical due to simple screw on type

Better surface roughness when you use only 1 insert but adjust the 'ap' under 0.03 mm

Adjustable cutting-edge (Type B)



Easy to handle the run-out due to Korloy exclusive high toughness cutting-edge special parts



Good cutting performance & chip flow due to positive rake angle chip breaker

Economical 4 corner insert

Good surface roughness by wiper crown cutting-edge design

Adjustable Range	· Range: 1.0 mm · Allowance: Within 2μ

Recommended cutting condition

Workpiece	Cutting condition			Tooth	Grades
	vc (m/min)	fz (mm/t)	ap (mm)		
P	160~270	0.05~0.20	~0.50	Full use	PC3500
	160~270	2~5	~0.03	1 use	
K	140~230	0.05~0.20	~0.50	Full use	PC6510
	140~230	2~5	~0.03	1 use	

PNH4000/5000



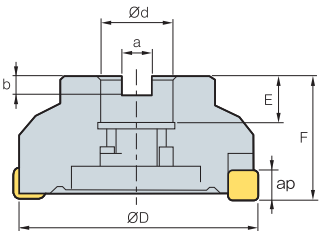


Fig. 1

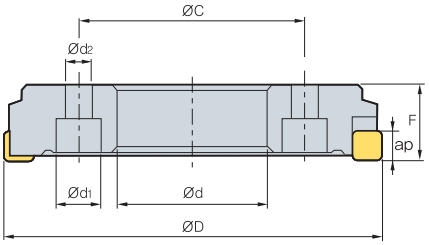


Fig. 2



AA
90°

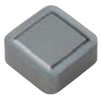
- AR: -5°
- RR: -6°

(mm)

Designation			ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	kg	Fig.
PNH	4125R/L	10	125	38.1	-	-	15.9	10	27	63	-	Max 0.5	3.4	1
	4160R/L	14	160	50.8	-	-	19.0	11	27	63	-	Max 0.5	5.5	1
	4200R/L	18	200	80	24	14	-	-	-	40	120	Max 0.5	5.5	2
	4250R/L	24	250	120	30	18	-	-	-	40	170	Max 0.5	7.7	2
	4315R/L	30	315	180	30	18	-	-	-	40	230	Max 0.5	10.5	2
	4355R/L	34	355	220	30	18	-	-	-	40	270	Max 0.5	12.9	2
	4400R/L	38	400	250	30	18	-	-	-	40	300	Max 0.5	16.1	2
	4450R/L	44	450	300	30	18	-	-	-	40	350	Max 0.5	19.1	2
PNH	5125R/L	10	125	38.1	-	-	15.9	10	27	63	-	Max 0.5	3.4	1
	5160R/L	14	160	50.8	-	-	19.0	11	27	63	-	Max 0.5	5.3	1
	5200R/L	18	200	80	24	14	-	-	-	40	120	Max 0.5	5.4	2
	5250R/L	24	250	120	30	18	-	-	-	40	170	Max 0.5	7.6	2
	5315R/L	30	315	180	30	18	-	-	-	40	230	Max 0.5	10.4	2
	5355R/L	34	355	220	30	18	-	-	-	40	270	Max 0.5	12.8	2
	5400R/L	38	400	250	30	18	-	-	-	40	300	Max 0.5	15.9	2
	5450R/L	44	450	300	30	18	-	-	-	40	350	Max 0.5	18.9	2

Available inserts

SNEF



Designation		Cermet		Coated									Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	PC2505	PC2510	PC3500	PC3600	PC3530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SNEF	435																	E21

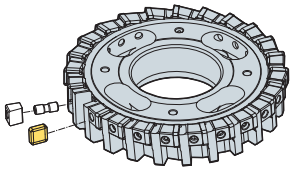
Available arbors

Designation		NC arbors	
PNH	125R/L	NT*□□(M/U)-FMA38.1-□□	-
	160R/L	NT*□□(M/U)-FMA50.8-□□	-
	200R/L	-	APR200
	250R/L	-	APR250
	315R/L	-	APR315
	355R/L	-	APR355
	400R/L	-	APR400
	450R/L	-	APR450

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
K	140~230	0.05~0.30	PC6510
	135~220	0.10~0.30	H01
	50~90	0.10~0.30	G10

Assembling



Parts

Specification	Wedge	Wedge screw	Wrench
Ø125~Ø450	WPNH4N	DHA0821F	HW40
Ø125~Ø450	WPNH5N		

Available inserts E21 Available arbors and bolt E371~E373

PPH4000



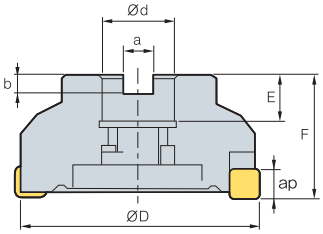


Fig. 1

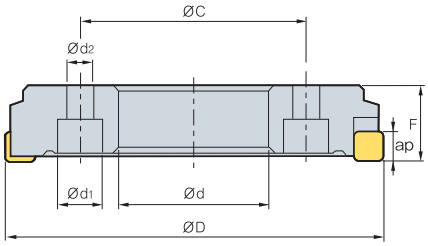


Fig. 2



AA
90°

- AR: 5°
- RR: -6°

(mm)

Designation		⌀	ØD	Ød	Ød1	Ød2	a	b	E	F	ØC	ap	kg	Fig.
PPH	4125R/L	10	125	38.1	-	-	15.9	10	27	63	-	Max 0.5	3.4	1
	4160R/L	14	160	50.8	-	-	19.0	11	27	63	-	Max 0.5	5.3	1
	4200R/L	18	200	80	24	14	-	-	-	40	120	Max 0.5	5.5	2
	4250R/L	24	250	120	24	14	-	-	-	40	170	Max 0.5	7.7	2
	4315R/L	30	315	180	30	18	-	-	-	40	230	Max 0.5	10.5	2
	4355R/L	34	355	220	30	18	-	-	-	40	270	Max 0.5	13	2
	4400R/L	38	400	250	30	18	-	-	-	40	300	Max 0.5	16	2
	4450R/L	44	450	300	30	18	-	-	-	40	350	Max 0.5	19	2

Available inserts

SPEN-WC



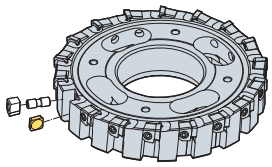
Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NCM325	NCM335	NC5330	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
SPEN	120416-WC																	E24

Available arbors

Designation		NC arbors	
PPH	4125R/L	NT*□□(M/U)-FMA38.1-□□	-
	4160R/L	NT*□□(M/U)-FMA50.8-□□	-
	4200R/L	-	APR200
	4250R/L	-	APR250
	4315R/L	-	APR315
	4355R/L	-	APR355
	4400R/L	-	APR400
	4450R/L	-	APR450

Recommended cutting condition

Workpiece	Cutting condition		Grades
	vc (m/min)	fz (mm/t)	
K	140~230	0.05~0.30	PC6510
	135~220	0.10~0.30	H01
	50~90	0.10~0.30	G10

Assembling	

Parts

Specification	Wedge	Wedge screw	Wrench
Ø125~Ø450	WPPH4R/L	DHA0821F	HW40

Available inserts E24 Available arbors and bolt E371~E373

SVM(M)4000



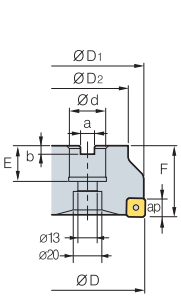


Fig. 1

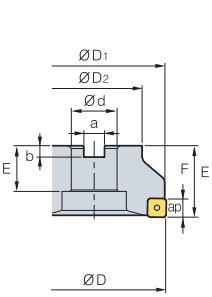


Fig. 2

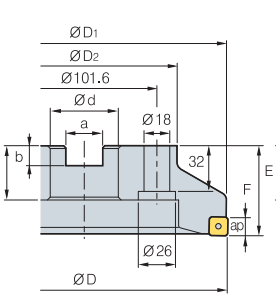


Fig. 3

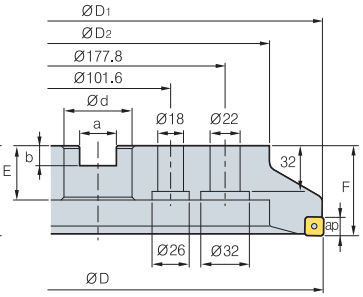


Fig. 4

(mm)

Designation		⌾	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
SVM	4080R/L-Z8	8	80	79	57	25.4	12.4	6	25	50	1.0	1.2	1
	4100R/L-Z12	12	100	99	67	31.75	14.4	8	32	63	1.0	2.3	1
	4125R/L-Z16	16	125	124	87	38.1	16.4	10	38	63	1.0	3.5	2
	4160R/L-Z20	20	160	159	107	50.8	16.4	11	38	63	1.0	5	2
	4200R/L-Z24	24	200	199	130	47.625	25.7	14	38	63	1.0	7.2	3
	4250R/L-Z30	30	250	249	180	47.625	25.7	14	38	63	1.0	12	3
	4315R/L-Z36	36	315	314	240	47.625	25.7	14	38	63	1.0	19.5	4
SVMM	4080R/L-Z8	8	80	79	57	27	12.4	7	22	50	1.0	1.2	1
	4100R/L-Z12	12	100	99	67	32	14.4	8	28	63	1.0	2.3	1
	4125R/L-Z16	16	125	124	87	40	16.4	9	30	63	1.0	3.5	2
	4160R/L-Z20	20	160	159	107	40	16.4	9	30	63	1.0	5	3
	4200R/L-Z24	24	200	199	130	60	25.7	14	38	63	1.0	7.2	3
	4250R/L-Z30	30	250	249	180	60	25.7	14	38	63	1.0	12	3
	4315R/L-Z36	36	315	314	240	60	25.7	14	38	63	1.0	19.5	4

Available inserts

	SNEU-MF	SNEU1204ANN-MF	SNEU-WMF	SNEU-TBW
				

Designation		Cermet		Coated											Uncoated		page
		CN2000	CN30	NCM325	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	H01	
SNEU	120420-MF												●					E21 E22
	1204ANN-MF																	
	1204R-WMF																	
	1204-TBW																	

Parts

Specification	Wedge	Wedge screw	Contract Screw	Wrench
Ø80~Ø315	WKAJ3	DTA0619	XTKA0412	TW15-100

Available inserts E21, E22

SVUM6000



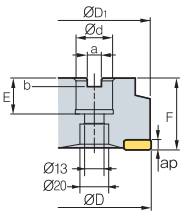


Fig. 1

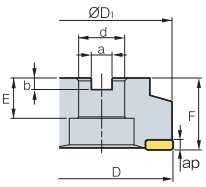


Fig. 2

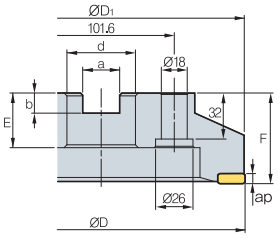


Fig. 3

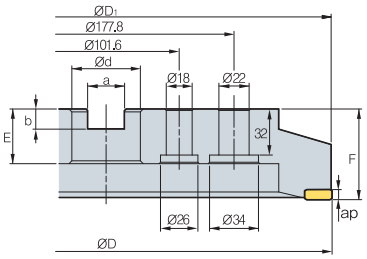


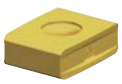
Fig. 4

(mm)

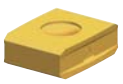
Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
SVUM	6080R/L-Z4	4	80	79	57	27	12.4	7	22	50	0.5	1.2	1
	6100R/L-Z4	4	100	100	67	32	14.4	8	28	63	0.5	2.3	1
	6125R/L-Z4	4	125	125	87	40	16.4	9	30	63	0.5	3.5	2
	6160R/L-Z4	4	160	160	107	40	16.4	9	30	63	0.5	5	3
	6200R/L-Z6	6	200	200	130	60	25.7	14	38	63	0.5	7.2	3
	6250R/L-Z6	6	250	250	180	60	25.7	14	38	63	0.5	12	3
	6315R/L-Z8	8	315	315	240	60	25.7	14	38	63	0.5	19.5	4

Available inserts

LNCS (R3.0)



LNCS (C1.5)



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNCS	1907-R3.0-WC																	E10
	1907-C1.5-WC																	

Parts

Specification	Screw	Wrench
Ø80~Ø315	FTNA0513	TW20-100

Available inserts E10

SVUM6000-B



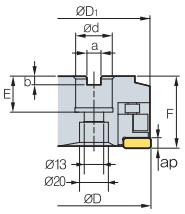


Fig. 1

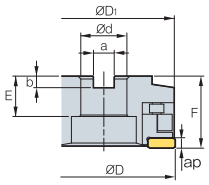


Fig. 2

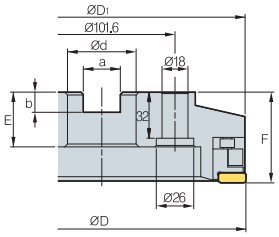


Fig. 3

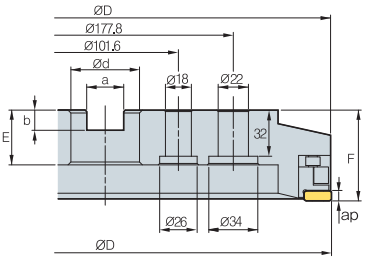


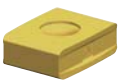
Fig. 4

(mm)

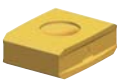
Designation			ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
SVUM	6080R/L-Z4-B	4	80	79	57	27	12.4	7	22	50	0.5	1.2	1
	6100R/L-Z4-B	4	100	99	67	32	14.4	8	28	63	0.5	2.3	1
	6125R/L-Z4-B	4	125	124	87	40	16.4	9	30	63	0.5	3.5	2
	6160R/L-Z4-B	4	160	160	107	40	16.4	9	30	63	0.5	5	3
	6200R/L-Z6-B	6	200	200	130	60	25.7	14	38	63	0.5	7.2	3
	6250R/L-Z6-B	6	250	250	180	60	25.7	14	38	63	0.5	12	3
	6315R/L-Z8-B	8	315	315	240	60	25.7	14	38	63	0.5	19.5	4

Available inserts

LNCS (R3.0)



LNCS (C1.5)



Designation		Cermet		Coated										Uncoated			page
		CN2000	CN30	NC5330	NC5340	NC5350	PC2505	PC2510	PC3500	PC3600	PC9530	PC6510	PC5300	PC5400	ST30A	G10	H01	
LNCS	1907-R3.0-WC																	E10
	1907-C1.5-WC																	

Parts

Specification	Locator	Wedge	Wedge screw	Adjust Screw	Contract Screw	Wrench
Ø80~Ø315	LSH4R	WSH4	DHA0724F	AZ0619F-D	FTNA0512	TW20-100

Available inserts E10

Inch

Actual designations of milling cutter

Fig. 1

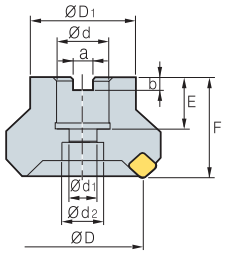


Fig. 2

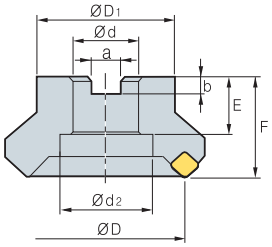


Fig. 3

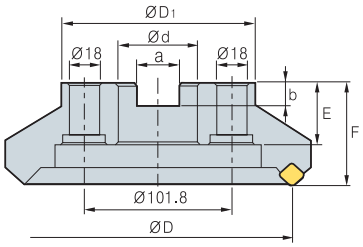
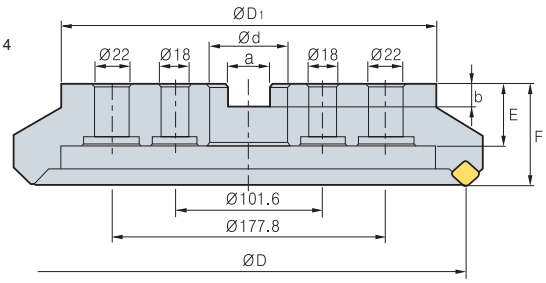


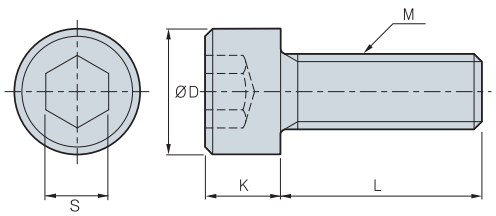
Fig. 4



Inch type

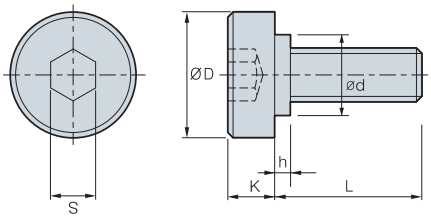
Dimensions (mm)									Fig.	Available arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2		
40	16	8.4	5.6	18	40	34	9	14	1	FMC16, SMA16
50	22	10.4	6.3	20	40	42	11	18	1	FMC22
63	22	10.4	6.3	20	40	49	11	18	1	FMC22
80	25.4	9.5	6	25	50	57	14	20	1	FMA25.4
100	31.75	12.7	8	32	50	67	-	45	2	FMA31.75, SMB31.75
125	38.1	15.9	10	38	63	87	-	56	2	FMA38.1
160	50.8	19	11	38	63	107	-	-	2	FMA50.8
200	47.625	25.4	14	38	63	130	-	-	3	FMA47.625
250	47.625	25.4	14	38	63	180	-	-	3	FMA47.625
315	47.625	25.4	14	38	63	240	-	-	4	-

Wrench bolt



Designation	ØD	S	K	L	M	Cutter size
SB0825	13	6	8	25	M08×1.25	Ø40
SB1025	16	8	10	25	M10×1.50	Ø50, Ø63
SB1035	16	8	10	35	M10×1.50	Ø50, Ø63 (HRM)
SB1230	18	10	12	30	M12×1.75	Ø80
SB1630	24	14	16	30	M16×2.0	Ø100
SB1645	24	14	16	45	M16×2.0	Ø80, Ø100 (HRM)
SB2040	30	17	20	40	M20×2.5	Ø125

Clamp bolt



Designation	Dimensions (mm)						Cutter size
	D	L	K	S	h	d	
M8×1.25	20	20	7	6	-	-	Ø40
M10×1.5	28	24	9	8	-	-	Ø50, Ø63
M12×1.75	33	28	10	10	2	23	Ø80
M16×2	40	32	10	14	5	23	Ø100
M20×2.5	50	40	14	17	5	27	Ø125
M24×3	64	46	14	19	9	37	Ø160

Metric - ISO6462, DIN138

Clamping part of milling cutter

Fig. 1

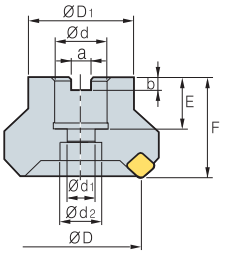


Fig. 2

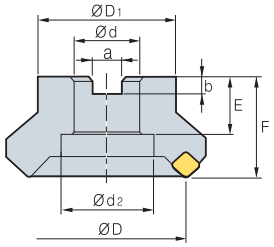


Fig. 3

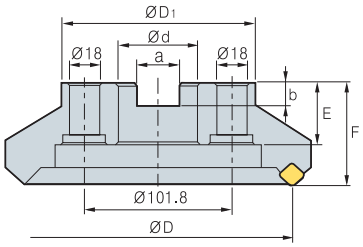
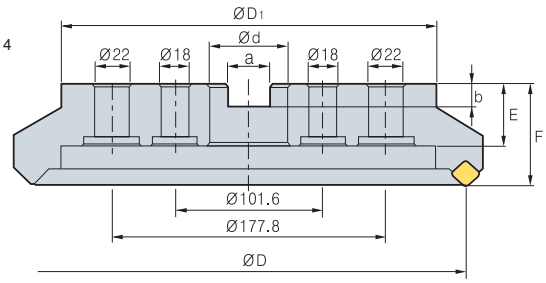


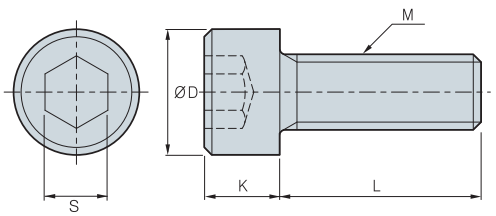
Fig. 4



Metric type

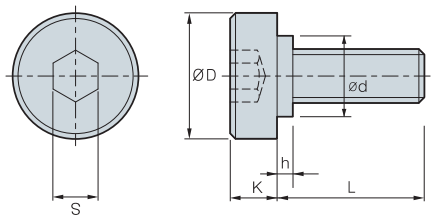
Dimensions (mm)									Fig.	Available arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2		
40	16	8.4	5.6	18	40	34	9	14	1	FMC16, SMA16
50	22	10.4	6.3	20	40	42	11	18	1	FMC22
63	22	10.4	6.3	20	40	49	11	18	1	FMC22
80	27	12.4	7	22	50	57	14	20	1	FMC27
100	32	14.4	8	28	50	67	-	45	2	FMC32
125	40	16.4	9	32	63	87	-	56	2	FMB40
160	40	16.4	9	32	63	107	-	-	2	FMB40
200	60	25.7	14	38	63	130	-	-	3	FMB60
250	60	25.7	14	38	63	180	-	-	3	FMB60
315	60	25.7	14	38	63	240	-	-	4	-

Wrench bolt



Designation	ØD	S	K	L	M	Cutter size
SB0825	13	6	8	25	M08×1.25	Ø40
SB1025	16	8	10	25	M10×1.50	Ø50, Ø63
SB1035	16	8	10	35	M10×1.50	Ø50, Ø63 (HRM)
SB1230	18	10	12	30	M12×1.75	Ø80
SB1245	18	10	12	45	M12×1.75	Ø80 (HRM)
SB1630	24	14	16	30	M16×2.0	Ø100
SB1645	24	14	16	45	M16×2.0	Ø100 (HRM)
SB2040	30	17	20	40	M20×2.5	Ø125

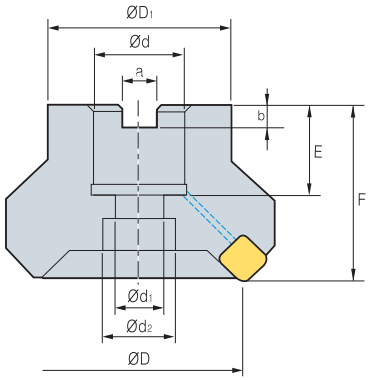
Clamp bolt



Specifications	Dimensions (mm)						Cutter size
	D	L	K	S	h	d	
M12×1.75	33	28	10	10	2	23	Ø80
M16×2	40	32	10	14	5	23	Ø100
M20×2.5	50	40	14	17	5	27	Ø125, Ø160

Clamping part of milling cutter (Oil-hole)

Clamping part of milling cutter



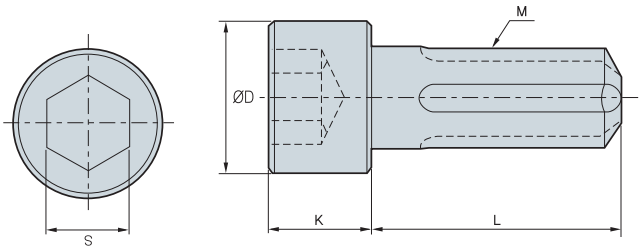
Inch type

Dimensions (mm)									Available arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2	
40	16	8.4	5.6	19	40	34	9	14	FMC16, SMA16
50	22	10.4	6.3	21	40	42	11	18	FMC22
63	22	10.4	6.3	21	40	49	11	18	FMC22
80	25.4	9.5	6	24	50	57	14	20	FMA25.4, FMB25.4
100	31.75	12.7	8	32	63	67	18	26	FMA31.75, SMB31.75
125	38.1	15.9	10	35	63	87	22	32	FMA38.1, FMB38.1, FMC38.1

Metric type

Dimensions (mm)									Available arbors
ØD	Ød	a	b	E	F	ØD1	Ød1	Ød2	
40	16	8.4	5.6	19	40	34	9	14	FMC16, SMA16
50	22	10.4	6.3	21	40	42	11	18	FMC22
63	22	10.4	6.3	21	40	49	11	18	FMC22
80	27	12.4	7.0	23	50	57	14	20	FMC27
100	32	14.4	8.0	25	50	67	18	26	FMC32
125	40	16.4	9.0	29	63	87	22	32	FMB40/FMC40

Wrench bolt



Designation	ØD	S	K	L	M	Cutter size
CB0825	13	6	8	25	M08×1.25	Ø40
CB1025	16	8	10	25	M10×1.50	Ø50, Ø63
CB1035	16	8	10	35	M10×1.50	Ø50, Ø63 (HRM)
CB1230	18	10	12	30	M12×1.75	Ø80
CB1245	18	10	12	45	M12×1.75	Ø80 (HRM)
CB1630	24	14	16	30	M16×2.0	Ø100
CB1645	24	14	16	45	M16×2.0	Ø100 (HRM)
CB2040	30	17	20	40	M20×2.5	Ø125

Gear cutter applicable example

Applicable example-external tooth gear

Finishing: M20



- **Cutter Dia**: Ø400
- **Tooth No**: 20 tooth
- **External tooth gear**: Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chamfer while milling



M20XZ130-EX

Semi-finishing



- **Cutter Dia**: Ø280
- **Tooth No**: 48 tooth
- Designed for processing of external gear involute curve line shape
- Possible to work for gear root portion R with optimal insert R design



M20-M22-ROU

Roughing



- **Cutter Dia**: Ø300
- **Tooth No**: 60 tooth
- High feed rate with low cutting resistance due to V shape insert setting design



LNE333-02-1



LNE434-02-1



KEL1906-C0.6-MF

Applicable example-internal tooth gear

Finishing: M16



- **Cutter Dia**: Ø400
- **Tooth No**: 20 tooth
- **Internal tooth gear**: Formal cutter for gear processing which can be expected to KS 4 level accuracy
- Cutter can simultaneously chamfer while milling



M16XZ130

Semi-finishing



- **Cutter Dia**: Ø280
- **Tooth No**: 48 tooth
- The semi-finishing cutter was designed for processing of external gear involute curb line shape



M16-M18-ROU

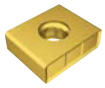


LNE433-R60

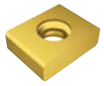
Roughing



- **Cutter Dia**: Ø560
- **Tooth No**: 40 tooth
- Possible to use for gear processing of all module due to step type of insert setting design



KEL1906-C0.6-MF

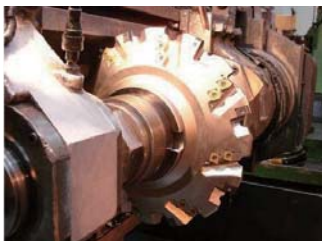


LNE434-02-1

Gear cutter machining example

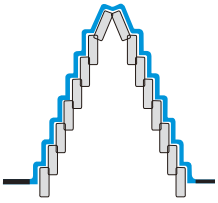
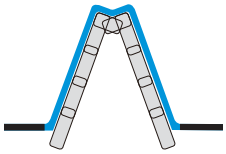
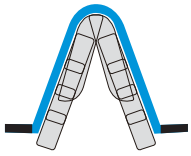
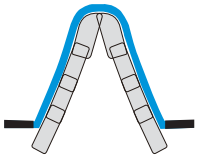
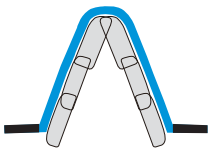
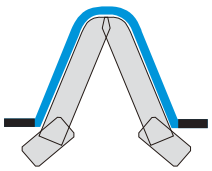
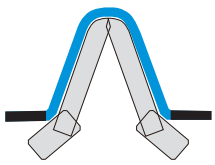
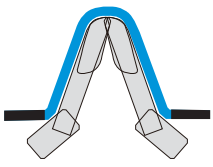


- **Machine**
  Gleason-PFAUTER CNC Hobbing Machine (Power: 52kW)
- **Cutting condition**
  vc = 119.98 m/min (n = 86.8 rpm)
  fz = 0.518 mm/t (vf = 450 mm/min)
  ae = 36 mm
  Dry
- **Tools**
  M16-PT-RACK-KOR03 (Ø440xW90)
- **Semi-finishing cutter (low cut, low resistance)**





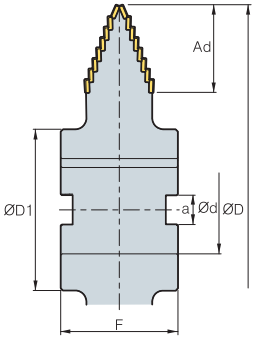
- **Machine**
  KARATS (30kw)
- **Cutting condition**
  vc = 150 m/min, n = 119 rpm
  fz = 0.09 mm/t, vf = 81.6 mm/min
  ae = 45 mm
  Dry
- **Tools**
  M24 Semi-finishing External type
  Applicable Insert
  M40-ROU (Main),
  CPE424-01 (Flank)

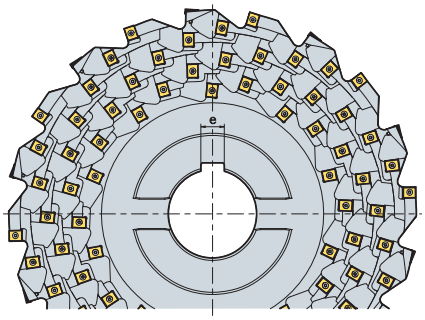
Type	Cutter shape	Cutting-edge shape	Type	Figure
Roughing			Step type	• Working for big sized gear tooth • Low cutting resistance with step type insert setting
			V shape type	• Low cutting resistance with V shape cutting insert setting • Optimal cutting-edge line setting according to Rach type & cutting-edge shape
Semi-finishing			Low cutting resistance type	• 4-Corner insert on Root portion • 3D chip breaker shape on flank • Optimal cutting-edge line setting for low cutting resistance
			External gear high rigidity type	• Optimal R type insert setting on Root portion • Superior Semi-finishing cutting with high rigidity shape of cutter & insert
			Internal gear high rigidity type	• Exclusive semi-finishing Internal Gear insert • Optimal cutting-edge line setting with Internal tooth shape
Finishing			External gear	• Concave shape of cutting-edge line according to external gear type • Optimal cutting insert setting design according to a customer conditions
			Internal gear	• 2-corner insert setting on right & left side and chamfering insert setting • Adjustable chamfering cartridge use for chamfering control
			2STEP type	• Exclusive insert for machining the root part • 4-cornered insert

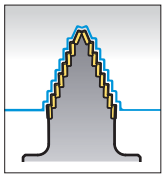
• Optimal cutting insert setting design according to customer condition

Gear Roughing Cutter (Step type)







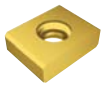
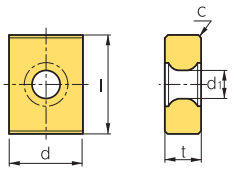


(mm)

m	⊚	ØD	Ad	Ød	ØD1	a	e	F
30	96	450	90	100	180	25	14	140
	108	500	90	100	180	25	14	140
	120	560	90	120	220	40	32	160
40	112	450	105	100	180	25	14	140
	126	500	105	100	180	25	14	140
	140	560	105	120	220	40	32	160
50	160	560	119	120	220	40	32	160

Available inserts

(mm)

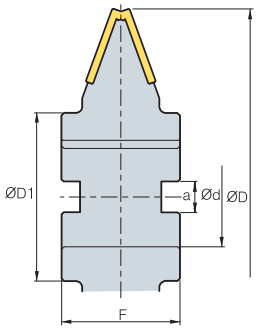
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	c	
 Reinforced cutting-edge	LNE	434-02-1			○	◎			19.05	14.29	6.35	5.4	0.6	
 Low cutting resistance	KEL	1906-C0.6-MF			○	◎			19.05	14.29	6.35	5.4	0.6	
		190610-MR			○	◎			19.05	14.29	6.35	5.4	-	

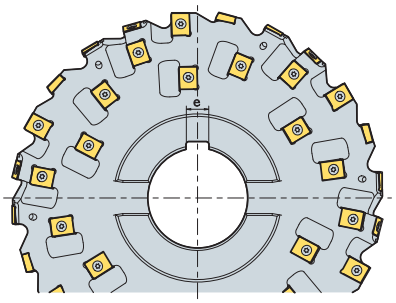
※ The above specification is subject to change according to customer related condition & Korloy technical condition

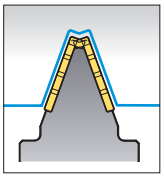
◎: 1st Rec ○: 2nd Rec

Gear Roughing Cutter (V shape type)







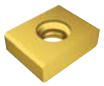
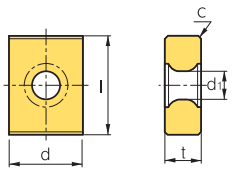
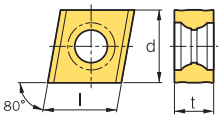


(mm)

m	Type	⊚	ØD	Ød	ØD1	a	e	F
20	rack	48	280	80	135	25	18	95
22	rack	48	280	80	135	25	18	95
24	rack	48	320	80	145	25	18	105
26	rack	60	320	80	145	25	18	105
28	rack	96	400	100	180	25	24	130
30	rack	96	400	100	180	25	24	130
32	rack	96	400	100	180	25	24	130
34	rack	112	400	100	180	25	24	130
36	rack	112	450	100	180	25	24	130
38	rack	112	450	100	180	25	24	130
40	rack	128	450	100	180	25	24	160
42	rack	128	450	100	180	25	24	160
44	rack	128	560	120	220	32	32	160
46	rack	144	560	120	220	32	32	160
48	rack	144	560	120	220	32	32	160
50	rack	144	560	120	220	32	32	160

Available inserts

(mm)

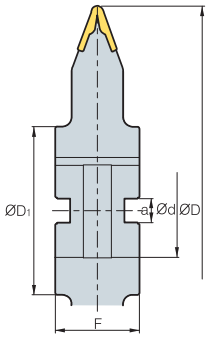
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	c	
 Reinforced cutting-edge	LNE	434-02-1			○	◎			19.05	14.29	6.35	5.4	0.6	
 Low cutting resistance	LNE	1906-C0.6-MF			○	◎			19.05	14.29	6.35	5.4	0.6	
		190610-MR							19.05	14.29	6.35	5.4	-	
 Reinforced cutting-edge	KEL	333-02-1			○	◎			14.3	12.7	6.35	5.8	0.8	
	CNHQ	1005-C0.5							10	10	5.4	-	-	

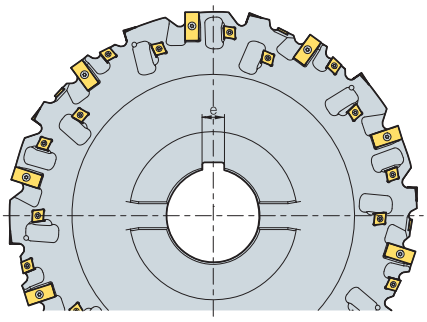
※ The above specification is subject to change according to customer related condition & Korloy technical condition

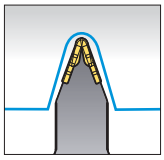
◎: 1st Rec ○: 2nd Rec

Gear Semi-finishing Cutter
(Low cutting resistance type)







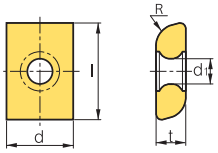
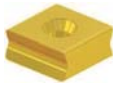
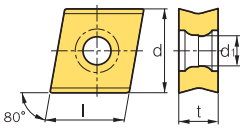


(mm)

m	No.of teeth		ØD	Ød	ØD1	a	e	F
6	30,60,120	18	250	60	100	25	18	70
8	30,60,120	18	250	60	100	25	18	80
10	30,60,120	24	250	60	100	25	18	80
12	30,60,120	24	250	60	100	25	18	90
14	30,60,120	24	280	80	135	25	24	95
16	30,60,120	32	280	80	135	25	24	100
18	30,60,120	32	320	80	145	25	24	105
20	30,60,120	64	400	100	180	25	24	110
22	30,60,120	64	400	100	180	25	24	110
24	30,60,120	64	400	100	180	25	24	120

Available inserts

(mm)

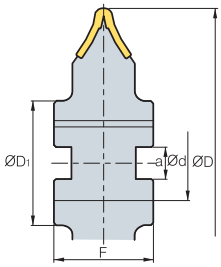
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	c	
		M6-2ST			○	◎			19.05	11.6	3.8	4.4	2.25	
		M8-2ST			○	◎			19.05	11.6	4	4.4	3	
		M10-2ST			○	◎			19.05	11.6	4.76	4.4	3.75	
		M12-2ST			○	◎			19.05	14.3	6.35	5.5	4.5	
		M14-2ST			○	◎			25.4	14.3	6.35	5.5	5.25	
		M16-2ST			○	◎			31.8	14.3	7.14	5.5	6	
		M18-2ST			○	◎			31.8	14.3	7.14	5.5	6.75	
		M20-2ST			○	◎			31.8	14.3	9.52	5.5	7.5	
		M22-2ST			○	◎			31.8	14.3	9.52	5.5	8.25	
		M24-2ST			○	◎			31.8	14.3	9.52	5.5	9	
	KEC	120606-MX			○	◎			12	12.7	6.35	4.5	-	
		150708-MX			○	◎			15.15	15	7.6	5.8	-	

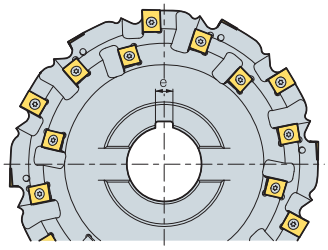
※ The above specification is subject to change according to customer related condition & Korloy technical condition

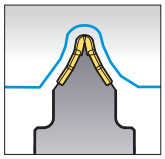
◎: 1st Rec ○: 2nd Rec

Gear Semi-finishing Cutter
(High rigid edge type, External gear)







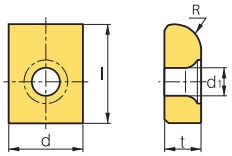
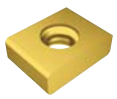
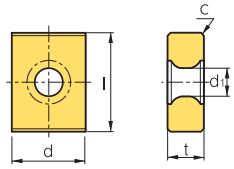


(mm)

m	No.of teeth		ØD	Ød	ØD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

Available inserts

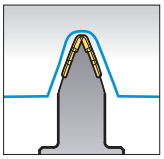
(mm)

Picture	Designation	Coated				Uncoated		Dimensions						Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	R	c	
	M8-ROU			○	◎			15.875	11	4.76	4.6	4.6	-	
	M12-M14-ROU			○	◎			19.05	14.29	6.35	5.4	5.4	-	
	M16-M18-ROU			○	◎			19.05	14.29	7	5.4	5.4	-	
	M20-M22-ROU			○	◎			19.05	14.29	7.94	5.4	5.4	-	
	M40-ROU			○	◎			25.4	14.29	9.52	5.4	5.4	-	
	LNE 434-02-1			○	◎			19.05	14.29	6.35	5.4	-	0.6	
	KEL 1906-C0.6-MF			○	◎			19.05	14.29	6.35	5.4	-	0.6	
	190610-MR			○	◎			19.05	14.29	6.35	5.4		-	

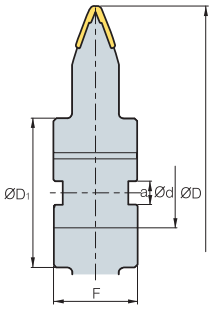
※ The above specification is subject to change according to customer related condition & Korloy technical condition

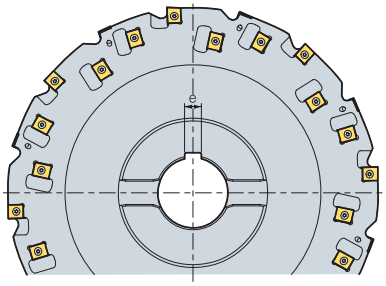
◎: 1st Rec ○: 2nd Rec

Gear Semi-finishing Cutter
(High rigid edge type, Internal gear)







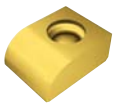
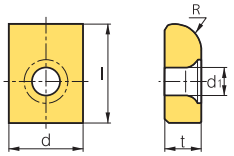
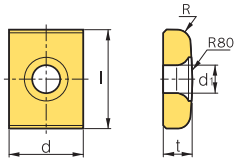


(mm)

m	No.of teeth		ØD	Ød	ØD1	a	e	F
12	30,60,120	24	250	60	100	25	14	70
14	30,60,120	36	250	60	100	25	14	80
16	30,60,120	36	250	60	100	25	14	80
18	30,60,120	36	250	60	100	25	14	90
20	30,60,120	48	280	80	135	25	18	95
22	30,60,120	48	280	80	135	25	18	100
24	30,60,120	48	320	80	145	25	18	105
26	30,60,120	72	400	100	180	25	24	110
28	30,60,120	72	400	100	180	25	24	110
30	30,60,120	72	400	100	180	25	24	120
32	30,60,120	84	400	100	180	25	24	130
34	30,60,120	84	400	100	180	25	24	130

Available inserts

(mm)

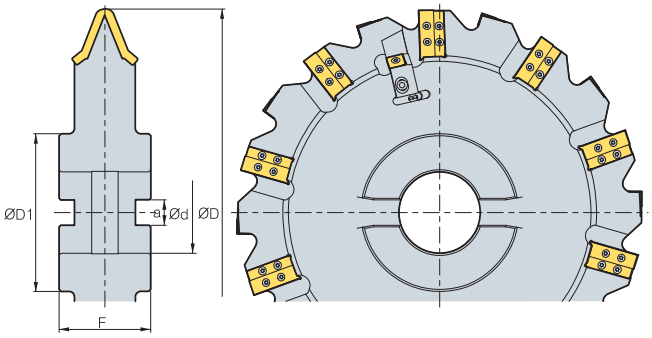
Picture	Designation	Coated				Uncoated		Dimensions					Configuration
		NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	c	
	M8-ROU			○	◎			15.875	11	4.76	4.6	2	
	M12-M14-ROU			○	◎			19.05	14.29	6.35	5.4	3	
	M16-M18-ROU			○	◎			19.05	14.29	7	5.4	5	
	M20-M22-ROU			○	◎			19.05	14.29	7.94	5.4	7	
	M40-ROU			○	◎			25.4	14.29	9.52	5.4	10	
	LNE 433-R80			○	◎			19.05	14.29	5.56	5.4	2.5	

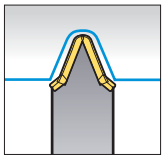
※ The above specification is subject to change according to customer related condition & Korloy technical condition

◎: 1st Rec ○: 2nd Rec

Gear Finishing Cutter
(1 Step type, External gear)





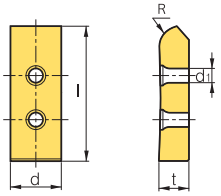
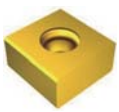
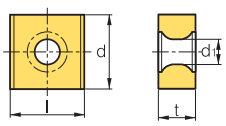


(mm)

m	⊙	ØD	Ød	ØD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

Available inserts

(mm)

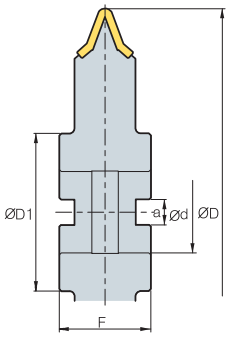
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	R	
		M6			○	◎			19	14.3	5	5.5	2.25	
		M8			○	◎			27	14.3	5.4	5.5	3	
		M10			○	◎			29	14.3	6.35	5.5	3.75	
		M12			○	◎			33	14.3	6.35	5.5	4.5	
		M14			○	◎			39	14.3	6.35	5.5	5.25	
		M16			○	◎			43	14.3	7.94	5.5	6	
		M18			○	◎			50	14.3	7.94	5.5	6.75	
		M20			○	◎			54	14.3	9.53	5.5	7.5	
		M22			○	◎			57	14.3	9.53	5.5	8.25	
		M24			○	◎			64	14.3	9.53	5.5	9	
	SNEQ	1507-C0.8			○	◎			15.875	15.875	7.94	-	-	

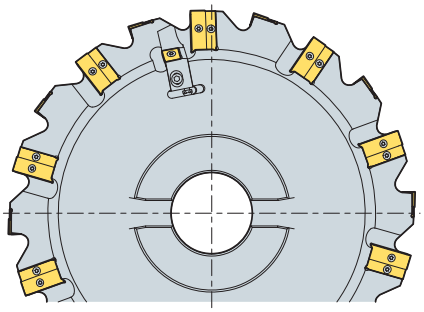
※ The above specification is subject to change according to customer related condition & Korloy technical condition

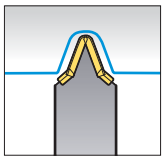
◎: 1st Rec ○: 2nd Rec

Gear Finishing Cutter
(1 Step type, Internal gear)







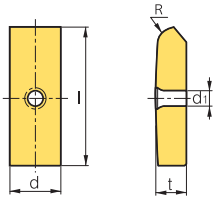
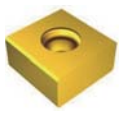
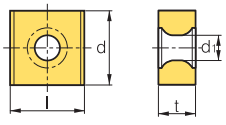


(mm)

m	⚙	ØD	Ød	ØD1	a	F
6	20	400	80	155	25	90
8	20	400	80	155	25	90
10	20	400	80	155	25	90
12	20	400	80	155	25	90
14	20	400	80	155	25	90
16	20	400	80	155	25	90
18	20	400	80	155	25	90
20	20	400	80	155	25	90
22	20	400	80	155	25	90
24	20	400	80	155	25	90

Available inserts

(mm)

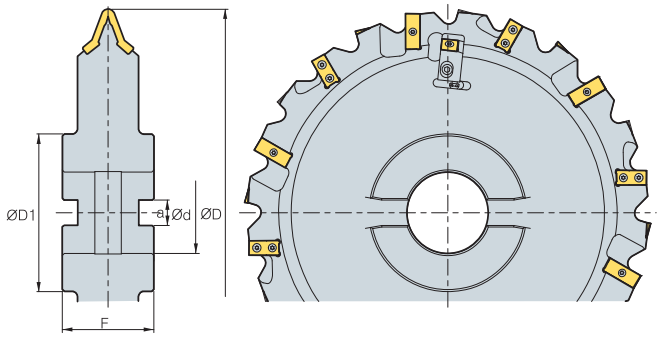
Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d1	R	
		M6			○	◎			19	14.3	5	5.5	2.25	
		M8			○	◎			27	14.3	5.4	5.5	3	
		M10			○	◎			29	14.3	6.35	5.5	3.75	
		M12			○	◎			33	14.3	6.35	5.5	4.5	
		M14			○	◎			39	14.3	6.35	5.5	5.25	
		M16			○	◎			43	14.3	7.94	5.5	6	
		M18			○	◎			50	14.3	7.94	5.5	6.75	
		M20			○	◎			54	14.3	9.53	5.5	7.5	
		M22			○	◎			57	14.3	9.53	5.5	8.25	
		M24			○	◎			64	14.3	9.53	5.5	9	
	SNEQ	1507-C0.8			○	◎			15.875	15.875	7.94	-	-	

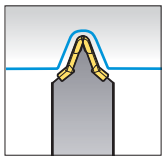
※ The above specification is subject to change according to customer related condition & Korloy technical condition

◎: 1st Rec ○: 2nd Rec

Gear Finishing Cutter
(2 Step type, Internal/Externa gear)





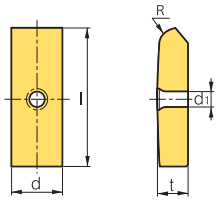
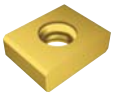
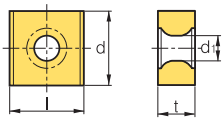
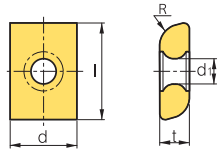


(mm)

m	⊙	ØD	Ød	ØD1	a	F
6	24	400	80	155	25	90
8	24	400	80	155	25	90
10	24	400	80	155	25	90
12	24	400	80	155	25	90
14	24	400	80	155	25	90
16	24	400	80	155	25	90
18	24	400	80	155	25	90
20	24	400	80	155	25	90
22	24	400	80	155	25	90
24	24	400	80	155	25	90

Available inserts

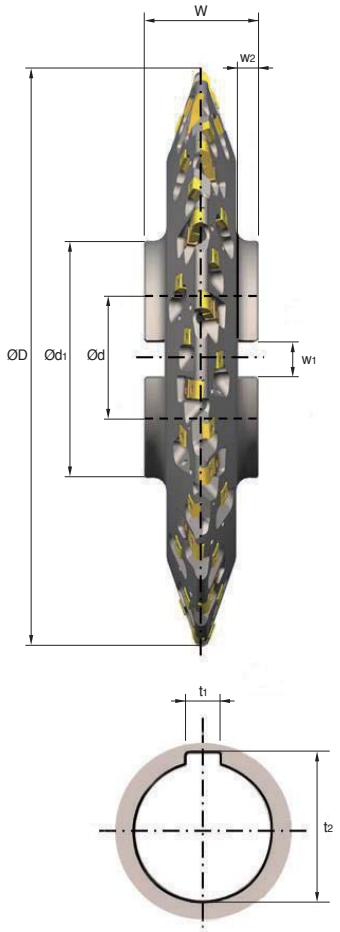
(mm)

Picture	Designation		Coated				Uncoated		Dimensions					Configuration
			NC5330	PC9530	PC3500	PC5300	H01	G10	l	d	t	d_1	R	
		M6		○		◎			19	14.3	5	5.5	2.25	
		M8		○		◎			27	14.3	5.4	5.5	3	
		M10		○		◎			29	14.3	6.35	5.5	3.75	
		M12		○		◎			33	14.3	6.35	5.5	4.5	
		M14		○		◎			39	14.3	6.35	5.5	5.25	
		M16		○		◎			43	14.3	7.94	5.5	6	
		M18		○		◎			50	14.3	7.94	5.5	6.75	
		M20		○		◎			54	14.3	9.53	5.5	7.5	
		M22		○		◎			57	14.3	9.53	5.5	8.25	
		M24		○		◎			64	14.3	9.53	5.5	9	
	SNEQ	1507-C0.8		○		◎			15.875	15.875	7.94	-	-	
		M6-2ST							19.05	11.6	3.8	4.4	2.25	
		M8-2ST							19.05	11.6	4	4.4	3	
		M10-2ST							19.05	11.6	4.76	4.4	3.75	
		M12-2ST							19.05	14.3	6.35	5.5	4.5	
		M14-2ST							25.4	14.3	6.35	5.5	5.25	
		M16-2ST							31.8	14.3	7.14	5.5	6	
		M18-2ST							31.8	14.3	7.14	5.5	6.75	
		M20-2ST							31.8	14.3	9.52	5.5	7.5	
		M22-2ST							31.8	14.3	9.52	5.5	8.25	
		M24-2ST							31.8	14.3	9.52	5.5	9	

※ The above specification is subject to change according to customer related condition & Korloy technical condition

◎: 1st Rec ○: 2nd Rec

Gear cutter order form



Cutter type

☐ **Roughing** ☐ **Semi-finishing** ☐ **Finishing**

☐ Step ☐ Low cutting resistance ☐ 1 Step

☐ V shape ☐ High rigid edge ☐ 2 Step

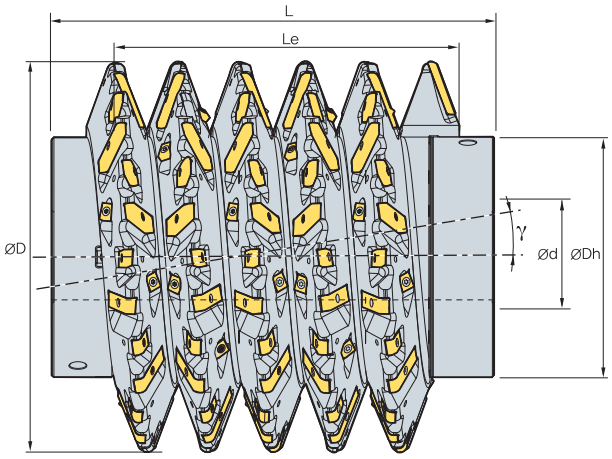
- Stock for finishing (one side) (mm):
- Outside diameter D (mm):
- Bore diameter d (mm):
- Hub diameter d1 (mm):
- Cutter width W (mm):
- Radial keyway w1 (mm):
- Radial keyway w2 (mm):
- Axial keyway t1 (mm):
- Axial keyway t2 (mm):

Involute gear data

☐ **External gear** ☐ **Internal gear** ☐ **Rack gear**

- Module M (mm):
- No.of teeth Z (mm):
- Pressure angle α (°):
- Helix angle β (°):
- Addendum modification coefficient x:
- Tip diameter da (mm):
- Root diameter d_f (mm):
- Root radius ρ_{fp} (mm)
- Base tangent length W_k (mm)
- No. of measuring teeth K:
- Dimensions/Dimension over balls M_d (mm):
- Ball diameter D_M (mm):
- Gear quality (DIN, JIS):

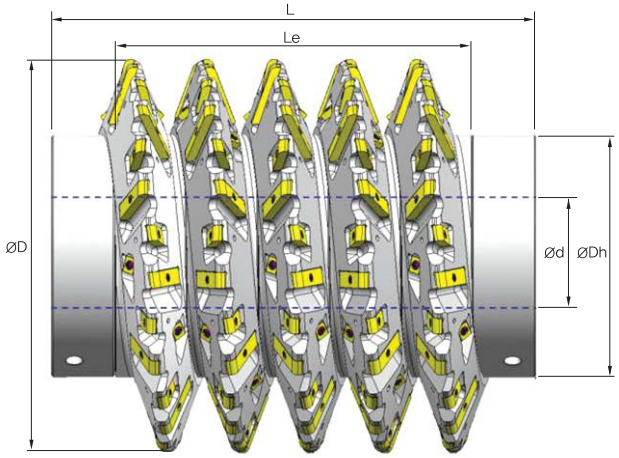
Indexable HOB



(mm)

Gear module	ØD	ØDh	Ød	No.Segm. (Pitch)	Le	Segment insert	Total insert	γ (Lead Ang.)
6	180	125	40	6	(113)	15	90	2.084
	210	125	50	6	(113)	17	102	1.763
	240	160	60	6	(113)	19	114	1.528
7	180	125	40	6	(132)	15	90	2.469
	210	125	50	6	(132)	17	102	2.084
	240	160	60	6	(132)	19	114	1.803
8	210	125	50	6	(151)	17	102	2.413
	240	160	60	6	(151)	19	114	2.084
	270	180	80	6	(151)	21	126	1.834
9	210	125	50	6	(169)	17	102	2.751
	240	160	60	6	(169)	19	114	2.372
	270	180	80	6	(169)	21	126	2.084
10	210	125	50	6	(189)	17	102	3.099
	240	160	60	6	(189)	19	114	2.666
	270	180	80	6	(189)	21	126	2.339
12	240	140	60	6	(226)	18	108	3.276
	270	180	80	6	(226)	22	132	2.866
	350	215	80	6	(226)	26	156	2.149
14	270	180	80	6	(264)	22	132	3.415
	350	215	80	6	(264)	26	156	2.547
16	270	160	80	6	(302)	22	132	3.989
	350	215	80	6	(302)	26	156	2.959
18	270	145	80	5	(283)	22	110	4.589
	350	215	80	5	(283)	26	130	3.383
20	350	215	80	5	(314)	26	130	3.823
	450	265	100	5	(314)	34	170	2.866

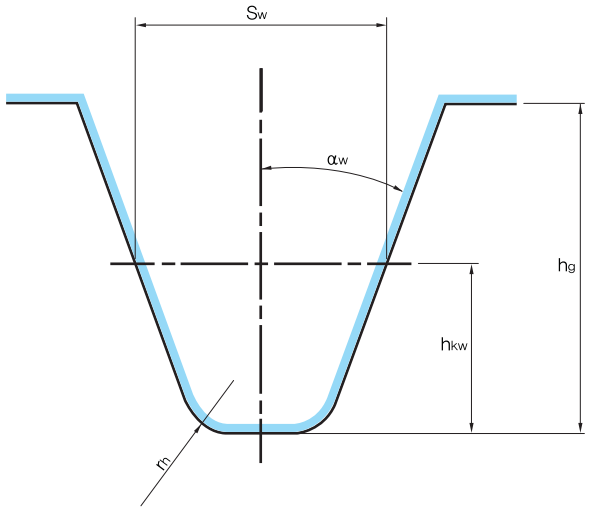
Indexable HOB



Tool SPEC.

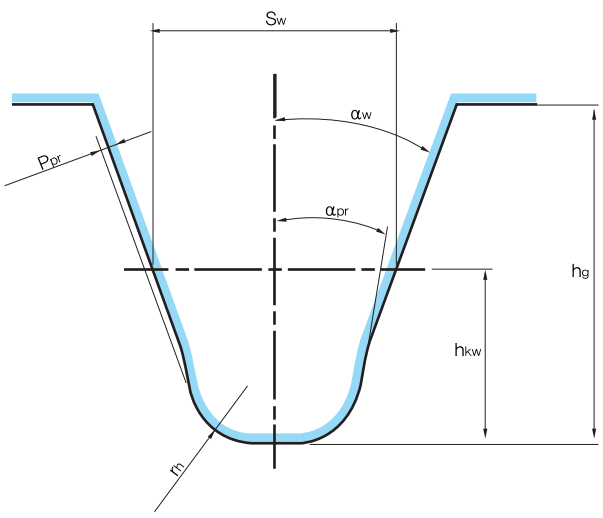
- Outside diameter ØD (mm):
- Bore diameter Ød (mm):
- Hub diameter ØDh (mm):
- Hob length L (mm):
- Cutting length Le (mm):
- Spiral direction RH/LH:
- Quality class acc. to DIN 3968:

Profile of hob [Module m6~]



- Module M (mm):
- Addendum hkw (mm):
- Tooth thickness Sw (mm):
- Tooth depth hg (mm):

Profile of roughing hob [Module m8~]

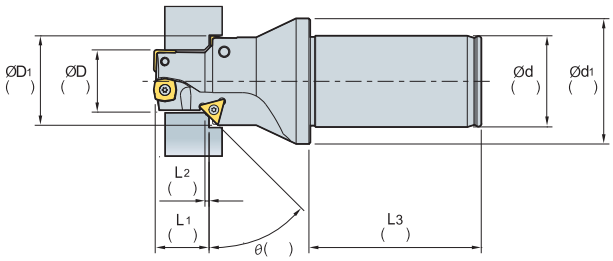


- Pressure angle αw (mm):
- Protuberance amount Ppr (mm):
- Protuberance angle αpr (mm):
- Tip radius rh (mm):

Special drill holder for multi-purpose

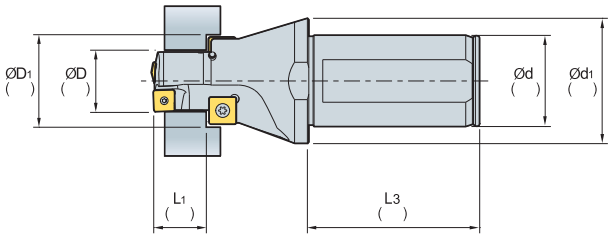
Drilling & Chamfering & Counter Boring





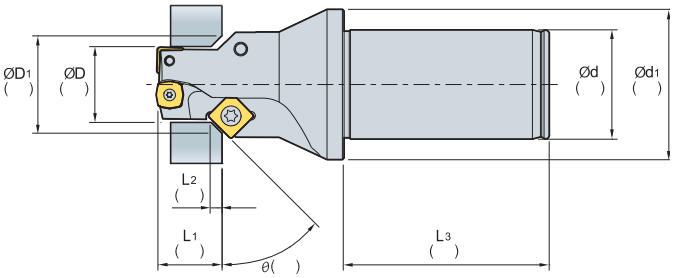
Drilling & Counter Boring





Drilling & Chamfering

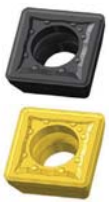
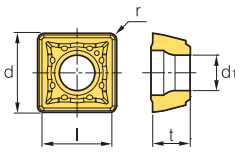
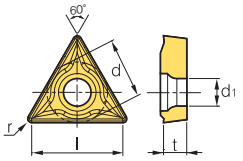




※ Order-made items available outer above configulations

Available inserts

(mm)

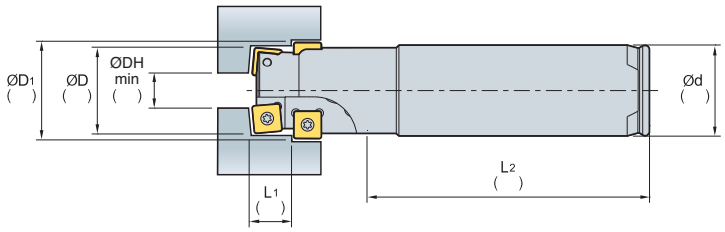
Picture	Designation		Coated PC5300	Coated PC3600	Dimensions l	d	t	r	d1	Available screw	Configuration
	SPMT	050204-BC	●		4.2	5	2.48	0.4	2.25	FTNA0204	
		060204-BC	●		5.2	6	2.48	0.4	2.61	FTNA02205	
		07T308-BC	●		6.34	7.94	3.97	0.8	2.85	FTKA02565	
		090408-BC	●		7.9	9.525	4.3	0.8	4.05	FTNA03508	
		110408-BC	●		9.9	11.5	5	0.8	4.45	FTKA0408	
		120408-BC	●		11.1	12.7	5	0.8	4.45	FTKA0408	
		140512-BC	●		11.9	14.3	5.4	1.2	5.75	FTNA0510	
	TCMT	090204-HMP	●		8.6	5.56	2.38	0.4	2.50	FTKA02206	
		090208-HMP	●		7.6	5.56	2.38	0.8	2.50	FTKA02206	
		110202-HMP	●		10.5	6.35	2.38	0.2	2.80	FTKA2565	
		110204-HMP	●		10.0	6.35	2.38	0.4	2.80	FTKA2565	
		110208-HMP	●		9.0	6.35	2.38	0.8	2.80	FTKA2565	
		16T304-HMP	●		15.5	9.525	3.97	0.4	4.40	FTGA3512	
		16T308-HMP	●		14.5	9.525	3.97	0.8	4.40	FTGA3512	

● Stock item

Special Boring holder for multi-purpose

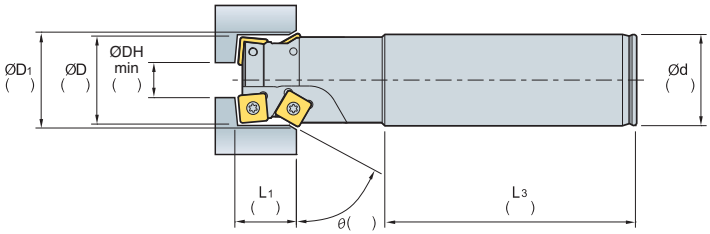
Boring & Counter Boring





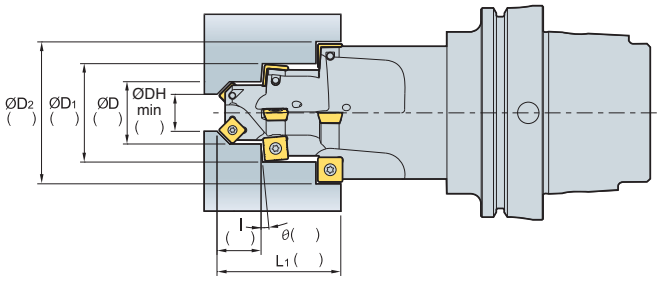
Boring & Chamfering





Boring & Chamfering & Counter Boring

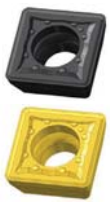
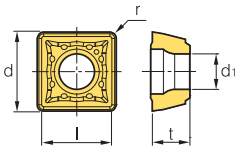
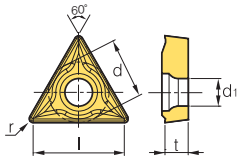




※ Order-made items available outer above configulations

Available inserts

(mm)

Picture	Designation		Coated PC5300	Coated PC3600	l	d	t	r	d1	Available screw	Configuration
	SPMT	050204-BC	●		4.2	5	2.48	0.4	2.25	FTNA0204	
		060204-BC	●		5.2	6	2.48	0.4	2.61	FTNA02205	
		07T308-BC	●		6.34	7.94	3.97	0.8	2.85	FTKA02565	
		090408-BC	●		7.9	9.525	4.3	0.8	4.05	FTNA03508	
		120408-BC	●		9.9	11.5	5	0.8	4.45	FTKA0408	
		140512-BC	●		11.1	12.7	5	0.8	4.45	FTKA0408	
		140512-BC	●		11.9	14.3	5.4	1.2	5.75	FTNA0510	
	TCMT	090204-HMP	●		8.6	5.56	2.38	0.4	2.50	FTKA02206	
		090208-HMP	●		7.6	5.56	2.38	0.8	2.50	FTKA02206	
		110202-HMP	●		10.5	6.35	2.38	0.2	2.80	FTKA2565	
		110204-HMP	●		10.0	6.35	2.38	0.4	2.80	FTKA2565	
		110208-HMP	●		9.0	6.35	2.38	0.8	2.80	FTKA2565	
		16T304-HMP	●		15.5	9.525	3.97	0.4	4.40	FTGA3512	
		16T308-HMP	●		14.5	9.525	3.97	0.8	4.40	FTGA3512	

● Stock item



F

ENDMILLS

Korloy Endmills, with New technology and our technical know-how,
are the best for increasing productivity and machinability



Technical Information for Endmills

F02 Endmill Code System
F04 KORLOY Endmills

Solid Endmills

F09 Technical Information for H Endmill
F12 H Endmill
F14 Technical Information for V Endmill
F16 V Endmill
F17 Technical Information for Z Endmill
F20 Z Endmill
F24 Technical Information for F Endmill
F26 F Endmill
F27 Technical Information for T Endmill
F29 Special T Endmill Order Form
F30 Technical Information for I+ Endmill
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Solid Endmills

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Brazed Endmills

F102 Technical Information for Brazed Endmill
F104 Brazed Endmill

Special Endmill order Form

F109 Special Endmill Order Form

Z B E 2 040 - 050 -

1	2	3	4	5	6
Series	Type	Endmill	No. of flutes	Cutting dia.	Overall length

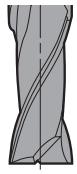
1 Series

Z B E 2 040 - 050 - R T - V N S

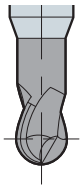
IP, Z: Infinity-Max Endmill
HP, P: High performance-Max Endmill
C: Copper-Max Endmill
D: Dia coated-Max Endmill
V: Variable Endmill
FM: Feed-up Endmill
SSEA, AP: Aluminum Endmill
SP: Stainless Endmill
CC: Composite Rough Endmill
T: Dental Endmill

2 Type

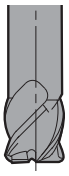
Z B E 2 040 - 050 - R T - V N S



Flat type — F



Ball type — B



Radius type — R

3 Endmill

Z B E 2 040 - 050 - R T - V N S

4 No. of flutes

Z B E 2 040 - 050 - R T - V N S



2 Flutes — 2



3 Flutes — 3



4 Flutes — 4

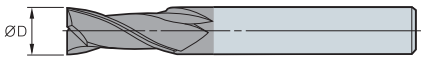


6 Flutes — 6

※ The above code system is not applied for SSEA and ZSE

5 Cutting dia

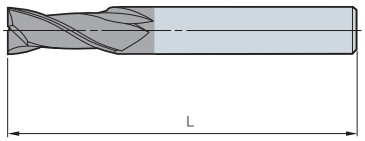
Z B E 2 040 - 050 - R T - V N S



Notation	ØD (mm)
040	Ø4.0
060	Ø6.0
080	Ø8.0
100	Ø10.0

6 Overall length

Z B E 2 040 - 050 - R T - V N S



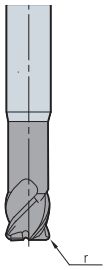
Overall length	
Notation	L (mm)
050	50
080	80
100	100

R02 T00 - V05 N12 S06

7 Corner radius | 8 Taper angle | 9 Taper length | 10 Neck length | 11 Shank diameter

7 Corner radius

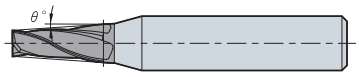
Z B E 2 040 - 050 - **R** T - V N S



Corner radius	
Notation	R (mm)
R02	r 0.2
R05	r 0.5
R10	r 1.0
R15	r 1.5

8 Taper angle

Z B E 2 040 - 050 - R **T** - V N S

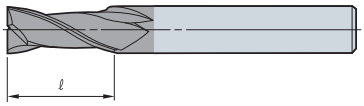


T (θ°): Taper Angle

Taper angle	
Notation	T (θ°)
T10	1°
T15	1.5°
T20	2°

9 Taper length

Z B E 2 040 - 050 - R T - **V** N S

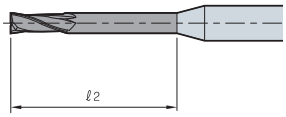


Taper length	
Notation	(mm)
V05	5
V10	10
V15	15

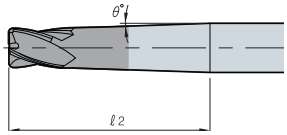
※ This code system is also for special endmills

10 Neck length

Z B E 2 040 - 050 - R T - V **N** S



Long Neck



Taper Long Neck

ℓ_2 (mm): Neck Length

T (θ°): Taper Angle

Long neck	
Notation	ℓ_2 (mm)
N05	5
N08	8
N10	10
N12	12

Taper long neck	
Notation	ℓ_2+T(θ°)
N0510	5+1°
N0815	8+1.5°
N1020	10+2°
N1225	12+2.5°

11 Shank diameter

Z B E 2 040 - 050 - R T - V N **S**



Shank diameter	
Notation	Ød (mm)
S06	Ø6
S08	Ø8
S10	Ø10
S12	Ø12
S16	Ø16

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
H Endmill (new)	Ball	PBE2000	PC303S		○	High speed High hardness	2	0.5	12	◎		◎		○	◎	F12
	Radius	PRE4000	PC310U		○	High speed High hardness	4	3	12	◎		◎		○	◎	F13
V Endmill	Flat	VFE4000	PC215F		○	General	4	2.5	16	◎	○	○		○	○	F16
Z Endmill (new)	Flat	ZFE2000	PC315E		○	General	2	1	16	◎	○	◎		○		F20
		ZFE4000	PC315E		○	General	4	1	16	◎	○	◎		○		F21
	Short flat	ZSFE2000	PC315E		○	General	2	1	12	◎	○	◎		○		F22
		ZSFE4000	PC315E		○	General	4	1	12	◎	○	◎		○		F22
	Ball	ZBE2000	PC315E		○	General	2	1	12	◎	○	◎		○		F23
F Endmill	Standard	FME4000	PC203F		○	High speed High hardness	4	6	12	○		○		◎	◎	F26
	Long	FMLE4000	PC203F		○	High speed High hardness	4	6	12	○		○		◎	◎	F26
T Endmill (new)	Ball	TZBE	ND3000		○	Dental, Zirconia	2	0.6	3				◎			F27
		TTBE	PC2510		○	Dental, Metal	2	0.6	3					◎		F27
		TWBE	H01		–	Dental, Wax	2	0.6	3				◎			F27
I+ Endmill	Flat	IPFE2000	PC320		○	General	2	1	20	◎	○	◎		○		F33
		IPFE4000	PC320		○	General	4	1	20	◎	○	◎		○		F35
	Long flat	IPLFE2000	PC320		○	General	2	1	20	◎	○	◎		○		F34
		IPLFE4000	PC320		○	General	4	1	20	◎	○	◎		○		F36
	Ball	IPBE2000	PC320		○	General	2	1	20	◎	○	◎		○		F37

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
								Min	Max	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Titanium alloy	H Hardened steel	
I+ Endmill	Ball	IPBE4000	PC320		○	General	4	1	20	◎	○	◎		○		F39
	Long ball	IPLBE2000	PC320		○	General	2	1	16	◎	○	◎		○		F38
	Radius	IPRE2000	PC320		○	General	2	1	12	◎	○	◎		○		F40 F41
		IPRE4000	PC320		○	General	4	2	12	◎	○	◎		○		F43
	Long radius	IPLRE2000	PC320		○	General	2	3	12	◎	○	◎		○		F42
		IPLRE4000	PC320		○	General	4	3	12	◎	○	◎		○		F44
Z+ Endmill new	Flat	ZPFE2000	PC320U		○	General	2	1	20	◎	○	◎		○		F48
	Short flat	ZPSFE2000	PC320U		○	General	2	1	16	◎	○	◎		○		F49
	Long flat	ZPLFE2000	PC320U		○	General	2	2	20	◎	○	◎		○		F49
	Long flute	ZPLFE2000	PC320U		○	General	2	2	20	◎	○	◎		○		F50
	Flat	ZPFE4000	PC320U		○	General	4	1	20	◎	○	◎		○		F51
	Short flat	ZPSFE4000	PC320U		○	General	4	1	16	◎	○	◎		○		F52
	Long flat	ZPLFE4000	PC320U		○	General	4	2	20	◎	○	◎		○		F53
	Long flute	ZPLFE4000	PC320U		○	General	4	1	20	◎	○	◎		○		F54
	Flat	ZPFE3000	PC320U		○	General	3	2	25	◎	○	◎		○		F55
		ZPFE6000	PC320U		○	General	6	6	20	◎	○	◎		○		F55
	Ball	ZPBE2000	PC320U		○	General	2	0.8	20	◎	○	◎		○		F56
	Long ball	ZPLBE2000	PC320U		○	General	2	2	12	◎	○	◎		○		F57

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
										P	M	K	N	S	H	
								Min	Max	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	
Z+ Endmill (new)	Ball	ZPBE4000	PC320U		○	General	4	2	20	◎	○	◎		○		F57
	Radius	ZPRE2000	PC320U		○	General	2	1	16	◎	○	◎		○		F58
	Long radius	ZPLRE2000	PC320U		○	General	2	6	16	◎	○	◎		○		F59
	radius	ZPRE4000	PC320U		○	General	4	1.5	16	◎	○	◎		○		F60
	Long radius	ZPLRE4000	PC320U		○	General	4	6	16	◎	○	◎		○		F61
S+ Endmill	Flat	SPFE4000	PC320S		–	STS	4	1	12	○	◎	○		◎		F64
	Long flat	SPLFE4000	PC320S		–	STS	4	1	12	○	◎	○		◎		F64
R+ Endmill (new)	Roughing	EM09CA	PC30T		○	General	4	5	20	◎	○	◎		○		F70
		EM11CA	FN30T		–	Aluminum	3	6	25				◎			F70
		EM36CA	PC30T		○	General	4	5	20	◎	○	◎		○		F71
		EM37CA	PC30T		○	General	4	5	20	◎	○	◎		○		F71
		EM38CA	PC40T		○	General	4	5	20	◎	○	◎		○		F72
		EM43CA	PC30T		○	General	4	5	20	◎	○	◎		○		F72
		EM11PM	HC30T		○	General	4	6	20	◎	○	◎		○		F73
		EM16PM	HC30T		○	General	4	6	20	◎	○	◎		○		F73
		EM17PM	HC30T		○	General	4	6	20	◎	○	◎		○		F74
		EM06H9M	HC10T HC20T		○	General	4	6	50	◎	○	◎		○		F75
Solid Endmills for aluminum	Flat	SSEA2000	H01 PD3000		– (○)	Aluminum	2	1	20	○			◎			F77

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
								Min	Max	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Titanium alloy	H Hardened steel	
Solid Endmills for aluminum	Flat	SSEA3000	H01 PD3000		– (○)	Aluminum	3	2	16	○			◎			F77
	Ball	SSBEA2000	H01 PD3000		– (○)	Aluminum	2	1	20	○			◎			F78
A+ Endmill	Flat	APFE2000	H05S		–	Aluminum	2	2.5	20	○			◎			F81
		APFE3000	H05S		–	Aluminum	3	2.5	20	○			◎			F81
	Long flat	APLFE2000	H05S		–	Aluminum	2	3	20	○			◎			F82
		APLFE3000	H05S		–	Aluminum	3	3	20	○			◎			F82
	Ball	APBE2000	H05S		–	Aluminum	2	1	12	○			◎			F83
	Roughing	APRE3000	H05S		–	Aluminum	3	4	25	○			◎			F83
C-Max	Flat	CFE2000	PC210C		○	Copper, Copper alloy	2	1.0	12	○			◎			F85
	Long neck flat	CFNE2000	PC210C		○	Copper, Copper alloy	2	0.5	4	○			◎			F85
	Ball	CBE2000	PC210C		○	Copper, Copper alloy	2	1.0	12	○			◎			F86
	Long neck ball	CBNE2000	PC210C		○	Copper, Copper alloy	2	0.5	4	○			◎			F86
	Radius	CRE2000	PC210C		○	Copper, Copper alloy	2	2.0	12	○			◎			F87
	Long neck radius	CRNE2000	PC210C		○	Copper, Copper alloy	2	1.0	4	○			◎			F87
D Endmill new	Flat	DFE2000	ND3000		○	Graphite, Ceramics	2	1.0	12				◎			F90
		DFE4000	ND3000		○	Graphite, Ceramics	4	2	12				◎			F91
	Ball	DBE2000	ND3000		○	Graphite, Ceramics	2	0.6	12				◎			F92 F93
		DBE4000	ND3000		○	Graphite, Ceramics	4	2	12				◎			F94

◎: Excellent ○: Good

Type	Shape	Designation	Substrate	Figure	Coated	Used	No. of flute	Size		Workpiece						page
								Min	Max	P Steel	M Stainless steel	K Cast iron	N Non-ferrous metal	S Heat resistant alloy, Titanium alloy	H Hardened steel	
Composite Router Endmill (new)	Flat	CCDR4000	ND2100		○	Composite CFRP, GFRP	4	6	8				◎			F96
		CCDR6000	ND2100		○	Composite CFRP, GFRP	6	10	12				◎			F96
		CCR2000	ND2100		○	Composite CFRP, GFRP	2	4	12				◎			F97
		CCLR4000	ND2100		○	Composite CFRP, GFRP	4	4	12				◎			F98
		CCRR6000	ND2100		○	Composite CFRP, GFRP	6	6	8				◎			F99
		CCRR8000	ND2100		○	Composite CFRP, GFRP	8	10	12				◎			F99
PCD Endmill	Flat	PDE1000	DP200		–	Nonferrous, High speed	1	4.6	6				◎			F101
		PDE2000	DP200		–	Nonferrous, High speed	2	6.0	12				◎			F101
Brazed Endmill	Flat	ZSE200	FCC PC221F		– (○)	Cast iron, Steel	2	14	50	○	○	◎		○		F104
		ZSE300	FCC PC221F		– (○)	Cast iron, Steel	3	14	50	○	○	◎		○		F104 F105
		ZSE400	FCC PC221F		– (○)	Cast iron, Steel	4	14	50	○	○	◎		○		F105
		ZSE600	FCC PC221F		– (○)	Cast iron, Steel	6	34	50	○	○	◎		○		F105
		ZSEA200	FCC		–	Aluminum, Copper	2	15	50				◎			F106
	Long flat	ZSEL200	FCC PC221F		–	Cast iron, Steel	2	14	50	○	○	◎		○		F107
		ZSEL400	FCC PC221F		–	Cast iron, Steel	4	16	40	○	○	◎		○		F107
		ZSEXL200	FCC PC221F		–	Cast iron, Steel	2	20	25	○	○	◎		○		F107
	Ball	ZSBE200	FCC PC221F		–	Cast iron, Steel	2	13	50	○	○	◎		○		F108

◎: Excellent ○: Good

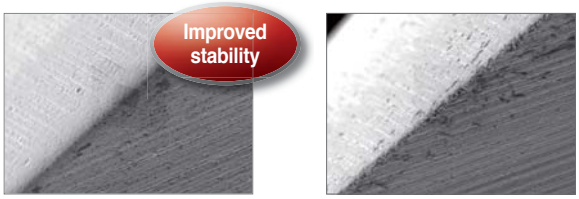
Endmill for high speed machining for high hardened steel

H Endmill new

- For cutting high hardened and heat-treated steel under HRC70
- New coating technology improves wear resistance
- A new shape improves machinability
- High speed and highly accurate machining available

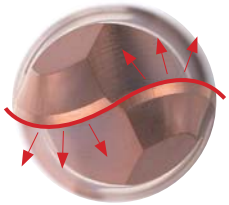
Features

- New grade (PC303S, PC310U) - Ultra fine substrate and AlTiSiN coating guarantee excellent wear resistance
- Special edge treatment - Special cutting edge design was applied for less chipping and longer tool life
- High accuracy with tolerance h5 - High quality production system enables tolerance-h5 throughout the whole series



After special edge treatment | before

PBE (Ball)



Cutting load is dispersed

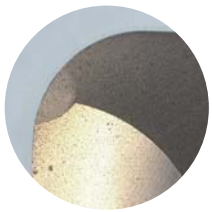
S shape of ball

- The S shape of ball disperses cutting loads
- The tolerance of ball R is under ±0.005 mm

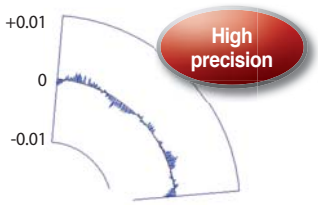
PRE (Radius)



H Endmill radius



New shape of corner R



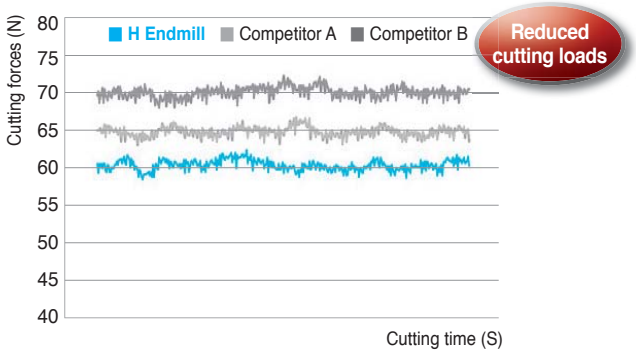
Measurement result of tolerance of corner R

- The new shape of corner R reduces cutting loads
- The tolerance of corner R is under ±0.005 mm

Performance evaluation

- **Workpiece** STD11 (HRC60)
- **Cutting conditions** Diameter = Ø8.0, n (min^{-1}) = 4,000, vc (m/min) = 100
  vf (mm/min) = 800, fz (mm/t) = 0.05
  ap (mm) = 8.0, ae (mm) = 0.25, dry
- **Tools** PRE4080-100-R05

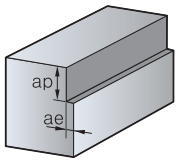
※ Special cutting edge design reduces cutting loads and prolongs tool life



Recommended cutting conditions (PRE4000 radius)

Workpiece / Conditions / Diameter (Ø)	Pre-hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened steel (HRC55~70)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
3	17,300	1,250	11,500	840	7,500	256
4	13,200	1,300	8,800	880	5,600	268
5	12,500	1,500	8,300	1,000	5,100	296
6	10,350	1,400	6,900	950	4,200	280
8	7,800	1,350	5,200	900	3,200	264
10	6,150	1,260	4,100	840	2,550	248
12	5,250	1,260	3,500	840	2,100	240

Application tip



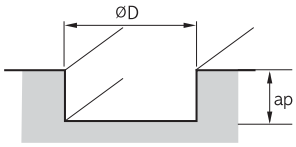
- Shouldering depth (ap) and radial depth (ae)
  - ap = 0.1D
  - ae = 0.03D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (PRE4000 radius)

Workpiece / Conditions / Diameter (Ø)	Pre-hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened steel (HRC55~70)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
3	17,300	544	11,500	336	7,500	128
4	13,200	560	8,800	352	5,600	136
5	12,500	644	8,300	400	5,100	144
6	10,350	616	6,900	384	4,200	144
8	7,800	576	5,200	356	3,200	132
10	6,150	544	4,100	332	2,550	124
12	5,250	544	3,500	332	2,100	124

Application tip

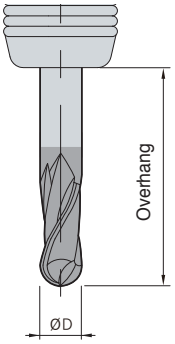


- Slotting depth (ap)
  - ap = 0.05D
  - ae = 1.0D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Cutting condition by overhang

- Cutting conditions of the shank taper type in case of being clamped at neck
  - When the overhang is increased by 1D, decrease R.P.M and feed 10%
- In case of the straight type adjust conditions according to the overhang
  - Ex: When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%



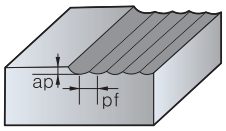
Notice

- Cutting conditions are up to the machine's condition and the shape of cutting
- Use cutting fluid that is proper to the workpiece and produces few temperature reactions

Recommended cutting conditions (PBE2000 ball)

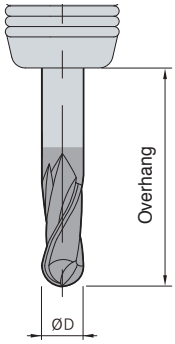
Workpiece / Conditions / Diameter(Ø)	Pre-hardened steel (HRC35~45)		Hardened steel (HRC45~55)		High hardened Steel (HRC55~HRC70)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
0.5	35,000	1,470	31,500	1,330	28,000	1,050
1	35,000	2,940	31,500	2,660	28,000	2,000
1.2	33,600	3,010	30,100	2,695	26,600	2,100
1.5	33,600	3,150	30,100	2,800	25,900	2,150
2	33,460	3,360	28,000	2,800	24,500	2,200
2.5	25,900	3,710	22,400	2,800	17,500	2,200
3	22,260	3,710	18,550	2,800	16,500	2,200
4	16,730	3,710	14,000	2,800	13,000	2,200
5	17,800	4,900	15,000	3,750	12,500	2,100
6	13,400	4,100	11,000	3,100	10,000	2,500
8	10,700	3,500	9,000	2,700	8,000	2,150
10	8,900	3,100	7,500	2,400	6,600	1,900
12	6,680	2,500	5,600	1,900	5,000	1,550

Application tip



- ap = 0.02D
- pf = 0.05D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio



Cutting condition by overhang

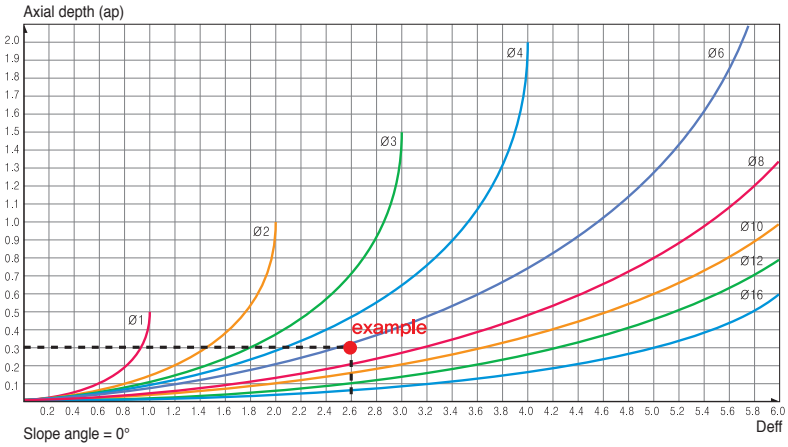
- Cutting conditions of the shank taper type in case of being clamped at neck
  - When the overhang is increased by 1D, decrease R.P.M and feed 10%
- In case of the straight type adjust conditions according to the overhang
  - Ex: When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%

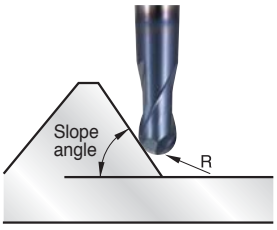
Cutting speed formulas (Ball endmills)

- Efficient cutting speed Veff = (π × Deff × n)/1000 (n = min^{-1})
- Efficient diameter Deff calculation formula Deff = ($2\sqrt{ap(D-ap)} \times \alpha$)
  D = Ø (Tool diameter), Deff = Efficient diameter
- Efficient cutting speed formulas: When slope Ø is 0° Veff = (π × Deff × n)/1000
  Deff = Efficient, diameter Calculate Deff as ap with various ball endmills

α:	α = 1	Slope angle θ = 0°
	α = 1.2	Slope angle θ = 7°
	α = 1.5	Slope angle θ = 15°
	α = 1.7	Slope angle θ = 30°
	α = 2.17	Slope angle θ = 45°
	α = 2.3	Slope angle θ = 60°

Cutting speed formulas (Ball endmills, slope angle = 0°)





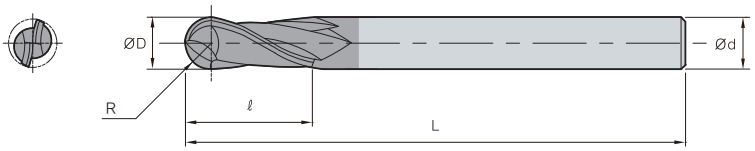
Ex) **Diameter**: 6 mm, ap = 0.3 mm,
Deff = 2.6 mm, N = 14,000 (min^{-1})
Slope angle 0°: Veff = 113.7 (m/min)
Slope angle 15°: Veff = 113.7 x 1.5 = 170.6 (m/min)

Notice

- Cutting conditions are up to the machine's condition and the shape of cutting
- Use cutting fluid that is proper to the workpiece and produces few temperature reactions

PBE2000 (Ball)







ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025

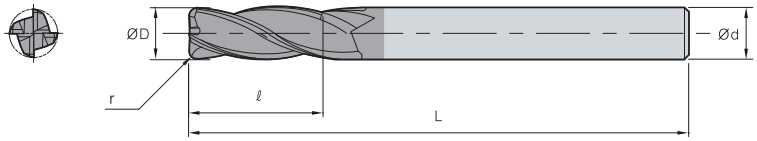


(mm)

Designation		R	ØD	Ød	ℓ	L
PBE	2005-040	0.25	0.5	6	1	40
	2010-050	0.5	1	6	2.5	50
	2012-050	0.6	1.2	6	3	50
	2015-050	0.75	1.5	6	4	50
	2020-050	1	2	6	5	50
	2025-060	1.25	2.5	6	7	60
	2030-060	1.5	3	6	8	60
	2040-070	2	4	6	8	70
	2050-080	2.5	5	6	10	80
	2060-090	3	6	6	12	90
	2080-100	4	8	8	14	100
	2100-100	5	10	10	18	100
	2120-110	6	12	12	22	110

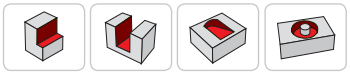
PRE4000 (Radius)





4 | H·A 30° | h5 shank | Substrate PC310U

ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



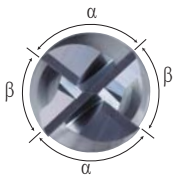
(mm)

Designation		ØD	Ød	ℓ	L	r
PRE 4	4030-060-R01	3	6	8	60	0.1
	4030-060-R02	3	6	8	60	0.2
	4030-060-R03	3	6	8	60	0.3
	4030-060-R05	3	6	8	60	0.5
	4040-070-R01	4	6	10	70	0.1
	4040-070-R02	4	6	10	70	0.2
	4040-070-R03	4	6	10	70	0.3
	4040-070-R05	4	6	10	70	0.5
	4040-070-R10	4	6	10	70	1
	4060-090-R02	6	6	15	90	0.2
	4060-090-R03	6	6	15	90	0.3
	4060-090-R05	6	6	15	90	0.5
	4060-090-R10	6	6	15	90	1
	4080-100-R02	8	8	20	100	0.2
	4080-100-R03	8	8	20	100	0.3
	4080-100-R05	8	8	20	100	0.5
	4080-100-R10	8	8	20	100	1
	4100-100-R03	10	10	25	100	0.3
	4100-100-R05	10	10	25	100	0.5
	4100-100-R10	10	10	25	100	1
	4120-110-R03	12	12	30	110	0.3
	4120-110-R05	12	12	30	110	0.5
	4120-110-R10	12	12	30	110	1

Improved productivity with effective machining due to less vibration

V Endmill

Variable Endmill





- Irregular helix angle
- Irregular indexing angle

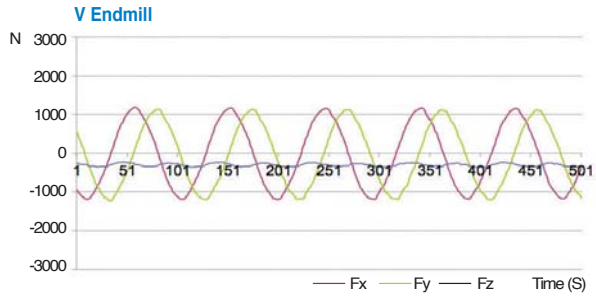
※ Irregular flute spacing = Decreased vibration

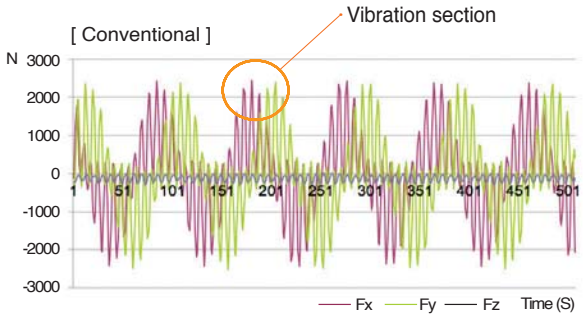
Features

- 30% increased cutting speed (vc) and feed rate (vf) to boost productivity
- High quality machining available thanks to minimized tool vibrations and excellent surface finish

Performance (Vibration test)

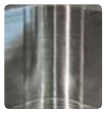
- **Workpiece** SCM440
- **Cutting condition** D = Ø8.0, n (m/min) = 3183, vc (m/min) = 80, vf (mm/min) = 713, fz (mm/t) = 0.055, ap (mm) = 8.0, ae (mm) = 8, Dry
- **Tools** V Endmill (VFE4080-060) Conventional endmill

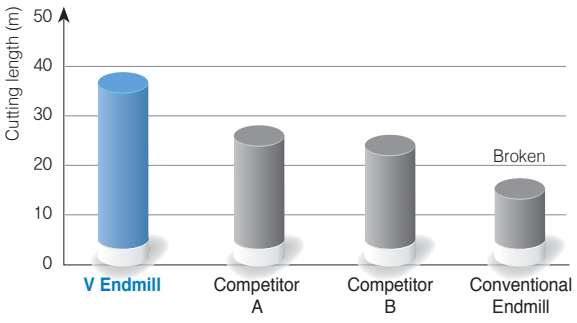




Performance (Surface finish)

- **Workpiece** STS304
- **Cutting condition** D = Ø8.0, n (min^{-1}) = 3979, vc (m/min) = 100, vf (mm/min) = 796, fz (mm/t) = 0.05, ap (mm) = 12, ae (mm) = 0.8, Dry
- **Tools** VFE4080-060

Edge			
Surface finish			
Division	V Endmill	Competitor A Irregular flute spacing Endmill	Competitor B Irregular flute spacing Endmill



Application examples

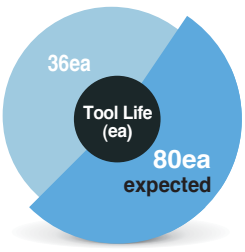
- **Workpiece** SNCM439 (HRC 43~45)
- **Cutting condition** D = Ø8.0, n (m/min) = 6000, vc (m/min) = 150, vf (mm/min) = 600, fz (mm/t) = 0.025, ap (mm) = 7, ae (mm) = 0.8, Wet (Water-soluble)
- **Tools** VFE4080-060



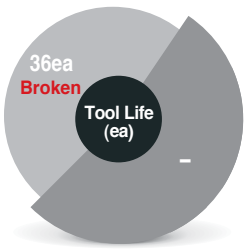
V Endmill



Conventional Endmill



V Endmill(VFE4080)



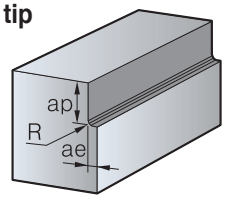
Conventional Endmill

Cutting condition

■ Shouldering

Diameter (ØD)	Alloy & Carbon steel, HRC25 or less (SM, SCM)				Mold steel, HRC35~45 (STS, KP4M)			
	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)
2.5	15,915	1,241	3.8	0.7	12.732	891	0.3	0.3
3.0	13,263	1,241	4.5	0.8	10,610	891	0.3	0.3
3.5	11,368	1,241	5.3	0.9	9,095	891	0.4	0.4
4.0	9,947	1,241	6.0	1.1	7,958	891	0.4	0.4
5.0	7,958	1,241	7.5	1.4	6,366	891	0.5	0.5
6.0	6,631	1,241	9.0	1.6	5,305	891	0.6	0.6
7.0	5,684	1,241	10.5	1.9	4,547	891	0.7	0.7
8.0	4,974	1,194	12.0	2.2	3,979	891	0.8	0.8
9.0	4,421	1,194	13.5	2.4	3,537	891	0.9	0.9
10.0	3,979	1,194	15.0	2.7	3,183	891	1.0	1.0
12.0	3,316	1,194	18.0	3.2	2,653	891	1.2	1.2
14.0	2,842	1,194	21.0	3.8	2,274	891	1.4	1.4
16.0	2,487	1,194	24.0	4.3	1,989	891	1.6	1.6

Application tip



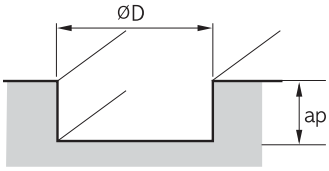
※ Cutting condition by overhang

1. Standard overhang: Follow cutting condition above
2. Long overhang: When the overhang is increased by 10mm, decrease feed 5% & ae 5%

■ Slotting

Diameter (ØD)	Alloy & Carbon steel, HRC25 or less (SM, SCM)			Mold steel, HRC35~45 (STS, KP4M)		
	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)	R.P.M (min^{-1})	Feed (mm/min)	ap (mm)
2.5	15.915	1,035	2.8	12,732	700	2.5
3.0	13,263	1,035	3.3	10,610	700	3.0
3.5	11,268	1,035	3.9	9,095	700	3.5
4.0	9,947	1,035	4.4	7,958	700	4.0
5.0	7,958	1,035	5.5	6,366	700	5.0
6.0	6,631	1,035	6.6	5,305	700	6.0
7.0	5,687	1,035	7.7	4,549	700	7.0
8.0	4,974	1,035	8.8	3,979	700	8.0
9.0	4,421	1,035	9.9	3,537	700	9.0
10.0	3,979	1,035	11.0	3,183	700	10.0
12.0	3,316	1,035	13.2	2,653	700	12.0
14.0	2,842	1,035	15.4	2,274	700	14.0
16.0	2,487	1,035	17.6	1,989	700	16.0

Application tip



※ Cutting condition by overhang

1. Standard overhang: Follow cutting condition above
2. Long overhang: When the overhang is increased by 10mm, decrease feed 5% & ae 5%

VFE4000 (Flat)



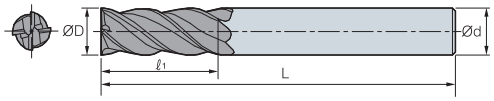


Fig. 1

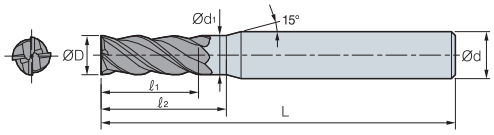


Fig. 2









ØD	Tolerance
Ø2.5~Ø9	0.00~ -0.02
Ø10~Ø16	0.00~ -0.03



(mm)

Designation		ØD	Ød	d1	ℓ1	ℓ2	L	Fig.
VFE	4025-045	2.5	6.0	2.48	6.0	8.0	45	2
	4030-050	3.0	6.0	2.98	7.0	9.5	50	2
	4035-050	3.5	6.0	3.48	8.0	11.0	50	2
	4040-050	4.0	6.0	3.98	9.0	12.0	50	2
	4050-050	5.0	6.0	4.98	12.0	16.0	50	2
	4060-050	6.0	6.0	-	14.0	-	50	1
	4070-060	7.0	8.0	6.97	16.0	21.0	60	2
	4080-060	8.0	8.0	-	19.0	-	60	1
	4090-070	9.0	10.0	8.97	20.0	27.0	70	2
	4100-075	10.0	10.0	-	23.0	-	75	1
	4120-080	12.0	12.0	-	27.0	-	80	1
	4140-085	14.0	14.0	-	31.0	-	85	1
	4160-090	16.0	16.0	-	36.0	-	90	1

Endmill for general cutting

Z Endmill new

- Endmill for general cutting of various workpieces under HRC45 (carbon steel, alloy steel, cast iron, pre-hardened steel, etc.)
- New shape and coating improves performance and tool life
- Optimized blade design for less chipping and stable machining

Features

- New grade (PC315E) - Fine substrate and lubricative coating guarantee excellent performance at high speed and high temperature
- Special edge treatment - Special cutting-edge design was applied for less chipping and longer tool life
- High accuracy with tolerance-h5 - High quality production system enables tolerance-h5 throughout the whole series

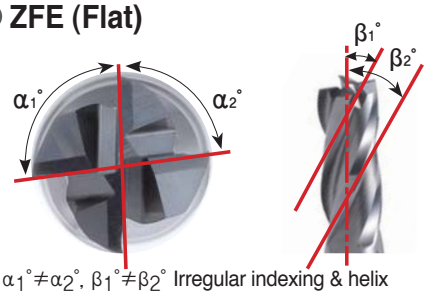


After special edge treatment



before

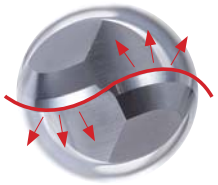
ZFE (Flat)



$\alpha_1^\circ \neq \alpha_2^\circ$, $\beta_1^\circ \neq \beta_2^\circ$ Irregular indexing & helix

- Irregular indexing & helix prevent chattering and improve surface

ZBE (Ball)



Cutting load is dispersed

S shape of ball

- The S shape of ball disperses cutting loads
- The tolerance of ball R is under ±0.005 mm

Application examples

- **Workpiece** Carbon steel [1045(AISI)/C45(DIN)/S45C(JIS), HRC20)]
- **Cutting condition** D = Ø8.0, n (min^{-1}) = 7,165, vc (m/min) = 180, vf (mm/min) = 1.433, fz (mm/t) = 0.05, ap (mm) = 8, ae (mm) = 0.8, dry
- **Tools** ZFE4080-070

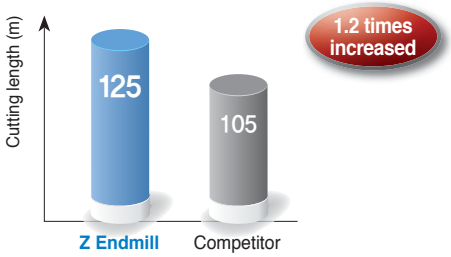


Z Endmill



Competitor

■ Test result

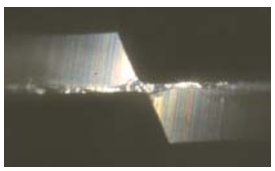


- Cutting edge treatment for less chipping

- **Workpiece** Carbon steel [1045(AISI)/C45(DIN)/S45C(JIS), HRC20)]
- **Cutting condition** D = Ø8.0, n (min^{-1}) = 5,175, vc (m/min) = 130, vf (mm/min) = 1.035, fz (mm/t) = 0.1, ap (mm) = 0.5, ae (mm) = 1.6, dry
- **Tools** ZFE2080-100

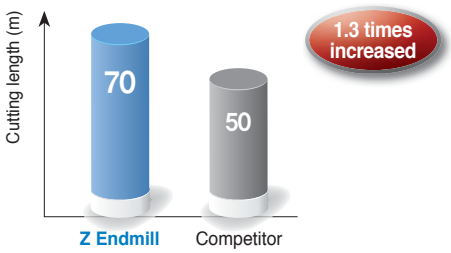


Z Endmill



Competitor

■ Test result

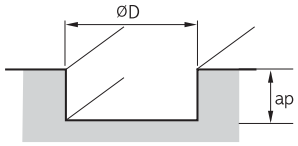


- New grade improves wear resistance

Recommended cutting conditions (ZFE2000/ZSFE2000 flat)

Workpiece / Condition / Diameter (Ø)	Alloy steel & carbon steel (under HRC30)		Pre-hardened steel (HRC30~45)		Stainless steel	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	19,745	175	13,057	100	10,500	70
2	11,560	190	7,560	120	6,300	90
3	8,920	210	5,560	140	4,620	120
4	7,560	300	4,620	180	3,880	150
5	6,300	320	3,780	190	3,160	160
6	5,560	350	3,360	220	2,840	180
8	4,200	380	2,520	200	2,100	180
10	3,260	330	2,000	160	1,680	160
12	2,740	280	1,680	130	1,360	130
16	2,200	220	1,360	110	1,060	110

Application tip



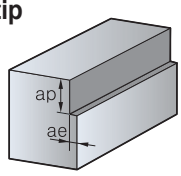
■ Slotting depth (ap)
- D ≤ Ø3 (ap = 0.2D)
- D > Ø3 (ap = 0.5D)

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (ZFE4000/ZSFE4000 flat)

Workpiece / Condition / Diameter (Ø)	Alloy steel & carbon steel (under HRC30)		Pre-hardened steel (HRC30~45)		Stainless steel	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
2	11,560	280	7,560	170	6,300	140
3	8,920	320	5,560	200	4,620	170
4	7,560	570	4,620	350	3,880	280
5	6,300	600	3,780	360	3,160	300
6	5,560	660	3,360	410	2,840	330
8	4,200	710	2,520	380	2,100	350
10	3,260	610	2,000	300	1,680	300
12	2,740	520	1,680	250	1,360	240
16	2,200	410	1,360	200	1,100	200

Application tip



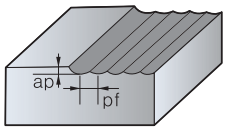
■ Shouldering depth (ap) and radial depth (ae)
- ap = 1.0D
- ae = 0.05D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (ZBE2000 ball)

Workpiece / Condition / Diameter (Ø)	Alloy steel & carbon steel (under HRC30)		Pre-hardened steel (HRC30~45)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	30,000	2,880	30,000	2,520
1.2	30,000	3,060	28,800	2,580
1.5	30,000	3,240	28,800	2,700
2	29,820	3,420	28,680	2,880
3	19,860	3,600	19,080	3,180
4	14,940	3,600	14,340	3,180
5	11,160	3,480	10,680	2,940
6	8,340	2,910	8,040	2,460
8	6,660	2,520	6,420	2,100
10	5,580	2,220	5,340	1,860
12	4,170	1,770	4,008	1,500

Application tip

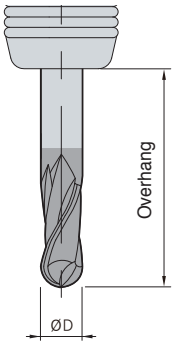


- ap = 0.03D
- pf = 0.05D

※ Workpiece should be clamped rigidly. In case of vibration, reduce R.P.M and feed rate by the same ratio

Cutting condition by overhang

- Cutting conditions of the shank taper type in case of being clamped at neck
  - When the overhang is increased by 1D, decrease R.P.M and feed 10%
- In case of the straight type adjust conditions according to the overhang
  - Ex: When the overhang is 3D and is increased by 1D, decrease R.P.M and feed 10%



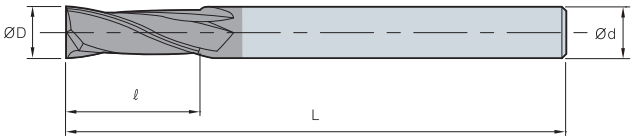
Notice

- Cutting conditions are up to the machine's condition and the shape of cutting
- Use cutting fluid that is proper to the workpiece and produces few temperature reactions

ZFE2000 (Flat)







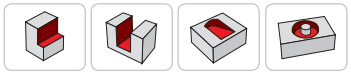








ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



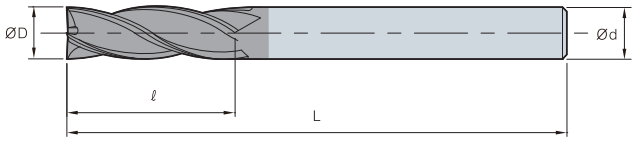
(mm)

Designation		ØD	Ød	ℓ	L
ZFE 2	2010-050-S4	1	4	2.5	50
	2010-050-S6	1	6	2.5	50
	2012-050-S4	1.2	4	3	50
	2012-050-S6	1.2	6	3	50
	2015-050-S4	1.5	4	4	50
	2015-050-S6	1.5	6	4	50
	2020-050-S4	2	4	6	50
	2020-050-S6	2	6	6	50
	2025-050-S4	2.5	4	7.5	50
	2025-050-S6	2.5	6	7.5	50
	2030-050-S4	3	4	9	50
	2030-050-S6	3	6	9	50
	2035-050	3.5	6	10	50
	2040-050-S4	4	4	11	50
	2040-050-S6	4	6	11	50
	2045-050	4.5	6	14	50
	2050-060	5	6	15	60
	2055-060	5.5	6	15	60
	2060-060	6	6	15	60
	2065-060	6.5	8	18	60
	2070-060	7	8	20	60
	2075-060	7.5	8	20	60
	2080-070	8	8	20	70
	2085-070	8.5	10	22	70
	2090-070	9	10	22	70
	2095-070	9.5	10	24	70
	2100-075	10	10	25	75
	2120-080	12	12	30	80
	2140-100	14	14	35	100
	2160-100	16	16	40	100

ZFE4000 (Flat)

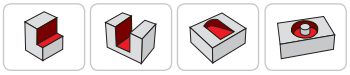






4 | Multiple H·A | h5 shank | Substrate PC315E

ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



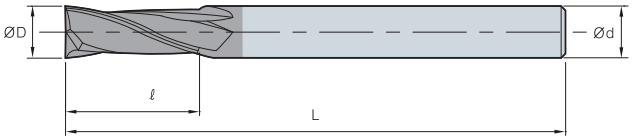
(mm)

Designation		ØD	Ød	ℓ	L
ZFE 4	4010-050-S4	1	4	2.5	50
	4010-050-S6	1	6	2.5	50
	4012-050-S4	1.2	4	3	50
	4012-050-S6	1.2	6	3	50
	4015-050-S4	1.5	4	4	50
	4015-050-S6	1.5	6	4	50
	4020-050-S4	2	4	6	50
	4020-050-S6	2	6	6	50
	4025-050-S4	2.5	4	7.5	50
	4025-050-S6	2.5	6	7.5	50
	4030-050-S4	3	4	9	50
	4030-050-S6	3	6	9	50
	4035-050	3.5	6	10	50
	4040-050-S4	4	4	11	50
	4040-050-S6	4	6	11	50
	4045-050	4.5	6	14	50
	4050-060	5	6	15	60
	4055-060	5.5	6	15	60
	4060-060	6	6	15	60
	4065-060	6.5	8	18	60
	4070-060	7	8	20	60
	4075-060	7.5	8	20	60
	4080-070	8	8	20	70
	4085-070	8.5	10	22	70
	4090-070	9	10	22	70
	4095-070	9.5	10	24	70
	4100-075	10	10	25	75
	4120-080	12	12	30	80
	4140-100	14	14	35	100
	4160-100	16	16	40	100

ZSFE2000/4000 (Short flat)

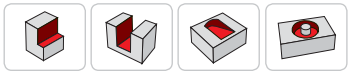








ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025

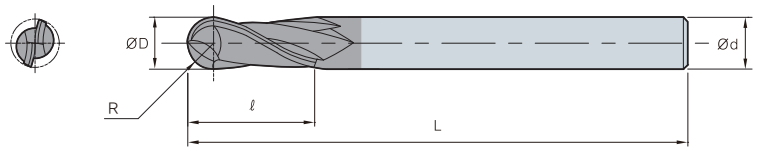


(mm)

Designation		ØD	Ød	ℓ	L
ZSFE 2	2010-040-S4	1	4	1.5	40
	2010-040-S6	1	6	1.5	40
	2012-040-S4	1.2	4	1.5	40
	2012-040-S6	1.2	6	1.5	40
	2015-040-S4	1.5	4	2.2	40
	2015-040-S6	1.5	6	2.2	40
	2020-040-S4	2	4	3	40
	2020-040-S6	2	6	3	40
	2025-040-S4	2.5	4	4	40
	2025-040-S6	2.5	6	4	40
	2030-045-S4	3	4	4.5	45
	2030-045-S6	3	6	4.5	45
	2040-045-S4	4	4	6	45
	2040-045-S6	4	6	6	45
	2060-050	6	6	9	50
	2080-060	8	8	12	60
	2100-065	10	10	15	65
	2120-070	12	12	18	70
ZSFE 4	4010-040-S4	1	4	1.5	40
	4010-040-S6	1	6	1.5	40
	4012-040-S4	1.2	4	1.5	40
	4012-040-S6	1.2	6	1.5	40
	4015-040-S4	1.5	4	2.2	40
	4015-040-S6	1.5	6	2.2	40
	4020-040-S4	2	4	3	40
	4020-040-S6	2	6	3	40
	4025-040-S4	2.5	4	4	40
	4025-040-S6	2.5	6	4	40
	4030-045-S4	3	4	4.5	45
	4030-045-S6	3	6	4.5	45
	4040-045-S4	4	4	6	45
	4040-045-S6	4	6	6	45
	4060-050	6	6	9	50
	4080-060	8	8	12	60
	4100-065	10	10	15	65
	4120-070	12	12	18	70

ZBE2000 (Ball)







ØD	Tolerance
~Ø5.9	0.00~ -0.015
Ø6.0~	0.00~ -0.025



(mm)

Designation		R	ØD	Ød	ℓ	L
ZBE	2010-050-S4	0.5	1	4	2.5	50
	2010-050-S6	0.5	1	6	2.5	50
	2012-050-S4	0.6	1.2	4	3	50
	2012-050-S6	0.6	1.2	6	3	50
	2015-050-S4	0.75	1.5	4	4	50
	2015-050-S6	0.75	1.5	6	4	50
	2020-050-S4	1	2	4	5	50
	2020-050-S6	1	2	6	5	50
	2025-060-S4	1.25	2.5	4	6	60
	2025-060-S6	1.25	2.5	6	6	60
	2030-060-S4	1.5	3	4	8	60
	2030-060-S6	1.5	3	6	8	60
	2035-070	1.75	3.5	6	8	70
	2040-070-S4	2	4	4	8	70
	2040-070-S6	2	4	6	8	70
	2045-080	2.25	4.5	6	9	80
	2050-080	2.5	5	6	10	80
	2055-090	2.75	5.5	6	11	90
	2060-090	3	6	6	12	90
	2065-090	3.25	6.5	8	13	90
	2070-090	3.5	7	8	14	90
	2080-100	4	8	8	14	100
	2085-100	4.25	8.5	10	16	100
	2090-100	4.5	9	10	18	100
	2100-100	5	10	10	18	100
	2120-110	6	12	12	22	110

High efficiency and high feed machining

F Endmill

Feed-up Endmill

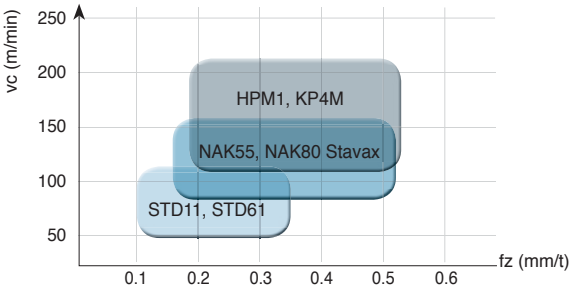
- Improved productivity and shortened working time thanks to high feed capability
- Reduced costs thanks to the highly efficient machining process

Feature



- Wider chip pocket area highly efficient operation
- High feed machining possible by dispersing cutting forces

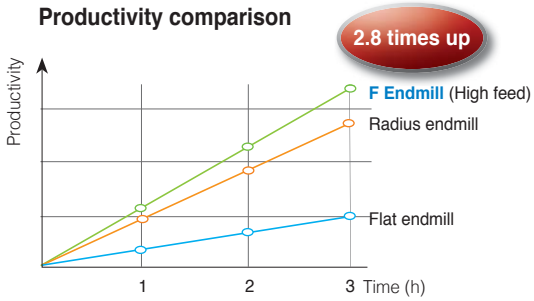
Application by workpiece



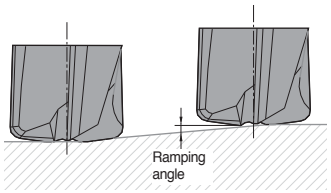
Productivity example

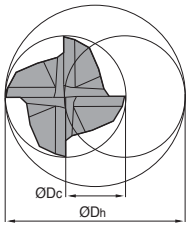
Type	Speed (vc)	Feed (fz)	D.O.C		Machining volume (mm^3/min)
			ap	ae	
F-Endmill (High feed)	180	**0.30**	0.5	5.0	**135,000**
Radius Endmill	200	0.09	1.0	5.0	90,000
Flat Endmill	120	0.05	8.0	0.2	48,000

Higher productivity by feed increase. 2.8 times

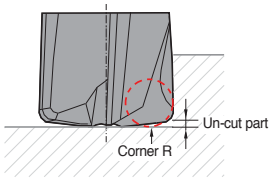


Programing information

Ramping	Ramping angle	Feed
	1°	100%
	2°	80%
	3°	60%
	4°	50%

Helical Ramping	Diameter (ØD)	Min. diameter	Max. diameter
	6	7.8	12
	8	10.2	16
	10	12.4	20
	12	14.9	24

∗ ØDc: Feed(Tool center) ∗ ØDh: Machining area

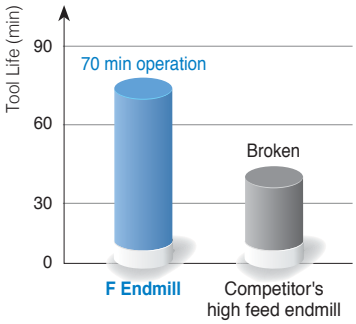
CAM Ramping	Diameter (ØD)	Endmill-R	CAM-Radius	Un-cut part
	6	0.5	0.7	0.21
	8	0.5	0.8	0.32
	10	1.0	1.3	0.36
	12	1.2	1.6	1.45

Application examples

- **Workpiece** STD61+SKT (HRC45~50)
- **Cutting condition** D = Ø12, n (min^{-1}) = 4.000, vc (m/min) = 150.8, vf (mm/min) = 4.000, fz (mm/t) = 0.25, ap (mm) = 3.6, ae (mm) = 0.6, dry
- **Tools** FME4120-075-R12



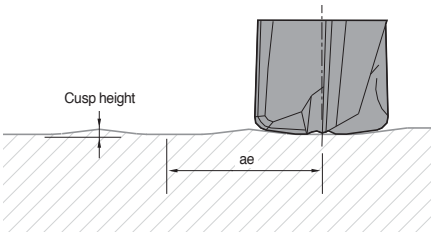
Test result



Cutting condition

Cusp height by radial depth of cut

Diameter (ØD)	Radial depth ae (mm)					
	0.1XD	0.2XD	0.3XD	0.4XD	0.5XD	0.6XD
6	0	0	0	0.02	0.06	0.11
8	0	0	0	0.04	0.10	0.15
10	0	0	0.01	0.07	0.14	0.21
12	0	0	0.01	0.08	0.17	0.25



Medium cut

Diameter (ØD)	Mold steel HRC35~45 (HPM1, KP4M)				Mold steel HRC45~55 (NAK55, NAK80, STAVAX)				Heat treated HRC55 (SKD11, STD61)			
	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)
6	11,600	11,200	0.24	1.6	9,000	7,570	0.21	1.6	5,800	3,500	0.18	1.6
8	8,700		0.32	2.2	6,700		0.28	2.2	4,300		0.24	2.2
10	7,000		0.40	2.7	5,400		0.35	2.7	3,500		0.30	2.7
12	5,800		0.48	3.3	4,500		0.42	3.3	2,900		0.36	3.3

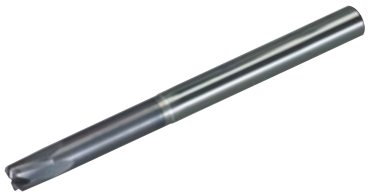
Roughing cut

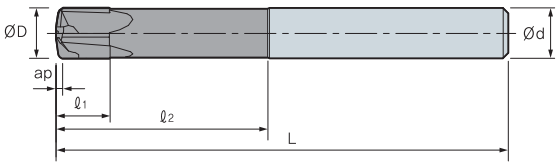
Diameter (ØD)	Mold steel HRC35~45 (HPM1, KP4M)				Mold steel HRC45~55 (NAK55, NAK80, STAVAX)				Heat treated HRC55 (SKD11, STD61)			
	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)	RPM n (min^{-1})	Feed (mm/min)	ap (mm)	ae (mm)
6	8,488	9,167	0.27	3.0	6,366	6,112	0.24	3.0	4,244	2,546	0.21	3.0
8	6,366		0.36	4.0	4,775		0.32	4.0	3,183		0.28	4.0
10	5,093		0.45	5.0	3,820		0.40	5.0	2,546		0.35	5.0
12	4,244		0.54	6.0	3,183		0.48	6.0	2,122		0.42	6.0

* Cutting condition by overhang

1. Standard overhang: Follow cutting conditions above
2. Long type: Apply 80% feed & 80% ae
3. Long overhang: When the overhang is increased by 10mm, decrease feed 5% & ae 5%

FME4000 (Standard)





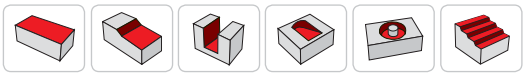








ØD	Tolerance
Ø6~Ø12	-0.01~ -0.03

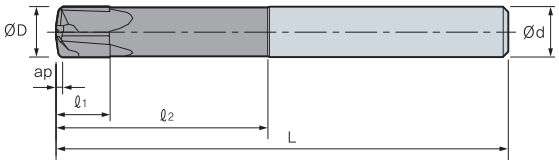


(mm)

Designation		R	ØD	Ød	ℓ1	ℓ2	L	Max. ap (mm)	CAM-Radius
FME	4060-050-R05	0.5	6	6	4.5	18	50	0.35	0.7
4	4080-060-R05	0.5	8	8	6	24	60	0.45	0.8
	4100-070-R10	1.0	10	10	7.5	30	70	0.65	1.3
	4120-075-R12	1.2	12	12	9	36	75	0.78	1.6

FMLE4000 (Long)





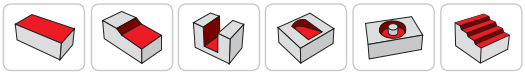








ØD	Tolerance
Ø6~Ø12	-0.01~ -0.03



(mm)

Designation		R	ØD	Ød	ℓ1	ℓ2	L	Max. ap (mm)	CAM-Radius
FMLE	4060-090-R05	0.5	6	6	4.5	30	90	0.35	0.7
4	4080-090-R05	0.5	8	8	6	40	90	0.45	0.8
	4100-100-R10	1.0	10	10	7.5	50	100	0.65	1.3
	4120-110-R12	1.2	12	12	9	60	110	0.78	1.6

Endmill for machining dental prostheses

T Endmill new

- For machining dental prostheses made of zirconia, titanium, Co-Cr, wax, PMMA, etc
- Optimized cutting performance by matching a proper grade with each type of materials
- Inhibited unevenness and excellent finish in machined surfaces due to the optimized cutting-edge design
- Specialized tool shape for each machine type

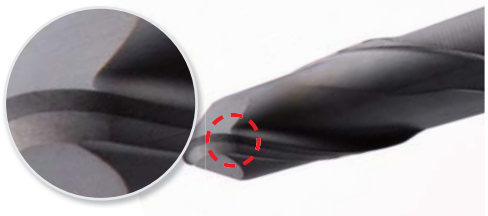
Code system

T Z E 2 030 - 050 - N100 S04 (Z-MATCH)

- **T Endmill**
- **Workpiece**
  - Z: Zirconia
  - T: Ti/Co-Cr
  - W: Wax/PMMA
- **Type**
  - BE: Ball Endmill
  - FE: Flat Endmill
  - RE: Radius Endmill
- **No. of flutes**
  - 2: 2 Flute
- **Drill dia.**
  - 030: 3 mm
- **Overall length**
  - 050: 50 mm
- **Neck length**
  - N100: 10 mm
- **Shank dia.**
  - S04: 4 mm
- **Machine Maker**

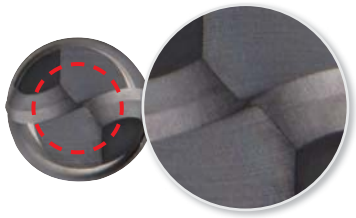
Features

- A dedicated tool for each machine - Meets marketplace demands
- A specialized grade for each workpiece - Provides optimized performance for various materials of implants
- Optimized cutting-edge design - Enables excellent machinability



Tangential cutting-edge shape

- One-Pass Grinding applied
- Inhibited unevenness and excellent finish in machined surfaces



Center-Matched ball shape

- High Center-Matched shape ensures relief angle at the ball point
- Cutting edges of the ball point shape provide excellent wear resistance and cutting performance

Grade solution for zirconia

•Development of ND3000 (Diamond-coated grade)

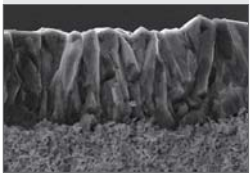
- High hardness diamond coating that is excellent in machining graphite and ceramic
- Optimized for high speed and medium duty cutting thanks to its excellent grip to coated layers

Surface of ND3000



High hardness diamond coating (Hv 10,000) provides excellent wear resistance

Cross section of coated layers

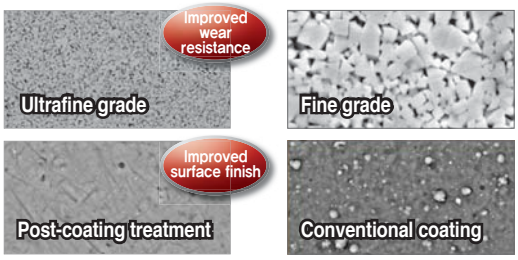


Specialized grade for Zirconia provides excellent adhesion

Grade solution for titanium

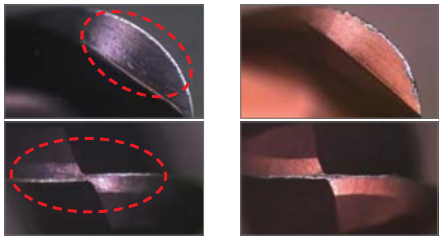
•Development of PC2510 (Coated grade for high hardened steel)

- Post-coating treatment was applied to improve surface finish
- A grade optimized for interrupted machining of high hardness steels and wet treatment accompanying high thermal shock. Its ultrafine substrate features high toughness which allows stable performance



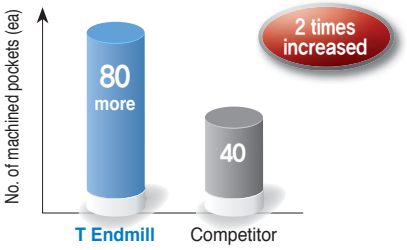
Performance evaluation

- **Workpiece** Co-Cr
- **Cutting conditions** vc (m/min) = 150, Use
  fz (mm/t) = 0.08
  ap (mm) = 0.13
  ae (mm) = 0.7, wet
- **Tools** TTBE2030-050



T Endmill Competitor

■ Test result



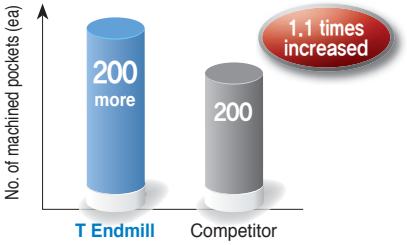
Excellent resistance to toughness and wear thanks to the new grade PC2510

Application examples

- **Use** Implant crowns
- **Workpiece** Zirconia
- **Cutting conditions** vc (m/min) = 140
  fz (mm/t) = 0.05
  ae (mm) = 0.6, dry
- **Tools** TZBE2020-044-N200S03 (DOF)



■ Test result



Recommended cutting conditions (Titanium & Co-Cr)

Diameter (Ø)	Application	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)
3.0	Roughing	0.12	0.7	10,500	1,150
2.5	Medium	0.08	0.53	11,500	850
2.0	Medium	0.08	0.42	14,500	850
1.5	Finishing	0.04	0.32	19,000	850
1.0	Finishing	0.02	0.07	28,500	850
0.6	Finishing	0.02	0.07	28,500	850

Recommended cutting conditions for zirconia

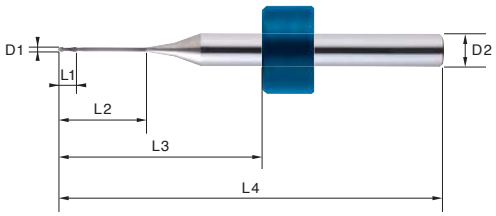
Diameter (Ø)	Application	ap (mm)	ae (mm)	n (min^{-1})	vf (mm/min)
3.0	Roughing	0.5	1.5	23,500	1,600
2.5	Medium	0.3	1.25	28,000	1,200
2.0	Finishing	0.3	1.0	35,000	1,200
1.0	Finishing	0.1	0.2	38,500	1,050
0.6	Finishing	0.1	0.2	63,500	630

Special T Endmill order form

• Stop rings and other tool resources can be made to order

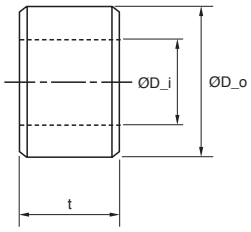
[Data sheet]

Type of machine	
Workpiece	
Dental material	
Cutting diameter (D1)	
Shank diameter (D2)	
Cutting length (L1)	
Neck length (L2)	
Stop ring position (L3)	
Overall length (L4)	
Stop ring shape	

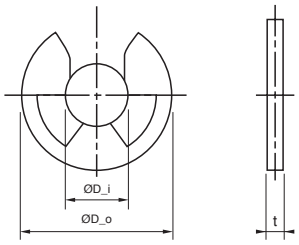


※ Should you make a special order, please complete this form and send it to an adjacent KORLOY sales office

[Stop ring specification]



< Plastic ring >



< E type ring >

(mm)

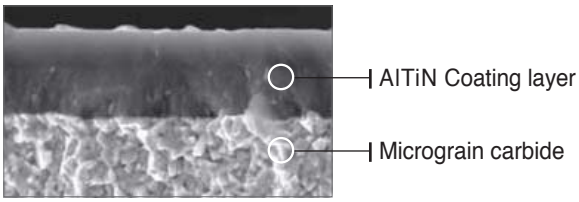
Type	Stop ring			Shank diameter		
	ØD_o	ØD_i	t	Ø3	Ø4	Ø6
Plastic ring	Ø7.55	Ø3	4.45	●		
	Ø7.7	Ø4	5.0		●	
	Ø10.5	Ø6	6.5			●
E type ring	Ø6.0	Ø2.5	0.4	●		

※ Stop ring can be made to order when specified sizes are send to an adjacent KORLOY sales office

Stable performance guaranteed for workpiece workpieces under HRC45

I+ Endmill

- Tough substrate & wear-resisting coating technology applied
- Wide application range in general use
  - Stable performance guaranteed for workpiece which is under 45 HRC
- Saving cost by higher productivity

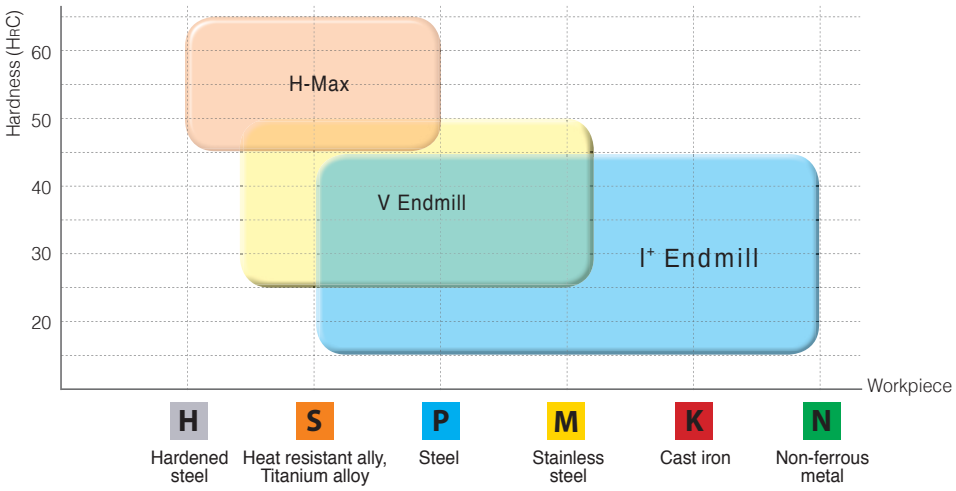


PC320

Product line-up

- IPBE: I Plus Ball Endmill (Ø1~Ø20)
- IPFE: I Plus Flat Endmill (Ø1~Ø20)
- IPRE: I Plus Radius Endmill (Ø1~Ø12)

Application area



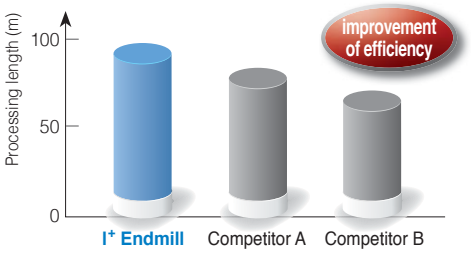
Performance evaluation

- **Workpiece** SM45C
- **Cutting conditions** Diameter = Ø8.0, n (min-1) = 5.173, vc (m/min) = 130.0, vf (mm/min) = 1.034, fz (mm/t) = 0.1, ap (mm) = 0.5, ae (mm) = 1.6, dry
- **Tools** IPBE2080-060



I+ Endmill | Competitor A | Competitor B

Test result

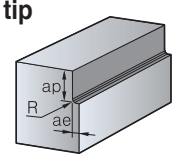


Recommended cutting condition (flat)

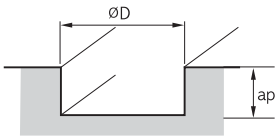
■ IPFE2000

Diameter (ØD)	Carbon steel, Alloy steel~HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre-hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	600	480	20,000	400	320	12,600	300	180
1.5	20,000	600	480	14,000	400	320	8,400	300	180
2.0	15,000	600	480	10,000	400	400	6,300	300	180
2.5	12,000	600	480	8,200	400	320	5,100	300	180
3.0	10,000	600	480	7,000	400	320	4,200	300	180
4.0	7,500	600	480	5,200	400	320	3,100	300	180
5.0	6,000	600	480	4,200	400	320	2,500	300	180
6.0	5,000	600	480	3,500	400	320	2,100	300	180
8.0	4,000	520	410	2,800	350	280	1,600	260	150
10.0	3,200	450	360	2,200	300	240	1,300	230	130
12.0	2,700	410	320	1,900	270	210	1,100	210	120
16.0	2,000	240	190	1,400	210	160	840	160	100
20.0	1,600	200	160	1,100	170	130	680	140	80

Application tip



■ **Shouldering depth (ap) and radial depth (ae)**
- ap: ≤ 1.5 (All dia.)
- ae: ≤ 0.1D (D ≤ Ø3)
  ≤ 0.2D (D > Ø3)

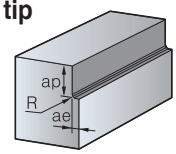


■ **Slotting depth (ap)**
- ap: ≤ 0.1D (D ≤ Ø2)
  ≤ 0.2D (D > Ø2)

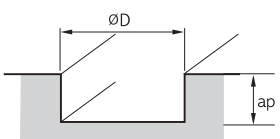
■ IPFE4000

Diameter (ØD)	Carbon steel, Alloy steel ~HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre-hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
1.0	30,000	900	720	20,000	600	480	12,600	450	270
1.5	20,000	900	720	14,000	600	480	8,400	450	270
2.0	15,000	900	720	10,000	600	480	6,300	450	270
2.5	12,000	900	720	8,200	600	480	5,100	450	270
3.0	10,000	900	720	7,000	600	480	4,200	450	270
4.0	7,500	900	720	5,200	600	480	3,100	450	270
5.0	6,000	900	720	4,200	600	480	2,500	450	270
6.0	5,000	900	720	3,500	600	480	2,100	450	270
8.0	4,000	780	620	2,800	520	410	1,600	390	230
10.0	3,200	680	540	2,200	450	360	1,300	340	200
12.0	2,700	620	490	1,900	410	320	1,100	310	180
16.0	2,000	360	280	1,400	310	240	840	240	140
20.0	1,600	300	240	1,100	250	200	680	210	120

Application tip



■ **Shouldering depth (ap) and radial depth (ae)**
- ap: ≤ 1.5 (All dia.)
- ae: ≤ 0.1D (D ≤ Ø3)
  ≤ 0.2D (D > Ø3)



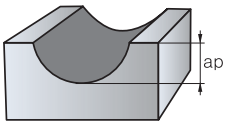
■ **Slotting depth (ap)**
- ap: ≤ 0.1D (D ≤ Ø2)
  ≤ 0.2D (D > Ø2)

Recommended cutting condition (ball)

■ IPBE2000

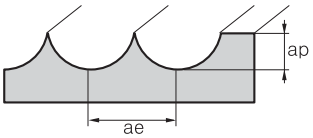
Diameter (ØD)	Carbon steel (SM50C)		Alloy steel (SCM, STD, STS, KP4M, NAK)		Mold steel ~HRC45 (STD61)		Non-ferrous metal (Aluminum)	
	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)	R.P.M (min^{-1})	Feed (mm/min)
1.0	40,000	1,200	38,000	1,200	29,000	900	40,000	1,000
1.5	30,000	1,270	25,500	1,100	19,000	700	40,000	1,360
2.0	24,000	1,160	19,000	800	14,300	600	40,000	2,000
2.5	19,000	1,000	15,300	670	11,500	510	38,000	2,400
3.0	16,000	930	13,000	600	9,600	460	32,000	2,400
3.5	13,700	930	11,400	580	8,200	450	27,300	2,400
4.0	12,000	930	10,000	570	7,200	450	24,000	2,400
5.0	9,600	930	8,000	560	5,700	450	19,000	2,400
6.0	8,000	930	6,400	540	4,800	450	16,000	2,400
8.0	6,000	900	4,800	540	3,600	450	12,000	2,400
10.0	4,800	900	3,800	540	2,900	450	9,600	2,300
12.0	4,000	900	3,200	540	2,400	450	8,000	2,100
14.0	3,400	900	2,750	540	2,050	450	6,800	2,000
16.0	3,000	900	2,400	540	1,800	450	6,000	2,000
20.0	2,400	900	1,900	520	1,450	450	4,800	2,000

Application tip



■ Slotting depth (ap)

• ap: 0.1×R (~45HRC)
0.08 ×R (~50HRC)



(R0.1~0.5 = 0.2×R)
0.3×R

■ Shouldering depth (ap) and radial depth (ae)

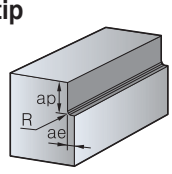
~0.16×R R ≦ 0.3 (~45HRC)
~0.25×R R ≦ 3 (~45HRC)
~0.17×R R ≦ 4 (~45HRC)
~0.05×R (~50HRC)

Recommended cutting condition (Radius)

■ IPRE2000

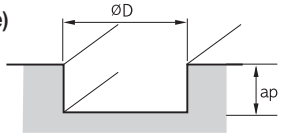
Diameter (ØD)	Carbon steel, Alloy steel ~HRC30 (SM50C, SCM, GC250, Cast iron)			Alloy steel, High speed steel HRC30~45 (Pre-hardened steels, STD61, NAK)			Stainless steel (STS304, STS316)		
	R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)		R.P.M (min^{-1})	Feed (mm/min)	
		Shouldering	Slotting		Shouldering	Slotting		Shouldering	Slotting
2.0	11,000	180	180	7,200	110	110	6,000	90	90
3.0	8,500	200	160	5,300	130	100	4,400	110	66
4.0	7,200	360	290	4,400	220	180	3,000	180	110
5.0	6,000	380	300	3,600	230	180	2,400	190	110
6.0	5,300	420	340	3,200	240	190	2,200	210	130
8.0	4,000	450	360	2,400	240	190	1,600	220	130
10.0	3,200	390	310	1,900	190	150	1,300	190	110
12.0	2,700	330	260	1,600	160	130	1,000	150	90

Application tip



■ Shouldering depth (ap) and radial depth (ae)

• ap: ≤ 1.5D
• ap: ≤ 0.1D

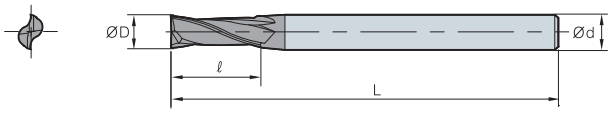


■ Slotting depth (ap)

• ap: ≤ 0.3D

IPFE2000 (Flat)












ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

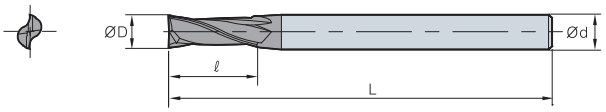


(mm)

Designation		ØD	Ød	ℓ	L
IPFE	2010-050-S3	1	3	3	50
	2010-050-S4	1	4	3	50
	2010-050	1	6	3	50
	2015-050-S3	1.5	3	4	50
	2015-050-S4	1.5	4	4	50
	2015-050	1.5	6	4	50
	2020-050-S3	2	3	6	50
	2020-050-S4	2	4	6	50
	2020-050	2	6	6	50
	2025-050-S3	2.5	3	8	50
	2025-050-S4	2.5	4	8	50
	2025-050	2.5	6	8	50
	2030-050-S3	3	3	8	50
	2030-050-S4	3	4	8	50
	2030-050	3	6	8	50
	2035-050-S4	3.5	4	10	50
	2035-050	3.5	6	10	50
	2040-050-S4	4	4	11	50
	2040-050	4	6	11	50
	2045-050	4.5	6	13	50
	2050-050	5	6	13	50
	2055-050	5.5	6	13	50
	2060-050	6	6	16	50
	2065-060	6.5	8	16	60
	2070-060	7	8	16	60
	2075-060	7.5	8	19	60
	2080-060	8	8	20	60
	2085-075	8.5	10	20	75
	2090-075	9	10	20	75
	2095-075	9.5	10	25	75
	2100-075	10	10	25	75
	2105-075	10.5	12	25	75
	2110-075	11	12	30	75
	2115-075	11.5	12	30	75
	2120-075	12	12	32	75
	2140-100	14	16	40	100
	2160-100	16	16	40	100
	2180-100	18	20	45	100
	2200-100	20	20	45	100

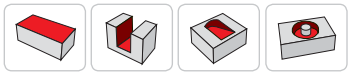
IPLFE2000 (Long flat)







ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



Long shank type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 2	2060-075	6	6	16	75
	2060-100	6	6	16	100
	2080-075	8	8	20	75
	2080-100	8	8	20	100
	2100-100	10	10	25	100
	2100-150	10	10	25	150
	2120-100	12	12	32	100
	2120-150	12	12	32	150

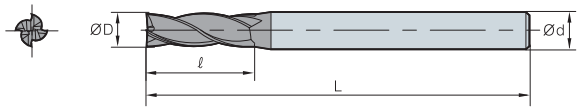
Long flute type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 2	2010-050-V7S4	1	4	7	50
	2015-050-V9S4	1.5	4	9	50
	2020-050-V12S4	2	4	12	50
	2025-050-V12S4	2.5	4	12	50
	2030-060-V15S6	3	6	15	60
	2035-060-V15S6	3.5	6	15	60
	2040-075-V20S6	4	6	20	75
	2045-075-V20S6	4.5	6	20	75
	2050-075-V25S6	5	6	25	75
	2055-075-V25S6	5.5	6	25	75
	2060-075-V30S6	6	6	30	75
	2070-100-V30S8	7	8	30	100
	2080-100-V40S8	8	8	40	100
	2090-100-V40S10	9	10	40	100
	2100-100-V40S10	10	10	40	100
	2110-100-V40S12	11	12	40	100
	2120-100-V50S12	12	12	50	100
	2140-150-V50S16	14	16	50	150
	2160-150-V60S16	16	16	60	150
	2200-200-V90S20	20	20	90	200

IPFE4000 (Flat)





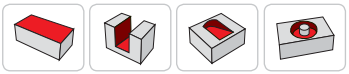








ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

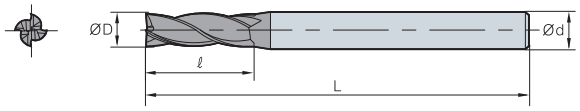


(mm)

Designation		ØD	Ød	ℓ	L
IPFE	4010-050-S3	1	3	3	50
4	4010-050-S4	1	4	3	50
	4010-050	1	6	3	50
	4015-050-S3	1.5	3	4	50
	4015-050-S4	1.5	4	4	50
	4015-050	1.5	6	4	50
	4020-050-S3	2	3	6	50
	4020-050-S4	2	4	6	50
	4020-050	2	6	6	50
	4025-050-S3	2.5	3	8	50
	4025-050-S4	2.5	4	8	50
	4025-050	2.5	6	8	50
	4030-050-S3	3	3	8	50
	4030-050-S4	3	4	8	50
	4030-050	3	6	8	50
	4035-050-S4	3.5	4	10	50
	4035-050	3.5	6	10	50
	4040-050-S4	4	4	11	50
	4040-050	4	6	11	50
	4045-050	4.5	6	13	50
	4050-050	5	6	13	50
	4055-050	5.5	6	13	50
	4060-050	6	6	16	50
	4065-060	6.5	8	16	60
	4070-060	7	8	16	60
	4075-060	7.5	8	19	60
	4080-060	8	8	20	60
	4085-075	8.5	10	20	75
	4090-075	9	10	20	75
	4095-075	9.5	10	25	75
	4100-075	10	10	30	75
	4105-075	10.5	12	30	75
	4110-075	11	12	30	75
	4115-075	11.5	12	30	75
	4120-075	12	12	32	75
	4140-100	14	16	40	100
	4160-100	16	16	40	100
	4180-100	18	20	45	100
	4200-100	20	20	45	100

IPLFE4000 (Long flat)













ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03



Long shank type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 4	4060-075	6	6	16	75
	4060-100	6	6	16	100
	4080-075	8	8	20	75
	4080-100	8	8	20	100
	4100-100	10	10	30	100
	4100-150	10	10	30	150
	4120-100	12	12	32	100
	4120-150	12	12	32	150

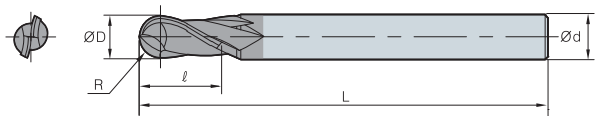
Long flute type

(mm)

Designation		ØD	Ød	ℓ	L
IPLFE 4	4010-050-V6S4	1	4	6	50
	4015-050-V9S4	1.5	4	9	50
	4020-050-V12S4	2	4	12	50
	4025-050-V12S4	2.5	4	12	50
	4030-060-V15S6	3	6	15	60
	4035-060-V15S6	3.5	6	15	60
	4040-075-V20S6	4	6	20	75
	4045-075-V20S6	4.5	6	20	75
	4050-075-V25S6	5	6	25	75
	4055-075-V25S6	5.5	6	25	75
	4060-075-V30S6	6	6	30	75
	4070-100-V30S8	7	8	30	100
	4080-100-V40S8	8	8	40	100
	4090-100-V40S10	9	10	40	100
	4100-100-V40S10	10	10	40	100
	4110-100-V40S12	11	12	40	100
	4120-100-V50S12	12	12	50	100
	4140-150-V50S16	14	16	50	150
	4160-150-V60S16	16	16	60	150
	4200-200-V90S20	20	20	90	200

IPBE2000 (Ball)













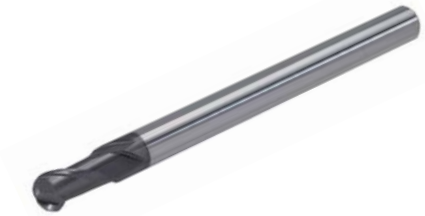
ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

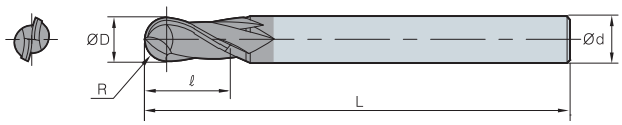


(mm)

Designation		R	ØD	Ød	ℓ	L
IPBE	2010-050-S3	0.5	1	3	2	50
2	2010-050-S4	0.5	1	4	2	50
	2010-050	0.5	1	6	2	50
	2015-050-S3	0.75	1.5	3	3	50
	2015-050-S4	0.75	1.5	4	3	50
	2015-050	0.75	1.5	6	3	50
	2020-050-S3	1	2	3	4	50
	2020-050-S4	1	2	4	4	50
	2020-050	1	2	6	4	50
	2025-050-S3	1.25	2.5	3	5	50
	2025-050-S4	1.25	2.5	4	5	50
	2025-050	1.25	2.5	6	5	50
	2030-050-S3	1.5	3	3	6	50
	2030-050-S4	1.5	3	4	6	50
	2030-050	1.5	3	6	6	50
	2035-050-S4	1.75	3.5	4	7	50
	2035-050	1.75	3.5	6	7	50
	2040-050-S4	2	4	4	8	50
	2040-050	2	4	6	8	50
	2045-050	2.25	4.5	6	9	50
	2050-050	2.5	5	6	10	50
	2060-050	3	6	6	12	50
	2070-060	3.5	7	8	14	60
	2080-060	4	8	8	16	60
	2090-075	4.5	9	10	18	75
	2100-075	5	10	10	20	75
	2120-075	6	12	12	24	75
	2140-100	7	14	16	28	100
	2160-100	8	16	16	32	100
	2180-100	9	18	20	36	100
	2200-100	10	20	20	40	100

IPLBE2000 (Long ball)







ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø16	0.00~ -0.03

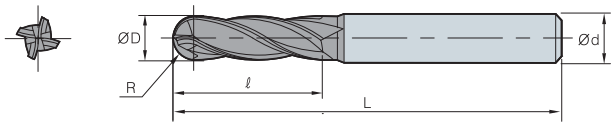


(mm)

Designation		R	ØD	Ød	ℓ	L
IPLBE 2	2010-075	0.5	1	6	2	75
	2010-100	0.5	1	6	2	100
	2015-075	0.75	1.5	6	3	75
	2015-100	0.75	1.5	6	3	100
	2020-075	1	2	6	4	75
	2020-100	1	2	6	4	100
	2025-075	1.25	2.5	6	5	75
	2025-100	1.25	2.5	6	5	100
	2030-075	1.5	3	6	6	75
	2030-100	1.5	3	6	6	100
	2035-100	1.75	3.5	6	7	100
	2040-075	2	4	6	8	75
	2040-100	2	4	6	8	100
	2050-075	2.5	5	6	10	75
	2050-100	2.5	5	6	10	100
	2060-075	3	6	6	12	75
	2060-100	3	6	6	12	100
	2060-150	3	6	6	12	150
	2080-075	4	8	8	16	75
	2080-100	4	8	8	16	100
	2080-150	4	8	8	16	150
	2100-100	5	10	10	20	100
	2100-150	5	10	10	20	150
	2100-200	5	10	10	20	200
	2120-100	6	12	12	24	100
	2120-150	6	12	12	24	150
	2120-200	6	12	12	24	200
	2160-150	8	16	16	32	150
	2160-200	8	16	16	32	200

IPBE4000 (Ball)





4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

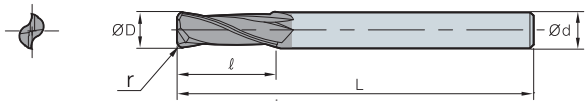


(mm)

Designation		R	ØD	Ød	ℓ	L
IPBE 4	4010-050-S4	0.5	1	4	2	50
	4010-050	0.5	1	6	2	50
	4015-050-S4	0.75	1.5	4	3	50
	4015-050	0.75	1.5	6	3	50
	4020-050-S4	1	2	4	4	50
	4020-050	1	2	6	4	50
	4025-050-S4	1.25	2.5	4	5	50
	4025-050	1.25	2.5	6	5	50
	4030-050-S3	1.5	3	3	6	50
	4030-050-S4	1.5	3	4	6	50
	4030-050	1.5	3	6	6	50
	4035-050-S4	1.75	3.5	4	7	50
	4035-050	1.75	3.5	6	7	50
	4040-050-S4	2	4	4	8	50
	4040-050	2	4	6	8	50
	4045-050	2.25	4.5	6	9	50
	4050-050	2.5	5	6	10	50
	4060-050	3	6	6	12	50
	4070-060	3.5	7	8	14	60
	4080-060	4	8	8	16	60
	4090-075	4.5	9	10	18	75
	4100-075	5	10	10	20	75
	4120-075	6	12	12	24	75
	4140-100	7	14	16	28	100
	4160-100	8	16	16	32	100
	4180-100	9	18	20	36	100
	4200-100	10	20	20	40	100

IPRE2000 (Radius)





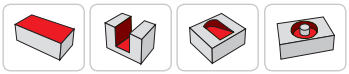








ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

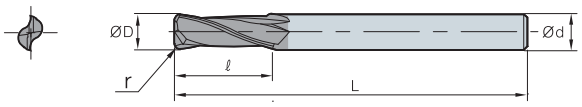


(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE 2	2010-050-R01	1	4	3	50	0.1
	2010-050-R02	1	4	3	50	0.2
	2010-050-R03	1	4	3	50	0.3
	2015-050-R02	1.5	4	4	50	0.2
	2015-050-R03	1.5	4	4	50	0.3
	2020-050-R02	2	4	6	50	0.2
	2020-050-R03	2	4	6	50	0.3
	2020-050-R05	2	4	6	50	0.5
	2025-050-R02	2.5	4	8	50	0.2
	2030-050-R02-S3	3	3	8	50	0.2
	2030-050-R03-S3	3	3	8	50	0.3
	2030-050-R05-S3	3	3	8	50	0.5
	2030-050-R10-S3	3	3	8	50	1
	2030-050-R02	3	4	8	50	0.2
	2030-050-R03	3	4	8	50	0.3
	2030-050-R05	3	4	8	50	0.5
	2030-050-R10	3	4	8	50	1
	2040-050-R02	4	4	10	50	0.2
	2040-050-R03	4	4	10	50	0.3
	2040-050-R05	4	4	10	50	0.5
	2040-050-R10	4	4	10	50	1
	2040-050-R15	4	4	10	50	1.5
	2050-050-R02	5	6	13	50	0.2
	2050-050-R03	5	6	13	50	0.3
	2050-050-R05	5	6	13	50	0.5
	2050-050-R10	5	6	13	50	1
	2060-050-R02	6	6	15	50	0.2
	2060-050-R03	6	6	15	50	0.3
	2060-050-R05	6	6	15	50	0.5
	2060-050-R10	6	6	15	50	1
	2060-050-R15	6	6	15	50	1.5
	2060-050-R20	6	6	15	50	2

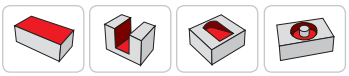
IPRE2000 (Radius)







ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

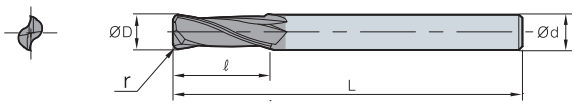


(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE 2	2080-060-R03	8	8	20	60	0.3
	2080-060-R05	8	8	20	60	0.5
	2080-060-R10	8	8	20	60	1
	2080-060-R15	8	8	20	60	1.5
	2080-060-R20	8	8	20	60	2
	2080-060-R25	8	8	20	60	2.5
	2080-060-R30	8	8	20	60	3
	2100-075-R03	10	10	25	75	0.3
	2100-075-R05	10	10	25	75	0.5
	2100-075-R10	10	10	25	75	1
	2100-075-R15	10	10	25	75	1.5
	2100-075-R20	10	10	25	75	2
	2100-075-R25	10	10	25	75	2.5
	2100-075-R30	10	10	25	75	3
	2120-075-R03	12	12	30	75	0.3
	2120-075-R05	12	12	30	75	0.5
	2120-075-R10	12	12	30	75	1
	2120-075-R15	12	12	30	75	1.5
	2120-075-R20	12	12	30	75	2
	2120-075-R25	12	12	30	75	2.5
	2120-075-R30	12	12	30	75	3

IPLRE2000 (Long radius)





2 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø3~Ø12	0.00~ -0.02

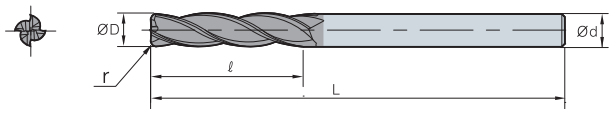


(mm)

Designation		ØD	Ød	ℓ	L	r
IPLRE 2	2030-075-R03	3	3	8	75	0.3
	2030-075-R05	3	3	8	75	0.5
	2030-075-R10	3	3	8	75	1
	2040-075-R03	4	4	10	75	0.3
	2040-075-R05	4	4	10	75	0.5
	2040-075-R10	4	4	10	75	1
	2040-075-R15	4	4	10	75	1.5
	2060-100-R03	6	6	15	100	0.3
	2060-100-R05	6	6	15	100	0.5
	2060-100-R10	6	6	15	100	1
	2060-100-R15	6	6	15	100	1.5
	2060-100-R20	6	6	15	100	2
	2080-100-R03	8	8	20	100	0.3
	2080-100-R05	8	8	20	100	0.5
	2080-100-R10	8	8	20	100	1
	2080-100-R15	8	8	20	100	1.5
	2080-100-R20	8	8	20	100	2
	2080-100-R25	8	8	20	100	2.5
	2080-100-R30	8	8	20	100	3
	2100-100-R03	10	10	25	100	0.3
	2100-100-R05	10	10	25	100	0.5
	2100-100-R10	10	10	25	100	1
	2100-100-R15	10	10	25	100	1.5
	2100-100-R20	10	10	25	100	2
	2100-100-R25	10	10	25	100	2.5
	2100-100-R30	10	10	25	100	3
	2120-100-R03	12	12	30	100	0.3
	2120-100-R05	12	12	30	100	0.5
	2120-100-R10	12	12	30	100	1
	2120-100-R15	12	12	30	100	1.5
	2120-100-R20	12	12	30	100	2
	2120-100-R25	12	12	30	100	2.5
	2120-100-R30	12	12	30	100	3

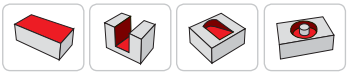
IPRE4000 (Radius)





4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø2~Ø12	0.00~ -0.02

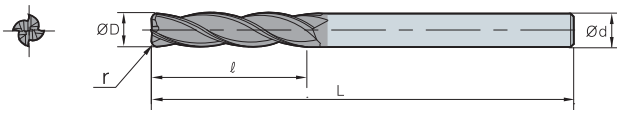


(mm)

Designation		ØD	Ød	ℓ	L	r
IPRE 4	4020-050-R02	2	4	6	50	0.2
	4020-050-R03	2	4	6	50	0.3
	4020-050-R05	2	4	6	50	0.5
	4025-050-R02	2.5	4	8	50	0.2
	4030-050-R02-S3	3	3	8	50	0.2
	4030-050-R03-S3	3	3	8	50	0.3
	4030-050-R05-S3	3	3	8	50	0.5
	4030-050-R10-S3	3	3	8	50	1
	4030-050-R02	3	4	8	50	0.2
	4030-050-R03	3	4	8	50	0.3
	4030-050-R05	3	4	8	50	0.5
	4030-050-R10	3	4	8	50	1
	4040-050-R02	4	4	10	50	0.2
	4040-050-R03	4	4	10	50	0.3
	4040-050-R05	4	4	10	50	0.5
	4040-050-R10	4	4	10	50	1
	4040-050-R15	4	4	10	50	1.5
	4050-050-R02	5	6	13	50	0.2
	4050-050-R03	5	6	13	50	0.3
	4050-050-R05	5	6	13	50	0.5
	4050-050-R10	5	6	13	50	1
	4060-050-R02	6	6	15	50	0.2
	4060-050-R03	6	6	15	50	0.3
	4060-050-R05	6	6	15	50	0.5
	4060-050-R10	6	6	15	50	1
	4060-050-R15	6	6	15	50	1.5
	4060-050-R20	6	6	15	50	2
	4080-060-R03	8	8	20	60	0.3
	4080-060-R05	8	8	20	60	0.5
	4080-060-R10	8	8	20	60	1
	4080-060-R15	8	8	20	60	1.5
	4080-060-R20	8	8	20	60	2
	4080-060-R25	8	8	20	60	2.5
	4080-060-R30	8	8	20	60	3
	4100-075-R03	10	10	25	75	0.3
	4100-075-R05	10	10	25	75	0.5
	4100-075-R10	10	10	25	75	1
	4100-075-R15	10	10	25	75	1.5
	4100-075-R20	10	10	25	75	2
	4100-075-R25	10	10	25	75	2.5
	4100-075-R30	10	10	25	75	3
	4120-075-R03	12	12	30	75	0.3
	4120-075-R05	12	12	30	75	0.5
	4120-075-R10	12	12	30	75	1
	4120-075-R15	12	12	30	75	1.5
	4120-075-R20	12	12	30	75	2
	4120-075-R25	12	12	30	75	2.5
	4120-075-R30	12	12	30	75	3

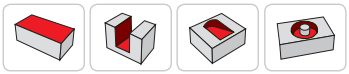
IPLRE4000 (Long radius)





4 | H A 35° | Substrate PC320 | h6 shank

ØD	Tolerance
Ø3~Ø12	0.00~ -0.02



(mm)

Designation		ØD	Ød	ℓ	L	r
IPLRE 4	4030-075-R03	3	3	8	75	0.3
	4030-075-R05	3	3	8	75	0.5
	4030-075-R10	3	3	8	75	1
	4040-075-R03	4	4	10	75	0.3
	4040-075-R05	4	4	10	75	0.5
	4040-075-R10	4	4	10	75	1
	4040-075-R15	4	4	10	75	1.5
	4060-100-R03	6	6	15	100	0.3
	4060-100-R05	6	6	15	100	0.5
	4060-100-R10	6	6	15	100	1
	4060-100-R15	6	6	15	100	1.5
	4060-100-R20	6	6	15	100	2
	4080-100-R03	8	8	20	100	0.3
	4080-100-R05	8	8	20	100	0.5
	4080-100-R10	8	8	20	100	1
	4080-100-R15	8	8	20	100	1.5
	4080-100-R20	8	8	20	100	2
	4080-100-R25	8	8	20	100	2.5
	4080-100-R30	8	8	20	100	3
	4100-100-R03	10	10	25	100	0.3
	4100-100-R05	10	10	25	100	0.5
	4100-100-R10	10	10	25	100	1
	4100-100-R15	10	10	25	100	1.5
	4100-100-R20	10	10	25	100	2
	4100-100-R25	10	10	25	100	2.5
	4100-100-R30	10	10	25	100	3
	4120-100-R03	12	12	30	100	0.3
	4120-100-R05	12	12	30	100	0.5
	4120-100-R10	12	12	30	100	1
	4120-100-R15	12	12	30	100	1.5
	4120-100-R20	12	12	30	100	2
	4120-100-R25	12	12	30	100	2.5
	4120-100-R30	12	12	30	100	3

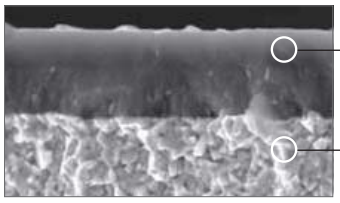
Highly efficient and economical endmill for general cutting

Z+ Endmill

- Wide range of workpiece materials up to HRC47
- Wide application range from roughing to finishing
- Increased tool life thanks to a new substrate and advanced coating layers
- Prevented chipping and extended cutting time thanks to its optimized blade design

Features

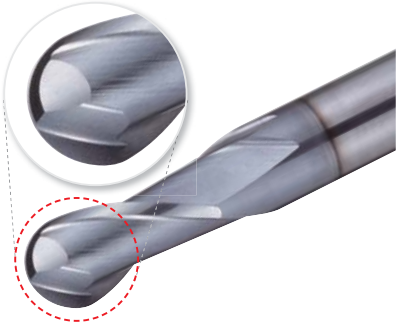
- Wide range of workpiece materials - Carbon steel, alloy steel, cast iron, etc
- Extended tool life - Newly invented substrate and high-tech coating layers applied
- Higher productivity - Wide application range from roughing to finishing

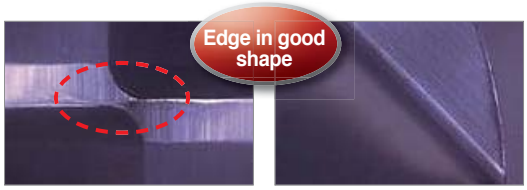


AlCrSiN coating layer
: Coating lubrication making possible high temperature/high speed machining

Ultra-fine substrate
: Substrate with excellent wear resistance applied

PC320U





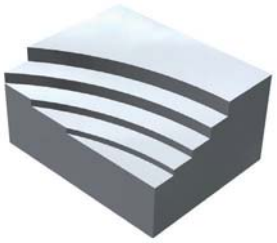
Z+ Endmill
Exceptional cutting edge rigidity



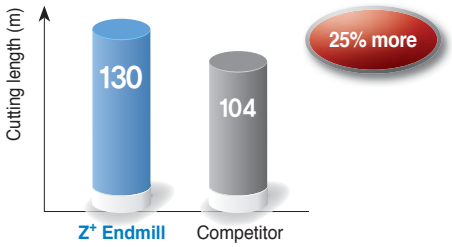
Competitor

Application examples

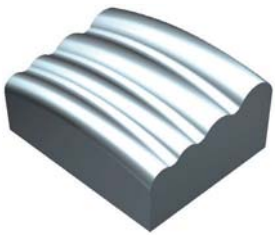
■ **Workpiece** Carbon steel (C45, ~HRC20)
■ **Cutting conditions** vc (m/min) = 180, fz (mm/t) = 0.05
ap (mm) = 8, dry
■ **Tools** ZPFE4080-060



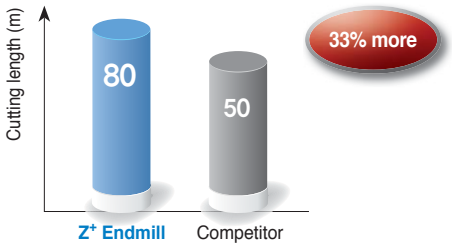
■ **Test result**



■ **Workpiece** Carbon steel (C45, ~HRC20)
■ **Cutting conditions** vc (m/min) = 130, fz (mm/t) = 0.1
ap (mm) = 0.5, dry
■ **Tools** ZPBE2080-100



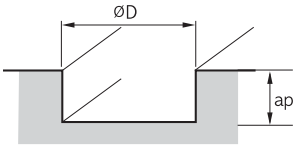
■ **Test result**



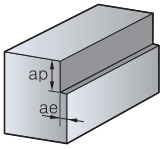
Recommended cutting conditions (ZPFE2000/ZPSFE2000 flat)

Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)		Stainless steel	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
1	19,745	175	13,057	100	10,500	70
2	11,560	190	7,560	120	6,300	90
3	8,920	210	5,560	140	4,620	120
4	7,560	300	4,620	180	3,880	150
5	6,300	320	3,780	190	3,160	160
6	5,560	350	3,360	220	2,840	180
8	4,200	380	2,520	200	2,100	180
10	3,260	330	2,000	160	1,680	160
12	2,740	280	1,680	130	1,360	130
16	2,200	220	1,360	110	1,060	110

Application tip



■ **Slotting depth (ap)**
- D ≤ Ø2.5 (ap = 0.3D)
- D > Ø2.5 (ap = 0.5D)



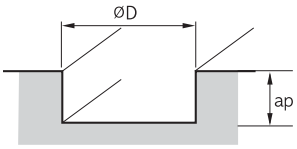
■ **Shouldering depth (ap)**
- D ≤ Ø2.5 (ap = 1.5D, ae = 0.05D)
- D > Ø2.5 (ap = 1.5D, ae = 0.1D)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

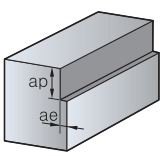
Recommended cutting conditions (ZPFE4000/ZPSFE4000 flat)

Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)		Stainless steel	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
2	11,560	280	7,560	170	6,300	140
3	8,920	320	5,560	200	4,620	170
4	7,560	570	4,620	350	3,880	280
5	6,300	600	3,780	360	3,160	300
6	5,560	660	3,360	410	2,840	330
8	4,200	710	2,520	380	2,100	350
10	3,260	610	2,000	300	1,680	300
12	2,740	520	1,680	250	1,360	240
16	2,200	410	1,360	200	1,100	200

Application tip



■ **Slotting depth (ap)**
- D ≤ Ø2.5 (ap = 0.3D)
- D > Ø2.5 (ap = 0.5D)



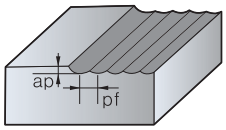
■ **Shouldering depth (ap)**
- D ≤ Ø2.5 (ap = 1.5D, ae = 0.05D)
- D > Ø2.5 (ap = 1.5D, ae = 0.1D)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

Recommended cutting conditions (ZPBE2000 ball)

Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
1	30,000	2,880	30,000	2,520
1.2	30,000	3,060	28,800	2,580
1.5	30,000	3,240	28,800	2,700
2	29,820	3,420	28,680	2,880
3	19,860	3,600	19,080	3,180
4	14,940	3,600	14,340	3,180
5	11,160	3,480	10,680	2,940
6	8,340	2,910	8,040	2,460
8	6,660	2,520	6,420	2,100
10	5,580	2,220	5,340	1,860
12	4,170	1,770	4,008	1,500

Application tip



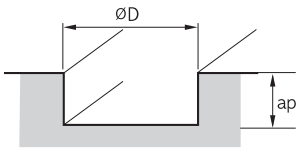
- ap = 0.03D
- pf = 0.05D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

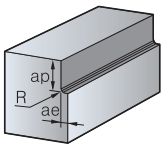
Recommended cutting conditions (ZPRE2000 radius)

Workpiece / Cutting conditions / Diameter (Ø)	Alloy steel and Carbon steel (under HRC30)		Pre-hardened steel (HRC30~47)		Stainless steel	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	5,300	420	3,200	240	2,400	180
8	4,000	450	2,700	210	2,040	150
10	3,200	390	2,400	180	1,600	120
12	2,700	330	2,040	150	1,300	100
14	2,400	270	1,600	120	1,000	70
16	2,040	200	1,300	100	1,300	60

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.3D



■ **Shouldering depth (ap)**
- ap: ≤ 1.5D
- ae: ≤ 0.1D

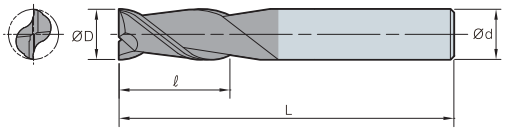
※ Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio

Notice

- Please adjust the recommended cutting conditions properly, according to the condition of your machines, the target shapes, and your purpose for machining
- Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio
- In case of overhang over 3D, reduce RPM and feed rate

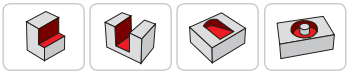
ZPFE2000 (Flat)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

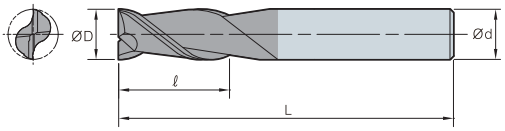


(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 2	2010-050-S4	1.0	4	3	50
	2015-050-S4	1.5	4	4	50
	2020-050-S4	2.0	4	6	50
	2025-050-V6S4	2.5	4	6	50
	2025-050-V8S4	2.5	4	8	50
	2030-050-S4	3.0	4	9	50
	2030-050	3.0	6	9	50
	2035-050-S4	3.5	4	9	50
	2035-050	3.5	6	9	50
	2040-050-S4	4.0	4	11	50
	2040-050	4.0	6	11	50
	2045-050	4.5	6	11	50
	2050-050	5.0	6	13	50
	2060-050	6.0	6	16	50
	2065-060	6.5	8	16	60
	2070-060	7.0	8	20	60
	2075-060	7.5	8	20	60
	2080-060	8.0	8	20	60
	2085-075	8.5	10	23	75
	2090-075	9.0	10	23	75
	2095-075	9.5	10	25	75
	2100-075	10.0	10	25	75
	2105-075	10.5	12	26	75
	2110-075	11.0	12	28	75
	2120-075	12.0	12	30	75
	2140-100	14.0	14	34	100
	2150-090	15.0	16	36	90
	2160-100	16.0	16	36	100
	2170-100	17.0	20	40	100
	2180-100	18.0	18	40	100
	2190-100	19.0	20	40	100
	2200-100	20.0	20	40	100

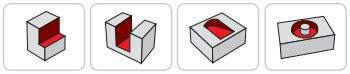
ZPSFE2000 (Short flat)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

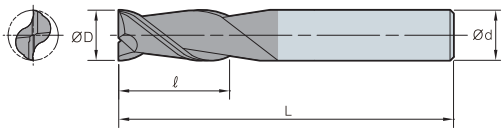


(mm)

Designation		ØD	Ød	ℓ	L
ZPSFE 2	2010-050-S4	1.0	4	2	50
	2015-050-S4	1.5	4	2	50
	2020-050-S4	2.0	4	3	50
	2025-050-S4	2.5	4	4	50
	2030-050-S4	3.0	4	5	50
	2040-050-S4	4.0	4	6	50
	2050-050	5.0	6	8	50
	2060-050	6.0	6	9	50
	2070-050	7.0	8	10	50
	2080-050	8.0	8	12	50
	2100-075	10.0	10	15	75
	2120-075	12.0	12	18	75
	2160-100	16.0	16	24	100

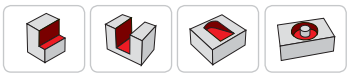
ZPLFE2000 (Long flat)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

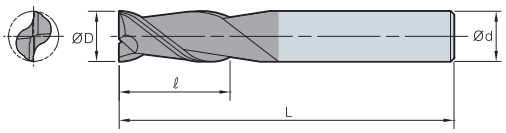


(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 2	2020-075-S4	2.0	4	6	75
	2030-075-S4	3.0	4	9	75
	2030-075	3.0	6	12	75
	2040-075-S4	4.0	4	11	75
	2050-075	5.0	6	20	75
	2060-100	6.0	6	16	100
	2060-100-V20S6	6.0	6	20	100
	2080-075	8.0	8	20	75
	2080-100	8.0	8	25	100
	2100-100	10.0	10	30	100
	2120-100	12.0	12	35	100
	2160-150	16.0	16	36	150
	2200-150	20.0	20	45	150

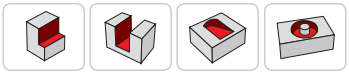
ZPLFE2000 (Long flute)







ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

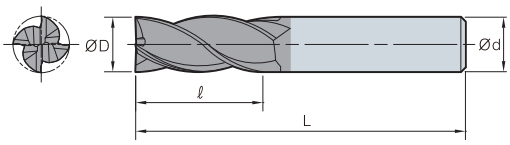


(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 2	2020-075-V15S4	2.0	4	15	75
	2030-075-V25S4	3.0	4	25	75
	2040-075-V30S4	4.0	4	30	75
	2050-075-V30S6	5.0	6	30	75
	2060-075-V35S6	6.0	6	35	75
	2080-100-V40S8	8.0	8	40	100
	2100-100-V45S10	10.0	10	45	100
	2120-100-V50S12	12.0	12	50	100
	2140-100-V55S14	14.0	14	55	100
	2160-150-V50S16	16.0	16	50	150
	2160-150-V60S16	16.0	16	60	150
	2180-150-V65S18	18.0	18	65	150
	2200-150-V70S20	20.0	20	70	150

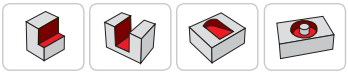
ZPFE4000 (Flat)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

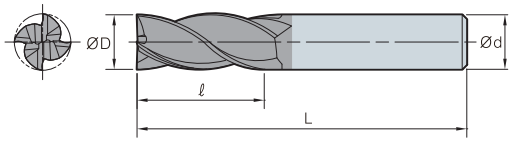


(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 4	4010-050-S4	1.0	4	3	50
	4015-050-S4	1.5	4	5	50
	4015-050	1.5	6	5	50
	4020-050-S4	2.0	4	6	50
	4020-050	2.0	6	6	50
	4025-050-S4	2.5	4	8	50
	4025-050	2.5	6	8	50
	4030-050	3.0	6	6	50
	4030-050-S4	3.0	4	9	50
	4030-050-V9S6	3.0	6	9	50
	4035-050-S4	3.5	4	11	50
	4035-050	3.5	6	9	50
	4040-050-S4	4.0	4	11	50
	4040-050	4.0	6	11	50
	4045-050	4.5	6	11	50
	4050-050	5.0	6	8	50
	4050-050-V13S6	5.0	6	13	50
	4055-050	5.5	6	16	50
	4060-050	6.0	6	16	50
	4065-060	6.5	8	16	60
	4070-060	7.0	8	20	60
	4075-060	7.5	8	20	60
	4080-060	8.0	8	20	60
	4085-075	8.5	10	23	75
	4090-075	9.0	10	23	75
	4095-075	9.5	10	23	75
	4100-075	10.0	10	25	75
	4110-075	11.0	12	28	75
	4120-075	12.0	12	30	75
	4130-100	13.0	14	32	100
	4140-075	14.0	14	32	75
	4140-100	14.0	14	34	100
	4150-100	15.0	16	36	100
	4160-100	16.0	16	36	100
	4160-100-V40S16	16.0	16	40	100
	4160-100-V45S16	16.0	16	45	100
	4170-100-S18	17.0	18	38	100
	4180-100-S18	18.0	18	45	100
	4200-100-S20	20.0	20	45	100

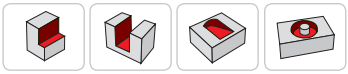
ZPSFE4000 (Short flat)





4 | H·A 35° | Substrate PC320U | h6 shank

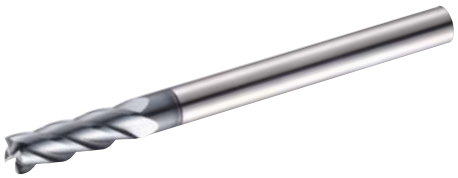
ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

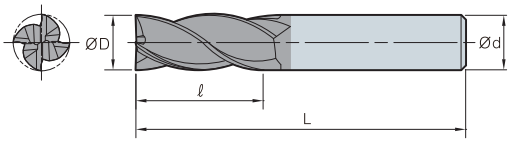


(mm)

Designation		ØD	Ød	ℓ	L
ZPSFE 4	4010-050-S4	1.0	4	2	50
	4015-050-S4	1.5	4	2	50
	4020-050-S4	2.0	4	3	50
	4025-050-S4	2.5	4	4	50
	4030-050-S4	3.0	4	5	50
	4040-050-S4	4.0	4	6	50
	4050-050	5.0	6	8	50
	4060-050	6.0	6	9	50
	4070-050	7.0	8	10	50
	4080-050	8.0	8	12	50
	4100-075	10.0	10	15	75
	4120-075	12.0	12	18	75
	4160-100	16.0	16	24	100

ZPLFE4000 (Long flat)





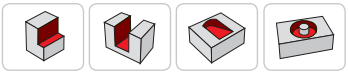








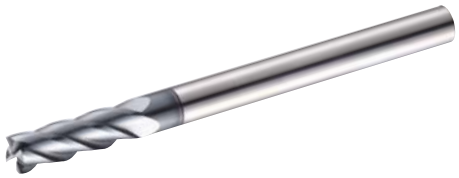
ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

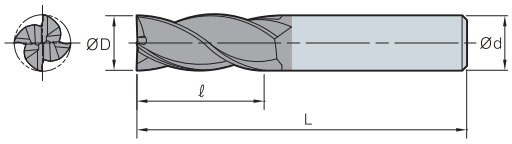


(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 4	4020-075-S4	2.0	4	10	75
	4030-075-S4	3.0	4	12	75
	4040-075-S4	4.0	4	11	75
	4040-050-V15S4	4.0	4	15	75
	4050-075	5.0	6	20	75
	4060-075	6.0	6	16	75
	4060-075-V20S6	6.0	6	20	75
	4080-075	8.0	8	20	75
	4080-100-S8	8.0	8	25	100
	4100-100	10.0	10	30	100
	4100-100-V35S10	10.0	10	35	100
	4120-100	12.0	12	35	100
	4160-150	16.0	16	36	150
	4200-150	20.0	20	45	150

ZPLFE4000 (Long flute)





4 | H·A 35° | Substrate PC320U | h6 shank

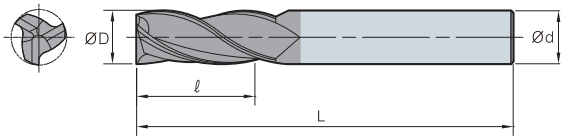
ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

(mm)

Designation		ØD	Ød	ℓ	L
ZPLFE 4	4010-050-V04S4	1.0	4	4	50
	4020-050-V10S4	2.0	4	10	50
	4030-060-V15S4	3.0	4	15	60
	4030-060-V16S6	3.0	6	16	60
	4040-060-V20S4	4.0	4	20	60
	4040-075-V20S6	4.0	6	20	75
	4040-075-V30S4	4.0	4	30	75
	4050-075-V25S6	5.0	6	25	75
	4050-075-V30S6	5.0	6	30	75
	4060-075-V30S6	6.0	6	30	75
	4060-075-V35S6	6.0	6	35	75
	4080-100-V35S8	8.0	8	35	100
	4080-100-V40S8	8.0	8	40	100
	4100-100-V45S10	10.0	10	45	100
	4100-100-V50S10	10.0	10	50	100
	4120-100-V45S12	12.0	12	45	100
	4120-100-V50S12	12.0	12	50	100
	4140-100-V45S14	14.0	14	45	100
	4160-150-V50S16	16.0	16	50	150
	4160-150-V60S16	16.0	16	60	150
	4160-150-V70S16	16.0	16	70	150
	4180-150-V70S18	18.0	18	70	150
	4200-150-V70S20	20.0	20	70	150

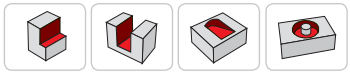
ZPFE3000 (Flat)







ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

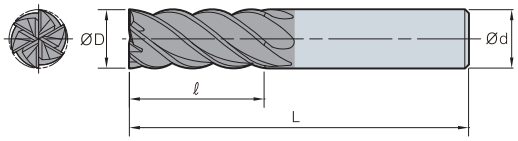


(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 3	3020-050-S4	2.0	4	6	50
	3030-050-S4	3.0	4	9	50
	3040-050-S4	4.0	4	11	50
	3050-050	5.0	6	13	50
	3060-050	6.0	6	16	50
	3065-060	6.5	8	16	60
	3080-060	8.0	8	20	60
	3095-075	9.5	10	24	75
	3100-075	10.0	10	25	75
	3120-075	12.0	12	30	75
	3106-100	16.0	16	36	100
	3180-100	18.0	18	40	100
	3200-100	20.0	20	45	100
	3250-100	25.0	25	50	100

ZPFE6000 (Flat)







ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

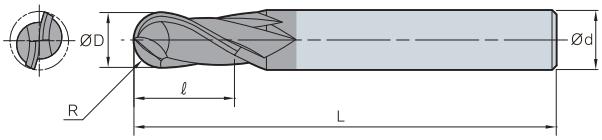


(mm)

Designation		ØD	Ød	ℓ	L
ZPFE 6	6060-050	6.0	6	15	50
	6080-060	8.0	8	20	60
	6100-075	10.0	10	25	75
	6120-075	12.0	12	30	75
	6160-100	16.0	16	36	100
	6200-100	20.0	20	45	100

ZPBE2000 (Ball)







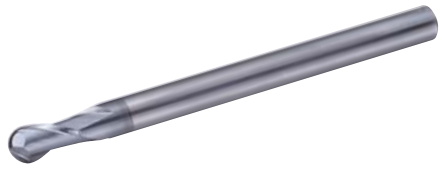
ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

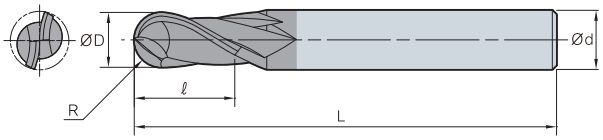


(mm)

Designation		R	ØD	Ød	ℓ	L
ZPBE 2	2008-050-S4	0.4	0.8	4	1.6	50
	2009-050-S4	0.5	0.9	4	1.8	50
	2010-050-S4	0.5	1.0	4	2	50
	2015-050-S4	0.8	1.5	4	3	50
	2020-050-S4	1.0	2.0	4	4	50
	2020-050	1.0	2.0	6	4	50
	2025-050-S4	1.3	2.5	4	5	50
	2030-050-S4	1.5	3.0	4	6	50
	2030-050	1.5	3.0	6	6	50
	2040-050-S4	2.0	4.0	4	8	50
	2040-050	2.0	4.0	6	8	50
	2050-050	2.5	5.0	6	10	50
	2060-050	3.0	6.0	6	12	50
	2070-060	3.5	7.0	8	14	60
	2080-060	4.0	8.0	8	14	60
	2090-075	4.5	9.0	10	16	75
	2100-075	5.0	10.0	10	18	75
	2110-075	5.5	11.0	12	20	75
	2120-075	6.0	12.0	12	22	75
	2130-090	6.5	13.0	14	26	90
	2140-090	7.0	14.0	14	26	90
	2150-090	7.5	15.0	16	30	90
	2160-100	8.0	16.0	16	30	100
	2200-100	10.0	20.0	20	38	100

ZPLBE2000 (Long ball)





2 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

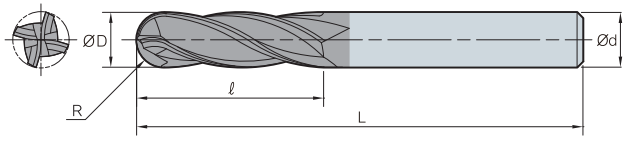


(mm)

Designation		R	ØD	Ød	ℓ	L
ZPLBE 2	2020-075-S4	1.0	2.0	4	4	75
	2030-075-S4	1.5	3.0	4	6	75
	2030-075	1.5	3.0	6	6	75
	2040-075-S4	2.0	4.0	4	8	75
	2040-075	2.0	4.0	6	8	75
	2050-075	2.5	5.0	6	10	75
	2060-075	3.0	6.0	6	12	75
	2080-100	4.0	8.0	8	14	100
	2100-100	5.0	10.0	10	18	100
	2120-100	6.0	12.0	12	20	100

ZPBE4000 (Ball)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

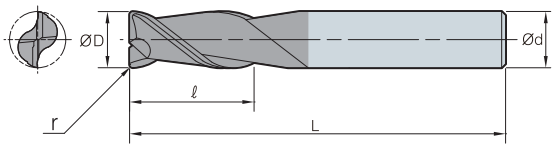


(mm)

Designation		R	ØD	Ød	ℓ	L
ZPBE 4	4020-050-S4	1.0	2.0	4	4	50
	4025-050-S4	1.3	2.5	4	5	50
	4030-050-S4	1.5	3.0	4	6	50
	4030-050	1.5	3.0	6	6	50
	4040-050-S4	2.0	4.0	4	8	50
	4040-050	2.0	4.0	6	8	50
	4050-050	2.5	5.0	6	10	50
	4060-050	3.0	6.0	6	12	50
	4070-060	3.5	7.0	8	14	60
	4080-060	4.0	8.0	8	14	60
	4090-075	4.5	9.0	10	16	75
	4100-075	5.0	10.0	10	18	75
	4110-075	5.5	11.0	12	20	75
	4120-075	6.0	12.0	12	22	75
	4140-075	7.0	14.0	14	24	75
	4160-100	8.0	16.0	16	30	100
	4200-100	10.0	20.0	20	38	100

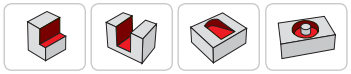
ZPRE2000 (Radius)







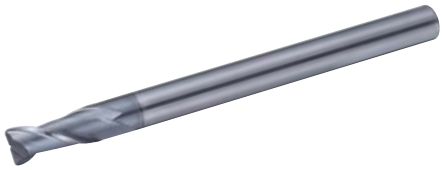
ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

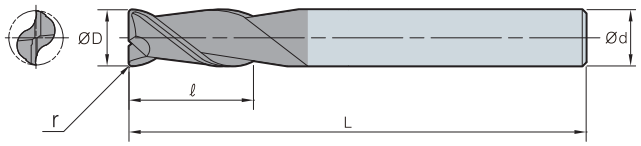


(mm)

Designation		ØD	Ød	ℓ	L	r
ZPRE 2	2010-050-S4-R02	1.0	4	3	50	0.2
	2020-050-S4-R02	2.0	4	6	50	0.2
	2030-050-S4-R02	3.0	4	9	50	0.2
	2030-050-R02	3.0	6	9	50	0.2
	2030-050-S4-R03	3.0	4	9	50	0.3
	2030-050-R03	3.0	6	9	50	0.3
	2030-050-S4-R05	3.0	4	9	50	0.5
	2030-050-R05	3.0	6	9	50	0.5
	2040-050-S4-R02	4.0	4	11	50	0.2
	2040-050-R02	4.0	6	11	50	0.2
	2040-050-S4-R03	4.0	4	11	50	0.3
	2040-050-R03	4.0	6	11	50	0.3
	2040-050-S4-R05	4.0	4	11	50	0.5
	2040-050-R05	4.0	6	11	50	0.5
	2040-050-S4-R10	4.0	4	11	50	1.0
	2050-050-R02	5.0	6	13	50	0.2
	2050-050-R03	5.0	6	13	50	0.3
	2050-050-R05	5.0	6	13	50	0.5
	2050-050-R010	5.0	6	13	50	1.0
	2060-050-R05	6.0	6	16	50	0.5
	2060-050-R10	6.0	6	16	50	1.0
	2060-050-R15	6.0	6	16	50	1.5
	2060-050-R20	6.0	6	16	50	2.0
	2080-060-R03	8.0	8	20	60	0.3
	2080-060-R05	8.0	8	20	60	0.5
	2080-060-R10	8.0	8	20	60	1.0
	2080-060-R15	8.0	8	20	60	1.5
	2080-060-R20	8.0	8	20	60	2.0
	2100-075-R03	10.0	10	25	75	0.3
	2100-075-R06	10.0	10	25	75	0.6
	2100-075-R10	10.0	10	25	75	1.0
	2100-075-R15	10.0	10	25	75	1.5
	2100-075-R20	10.0	10	25	75	2.0
	2100-075-R30	10.0	10	25	75	3.0
	2120-075-R05	12.0	12	30	75	0.5
	2120-075-R10	12.0	12	30	75	1.0
	2120-075-R15	12.0	12	30	75	1.5
	2120-075-R20	12.0	12	30	75	2.0
	2120-075-R30	12.0	12	30	75	3.0
	2160-100-R10	16.0	16	36	100	1.0
	2160-100-R20	16.0	16	36	100	2.0
	2160-100-R30	16.0	16	36	100	3.0

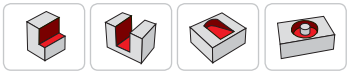
ZPLRE2000 (Long radius)







ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

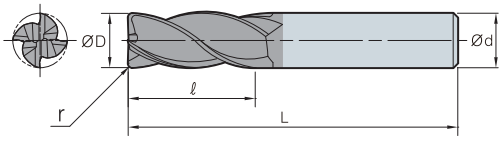


(mm)

Designation		ØD	Ød	ℓ	L	r
ZPLRE	2060-075-R05	6.0	6	16	75	0.5
	2060-075-R10	6.0	6	16	75	1.0
	2060-075-R15	6.0	6	16	75	1.5
	2080-100-R05	8.0	8	20	100	0.5
	2080-100-R10	8.0	8	20	100	1.0
	2080-100-R15	8.0	8	20	100	1.5
	2100-100-R05	10.0	10	25	100	0.5
	2100-100-R10	10.0	10	25	100	1.0
	2100-100-R15	10.0	10	25	100	1.5
	2100-100-R20	10.0	10	25	100	2.0
	2120-100-R05	12.0	12	30	100	0.5
	2120-100-R10	12.0	12	30	100	1.0
	2120-100-R15	12.0	12	30	100	1.5
	2120-100-R20	12.0	12	30	100	2.0
	2160-150-R05	16.0	16	36	150	0.5
	2160-150-R10	16.0	16	36	150	1.0
	2160-150-R15	16.0	16	36	150	1.5
	2160-150-R20	16.0	16	36	150	2.0

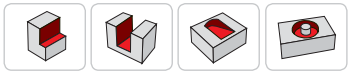
ZPRE4000 (Radius)





4 | H·A 35° | Substrate PC320U | h6 shank

ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03

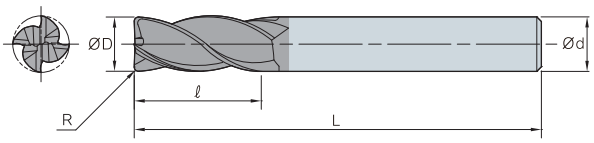


(mm)

Designation		ØD	Ød	ℓ	L	r
ZPRE 4	4015-050-S4-R02	1.5	4	5	50	0.2
	4020-050-S4-R02	2.0	4	6	50	0.2
	4030-050-S4-R02	3.0	4	9	50	0.2
	4030-050-S4-R03	3.0	4	9	50	0.3
	4030-050-S4-R05	3.0	4	9	50	0.5
	4040-050-S4-R02	4.0	4	11	50	0.2
	4040-050-S4-R03	4.0	4	11	50	0.3
	4040-050-S4-R05	4.0	4	11	50	0.5
	4040-050-S4-R10	4.0	4	11	50	1.0
	4045-050-R10	4.5	6	12	50	1.0
	4050-050-R02	5.0	6	13	50	0.2
	4050-050-R05	5.0	6	13	50	0.5
	4050-050-R10	5.0	6	13	50	1.0
	4050-050-R15	5.0	6	13	50	1.5
	4060-050-R05	6.0	6	16	50	0.5
	4060-050-R10	6.0	6	16	50	1.0
	4060-050-R15	6.0	6	16	50	1.5
	4080-060-R03	8.0	8	20	60	0.3
	4080-060-R05	8.0	8	20	60	0.5
	4080-060-R10	8.0	8	20	60	1.0
	4080-060-R15	8.0	8	20	60	1.5
	4080-060-R20	8.0	8	20	60	2.0
	4100-075-R03	10.0	10	25	75	0.3
	4100-075-R05	10.0	10	25	75	0.5
	4100-075-R10	10.0	10	25	75	1.0
	4100-075-R15	10.0	10	25	75	1.5
	4100-075-R20	10.0	10	25	75	2.0
	4100-075-R25	10.0	10	25	75	2.5
	4100-075-R30	10.0	10	25	75	3.0
	4120-075-R05	12.0	12	30	75	0.5
	4120-075-R10	12.0	12	30	75	1.0
	4120-075-R15	12.0	12	30	75	1.5
	4120-075-R20	12.0	12	30	75	2.0
	4120-075-R25	12.0	12	30	75	2.5
	4120-075-R30	12.0	12	30	75	3.0
	4160-100-R05	16.0	16	36	100	0.5
	4160-100-R10	16.0	16	36	100	1.0
	4160-100-R20	16.0	16	36	100	2.0
	4160-100-R30	16.0	16	36	100	3.0

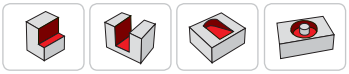
ZPLRE4000 (Long radius)







ØD	Tolerance
~Ø11.9	0.00~ -0.02
Ø12~	0.00~ -0.03



(mm)

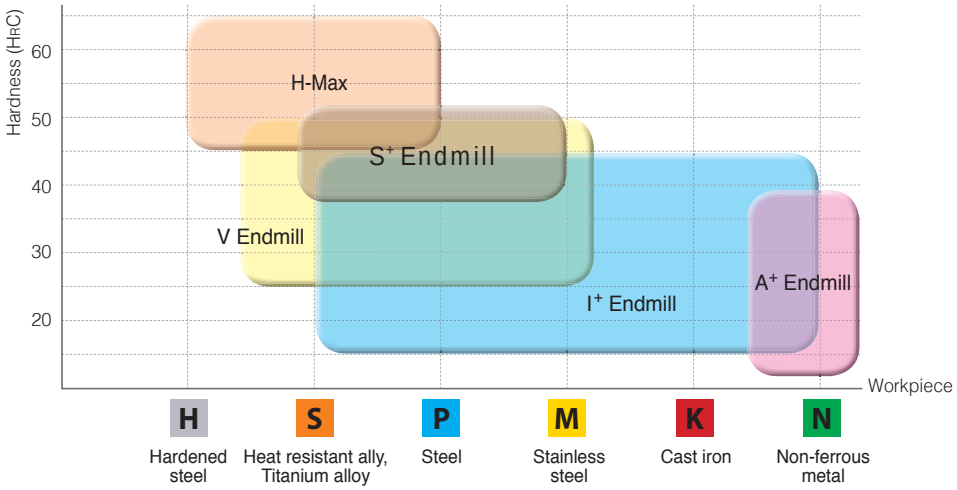
Designation		ØD	Ød	ℓ	L	r
ZPLRE 4	4060-075-R05	6.0	6	16	75	0.5
	4060-075-R10	6.0	6	16	75	1.0
	4060-075-R15	6.0	6	16	75	1.5
	4080-100-R05	8.0	8	20	100	0.5
	4080-100-R10	8.0	8	20	100	1.0
	4080-100-R15	8.0	8	20	100	1.5
	4080-100-R20	8.0	8	20	100	2.0
	4100-100-R05	10.0	10	25	100	0.5
	4100-100-R10	10.0	10	25	100	1.0
	4100-100-R15	10.0	10	25	100	1.5
	4100-100-R20	10.0	10	25	100	2.0
	4120-100-R05	12.0	12	30	100	0.5
	4120-100-R10	12.0	12	30	100	1.0
	4120-100-R15	12.0	12	30	100	1.5
	4120-100-R20	12.0	12	30	100	2.0
	4120-100-R30	12.0	12	30	100	3.0
	4160-150-R05	16.0	16	36	150	0.5
	4160-150-R10	16.0	16	36	150	1.0
	4160-150-R15	16.0	16	36	150	1.5
	4160-150-R20	16.0	16	36	150	2.0
	4160-150-R30	16.0	16	36	150	3.0

Stainless endmill

S+ Endmill

- Strong cutting edge ensures long tool life
- Special coating with high oxidation resistance
- High rake angle and curvilinear chip pocket allow chip evacuation
- Special cutting edge prevents hardening of tools
- Optimal machinability in stainless steel machining
- Available for steel, alloy steel and hardening steel machining
- Available for multiple operations (Shouldering, slotting and ramping etc.)

Application area



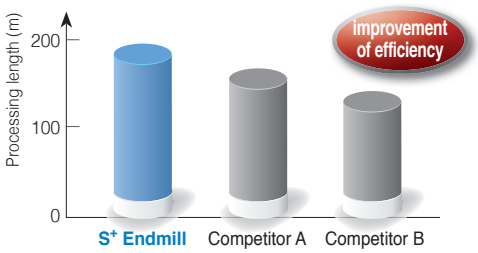
Performance evaluation

- **Workpiece** STS304
- **Cutting conditions** Diameter = Ø8.0, n (min-1) = 4.000, vc (m/min) = 100, vf (mm/min) = 480, fz (mm/t) = 0.04, ap (mm) = 8, ae (mm) = 0.8, dry
- **Tools** SPFE4080-060



S+ Endmill | Competitor A | Competitor B

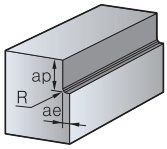
- **Test result**



Recommend cutting conditions

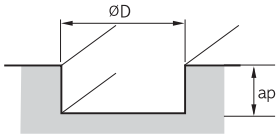
Workpiece / Condition / Diameter (Ø)	Stainless steel STS		Titanium alloy /Inconel		Normal steel (SS, SM) (Under HRC 25)		Alloy steel (SCM) (HRC 25~35)		Hardened steel (STD) (HRC 40~50)	
	R.P.M n (min-1)	Feed vf (mm/min)	R.P.M n (min-1)	Feed vf (mm/min)	R.P.M n (min-1)	Feed vf (mm/min)	R.P.M n (min-1)	Feed vf (mm/min)	R.P.M n (min-1)	Feed vf (mm/min)
2	5,500	240	2,600	90	9,000	540	6,000	3,200	4,000	240
4	4,000	260	2,000	90	6,600	600	4,500	340	3,000	280
6	3,000	360	1,200	90	4,800	720	3,000	360	2,500	280
8	2,000	390	1,000	100	3,600	750	2,200	460	2,000	300
10	1,700	410	800	120	2,800	750	1,800	460	1,500	300
12	1,500	380	700	100	2,400	710	1,500	410	1,200	280
14	1,200	320	600	95	2,200	660	1,300	370	1,000	270
16	1,000	270	500	90	1,800	490	1,100	320	800	230
20	750	250	400	85	900	270	900	270	600	200

Application tip



■ **Shouldering depth (ap) and radial depth (ae)**

- Normal steel, Alloy steel, Stainless steel: ae = 0.1D, ap = 1.5D
- Titanium alloy, Inconel, Hardened steel: ae = 0.05D, ap = 1.5D



■ **Slotting depth (ap)**

- Normal steel, Alloy steel: ap = 1.0D
- Stainless steel: ap = 0.3D
- Titanium alloy, Inconel, Hardened steel: ap = 0.2D

Stainless steel machining

- Low thermal conductivity of stainless steel alloy causes conducting heat to the tool and fracture and chipping
- Stainless steel alloy machining gets produces high wear and high cutting resistance
- High temperature in stainless steel alloy machining lowers cutting conditions and decrease the quality of surface roughness

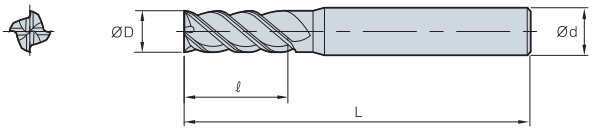
Trouble shooting for stainless steel

- Getting low cutting conditions
- Getting deeper ap than the work hardened layer and use tools with sharp cutting edge
- Use coolant



SPFE4000 (Flat)





4 | H·A 45° | Substrate PC320S | h6 shank

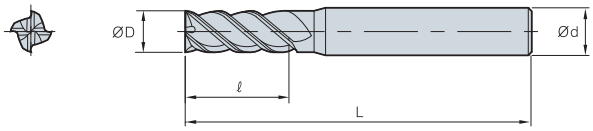
ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
SPFE 4	4010-050	1.0	4	3	50
	4015-050	1.5	4	4	50
	4020-050	2.0	4	6	50
	4025-050	2.5	4	8	50
	4030-050	3.0	4	9	50
	4030-050-S6	3.0	6	9	50
	4040-050	4.0	4	11	50
	4040-050-S6	4.0	6	11	50
	4050-050	5.0	6	13	50
	4060-050	6.0	6	16	50
	4080-060	8.0	8	20	60
	4100-075	10.0	10	30	75
	4120-075	12.0	12	32	75

SPLFE4000 (Long flat)





4 | H·A 45° | Substrate PC320S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
SPLFE 4	4010-050	1.0	4	4	50
	4015-050	1.5	4	6	50
	4020-050	2.0	4	8	50
	4025-050	2.5	4	10	50
	4030-050-S6	3.0	6	12	50
	4040-050-S6	4.0	6	16	50
	4050-060	5.0	6	20	60
	4060-060	6.0	6	24	60
	4080-075	8.0	8	35	75
	4100-100	10.0	10	45	100
	4120-100	12.0	12	45	100

High efficient roughing endmill

R+ Endmill new

- Cost-effective cutting-edge design for rough machining
- Specifically designed corners as irregular flute spacing and lead angle

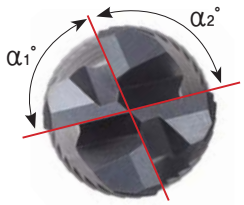
Feature

- Excellent machining efficiency - Special design for medium to rough cutting
- Longer cutting life - Extended tool cost thanks to newly applied grades
- Higher cutting performance - Blade design ideal for roughing



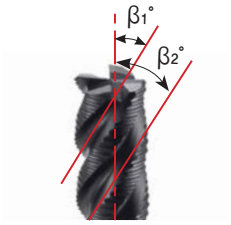
Lower cutting
- Ideal for medium to rough cutting
- Special edge design

Soft cutting
- Serrated cutting edges
- 3 Combo R



- Irregular flute spacing to prevent chattering

$(\alpha_1^\circ \neq \alpha_2^\circ)$



- Irregular lead angles to disperse cutting force

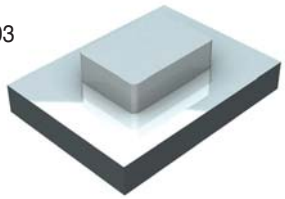
$(\beta_1^\circ \neq \beta_2^\circ)$

Grade system

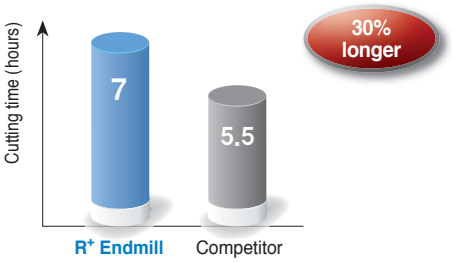
Carbide roughing		HSS roughing	
FN30T	Carbide, uncoated	HN30T	HSS, uncoated
PC10T	Carbide, TiCN coated	HC10T	HSS, TiCN coated
PC20T	Carbide, TiN coated	HC20T	HSS, TiN coated
PC30T	Carbide, TiAlN coated	HC20T	HSS, TiAlN coated
PC40T	Carbide, TiAlCrN coated		

Application examples

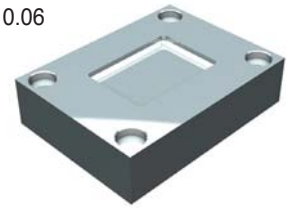
- **Workpiece** Mold
- **Cutting conditions** vc (m/min) = 57, fz (mm/t) = 0.03
  ap (mm) = 8, dry
- **Tools** EM16PM-080



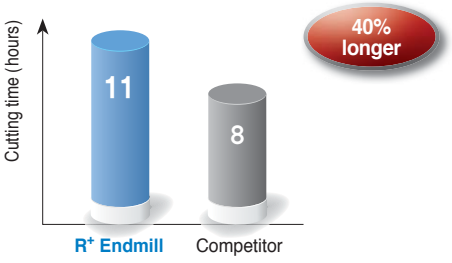
■ **Test result**



- **Workpiece** Mold
- **Cutting conditions** vc (m/min) = 2,700, fz (mm/t) = 0.06
  ap (mm) = 8, dry
- **Tools** EM43PM-080



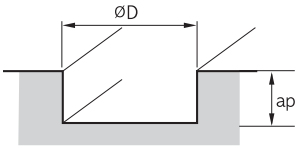
■ **Test result**



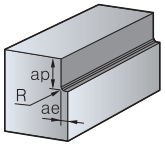
Recommended cutting conditions (EM09CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)		Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,000	1,090	10,600	770	15,800	1,800	14,300	1,300
8	9,000	1,160	8,100	830	11,900	1,890	10,700	1,370
10	7,200	1,160	6,400	830	9,500	1,890	8,500	1,370
12	6,000	1,080	5,400	800	8,000	1,800	7,100	1,300
14	5,200	1,080	4,750	770	7,000	1,760	6,250	1,260
16	4,500	1,080	4,100	740	6,000	1,720	5,400	1,230
18	4,400	1,000	3,650	680	5,400	1,610	4,850	1,140
20	3,600	930	3,200	630	4,800	1,500	4,300	1,050
25	3,200	840	2,800	600	4,400	1,400	3,800	980

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 1.0D (≤ HRC25)
  ≤ 0.8D (HRC25~40)



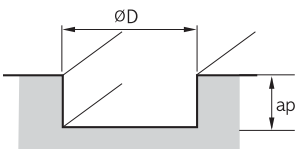
■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.5D (≤ HRC25)
  ≤ 0.35D (HRC25~40)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

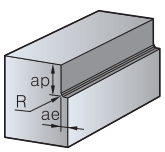
Recommended cutting conditions (EM09CA)

Workpiece / Conditions / Diameter (Ø)	Aluminum, Non-ferrous metal		Aluminum, Non-ferrous metal	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	13,000	1,125	13,000	1,400
8	10,400	1,300	10,400	1,600
10	10,400	1,585	10,400	2,000
12	10,400	1,950	10,400	1,650
14	7,800	1,675	7,800	2,050
16	7,800	1,755	7,800	2,250
18	5,200	1,300	5,200	1,700
20	5,200	1,495	5,200	1,800
25	5,000	1,495	5,000	1,800

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.2D



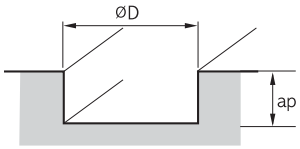
■ **Shouldering depth (ap)**
- ap: ≤ 1.5D
- ae: ≤ 0.15D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

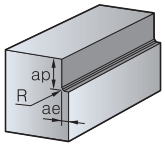
Recommended cutting conditions (EM36CA/EM43CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)		Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,000	1,550	10,600	1,100	15,800	2,570	14,300	1,850
8	9,000	1,650	8,100	1,180	11,900	2,700	10,700	1,950
10	7,200	1,650	6,400	1,180	9,500	2,700	8,500	1,950
12	6,000	1,540	5,400	1,140	8,000	2,570	7,100	1,850
14	5,200	1,540	4,750	1,095	7,000	2,510	6,250	1,800
16	4,500	1,540	4,100	1,050	6,000	2,450	5,400	1,750
18	4,400	1,435	3,650	975	5,400	2,295	4,850	1,625
20	3,600	1,330	3,200	900	4,800	2,140	4,300	1,500
25	3,200	1,200	2,800	850	4,400	2,000	3,800	1,400

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 1.0D (≤ HRC25)
  ≤ 0.8D (HRC25~40)



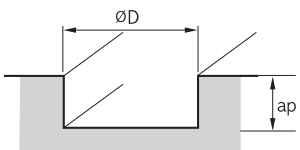
■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.5D (≤ HRC25)
  ≤ 0.35D (HRC25~40)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

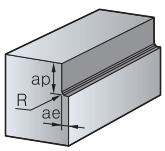
Recommended cutting conditions (EM37CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC35)		Pre-hardened steel (HRC35~HRC45)		High hardened steel (HRC45~HRC55)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,400	840	8,400	570	3,400	260
8	9,200	840	6,300	570	2,400	240
10	7,600	840	5,100	570	2,000	290
12	6,000	840	4,200	570	1,680	260
14	5,200	840	3,600	570	1,400	200
16	4,800	760	3,300	510	1,200	160
18	4,400	720	2,700	420	1,100	150
20	3,600	560	2,400	360	1,000	150
25	3,200	620	2,160	410	900	160

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.3D (≤ HRC45)
  ≤ 0.05D (HRC45~55)



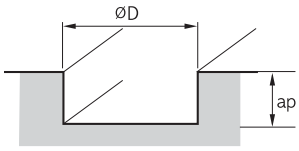
■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.3D (≤ HRC45)
  ≤ 0.05D (HRC45~55)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

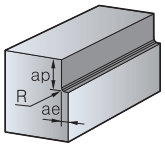
Recommended cutting conditions (EM38CA)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)		Alloy steel, Carbon steel (≤ HRC25)		Alloy steel, Carbon steel, Pre-hardened steel (HRC25~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	12,000	1,240	10,600	800	15,800	2,060	14,300	1,480
8	9,000	1,320	8,100	940	11,900	2,160	10,700	1,560
10	7,200	1,320	6,400	940	9,500	2,160	8,500	1,560
12	6,000	1,230	5,400	910	8,000	2,060	7,100	1,480
14	5,200	1,230	4,750	880	7,000	2,010	6,250	1,440
16	4,500	1,230	4,100	840	6,000	1,960	5,400	1,400
18	4,400	1,150	3,650	780	5,400	1,840	4,850	1,300
20	3,600	1,060	3,200	720	4,800	1,710	4,300	1,200
25	3,200	960	2,800	680	4,400	1,600	3,800	1,120

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 1.0D (≤ HRC25)
  ≤ 0.8D (HRC25~40)



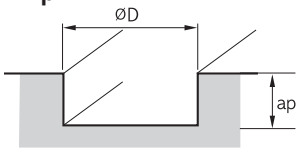
■ **Shouldering depth (ap)**
- ap: ≤ 1.0D
- ae: ≤ 0.5D (≤ HRC25)
  ≤ 0.35D (HRC25~40)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

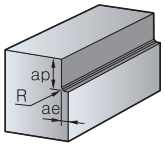
Recommended cutting conditions (EM06H9)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel, High speed steel		Alloy steel, Carbon steel, High speed steel (≤ HRC20)		Alloy steel, Carbon steel, High speed steel (HRC20~HRC30)		Alloy steel, Carbon steel, High speed steel (HRC30~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	1,800	80	1,600	60	1,200	55	800	30
8	1,400	105	1,100	75	900	65	560	45
10	1,100	150	900	120	800	110	450	60
12	900	180	800	140	630	110	400	70
14	800	180	700	140	560	110	350	70
16	700	180	560	140	450	110	280	70
18	630	180	500	140	400	110	250	70
20	560	180	450	140	400	110	220	70
22	500	220	450	170	350	140	220	70
25	450	220	400	170	310	140	180	85
28	400	210	350	160	280	130	160	85
30	350	210	310	160	250	130	160	85
32	350	210	280	160	220	130	140	85
36	310	210	250	160	200	130	120	85
40	280	200	220	150	180	120	110	80
50	220	200	180	170	160	140	90	80

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.15D



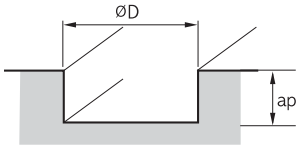
■ **Shouldering depth (ap)**
- ap: ≤ 1.5D
- ae: ≤ 0.1D

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

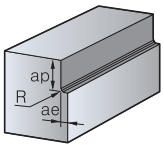
Recommended cutting conditions (EM17PM/EM16PM/EM11PM)

Workpiece / Conditions / Diameter (Ø)	Alloy steel, Carbon steel, High speed steel		Alloy steel, Carbon steel, High speed steel (≤ HRC20)		Alloy steel, Carbon steel, High speed steel (HRC20~HRC30)		Alloy steel, Carbon steel, High speed steel (HRC30~HRC40)	
	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
6	2,700	200	2,100	155	1,500	100	1,250	90
8	2,300	250	1,800	200	1,300	140	1,000	110
10	1,800	360	1,400	275	1,000	170	850	140
12	1,500	360	1,150	290	850	200	700	155
14	1,300	360	1,000	290	720	200	600	155
16	1,150	360	900	290	625	200	520	155
18	1,000	360	850	290	580	200	470	155
20	920	370	720	290	500	200	420	155
22	850	370	620	290	450	200	380	155
25	750	360	570	275	400	190	340	155

Application tip



■ **Slotting depth (ap)**
- ap: ≤ 0.15D

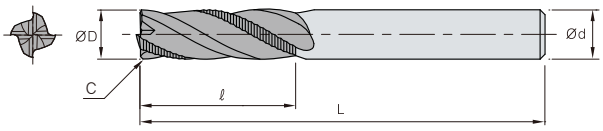


■ **Shouldering depth (ap)**
- ap: ≤ 1.5D (All dia.)
- ae: ≤ 0.5D (All dia.)

※ Workpiece should be clamped rigidly. In case of vibrations, reduce R.P.M and feed rate by the same ratio

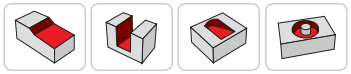
EM09CA (Roughing endmill with finishing capability)





4 | H·A 30° | Substrate PC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	0.00~ -0.058
Ø10~Ø18	0.00~ -0.070
Ø18~Ø20	0.00~ -0.084

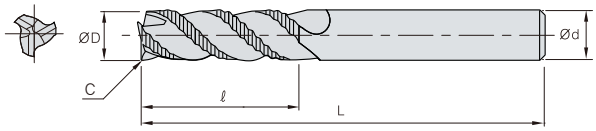


(mm)

Designation		ØD	Ød	ℓ	L	C
EM09CA-	060	6.0	6	14	52	0.25
4	070	7.0	8	18	63	0.3
	080	8.0	8	18	63	0.3
	090	9.0	10	22	80	0.3
	100	10.0	10	22	80	0.3
	110	11.0	12	26	80	0.4
	120	12.0	12	26	80	0.4
	140	14.0	14	30	80	0.4
	160	16.0	16	34	105	0.6
	180	18.0	18	38	105	0.6
	200	20.0	20	42	105	0.6

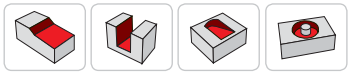
EM11CA (Roughing endmill for wave form of al)





3 | H·A 45° | Substrate FN30T | h6 shank

ØD	Tolerance
Ø6~Ø10	0.00~ -0.058
Ø10~Ø18	0.00~ -0.070
Ø18~Ø25	0.00~ -0.084



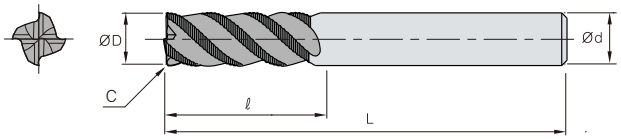
(mm)

Designation		ØD	Ød	ℓ	L	C
EM11CA-	060	6.0	6	18	63	0.3
3	070	7.0	8	23	63	0.3
	080	8.0	8	23	63	0.3
	090	9.0	10	30	80	0.3
	100	10.0	10	30	80	0.3
	110	11.0	12	32	80	0.5
	120	12.0	12	32	80	0.5
	140	14.0	14	32	80	0.5
	160	16.0	16	48	105	0.5
	180	18.0	18	48	105	0.5
	200	20.0	20	50	105	0.5
	250	25.0	25	50	105	0.5

EM36CA (Long type roughing endmill for fine pitches)

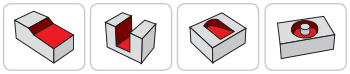
High helix angle, irregular flute spacing and lead





4 | H·A 40/42 | Substrate PC30T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05

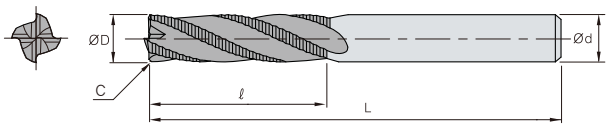


(mm)

Designation		ØD	Ød	ℓ	L	C
EM36CA-	050	5.0	6	19	63	0.3
4	060	6.0	8	19	63	0.5
	080	8.0	8	28	72	0.5
	100	10.0	10	34	82	0.5
	120	12.0	12	40	97	0.5
	140	14.0	16	40	97	0.6
	160	16.0	16	48	108	0.6
	180	18.0	20	48	108	0.6
	200	20.0	20	56	122	0.6

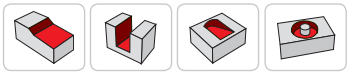
EM37CA (Roughing endmill for fine pitches)





4 | H·A 18/23 | Substrate PC30T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05

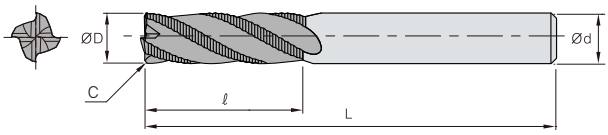


(mm)

Designation		ØD	Ød	ℓ	L	C
EM37CA-	050	5.0	6	13	60	0.3
4	060	6.0	8	13	80	0.5
	080	8.0	8	19	80	0.5
	100	10.0	10	22	80	0.5
	120	12.0	12	26	80	0.5
	140	14.0	16	26	85	0.6
	160	16.0	16	32	100	0.6
	180	18.0	20	32	100	0.6
	200	20.0	20	38	105	0.6

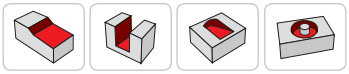
EM38CA (Standard roughing endmill)





4 | H·A 30° | Substrate PC40T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05



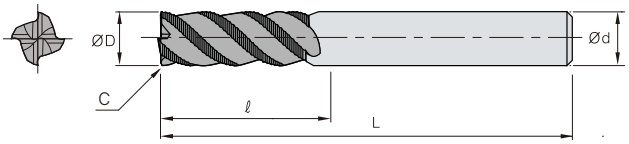
(mm)

Designation		ØD	Ød	ℓ	L	C
EM38CA-	050	5.0	6	13	50	0.3
4	060	6.0	6	16	50	0.3
	080	8.0	8	20	60	0.3
	100	10.0	10	25	75	0.3
	120	12.0	12	30	80	0.4
	140	14.0	16	35	100	0.6
	160	16.0	16	40	100	0.6
	180	18.0	20	40	110	0.6
	200	20.0	20	45	110	0.6

EM43CA (Standard roughing endmill for fine pitches)

High helix angle, irregular flute spacing and lead





4 | H·A 40/42° | Substrate PC30T | h6 shank

ØD	Tolerance
Ø5~Ø20	0.00~ -0.05

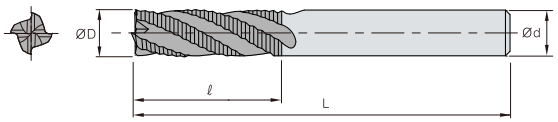


(mm)

Designation		ØD	Ød	ℓ	L	C
EM43CA-	050	5.0	6	13	57	0.3
4	060	6.0	6	13	57	0.5
	080	8.0	8	19	63	0.5
	100	10.0	10	22	72	0.5
	120	12.0	12	26	82	0.5
	140	14.0	16	26	82	0.6
	160	16.0	16	32	92	0.6
	180	18.0	20	32	92	0.6
	200	20.0	20	38	104	0.6

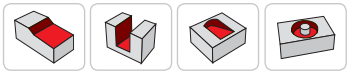
EM11PM (Roughing endmill)





4 | H·A 30° | HSSE PM | Substrate HN30T HC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø18~Ø20	±0.105



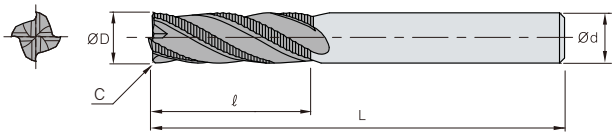
(mm)

Designation		ØD	Ød	ℓ	L
EM11PM-	060	6.0	6	20	60
4	070	7.0	10	20	70
	080	8.0	10	25	75
	090	9.0	10	30	75
	100	10.0	10	35	85
	120	12.0	12	40	100
	140	14.0	16	40	100
	160	16.0	16	50	110
	180	18.0	20	50	110
	200	20.0	20	60	125

EM16PM (Roughing endmill for fine pitches)

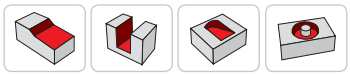
Irregular flute spacing





4 | H·A 25/30 | HSSE PM | Substrate HC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø1~Ø20	±0.105



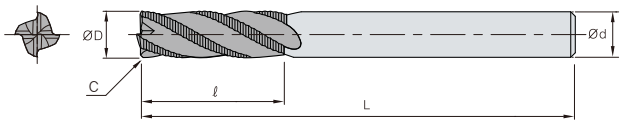
(mm)

Designation		ØD	Ød	ℓ	L	C
EM16PM-	060	6.0	6	20	60	0.5
4	070	7.0	10	20	70	0.5
	080	8.0	10	25	75	0.5
	090	9.0	10	30	75	0.5
	100	10.0	10	35	85	0.5
	120	12.0	12	40	100	0.6
	140	14.0	12	40	100	0.6
	160	16.0	16	50	110	0.6
	180	18.0	16	50	110	0.6
	200	20.0	20	60	125	0.6

EM17PM (Roughing endmill for fine pitches)

Irregular flute spacing





4 | H·A 25°/30° | HSSE PM | Substrate HC30T | h6 shank

ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø18~Ø20	±0.105

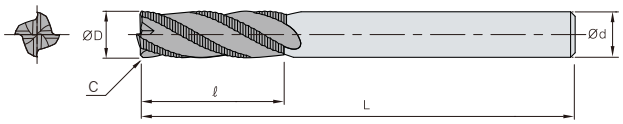


(mm)

Designation		ØD	Ød	ℓ	L	C
EM17PM-	060	6.0	6	13	80	0.5
4	070	7.0	10	16	80	0.5
	080	8.0	10	19	85	0.5
	090	9.0	10	19	95	0.5
	100	10.0	10	22	100	0.5
	120	12.0	12	26	110	0.6
	140	14.0	12	26	110	0.6
	160	16.0	16	32	125	0.6
	180	18.0	16	32	125	0.6
	200	20.0	20	38	140	0.6

EM06H9M (Roughing endmill)







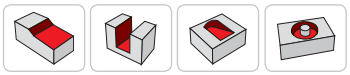








ØD	Tolerance
Ø6~Ø10	±0.075
Ø10~Ø18	±0.090
Ø18~Ø20	±0.105



(mm)

Designation		ØD	Ød	ℓ	L
EM06H9-	060	6.0	6	15	60
4	070	7.0	8	20	65
	080	8.0	8	20	65
	090	9.0	10	25	75
	100	10.0	10	25	75
	110	11.0	12	30	80
	120	12.0	12	30	80
	130	13.0	12	35	90
	140	14.0	12	35	90
	150	15.0	12	40	95
	160	16.0	16	40	95
	170	17.0	16	40	95
	180	18.0	16	40	105
	190	19.0	16	45	110
	200	20.0	20	45	110
	210	21.0	20	45	110
	220	22.0	20	45	110
	230	23.0	20	45	110
	240	24.0	25	50	120
	250	25.0	25	50	120
	260	26.0	25	50	120
	270	27.0	25	55	125
	280	28.0	25	55	125
	300	30.0	25	55	125
	320	32.0	32	60	145
	340	34.0	32	60	145
	350	35.0	32	60	145
	360	36.0	32	60	145
	380	38.0	32	65	150
	400	40.0	32	65	150
	420	42.0	42	65	155
	440	44.0	42	65	155
	450	45.0	42	70	160
	460	46.0	42	70	160
	500	50.0	42	70	160

Good chip evacuation

Solid Endmills for Aluminum

- Minimum cutting load and built-up edge
- Good surface finish
- DLC coating
  - Higher hardness (Hv3000-7000), longer tool life comparing uncoated endmill
  - Excellent lubrication by low friction co-efficient (u < 0.1)
  - Good chip evacuation
- Superior in Aluminum, Aluminum alloys, Copper and Copper alloys

Copper & aluminum machining

- Built-up edge
- Low heat resistance could create unnecessary stress or accuracy problem after machining
- Scratch due to low hardness
- Low tool life due to flank wear

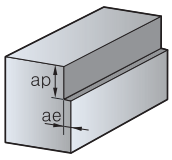
Trouble shooting for copper & aluminum machining

- Use a higher rake, sharp edge, oil (MQL) mist to decrease cutting load and built-up edge
- Increase Vc and reduce the depth of cut for a better surface finish

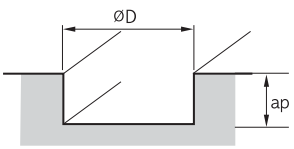
Recommended cutting condition (SSEA2000)

Workpiece / Condition / Diameter (Ø)	Shouldering				Slotting			
	Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)		Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	40,000	480	40,000	368	40,000	368	40,000	280
2	40,000	880	38,000	680	38,000	680	32,000	440
3	32,000	1,120	25,000	760	25,000	760	21,000	480
4	24,000	1,200	19,000	800	19,000	800	13,000	520
5	19,000	1,280	15,000	880	15,000	800	13,000	560
6	16,000	1,520	13,000	960	13,000	880	11,000	600
8	12,000	1,520	9,500	960	9,500	960	8,000	640
10	9,500	1,520	7,600	960	7,600	960	6,400	640
12	8,000	1,520	6,400	960	6,400	960	5,300	640
16	6,000	1,520	4,800	960	4,800	800	4,000	576
20	4,800	1,200	3,800	800	3,800	776	3,200	528

Application tip



■ **Shouldering depth (ap) and radial deoth (ae)**
- ae: ≤ 0.2D (D < Ø3)
  : ≤ 0.5D (D ≥ Ø3)
- ap: ≤ 2.0D



■ **Slotting depth (ap)**
- ap: ≤ D (max: 12mm)

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

SSEA2000/3000 (Flat)



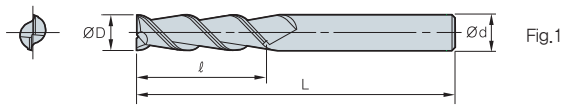


Fig.1

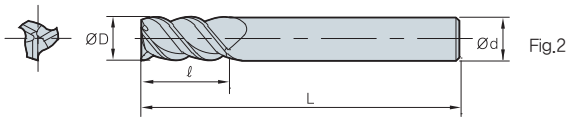


Fig.2



ØD	Tolerance
Ø1~Ø6	-0.010~-0.030
Ø7~Ø10	-0.015~-0.040
Ø11~Ø20	-0.020~-0.050

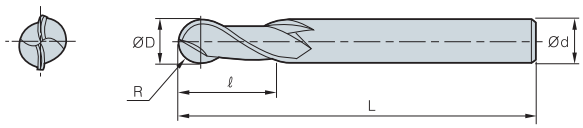
(mm)

Designation		ØD	Ød	ℓ	L	Fig.
SSEA 2	2010	1	6	3	40	1
	2015	1.5	6	4	40	1
	2020	2	6	6	40	1
	2025	2.5	6	7	40	1
	2030	3	6	10	45	1
	2035	3.5	6	10	45	1
	2040	4	6	12	45	1
	2050	5	6	15	50	1
	2060	6	6	15	50	1
	2070	7	8	20	60	1
	2080	8	8	20	60	1
	2090	9	10	20	70	1
	2100	10	10	25	70	1
	2110	11	12	25	75	1
	2120	12	12	30	75	1
	2130	13	16	30	90	1
	2140	14	16	35	90	1
	2150	15	16	40	90	1
	2160	16	16	40	90	1
	2180	18	18	45	100	1
	2200	20	20	45	100	1
SSEA 3	3020	2	6	6	40	2
	3030	3	6	10	45	2
	3035	3.5	6	10	45	2
	3040	4	6	12	45	2
	3050	5	6	15	50	2
	3060	6	6	15	50	2
	3070	7	8	20	60	2
	3080	8	8	20	60	2
	3090	9	10	20	70	2
	3100	10	10	25	70	2
	3110	11	12	25	75	2
	3120	12	12	30	75	2
	3130	13	16	30	90	2
	3140	14	16	35	90	2
	3150	15	16	40	90	2
	3160	16	16	40	90	2

Special endmills order: SSEA◎◎◎◎I-L
Ex.1) 3 flutes, diameter: 6.3.I: 17, L: 60 SSEA3063 17-60L
Ex.2) 3 flutes, diameter: 6.3.standard type SSEA3063

SSBEA2000 (Ball)





2 | H·A 45° | Carbide DLC | Substrate H01 PD3000

ØD	Tolerance
All	0~ -0.03

(mm)

Designation		R	ØD	Ød	ℓ	L
SSBEA	2010	0.5	1	6	3	70
2	2015	0.75	1.5	6	4	70
	2020	1	2	6	6	70
	2025	1.25	2.5	6	8	70
	2030	1.5	3	6	10	70
	2035	1.75	3.5	6	10	70
	2040	2	4	6	12	70
	2045	2.25	4.5	6	15	80
	2050	2.5	5	6	15	80
	2055	2.75	5.5	6	15	80
	2060	3	6	6	15	80
	2065	3.25	6.5	8	20	90
	2070	3.5	7	8	20	90
	2075	3.75	7.5	8	20	90
	2080	4	8	8	20	90
	2085	4.25	8.5	10	25	100
	2090	4.5	9	10	25	100
	2100	5	10	10	25	100
	2110	5.5	11	12	30	110
	2120	6	12	12	30	110
	2130	6.5	13	16	35	120
	2140	7	14	16	35	120
	2150	7.5	15	16	40	120
	2160	8	16	16	40	120
	2170	8.5	17	20	40	130
	2180	9	18	20	45	130
	2190	9.5	19	20	45	130
	2200	10	20	20	45	130

Special endmills order: SSBEA2◎◎◎l-L
Ex.1) 2 flutes, diameter: 6.3.l: 17, L: 60 SSBEA3063 17-60L
Ex.2) 2 flutes, diameter: 6.3.standard type SSBEA3063

Technique of machining copper/aluminum steel

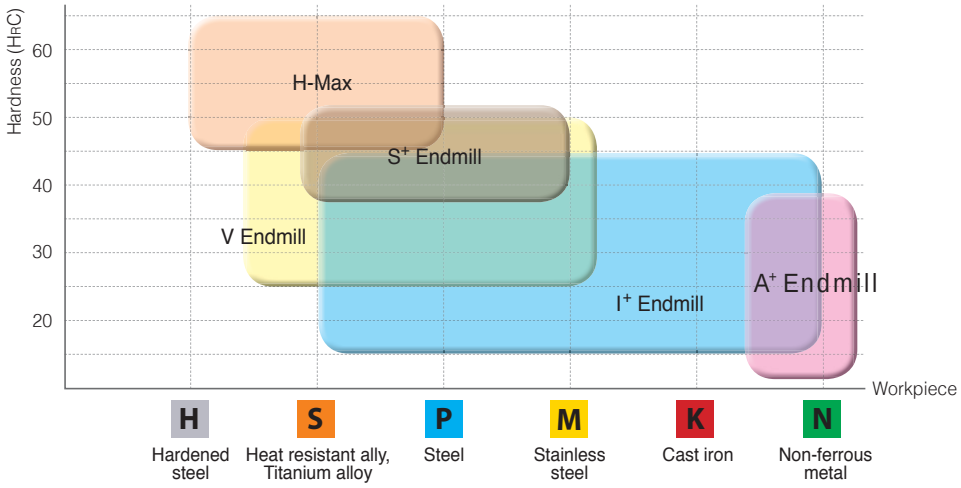
- With high rake angle cutting edge, sharp tools and oil mist, able to minimize cutting load and built-up-edge
- Applying higher cutting speed and shallower depth, able to make surface finishing and productivity improved

Aluminum Endmill

A+ Endmill

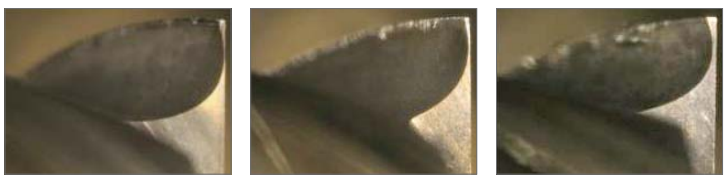
- Exclusive U-shaped flute
  - Excellent chip evacuation even in high feed machining
  - U shaped and buffed flute reduces built-up-edge
- Double relief angle
  - High rigidity of cutting edge ensures high productivity
- Sharp cutting edge
  - For both roughing and finishing (Shouldering, slotting and ramping etc.)

Application area



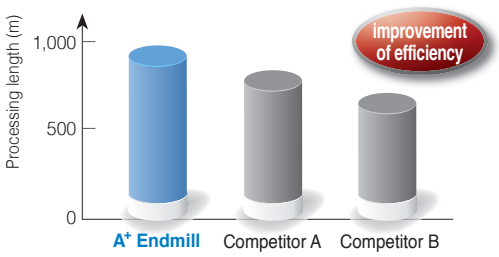
Performance evaluation

- **Workpiece** A7075
- **Cutting conditions** Diameter = Ø8.0, n (min-1) = 8.000, vc (m/min) = 200, vf (mm/min) = 1.200, fz (mm/t) = 0.05, ap (mm) = 8, ae (mm) = 2.0, wet
- **Tools** APFE3080-060



A+ Endmill | Competitor A | Competitor B

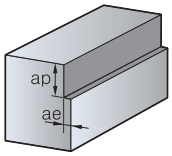
Test result



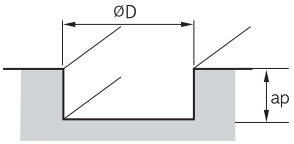
Recommended cutting condition

Workpiece / Condition / Diameter (Ø)	Shouldering				Slotting			
	Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)		Aluminum alloy (A7075)		Aluminum alloy (cast) (AC4B)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	40,000	480	40,000	368	40,000	368	40,000	280
2	40,000	880	38,000	680	38,000	680	32,000	440
3	32,000	1,120	25,000	760	25,000	760	21,000	480
4	24,000	1,200	19,000	800	19,000	800	13,000	520
5	19,000	1,280	15,000	880	15,000	800	13,000	560
6	16,000	1,520	13,000	960	13,000	880	11,000	600
8	12,000	1,520	9,500	960	9,500	960	8,000	640
10	9,500	1,520	7,600	960	7,600	960	6,400	640
12	8,000	1,520	6,400	960	6,400	960	5,300	640
16	6,000	1,520	4,800	960	4,800	800	4,000	576
20	4,800	1,200	3,800	800	3,800	776	3,200	528

Application tip



■ **Shouldering depth (ap) and radial deoth (ae)**
- ae: ≤ 0.2D (D < Ø3)
  : ≤ 0.5D (D ≥ Ø3)
- ap: ≤ 2.0D



■ **Slotting depth (ap)**
- ap: ≤ D (max: 12 mm)

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

Aluminum machining

- Built-up edge
- Low heat resistance could create residual stress or inaccuracy after machining
- Scratch due to low hardness
- Low tool life due to flank wear

Trouble shooting for aluminum machining

- Use a higher rake, sharp edge and oil (MQL) mist to decrease cutting load and built-up edge
- Increase Vc and reduce the depth of cut for better surface finish



APFE2000/3000 (Flat)



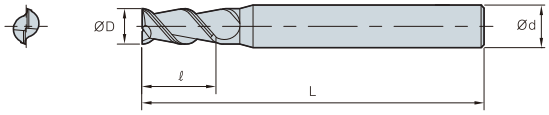


Fig.1

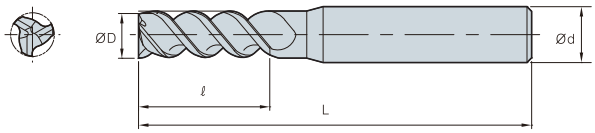


Fig.2



ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

(mm)

Designation		ØD	Ød	ℓ	L	Fig.
APFE	2010-050-S6	1	6	3	50	1
2	2015-050-S6	1.5	6	4	50	1
	2020-050-S4	2	4	6	50	1
	2025-050	2.2	6	8	50	1
	2030-050	3.0	6	9	50	1
	2040-050	4.0	6	12	50	1
	2050-050	5.0	6	15	50	1
	2060-050	6.0	6	18	50	1
	2080-060	8.0	8	20	60	1
	2100-075	10.0	10	30	75	1
	2120-075	12.0	12	32	75	1
	2160-100	16.0	16	45	100	1
	2200-100	20.0	20	45	100	1
APFE	3010-050-S4	1	4	3	50	2
3	3015-050-S4	1.5	4	4	50	2
	3020-050-S4	2	4	6	50	2
	3025-050	2.5	6	8	50	2
	3030-050	3.0	6	9	50	2
	3040-050	4.0	6	12	50	2
	3050-050	5.0	6	15	50	2
	3060-050	6.0	6	18	50	2
	3080-060	8.0	8	20	60	2
	3100-075	10.0	10	30	75	2
	3120-075	12.0	12	32	75	2
	3160-100	16.0	16	45	100	2
	3200-100	20.0	20	45	100	2

APLFE2000/3000 (Long flat)



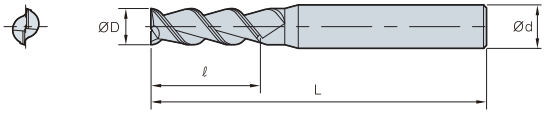


Fig.1

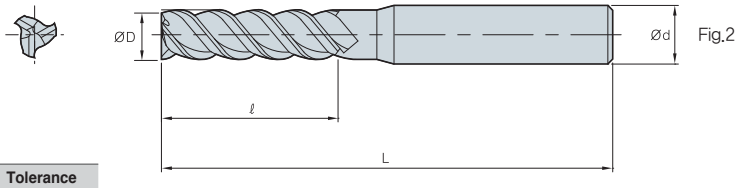


Fig.2

2 3 H·A 50° Substrate H05S h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02
Ø12.1~Ø20	0.00~ -0.03

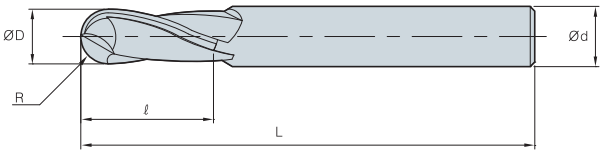
(mm)

Designation		ØD	Ød	ℓ	L	Fig.
APLFE 2	2030-060	3.0	6	12	60	1
	2040-060	4.0	6	16	60	1
	2050-060	5.0	6	20	60	1
	2060-075	6.0	6	25	75	1
	2080-075	8.0	8	32	75	1
	2100-100	10.0	10	45	100	1
	2120-100	12.0	12	45	100	1
	2160-150	16.0	16	65	150	1
	2200-150	20.0	20	75	150	1
APLFE 3	3030-060	3.0	6	12	60	2
	3040-060	4.0	6	16	60	2
	3050-060	5.0	6	20	60	2
	3060-075	6.0	6	25	75	2
	3080-075	8.0	8	32	75	2
	3100-100	10.0	10	45	100	2
	3120-100	12.0	12	45	100	2
	3160-150	16.0	16	65	150	2
	3200-150	20.0	20	75	150	2

APBE2000 (Ball)







2 | H·A 25° | Substrate H05S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

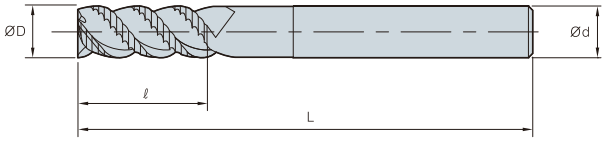
(mm)

Designation		ØD	Ød	ℓ	L
APBE	2010-050	1.0	4	2	50
2	2015-050	1.5	4	3	50
	2020-050	2.0	4	4	50
	2025-050	2.5	4	5	50
	2030-050	3.0	4	6	50
	2035-050	3.5	4	7	50
	2040-050	4.0	4	8	50
	2045-050	4.5	6	9	50
	2050-050	5.0	6	10	50
	2055-050	5.5	6	11	50
	2060-050	6.0	6	12	50
	2080-060	8.0	8	16	60
	2100-075	10.0	10	20	75
	2120-075	12.0	12	24	75

APRE3000 (Roughing)







3 | H·A 45° | Substrate H05S | h6 shank

ØD	Tolerance
Ø1~Ø12	0.00~ -0.02

(mm)

Designation		ØD	Ød	ℓ	L
APRE	3040-050	4.0	6	8	50
3	3050-050	5.0	6	13	50
	3060-050	6.0	6	15	50
	3065-060	6.5	8	16	60
	3070-060	7.0	8	16	60
	3075-060	7.5	8	20	60
	3080-060	8.0	8	20	60
	3085-075	8.5	10	20	75
	3090-075	9.0	10	20	75
	3095-075	9.5	10	22	75
	3100-075	10.0	10	25	75
	3110-075	11.0	12	30	75
	3120-075	12.0	12	30	75
	3130-075	13.0	14	30	75
	3140-075	14.0	16	32	75
	3150-075	15.0	16	32	75
	3160-100	16.0	16	35	100
	3170-100	17.0	20	35	100
	3180-100	18.0	20	35	100
	3200-100	20.0	20	45	100
	3250-105	25.0	25	50	105

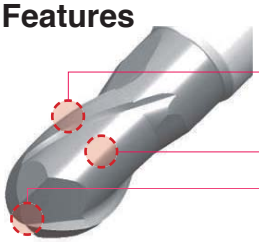
Long tool life and good surface roughness for electrode machining

C-Max

Copper

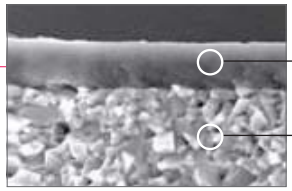
- Superior lubricity, wear resistance & chipping resistance due to the K-Silver coating layer and optimal substrate
- Optimal for copper and non-ferrous metal machining
- Wide line up (ball, flat, radius & long neck type)
- Long tool life and good surface roughness for electrode machining

Features



Optimal cutting edge for copper and non-ferrous metals machining

Good quality due to high precision cutting edge



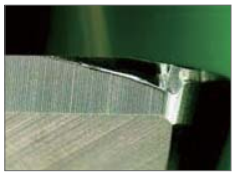
PC210C

Coating layer (K-Silver)
: Enhancing wear resistance and lubrication

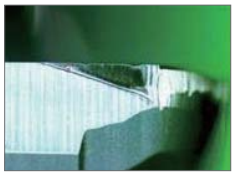
Substrate
: Optimal for wear and chipping resistance

Application example

- **Workpiece** Cu, Electrode machining
- **Cutting conditions** vc (m/min) = 70, fz (mm/t) = 0.083, ap (mm) = 0.6, ae (mm) = 3.0
- **Tools** CRE4100-070-R10



CRE

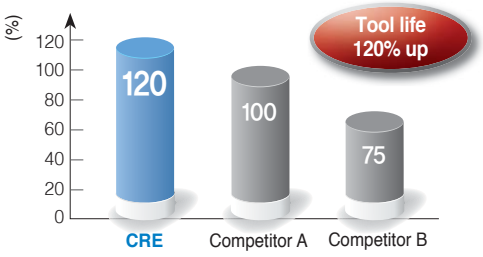


Competitor A



Competitor B

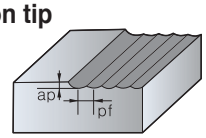
■ **Test result**



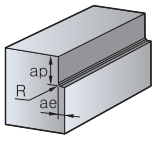
Recommended cutting condition

Workpiece	CBE/CBNE		CFE/CFNE		CRE/CRNE	
	Copper Alloys					
Condition / Diameter (Ø)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
0.5	40,000	2,600	40,000	1,800	-	-
1	40,000	2,800	40,000	2,000	40,000	2,000
1.5	40,000	3,200	40,000	2,400	30,000	2,400
2	40,000	3,600	30,000	1,800	30,000	1,800
3	40,000	4,000	23,000	1,380	20,000	1,380
4	32,000	3,200	15,000	900	15,000	900
5	25,000	2,500	12,000	750	12,000	750
6	21,000	2,100	10,000	600	10,000	600
8	16,000	1,600	8,000	480	8,000	480
10	13,000	1,300	6,400	384	6,400	384
12	9,000	900	5,400	324	5,400	324

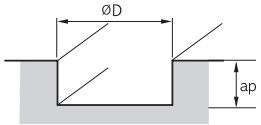
Application tip



• ap = 0.1D
• pf = 0.2D



• ap = 1.5D
• ae = 0.1D

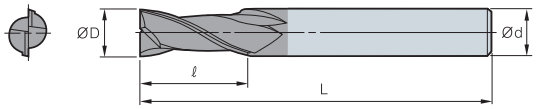


• ap ≤ 1.5D

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

CFE2000 (Flat)





2 | H·A 30° | CrN | Substrate PC210C

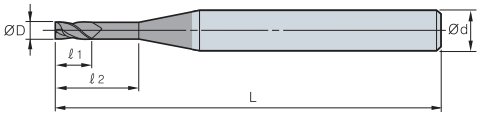
ØD	Tolerance
Ø0.5~Ø6	0.00~0.01
Ø8~Ø12	0.00~0.02

(mm)

Designation		ØD	Ød	ℓ	L
CFE 2	2010-040	1	4	2.5	40
	2015-040	1.5	4	4	40
	2020-045	2	4	5	45
	2030-045	3	6	8	45
	2040-050	4	6	11	50
	2050-060	5	6	13	60
	2060-060	6	6	13	60
	2080-060	8	8	19	60
	2100-070	10	10	22	70
	2120-075	12	12	26	75

CFNE2000 (Long neck flat)





2 | H·A 30° | CrN | Substrate PC210C

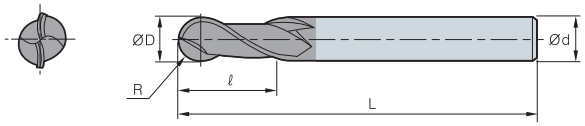
ØD	Tolerance
Ø0.5~Ø6	0.00~0.01
Ø8~Ø12	0.00~0.02

(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L
CFNE 2	2005-045-N2	0.5	4	0.8	2	45
	2005-045-N4	0.5	4	0.8	4	45
	2005-045-N6	0.5	4	0.8	6	45
	2005-050-N8	0.5	4	0.8	8	50
	2010-045-N4	1	4	1.5	4	45
	2010-045-N6	1	4	1.5	6	45
	2010-050-N8	1	4	1.5	8	50
	2010-050-N10	1	4	1.5	10	50
	2015-045-N6	1.5	4	2.3	6	45
	2015-050-N8	1.5	4	2.3	8	50
	2015-050-N10	1.5	4	2.3	10	50
	2015-050-N12	1.5	4	2.3	12	50
	2020-045-N6	2	4	3	6	45
	2020-050-N8	2	4	3	8	50
	2020-050-N10	2	4	3	10	50
	2020-055-N12	2	4	3	12	50
	2030-050-N10	3	4	4.5	10	50
	2030-050-N12	3	4	4.5	12	50
	2030-060-N14	3	4	4.5	14	60
	2030-060-N16	3	4	4.5	16	60
	2040-050-N12	4	6	6	12	50
	2040-050-N16	4	6	6	16	50
	2040-060-N20	4	6	6	20	60

CBE2000 (Ball)





2 | H·A 30° | CrN | Substrate PC210C

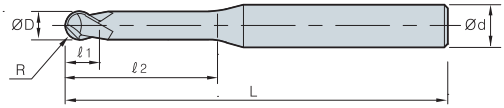
ØD	Tolerance	R Tolerance
Ø0.5~Ø6	0.00~0.01	±0.005
Ø8~Ø12	0.00~0.02	±0.005

(mm)

Designation		R	ØD	Ød	ℓ	L
CBE 2	2010-050	0.5	1	4	2.5	50
	2015-050	0.75	1.5	4	4	50
	2020-050	1	2	4	5	50
	2030-060	1.2	3	6	8	60
	2040-070	2	4	6	8	70
	2050-080	2.5	5	6	10	80
	2060-080	3	6	6	12	80
	2080-090	4	8	8	14	90
	2100-100	5	10	10	18	100
	2120-110	6	12	12	22	110

CBNE2000 (Long neck ball)





2 | H·A 30° | CrN | Substrate PC210C

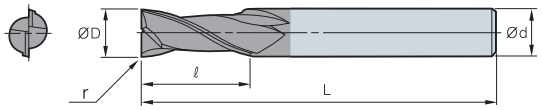
ØD	Tolerance
Ø0.5~Ø6	0.00~0.01
Ø8~Ø12	0.00~0.02

(mm)

Designation		R	ØD	Ød	ℓ1	ℓ2	L
CBNE 2	2005-045-N2	0.25	0.5	4	0.5	2	45
	2005-045-N4	0.25	0.5	4	0.5	4	45
	2005-045-N6	0.25	0.5	4	0.5	6	45
	2005-050-N8	0.25	0.5	4	0.5	8	50
	2010-045-N4	0.5	1	4	1	4	45
	2010-045-N6	0.5	1	4	1	6	45
	2010-050-N8	0.5	1	4	1	8	50
	2010-050-N10	0.5	1	4	1	10	50
	2015-050-N8	0.75	1.5	4	1.5	8	50
	2015-050-N10	0.75	1.5	4	1.5	10	50
	2015-050-N12	0.75	1.5	4	1.5	12	50
	2015-055-N14	0.75	1.5	4	1.5	14	55
	2020-050-N8	1	2	4	2	8	50
	2020-050-N10	1	2	4	2	10	50
	2020-050-N12	1	2	4	2	12	50
	2020-055-N14	1	2	4	2	14	55
	2030-050-N10	1.5	3	4	3	10	50
	2030-050-N12	1.5	3	4	3	12	50
	2030-055-N14	1.5	3	4	3	14	55
	2030-055-N16	1.5	3	4	3	16	60
	2040-060-N16	2	4	6	4	16	60
	2040-060-N20	2	4	6	4	20	60
	2040-070-N25	2	4	6	4	25	70
	2040-070-N30	2	4	6	4	30	70

CRE2000 (Radius)





2 | H·A 30° | CrN | Substrate PC210C

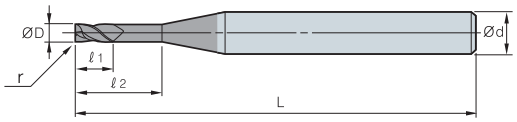
ØD	Tolerance	R Tolerance
Ø0.5~Ø6	0.00~0.01	±0.005
Ø8~Ø12	0.00~0.02	±0.005

(mm)

Designation		r	ØD	Ød	ℓ	L
CRE 2	2020-045-R05	0.5	2	4	5	45
	2030-045-R05	0.5	3	6	8	45
	2040-050-R05	0.5	4	6	11	50
	2050-060-R05	0.5	5	6	13	60
	2060-060-R05	0.5	6	6	13	60
	2080-060-R10	1	8	8	19	60
	2100-070-R10	1	10	10	22	70
	2120-075-R10	1	12	12	26	75

CRNE2000 (Long neck radius)





2 | H·A 30° | CrN | Substrate PC210C

ØD	Tolerance	R Tolerance
Ø0.5~Ø6	0.00~0.01	±0.005
Ø8~Ø12	0.00~0.02	±0.005

(mm)

Designation		r	ØD	Ød	ℓ1	ℓ2	L
CRNE 2	2010-045-R02N4	0.2	1	4	1.5	4	45
	2010-045-R02N6	0.2	1	4	1.5	6	45
	2010-050-R02N8	0.2	1	4	1.5	8	50
	2010-050-R02N10	0.2	1	4	1.5	10	50
	2015-045-R02N6	0.2	1.5	4	2.3	6	45
	2015-050-R02N8	0.2	1.5	4	2.3	8	50
	2015-050-R02N10	0.2	1.5	4	2.3	10	50
	2015-050-R02N12	0.2	1.5	4	2.3	12	50
	2020-045-R05N6	0.5	2	4	3	6	45
	2020-050-R05N8	0.5	2	4	3	8	50
	2020-050-R05N10	0.5	2	4	3	10	50
	2020-055-R05N12	0.5	2	4	3	12	50
	2030-050-R05N10	0.5	3	4	4.5	10	50
	2030-050-R05N12	0.5	3	4	4.5	12	50
	2030-060-R05N14	0.5	3	4	4.5	14	60
	2030-060-R05N16	0.5	3	4	4.5	16	60
	2040-050-R05N12	0.5	4	6	6	12	50
	2040-050-R05N16	0.5	4	6	6	16	50
	2040-060-R05N20	0.5	4	6	6	20	60

Diamond coated endmill

D Endmill new

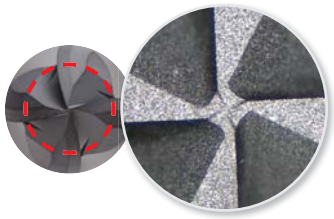
- Tangential cutting-edge geometries for excellent surface finish
- Excellent wear resistance due to high hardness and high purity diamond coating
- Advanced surface finish and cutting performance thanks to sharp edges and tangential tool geometries

Features



Tangential cutting-edge geometries

- One-Pass grinding system
- Prevents stepped cone on the machined surface
- 2-flutes and 4-flutes tooling with a ball nose

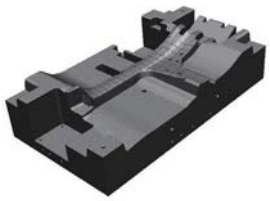


Center-matched ball shape (4-flutes)

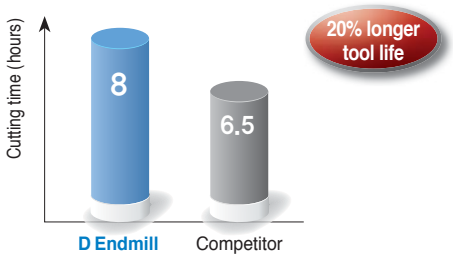
- Ball point shape for high feed machining
- Improved rigidity and excellent surface finish

Application examples

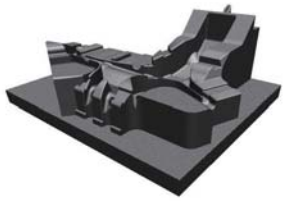
- **Workpiece** Graphite mold
- **Cutting conditions** vc (m/min) = 100, fz (mm/t) = 0.11, ap (mm) = 0.26, dry
- **Tools** DBE4060-110-N250S06



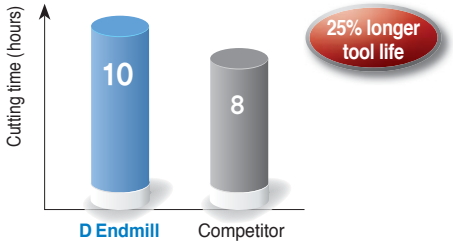
■ **Test result**



- **Workpiece** Graphite mold
- **Cutting conditions** vc (m/min) = 180, fz (mm/t) = 0.1, ap (mm) = 0.2, dry
- **Tools** DBE2060-110-N250S06



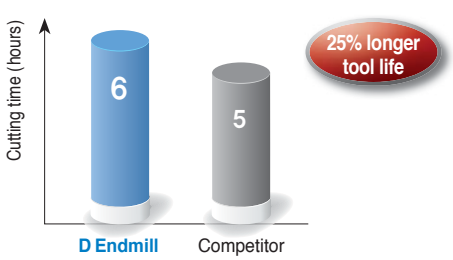
■ **Test result**



- **Workpiece** Graphite mold
- **Cutting conditions** vc (m/min) = 300, fz (mm/t) = 0.1, ap (mm) = 0.15, dry
- **Tools** DBE2060-080-N250S06



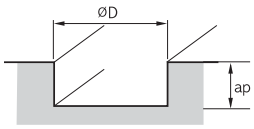
■ **Test result**



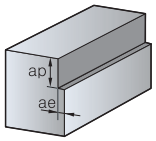
Recommended cutting conditions (Flat type)

Tool	DFE2000 (Slotting)		DFE2000 (Shouldering)		DFE4000 (Shouldering)	
Workpiece	Graphite					
Conditions / Diameter (Ø)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	RPM n (min-1)	Feed vf (mm/min)
1	40,000	500	40,000	700	-	-
2	25,000	570	25,000	800	25,000	1,600
3	20,000	570	20,000	800	20,000	1,600
4	18,000	680	18,000	950	18,000	1,900
5	14,000	960	14,000	1,200	14,000	2,400
6	11,000	1,000	11,000	1,400	11,000	2,800
8	8,000	930	8,000	1,300	8,000	2,600
10	6,500	860	6,500	1,200	6,500	2,400
12	5,500	860	5,500	1,200	5,500	2,400

Application tip



■ **Slotting depth (ap)**
- D ≤ Ø2.5, ap = 0.3D
- D > Ø2.5, ap = 0.5D



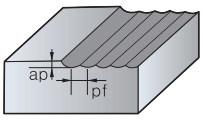
■ **Shouldering depth (ap)**
- D ≤ Ø2.5, ap = 1.5D, ae = 0.05D
- D > Ø2.5, ap = 1.5D, ae = 0.1D

※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

Recommended cutting conditions (Ball type)

Tool	DBE2000		DBE4000	
Workpiece	Graphite			
Conditions / Diameter (Ø)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
1	16,000	400	-	-
2	16,000	800	16,000	1,200
3	16,000	1,450	16,000	2,000
4	16,000	2,100	16,000	3,100
5	15,500	2,550	15,000	3,800
6	15,000	2,950	15,000	4,400
8	13,000	3,000	13,000	4,500
10	11,500	3,000	12,000	4,600
12	10,700	3,200	10,000	4,700

Application tip



■ **Depth of cut (ap)**
- ap = 0.2D
- pf = 0.2D

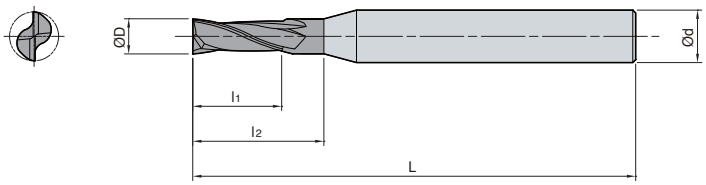
※ Workpiece should be clamped rigidly In case of vibrations, reduce R.P.M and feed rate by the same ratio

Notice

- Cutting conditions are up to the machine's condition and the shape of cutting
- Workpiece should be clamped rigidly. In case of vibrations, reduce RPM and feed rate by the same ratio
- When the overhang is longer than 3D, reduce RPM and feed rate

DFE2000 (Flat)





2 | H·A 30° | Substrate ND3000 | h6 shank

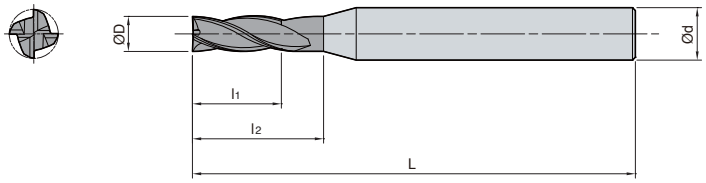
ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

(mm)

Designation		ØD	Ød	l1	l2	L
DFE 2	2010-045-N050S04	1	4	3	5	45
	2010-060-N050S04	1	4	3	5	60
	2010-060-N100S04	1	4	3	10	60
	2010-060-N150S04	1	4	3	15	60
	2010-060-N200S04	1	4	3	20	60
	2010-060-N250S04	1	4	3	25	60
	2015-060-N050S04	1.5	4	4	5	60
	2015-060-N100S04	1.5	4	4	10	60
	2015-060-N150S04	1.5	4	4	15	60
	2015-060-N200S04	1.5	4	4	20	60
	2015-060-N250S04	1.5	4	4	25	60
	2020-045-N080S04	2	4	6	8	45
	2020-080-N080S04	2	4	6	8	80
	2020-080-N100S04	2	4	6	10	80
	2020-080-N150S04	2	4	6	15	80
	2020-080-N200S04	2	4	6	20	80
	2020-080-N250S04	2	4	6	25	80
	2020-080-N300S04	2	4	6	30	80
	2020-080-N400S04	2	4	6	40	80
	2030-050-N100S06	3	6	9	10	50
	2030-080-N100S04	3	4	9	10	80
	2030-080-N200S04	3	4	9	20	80
	2030-080-N250S04	3	4	9	25	80
	2030-080-N300S04	3	4	9	30	80
	2030-080-N400S04	3	4	9	40	80
	2040-050-N160S06	4	6	12	16	50
	2040-080-N160S04	4	4	12	16	80
	2050-060-N200S06	5	6	15	20	60
	2050-110-N200S06	5	6	15	20	110
	2060-060-N180S06	6	6	18	-	60
	2060-110-N250S06	6	6	18	25	110
	2060-150-N250S06	6	6	18	25	150
	2080-070-N250S08	8	8	25	-	70
	2080-150-N400S08	8	8	25	40	150
	2100-080-N300S10	10	10	30	-	80
	2100-150-N500S10	10	10	30	50	150
	2120-080-N350S12	12	12	35	-	80
	2120-150-N600S12	12	12	35	60	150

DFE4000 (Flat)





4 | H·A 30° | Substrate ND3000 | h6 shank

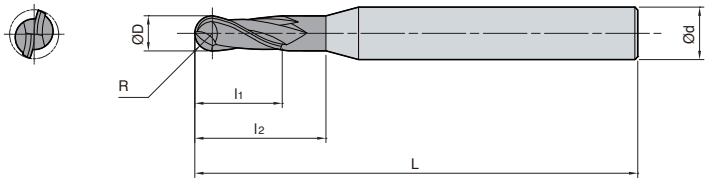
ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

(mm)

Designation		ØD	Ød	l_1	l_2	L
DFE 4	4020-045-N060S04	2	4	6	8	45
	4020-060-N100S04	2	4	10	12	60
	4030-050-N100S06	3	6	10	12	50
	4030-060-N150S04	3	4	15	18	60
	4040-050-N150S06	4	6	15	18	50
	4040-080-N200S04	4	4	20	-	80
	4060-060-N180S06	6	6	18	-	60
	4060-110-N300S06	6	6	30	-	110
	4060-150-N300S06	6	6	30	-	150
	4080-070-N250S08	8	8	25	-	70
	4080-110-N400S08	8	8	40	-	110
	4080-150-N400S08	8	8	40	-	150
	4100-080-N250S10	10	10	25	-	80
	4100-110-N400S10	10	10	40	-	110
	4100-150-N500S10	10	10	50	-	150
	4120-080-N300S12	12	12	30	-	80
	4120-110-N400S12	12	12	40	-	110
	4120-150-N500S12	12	12	50	-	150

DBE2000 (Ball)





2 | H·A 30° | Substrate ND3000 | h6 shank

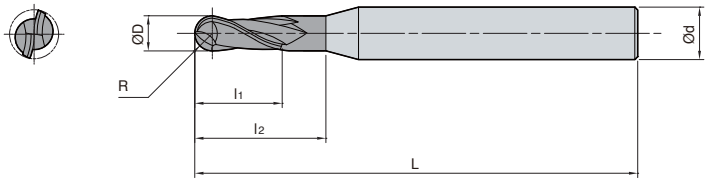
ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

(mm)

Designation		R	ØD	Ød	l_1	l_2	L
DBE	2006-045-N020S04	0.3	0.6	4	2	2	45
2	2006-045-N050S04	0.3	0.6	4	2	5	45
	2006-045-N080S04	0.3	0.6	4	2	8	45
	2006-045-N100S04	0.3	0.6	4	2	10	45
	2008-045-N030S04	0.4	0.8	4	2.5	3	45
	2008-045-N050S04	0.4	0.8	4	2.5	5	45
	2008-045-N100S04	0.4	0.8	4	2.5	10	45
	2010-060-N030S04	0.5	1	4	3	3	60
	2010-060-N050S04	0.5	1	4	3	5	60
	2010-060-N080S04	0.5	1	4	3	8	60
	2010-060-N100S04	0.5	1	4	3	10	60
	2010-060-N120S04	0.5	1	4	3	12	60
	2010-060-N150S04	0.5	1	4	3	15	60
	2010-060-N200S04	0.5	1	4	3	20	60
	2010-080-N250S04	0.5	1	4	3	25	80
	2010-080-N300S04	0.5	1	4	3	30	80
	2010-080-N350S04	0.5	1	4	3	35	80
	2010-080-N400S04	0.5	1	4	3	40	80
	2015-060-N050S04	0.75	1.5	4	4	5	60
	2015-080-N100S04	0.75	1.5	4	4	10	80
	2015-080-N150S04	0.75	1.5	4	4	15	80
	2015-080-N200S04	0.75	1.5	4	4	20	80
	2015-080-N250S04	0.75	1.5	4	4	25	80
	2015-080-N300S04	0.75	1.5	4	4	30	80
	2015-080-N350S04	0.75	1.5	4	4	35	80
	2015-080-N400S04	0.75	1.5	4	4	40	80
	2020-060-N080S04	1	2	4	6	8	60
	2020-080-N100S04	1	2	4	6	10	80
	2020-080-N150S04	1	2	4	6	15	80
	2020-080-N200S04	1	2	4	6	20	80
	2020-080-N250S04	1	2	4	6	25	80
	2020-080-N300S04	1	2	4	6	30	80
	2020-080-N350S04	1	2	4	6	35	80
	2020-100-N400S04	1	2	4	6	40	100
	2020-100-N450S04	1	2	4	6	45	100
	2020-100-N500S04	1	2	4	6	50	100

DBE2000 (Ball)





2 | H·A 30° | Substrate ND3000 | h6 shank

ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

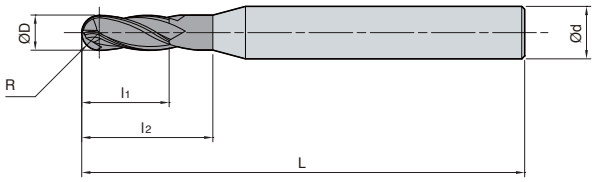
(mm)

Designation		R	ØD	Ød	l_1	l_2	L
DBE	2030-060-N100S04	1.5	3	4	9	10	60
2	2030-100-N150S04	1.5	3	4	9	15	100
	2030-100-N200S04	1.5	3	4	9	20	100
	2030-100-N250S04	1.5	3	4	9	25	100
	2030-100-N300S04	1.5	3	4	9	30	100
	2030-100-N350S04	1.5	3	4	9	35	100
	2030-100-N400S04	1.5	3	4	9	40	100
	2030-100-N500S04	1.5	3	4	9	50	100
	2040-060-N160S04	2	4	4	12	16	60
	2040-080-N160S04	2	4	4	12	16	80
	2040-080-N300S04	2	4	4	12	30	80
	2040-100-N160S04	2	4	4	12	16	100
	2040-100-N400S04	2	4	4	12	40	100
	2040-130-N160S04	2	4	4	12	16	130
	2040-130-N400S04	2	4	4	12	40	130
	2050-110-N200S06	2.5	5	6	15	20	110
	2060-080-N250S06	3	6	6	20	25	80
	2060-110-N250S06	3	6	6	20	25	110
	2060-150-N300S06	3	6	6	20	30	150
	2080-080-N300S08	4	8	8	25	30	80
	2080-110-N300S08	4	8	8	25	30	110
	2080-150-N500S08	4	8	8	25	50	150
	2080-200-N400S08	4	8	8	25	40	200
	2100-080-N400S10	5	10	10	30	40	80
	2100-110-N400S10	5	10	10	30	40	110
	2100-150-N600S10	5	10	10	30	60	150
	2100-200-N500S10	5	10	10	30	50	200
	2120-110-N500S12	6	12	12	35	50	110
	2120-150-N500S12	6	12	12	35	50	150
	2120-200-N600S12	6	12	12	35	60	200

DBE4000 (Ball)







4 | H·A 30° | Substrate ND3000 | h6 shank

ØD	Tolerance
~Ø5.9	0.00~ -0.02
Ø6.0~	0.00~ -0.03

(mm)

Designation		R	ØD	Ød	l_1	l_2	L
DBE	4020-060-N080S04	1	2	4	6	8	60
4	4020-080-N100S04	1	2	4	6	10	80
	4020-080-N200S04	1	2	4	6	20	80
	4020-080-N300S04	1	2	4	6	30	80
	4020-080-N400S04	1	2	4	6	40	80
	4030-060-N100S04	1.5	3	4	9	10	60
	4030-100-N150S04	1.5	3	4	9	15	100
	4030-100-N200S04	1.5	3	4	9	20	100
	4030-100-N300S04	1.5	3	4	9	30	100
	4030-100-N400S04	1.5	3	4	9	40	100
	4030-100-N500S04	1.5	3	4	9	50	100
	4040-060-N160S04	2	4	4	12	16	60
	4040-080-N160S04	2	4	4	12	16	80
	4040-100-N160S04	2	4	4	12	16	100
	4040-130-N160S04	2	4	4	12	16	130
	4060-080-N250S06	3	6	6	20	25	80
	4060-110-N250S06	3	6	6	20	25	110
	4060-150-N300S06	3	6	6	20	30	150
	4080-080-N300S08	4	8	8	25	30	80
	4080-110-N300S08	4	8	8	25	30	110
	4080-150-N350S08	4	8	8	25	35	150
	4080-200-N400S08	4	8	8	25	40	200
	4100-080-N350S10	5	10	10	30	35	80
	4100-110-N350S10	5	10	10	30	35	110
	4100-150-N400S10	5	10	10	30	40	150
	4100-200-N500S10	5	10	10	30	50	200
	4120-110-N500S12	6	12	12	35	50	110
	4120-150-N500S12	6	12	12	35	50	150
	4120-200-N600S12	6	12	12	35	60	200

Router endmill for machining composite materials

Composite Router Endmill new

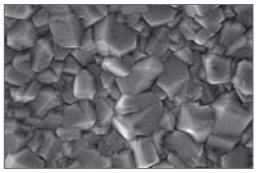
- Router endmills optimized for machining composite materials (CFRP/GFRP)
- Excellent tool life thanks to nano-crystal diamond coating
- Blade design for reducing flaking and burrs
- Improved productivity through high efficiency machining

Features

- Diamond-coated grade ND2110 for machining composite materials
- High hardness diamond coating (over Hv 8,000)
- Nano-diamond coating with excellent resistance to friction and welding
- Improved resistance to flaking thanks by applying the specialized grade for diamond coating



Nano-diamond coating



Existing diamond coating

CCR (Router Endmill)

- Down cut design for low vibrations and cutting force
- Endmill for roughing, profiling, and grooving



CCDR (Dual Helix Router Endmill)

- Dual helix design to inhibit flaking on upper and lower faces of workpieces
- Endmill for finishing, profiling, and grooving



CCLR (Low Helix Router Endmill)

- Fewer burrs thanks to the low axial cutting force
- Endmill for finishing, profiling, and blind groove making



CCRR (Reverse Helix Router Endmill)

- Reverse helix design to inhibit a drift in the workpiece's course
- Endmill for finishing, profiling, and through groove making



CCDR4000/6000 (Flat)



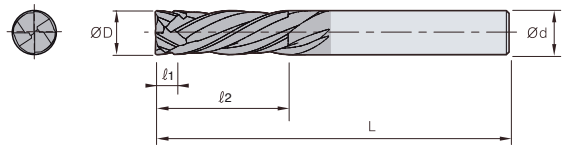


Fig.1

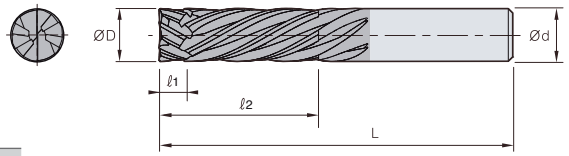


Fig.2

4 6 H·A 30°/30° Substrate ND2100 h5 shank

ØD	Tolerance
Ø6~12	0.00~ -0.03 (mm)

(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L	Fig.
CCDR 4	4060-065	6	6	3	18	65	1
	4080-075	8	8	4	24	75	1
CCDR 6	6100-085	10	10	5	30	85	2
	6120-100	12	12	6	36	100	2

4 6 H·A 30°/30° Substrate ND2100 h5 shank

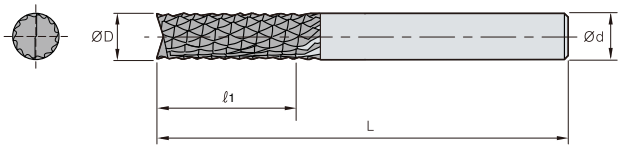
ØD	Tolerance
Ø0.250~0.500	0.0000~ -0.0012 (inch)

(inch)

Designation		ØD	Ød	ℓ1	ℓ2	L	Fig.
CCDR 4	402500	1/4 0.250	0.250	0.125	0.750	2.500	1
	402500L	1/4 0.250	0.250	0.125	1.500	4.000	1
CCDR 6	603750	3/8 0.375	0.375	0.125	1.000	3.250	2
	603750L	3/8 0.375	0.375	0.125	1.500	4.000	2
	605000	1/2 0.500	0.500	0.125	1.000	3.250	2
	605000L	1/2 0.500	0.500	0.125	1.500	4.000	2

CCR2000 (Flat)





2 | H·A -27° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø4~12	-0.02~-0.08 (mm)

(mm)

Designation		ØD	Ød	ℓ1	L
CCR 2	2040-050	4	4	12	50
	2050-050	5	5	15	50
	2060-065	6	6	18	65
	2080-075	8	8	24	75
	2100-065	10	10	30	85
	2120-065	12	12	36	100

2 | H·A -27° | Substrate ND2100 | h5 shank

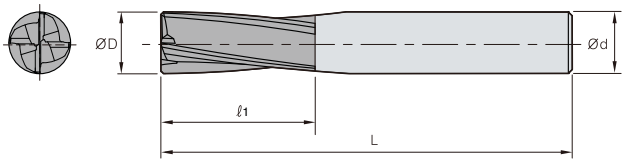
ØD	Tolerance
Ø0.250~0.500	-0.0008~-0.0032 (inch)

(inch)

Designation		ØD	Ød	ℓ1	L
CCR 2	202500	1/4 0.250	0.250	0.750	2.500
	202500L	1/4 0.250	0.250	1.500	4.000
	203750	3/8 0.375	0.375	1.000	3.250
	203750L	3/8 0.375	0.375	1.500	4.000
	205000	1/2 0.500	0.500	1.000	3.250
	205000L	1/2 0.500	0.500	1.500	4.000

CCLR4000 (Flat)





4 | H·A 15° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø4~12	0.00~ -0.03 (mm)

(mm)

Designation		ØD	Ød	ℓ1	L
CCLR 4	4040-050	4	4	12	50
	4050-050	5	5	15	50
	4060-065	6	6	18	65
	4080-075	8	8	24	75
	4100-085	10	10	30	85
	4120-100	12	12	36	100

4 | H·A 15° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø0.250~0.500	0.0000~ -0.0012 (inch)

(inch)

Designation		ØD	Ød	ℓ1	L
CCLR 4	402500	1/4 0.250	0.250	0.750	2.500
	402500L	1/4 0.250	0.250	1.500	4.000
	403750	3/8 0.375	0.375	1.000	3.250
	403750L	3/8 0.375	0.375	1.500	4.000
	405000	1/2 0.500	0.500	1.000	3.250
	405000L	1/2 0.500	0.500	1.500	4.000

CCRR6000/8000 (Flat)



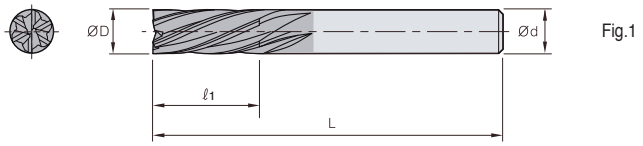


Fig.1

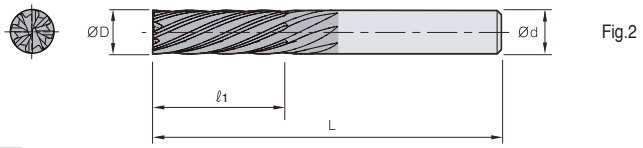


Fig.2

6 | 8 | H·A -25° | Substrate ND2100 | h5 shank

ØD	Tolerance
Ø6~12	0.00~-0.03 (mm)

(mm)

Designation		ØD	Ød	ℓ1	L	Fig.
CCRR 6	6060-065	6	6	18	65	1
	6080-075	8	8	24	75	1
CCRR 8	8100-085	10	10	30	85	2
	8120-100	12	12	36	100	2

6 | 8 | H·A -25° | Substrate ND2100 | h5 shank

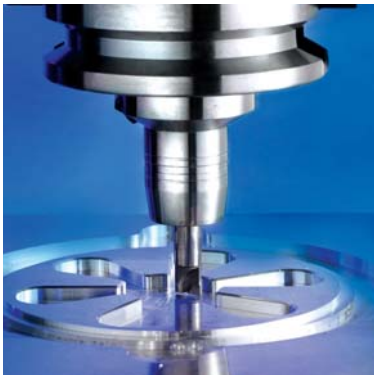
ØD	Tolerance
Ø0.250~0.500	0.0000~-0.0012 (inch)

(inch)

Designation		ØD	Ød	ℓ1	L	Fig.
CCRR 6	602500	1/4 0.250	0.250	0.750	2.500	1
	602500L	1/4 0.250	0.250	1.500	4.000	1
CCRR 8	803750	3/8 0.375	0.375	1.000	3.250	2
	803750L	3/8 0.375	0.375	1.500	4.000	2
	805000	1/2 0.500	0.500	1.000	3.250	2
	805000L	1/2 0.500	0.500	1.500	4.000	2

Longer tool life and good surface finishes

PCD Endmill



- Longer tool life and good surface roughness
- Reducing burrs at non-ferrous metals machining
- 1000 type: Ultra finishing for non-ferrous metals
- 2000 type: Optimal for aluminum alloy, carbon steel, graphite and reinforced Plastic machining

PCD endmill code system

PDE	2	080
Endmill	**No. of Flute**	**Diameter**
PDE: PCD Endmill	2 Flutes	Ø8.0

Recommended cutting condition

Workpiece	vc (m/min)	n (min^{-1})	fz (mm/t)
Aluminum Alloy, Copper	30~300	2,000~12,000	0.02~0.07
Reinforced Plastic	35~300	2,800~16,000	0.04~0.12
Carbon steel, Graphite	10~100	5,300~16,000	0.04~0.2

Special endmill order form



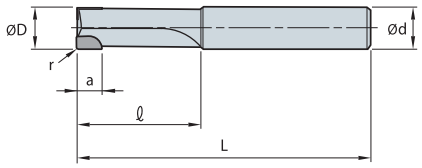


Fig.1

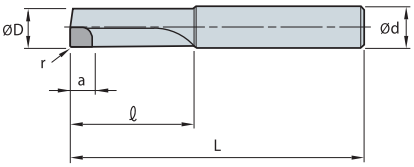


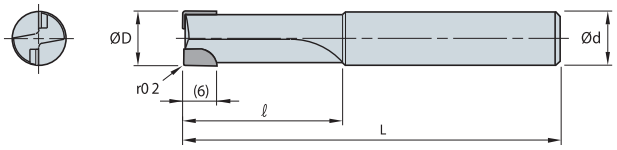
Fig.2

Designation	Fig.	No. of Flute	Dimension (mm)					
			ØD	Ød	r	a	ℓ	L
PDES								

※ Depending on customer requests, we can make special Endmill

PDE1000/2000 (Flat)







(mm)

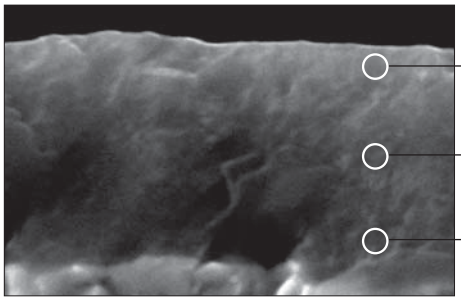
Designation		ØD	Ød	ℓ	L
PDE 1	1040	4	6	15	45
	1050	5	6	15	50
	1060	6	6	20	60
PDE 2	2060	6	8	20	60
	2070	7	8	20	60
	2080	8	8	20	60
	2090	9	10	25	70
	2100	10	10	25	70
	2120	12	12	25	75

High precision machining with our high stiffness design

Brazed Endmills

- Possible to machine with high precision due to high stiffness design
- High speed cutting by increasing wear resistance, decreasing frictional resistance through PVD coating and substrate
- Long tool life due to absorbing impact through brazed body in heavy interruption
- General steel, Alloy steel, mild steel, dice steel, stainless steel, cast iron, ductile cast iron
- ZSEA: Aluminum, Aluminum alloy, Copper, Copper alloy, Non-ferrous materials
- Coating brazed endmills (special) – Guaranteed long tool life due to high new-concept hardness and oxidation resistant coating

Features

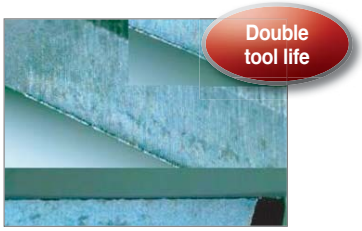


PC221F Coating

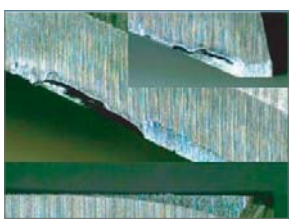
Brazed Endmills code system

Z	S	E	2	14	-	S
Brazed	Spiral	Endmill	No. of flutes	Diameter		Shank dia.
		E: Flat (Steel) EA: Flat (Al, Cu) EL: Flat Long (Steel) EXL: Flat Long (Steel) BE: Ball (Steel)	2: 2 Flutes 3: 3 Flutes	Ø14		S: Ø42.0 Q: Coated SQ: Ø42.0 Coated Standard Shank Diameter: none

Wear resistance test



Coated ZSE(PC221F)

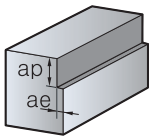


Carbide ZSE

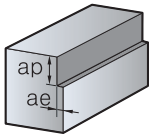
Recommended cutting conditions (ZSE200 flat)

Workpiece / Condition / Diameter (Ø)	SM50C,SCM,GC (~HRC30)		STD61,STD11 (HRC30~45)		STD61 (HRC45~55)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
20	1,600	152	950	88	560	44
25	1,300	136	750	72	450	36
30	1,100	120	650	64	370	32
40	800	96	500	56	280	24
50	650	88	400	48	220	20

Application tip



■ **Side milling (under HRC45)**
- ap: ≤ 1.5D
- ae: ≤ 0.1D



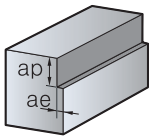
■ **Side milling (over HRC45)**
- ap: ≤ 1D (Max: 1mm)

※ Above table based on side milling, when it enters to ae direction, you should apply reduced cutting condition
※ When it enters to ae direction, for finishing you should increase revolution speed and feed in the table

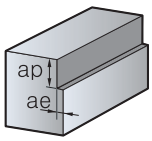
Recommended cutting conditions (ZSE400 flat)

Workpiece / Condition / Diameter (Ø)	SM50C,SCM,GC (~HRC30)		STD61,STD11 (HRC30~45)		STD61 (HRC45~55)	
	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)	R.P.M n (min^{-1})	Feed vf (mm/min)
20	1,600	230	950	133	560	66
25	1,300	205	750	109	450	54
30	1,100	180	650	96	370	48
40	800	145	500	85	280	36
50	650	135	400	72	220	30

Application tip



■ **Side milling (under HRC45)**
- ap: ≤ 1.5D
- ae: ≤ 0.1D

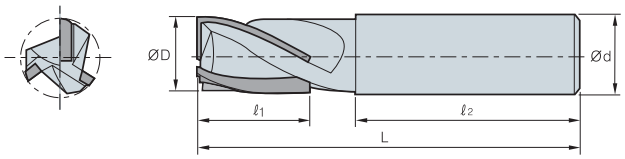


■ **Side milling (over HRC45)**
- ap: ≤ 1D (Max: 1mm)

※ Above table based on side milling, when it enters to ae direction, you should apply reduced cutting condition
※ When it enters to ae direction, for finishing you should increase revolution speed and feed in the table

ZSE200/300 (Flat)





2 | 3 | H·A 24°~26° | Carbide | Substrate FCC PC221F

ØD	Tolerance
All	0.00~ -0.05

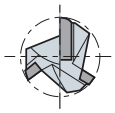
(mm)

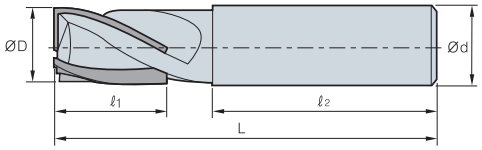
Designation		ØD	Ød	ℓ1	ℓ2	L
ZSE 2	214	14	16	28	57	95
	215	15	16	28	57	95
	216(Q)	16	16	28	55	95
	217	17	20	30	70	115
	218	18	20	30	70	115
	219	19	20	30	70	115
	220(Q)	20	20	30	70	115
	221	21	20	35	65	115
	222	22	20	35	65	115
	223	23	25	35	75	125
	224	24	25	35	75	125
	225	25	25	35	75	125
	226(Q)	26	25	35	75	125
	227	27	25	35	75	125
	228	28	25	35	75	125
	229	29	32	40	95	150
	230(Q)	30	32	40	95	150
	231	31	32	40	95	150
	232	32	32	45	90	150
	233	33	32	45	90	150
	234	34	32	50	85	150
	235	35	32	50	85	150
	236	36	32	50	85	150
	237	37	32	55	80	150
	238	38	32	55	80	150
	238S	38	42	55	80	150
	240(Q)	40	32	60	75	150
	240S	40	42	60	75	150
	242	42	32	60	75	150
	244	44	32	65	80	160
	245	45	32	65	80	160
	245S	45	42	65	80	160
	247	47	32	65	80	160
	248	48	32	65	80	160
	248S	48	42	65	80	160
	250	50	32	65	80	160
	250S	50	42	65	80	160
ZSE 3	314	14	16	28	57	95
	315	15	16	28	57	95
	316	16	16	28	55	95
	317	17	20	30	70	115
	318	18	20	30	70	115
	319	19	20	30	70	115
	320	20	20	30	70	115
	322	22	20	35	65	115
	325	25	25	35	75	125
	326	26	25	35	75	125
	328	28	25	35	75	125
	330	30	32	40	95	150
	331	31	32	40	95	150

Special Endmills order: ZSE○○○○I-L
Ex.1) 2 flutes, diameter: 6.3, I: 10, L: 60 ZSBE2063 10-60L
Ex.2) 2 flutes, diameter: 6.3, standard type ZSE2063

ZSE300/400/600 (Flat)
















ØD	Tolerance
All	0.00~ -0.05

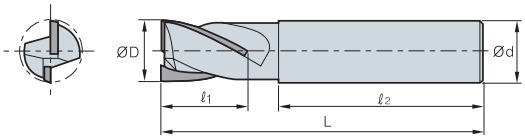
(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L
ZSE	332	32	32	45	90	150
3	333	33	32	45	90	150
	334	34	32	50	85	150
	335	35	32	50	85	150
	338	38	32	55	80	150
	338S	38	42	55	80	150
	340	40	32	60	75	150
	340S	40	42	60	75	150
	342	42	32	60	75	150
	345	45	32	65	80	160
	345S	45	42	65	80	160
	350	50	32	65	80	160
	350S	50	42	65	80	160
ZSE	414	14	16	28	57	95
4	415	15	16	28	57	95
	416(Q)	16	16	28	55	95
	417	17	20	30	70	115
	418	18	20	30	70	115
	419	19	20	30	70	115
	420(Q)	20	20	30	70	115
	421	21	20	35	65	115
	422	22	20	35	65	115
	423	23	25	35	75	125
	424	24	25	35	75	125
	425(Q)	25	25	35	75	125
	426	26	25	35	75	125
	427	27	25	35	75	125
	428	28	25	35	75	125
	429	29	32	40	95	150
	430	30	32	40	95	150
	432(Q)	32	32	45	90	150
	435	35	32	50	80	150
	438	38	32	55	85	150
	438S	38	42	55	85	150
	440(Q)	40	32	60	75	150
	440S	40	42	60	75	150
	445	45	32	65	80	160
	445S	45	42	65	80	160
	450	50	32	65	80	160
	450S	50	42	65	80	160
ZSE	634	34	32	50	85	150
6	635	35	32	50	85	150
	638	38	32	55	80	150
	638S	38	42	55	80	150
	640	40	32	60	75	150
	640S	40	42	60	75	150
	645	45	32	65	80	160
	645S	45	42	65	80	160
	650	50	32	65	80	160
	650S	50	42	65	80	160

Special Endmills order: ZSE○○○○I-L
Ex.1) 2 flutes, diameter: 6.3, I: 10, L: 60 ZSBE2063 10-60L
Ex.2) 2 flutes, diameter: 6.3, standard type ZSE2063

ZSEA200 (Flat)













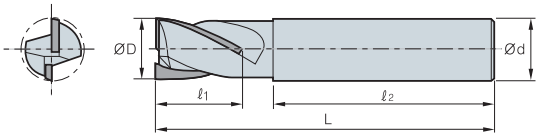
ØD	Tolerance
All	0.00~ -0.05

(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L
ZSEA 2	215	15	16	28	57	95
	216	16	16	28	55	95
	218	18	20	30	70	115
	219	19	20	30	70	115
	220	20	20	30	70	115
	221	21	20	35	65	115
	222	22	20	35	65	115
	223	23	25	35	75	125
	224	24	25	35	75	125
	225	25	25	35	75	125
	228	28	25	35	75	125
	230	30	32	40	95	150
	232	32	32	45	90	150
	238	38	32	55	80	150
	240	40	32	60	75	150
	250	50	32	65	80	160

ZSEL200/400, ZSEXL200 (Long flat)







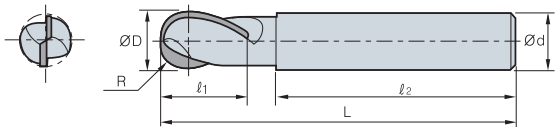
ØD	Tolerance
All	0.00~ -0.05

(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L
ZSEL	214	14	16	50	55	120
2	216	16	16	50	55	120
	218	18	20	60	65	140
	220	20	20	60	65	140
	222	22	20	60	65	140
	225	25	25	70	65	150
	230	30	32	80	85	180
	232	32	32	90	85	190
	235	35	32	100	85	200
	240	40	42	100	105	220
	245	45	42	120	95	230
	250	50	42	120	95	230
ZSEL	416	16	16	50	55	120
4	420	20	20	60	65	140
	425	25	25	70	65	150
	430	30	32	80	85	180
	435	35	32	100	85	200
	440	40	42	100	105	220
ZSEXL	220	20	20	120	65	200
2	222	22	20	120	65	200
	225	25	25	140	65	220

ZSBE200 (Ball)





ØD	Tolerance
All	0.00~ -0.05

(mm)

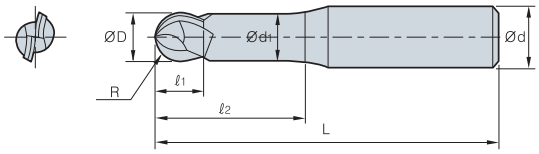
Designation		R	ØD	Ød	ℓ1	ℓ2	L
ZSBE	213	6.5	13	16	30	60	100
2	214	7	14	16	30	65	100
	215	7.5	15	16	35	55	100
	216Q	8	16	16	35	55	100
	217	8.5	17	20	35	65	110
	218	9	18	20	35	65	110
	219	9.5	19	20	35	65	110
	220Q	10	20	20	35	65	110
	221	10.5	21	20	35	65	110
	222	11	22	20	35	65	110
	223	11.5	23	25	40	65	120
	224	12	24	25	40	70	120
	225	12.5	25	25	40	70	120
	230	15	30	32	40	70	130
	231	15.5	31	32	40	80	130
	232	16	32	32	50	75	140
	233	16.5	33	32	50	75	140
	234	17	34	32	50	85	150
	235	17.5	35	32	50	85	150
	235S	17.5	35	42	50	85	150
	236	18	36	32	50	85	150
	236S	18	36	42	50	85	150
	237	18.5	37	32	50	95	160
	237S	18.5	37	42	50	95	160
	238	19	38	32	50	95	160
	238S	19	38	42	50	95	160
	239	19.5	39	32	50	95	160
	239S	19.5	39	42	50	95	160
	240	20	40	32	50	95	160
	240S	20	40	42	50	95	160
	245	22.5	45	32	50	105	170
	245S	22.5	45	42	50	105	170
	250	25	50	32	50	105	170
	250S	25	50	42	50	105	170

- **ZSBE200**
  Special Endmills order: ZSBE2◎◎l-L
  Ex 1) 2 flutes diameter: 6 3 l: 10 L: 60 ZSBE 206310-60L
  Ex.2) 2 flutes, diameter: 6.3, standard type ZSBE2063

- **ZSEA200**
  Special Endmills order : ZSEA2◎◎l-L
  Ex.1) 2 flutes, diameter: 16.3, l: 28, L: 95 ZSEA2163 28-95L
  Ex.2) 2 flutes, diameter: 17.0, standard type ZSEA2170

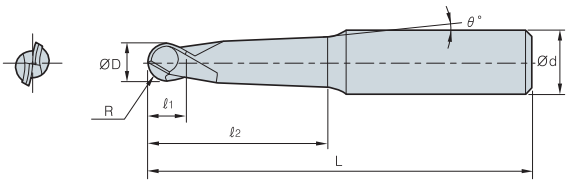
- **ZSEL200/400, ZSEXL200**
  Special Endmills orde r: ZSEL◎◎◎l-L





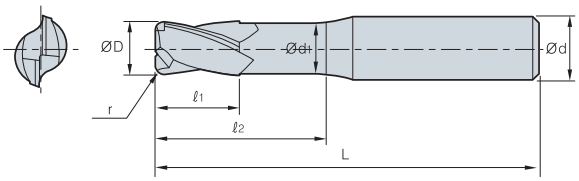
Designation	Flute	R	ØD	Ød	Ød$_1$	ℓ$_1$	ℓ$_2$	L





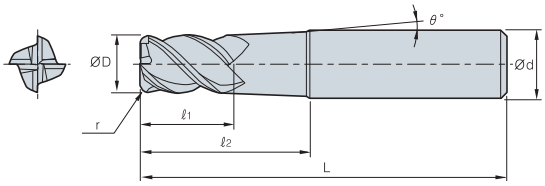
Designation	Flute	R	ØD	Ød	ℓ$_1$	ℓ$_2$	L	θ°





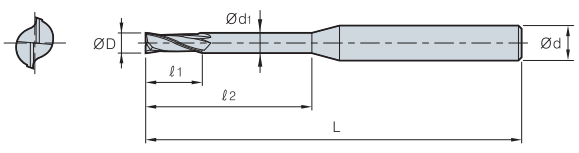
Designation	Flute	ØD	Ød	Ød$_1$	r	ℓ$_1$	ℓ$_2$	L





Designation	Flute	ØD	r	Ød	ℓ$_1$	ℓ$_2$	L	θ°





Designation	Flute	ØD	Ød	Ød$_1$	ℓ$_1$	ℓ$_2$	L

G

DRILL

Korloy drills provide a total solution for hole making,
based on tooling know-how as well as extensive research and
development for our tools.



Technical Information for Drills

G02 KORLOY Drills
G04 Available Insert

Indexable Drills

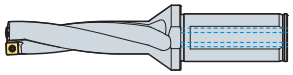
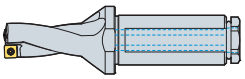
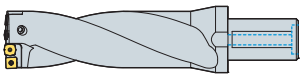
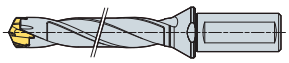
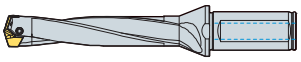
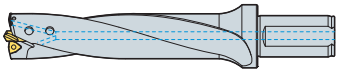
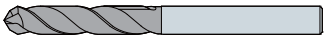
G06 Technical Information for King Drill
G12 King Drill
G21 Technical information of King Drill (for through coolant system with a lathe)
G22 King Drill (for through coolant system with a lathe)
G25 Technical Information for King Drill (for large diameter drilling)
G26 King Drill (for large diameter drilling)
G27 Technical Information for TPDC
G31 TPDC
G32 Technical Information for TPDB
G36 TPDB
G39 Technical Information for WPDC
G42 Center Drill
G43 WPDC

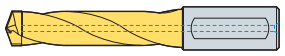
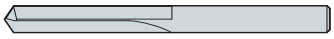
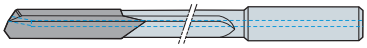
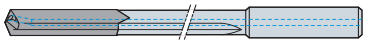
Solid Drills

G45 Technical Information for Mach Solid Drill Plus
G47 Mach Solid Drill Plus
G52 Technical Information for Mach Solid Drill plus CFRP
G54 Mach Solid Drill Plus CFRP
G55 Technical Information for Mach Solid Drill
G59 Mach Solid Drill
G67 Technical Information for Mach Solid Flat Drill
G70 Mach Solid Flat Drill
G74 Technical Information for Mach long Drill Plus
G76 Mach long Drill Plus
G79 Technical Information for Mach long Drill
G81 Mach long Drill
G82 Mach step Drills Order Form
G83 Technical Information for Vulcan Drill
G84 Vulcan Drill
G86 Technical Information for Carbide Drill (SSDP)
G87 Carbide Drill (SSDP)
G89 Burnishing Drill
G90 Top Solid Drill
G91 PCD Drill
G92 Technical Information for Gun Drill
G96 Gun Drill

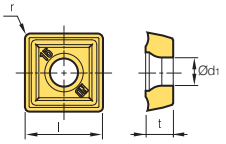
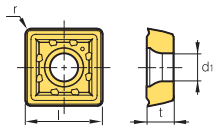
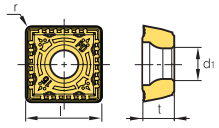
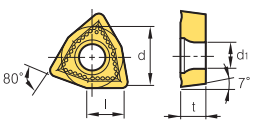
Reamer

G98 Technical Information for Indexable Reamer
G101 Available Insert for Indexable Reamer
G102 Indexable Reamer
G104 Chucking/Machine Reamer
G107 PCD Reamer
G108 Cermet Reamer
G109 Broach Reamer

Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Indexable Drills	King Drill	K□D	 Available insert: SP□T, XO□T	Ø12.0~Ø60.5	2D~5D	G12~G20
	King Dril HP	K□D..HP	 Available insert: SP□T, XO□T	Ø12.0~Ø60.5	2D~4D	G22~G24
	King Drill (for large diameter drilling)	K□D	 Available insert: SP□T, XO□T	Ø61.0~Ø100.0	2D~4D	G26
	TPDC new	TPDC	 Available insert: TPD□□□□CP	Ø12.0~Ø25.99	3D~8D	G31
	TPDB	TPDB	 Available insert: TPD□□□B	Ø10.0~Ø32.9	3D~8D	G36~G38
	Indexable Drills & Drill with center	WPDC	 Available insert: WC□T	Ø25.0~Ø80.0	5D~8D	G43~G44
Solid Drills	Mach Solid Drill Plus new	MSDP		Ø1.0~Ø20.0	3D~7D	G47~G51
		MSDPH		Ø2.5~Ø20.0	3D~7D	G48~G51
	Mach Solid Drill Plus CFRP new	MSDP-C		Ø3.0~Ø12.7	5D	G54
	Mach Solid Drill	MSD		Ø2.5~Ø20.0	3D~7D	G59~G62
		MSDH		Ø2.5~Ø20.0	3D~7D	G63~G66
	Mach Solid Flat Drill new	MSFD		Ø2.5~Ø12.0	2D	G70~G71
		MSFDH		Ø2.5~Ø12.0	3D	G72~G73
	Mach Long Drill Plus new	MLD□□□□N		Ø3.0~Ø10.0	10D~25D	G76~G78
	Mach Long Drill	MLDP		Ø3.0~Ø10.0	-	G81
		MLD		Ø3.0~Ø10.0	10D~25D	G81

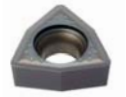
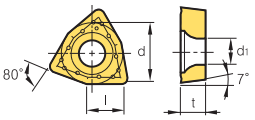
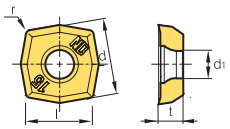
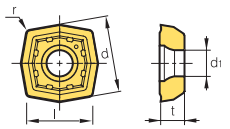
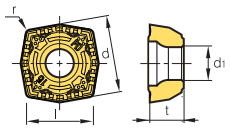
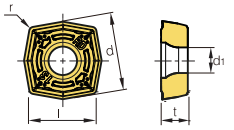
Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Solid Drills	Vulcan Drill	VZD		Ø12.6~Ø40.5	-	G84~G85
	Carbide Drill new	SSDP		Ø1.0~Ø15.0	-	G87~G88
	Burnishing Drill	BDS		Ø4.0~Ø16.0	5D~7D	G89
		BDT		Ø4.2~Ø10.3	2D~4D	G89
	Top solid Drill	TSDM		Ø8.0~Ø25.0	5D~8D	G90
	PCD Drill	PDD		Ø5.0~Ø12.0	5D	G91
	Gun Drill	KGDS		Ø2.0~Ø33.0	50D~100D	G96
		KGDT		Ø6.0~Ø26.5	50D~100D	G97
Reamer	Indexable Reamer	IRT		Ø10.0~Ø31.0	3D~5D	G102
		IRB	 Available Insert: RI	Ø10.0~Ø31.0	3D~5D	G103
	Chucking/Machine Reamer	SCRS	 Available Insert: RI	Ø5.0~Ø20.0	2D~3D	G105
		SCRH		Ø5.0~Ø20.0	2D~3D	G105
		TCRS		Ø7.0~Ø30.0	2D~3D	G106
		TMRS		Ø7.0~Ø30.0	3D~5D	G106
	PCD Reamer	PDR		Ø5.0~Ø20.0	3D~5D	G107
	Cermet Reamer	KCR		Ø6.0~Ø30.0	3D~7D	G108
	Broach Reamer	HBRE		Ø3.0~Ø25.0	3D~7D	G109

Available insert

Picture	Designation	Coated							Uncoated	Dimensions (mm)					Configuration	Page
		NC5330	NC3500	NC3600	PC9530	PC6510	PC5300	PC5400	H01	l	d	t	r	d1		
SPET-ND 	040204-ND								●	4.7	-	2.4	0.4	2.3		G12~ G24
	050204-ND								●	5.1	-	2.4	0.4	2.3		
	060205-ND								●	6.2	-	2.5	0.5	2.5		
	07T208-ND								●	7.5	-	2.8	0.7	2.8		
	090308-ND								●	9.2	-	3.3	0.8	3.4		
	11T308-ND								●	11.0	-	4.0	0.8	4.0		
	130410-ND								●	13.0	-	4.5	1.0	4.5		
	15M510-ND								●	15.2	-	5.0	1.0	5.5		
	180510-ND								●	18.2	-	5.5	1.0	6.0		
SPMT-LD 	060205-LD									6.2	-	2.5	0.5	2.5		G12~ G24
	07T208-LD									7.5	-	2.8	0.7	2.8		
	090308-LD									9.2	-	3.3	0.8	3.4		
	11T308-LD									11.0	-	4.0	0.8	4.0		
	130410-LD									13.0	-	4.5	1.0	4.5		
	15M510-LD									15.2	-	5.0	1.0	5.5		
	180510-LD									18.2	-	5.5	1.0	6.0		
SPMT-PD 	040204-PD	●				●	●			4.7	-	2.4	0.4	2.3		G12~ G24
	050204-PD	●				●	●			5.1	-	2.4	0.4	2.3		
	060205-PD	●				●	●			6.2	-	2.5	0.5	2.5		
	07T208-PD	●				●	●			7.5	-	2.8	0.7	2.8		
	090308-PD	●				●	●			9.2	-	3.3	0.8	3.4		
	11T308-PD	●				●	●			11.0	-	4.0	0.8	4.0		
	130410-PD	●				●	●			13.0	-	4.5	1.0	4.5		
	15M510-PD	●				●	●			15.2	-	5.0	1.0	5.5		
	180510-PD	●				●	●			18.2	-	5.5	1.0	6.0		
WCMT-C20N 	030208-C20N								●	3.8	5.56	2.38	0.8	2.8		-
	040208-C20N								●	4.3	6.35	2.38	0.8	3.0		
	050308-C20N								●	5.4	7.94	3.18	0.8	3.4		
	06T308-C20N								●	6.5	9.525	3.97	0.8	3.7		
	080408-C20N								●	8.7	12.7	4.76	0.8	4.3		
	080412-C20N								●	8.7	12.7	4.76	1.2	4.3		

●: Stock Item

Available insert

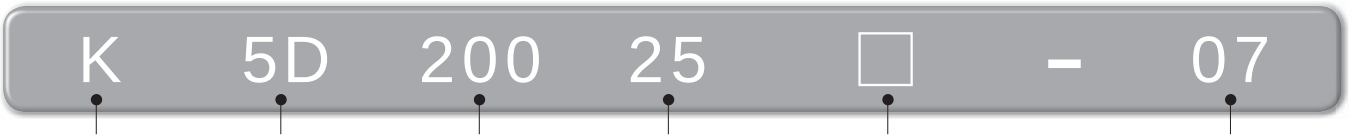
Picture	Designation	Coated							Uncoated	Dimensions (mm)					Configuration	Page
		NC5330	NC3500	NC3600	PC9530	PC6510	PC5300	PC5400	H01	l	d	t	r	d1		
WCMT-C21N 	030204-C21N									3.8	5.56	2.38	0.4	2.55		G43 G44
	040204-C21N									4.3	6.35	2.38	0.4	2.8		
	040208-C21N									4.3	6.35	2.38	0.8	2.8		
	050308-C21N									5.4	7.94	3.18	0.8	3.4		
	06T308-C21N									6.5	9.525	3.97	0.8	4.4		
	080408-C21N									8.7	12.7	4.76	0.8	5.5		
XOET-ND 	040204-ND								●	4.3	4.9	2.4	0.4	2.3		-
	050204-ND								●	4.8	5.4	2.4	0.4	2.3		
	060204-ND								●	5.8	6.6	2.5	0.4	2.5		
	07T205-ND								●	6.9	7.8	2.8	0.5	2.8		
	090305-ND								●	8.4	9.6	3.3	0.5	3.4		
	11T306-ND								●	10.0	11.4	4.0	0.6	4.0		
	130406-ND								●	11.9	13.6	4.5	0.6	4.5		
	15M508-ND								●	13.9	15.9	5.0	0.8	5.5		
	180508-ND								●	16.5	18.9	5.5	0.8	6.0		
XOMT-LD 	060204-LD									5.8	6.6	2.5	0.4	2.5		G12~ G24
	07T205-LD									6.9	7.8	2.8	0.5	2.8		
	090305-LD									8.4	9.6	3.3	0.5	3.4		
	11T306-LD									10.0	11.4	4.0	0.6	4.0		
	130406-LD									11.9	13.6	4.5	0.6	4.5		
	15M508-LD									13.9	15.9	5.0	0.8	5.5		
	180508-LD									16.5	18.9	5.5	0.8	6.0		
XOMT-PD 	040204-PD						●			4.3	4.9	2.4	0.4	2.3		G12~ G24
	050204-PD						●			4.8	5.4	2.4	0.4	2.3		
	060204-PD						●			5.8	6.6	2.5	0.4	2.5		
	07T205-PD						●			6.9	7.8	2.8	0.5	2.8		
	090305-PD						●			8.4	9.6	3.3	0.5	3.4		
	11T306-PD						●			10.0	11.4	4.0	0.6	4.0		
	130406-PD						●			11.9	13.6	4.5	0.6	4.5		
	15M508-PD						●			13.9	15.9	5.0	0.8	5.5		
	180508-PD						●			16.5	18.9	5.5	0.8	6.0		
XOMT-RD new 	07T207-RD						●			6.9	7.8	2.8	0.7	2.8		G12~ G24
	090308-RD						●			8.4	9.6	3.3	0.8	3.4		
	11T309-RD						●			10.0	11.4	4.0	0.9	4.0		
	130410-RD						●			11.9	13.6	4.5	1.0	4.5		
	15M511-RD						●			13.9	15.9	5.0	1.1	5.5		
	180512-RD						●			16.5	18.9	5.5	1.2	6.0		

● : Stock Item

Optimized insert design for maximum drilling efficiency

King Drill

Code system of holder



KING/KORLOY

Aspect ratio (L/D)
2D, 2.5D, 3D, 3.5D,
4D, 4.5D, 5D

Drill Dia.
Ø20.0
(One decimal place marked)

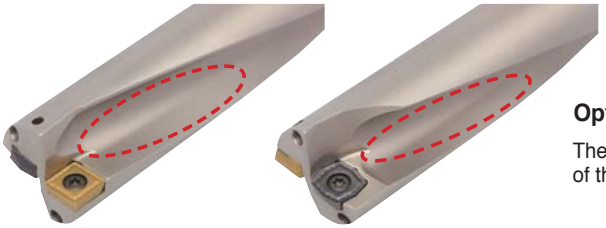
One decimal place marked
Ø20, Ø25
Ø32, Ø40

Shank shape
No mark: Flange Shank, Weldone
HP: Flange Shank, Weldon, PT Tap
F1: Flange Shank, Whistle Notch
F2: Flange Shank, Without Side Lock
S: Straight Shank, Weldone
S1: Straight Shank, Whistle Notch
S2: Straight Shank, Without Side Lock
M0, M1, M2, M3...: MT0, MT1, MT2, MT3...
H63, H100: HSK63, HSK100
B30, B40, B50: BT30, BT40, BT50

Inscribed circle of insert
05, 06, 07, 09
11 13, 15, 18

Features

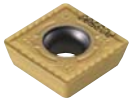
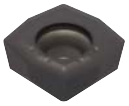
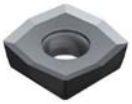
- Optimized design of inserts for maximum drilling efficiency
- Excellent cutting performance and chip control due to the optimized geometry and chip breaker of both inserts, central & peripheral
- Different inserts, optimized for the central and peripheral insert locations in order to maximize cutting tool life



Optimized flute system - 2 coolant holes applied

The optimized shape of the flute increases the rigidity of the drill body and improves chip evacuation

Features of chip breaker

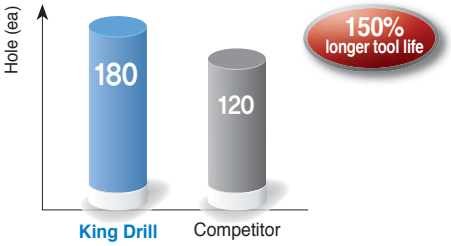
Chip breaker	PD		LD		ND		RD
Features	- Universal - At medium speed and medium feed		- Superior chip control for machining mild steel and stainless steel - Light cutting (at low ~ medium speed and low feed)		- Sharp cutting edge for aluminum machining - Insert surface buffed for high quality result - E Class Tolerance		- Improved chipping resistance - Excellent performance in case of frequent fracture and chipping on the cutting edge
Insert	Peripheral insert	Central insert	Peripheral insert	Central insert	Peripheral insert	Central insert	Central insert
Shape							
Grades for workpiece	NC5330: P, M, K PC3500: P PC5300: P, M, K, S PC6510: K	PC5300: P, M, K, S	PC5335: P, M		H01: N		PC5300: P,M,K,S

Application examples

- **Use** Track link bush
- **Cutting conditions** vc (m/min) = 120, fn (mm/rev) = 0.1
  Through coolant system
- **Tools** **inserts** SPMT07T208-PD (PC3500)
  XOMT07T205-PD (PC5300)
  Holder K5D20025-07
- **Machine** Drilling machine



■ **Test result**

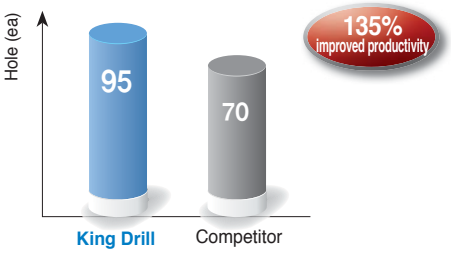


• Superior surface finish and chip evacuation

- **Use** Track link bush
- **Workpiece** SCM415H
- **Cutting conditions** King Drill: vc (m/min) = 140, fn (mm/rev) = 0.12
  Competitor: vc (m/min) = 125, fn (mm/rev) = 0.1
- **Tools** **inserts** SPMT090308-PD (PC3500)
  XOMT090305-PD (PC3500)
  Holder K3D27032-09
- **Machine** MCT



■ **Test result**



• Increased productivity due to higher capabilities for cutting conditions compared to the competitor

Recommended cutting condition

Workpiece				Insert			vc (m/min)	Depth of cut = 2D, 3D, 4D Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece	Hardness (HB)	Chip breaker	Grade			Ø12~Ø16	Ø17~Ø23	Ø24~Ø29	Ø30~Ø42	Ø43~Ø60
					Central	Peripheral						
P	Carbon steel	Low carbon steel	80~180	LD	PC5335	PC5335	120 (60~170)	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.08
				PD/RD	PC5300	PC3500	150 (120~180)					
						NC5330	180 (140~220)					
		High carbon steel	180~280	PD	PC5300	PC3500	120 (90~150)	0.04~0.10	0.04~0.12	0.05~0.16	0.06~0.16	0.06~0.18
						NC5330	150 (110~190)	0.04~0.06	0.04~0.07	0.04~0.08	0.04~0.08	0.04~0.08
	Alloy steel	Low alloy steel	140~260	LD	PC5335	PC5335	120 (60~160)	0.06~0.10	0.06~0.10	0.06~0.12	0.06~0.14	0.06~0.14
				PD	PC5300	PC3500	150 (120~170)	0.06~0.12	0.06~0.12	0.06~0.14	0.06~0.16	0.06~0.16
						NC5330	180 (140~210)	0.06~0.08	0.06~0.08	0.06~0.10	0.06~0.12	0.06~0.12
		Hardened low alloy steel	200~400	PD	PC5300	PC5300	100 (50~150)	0.04~0.10	0.06~0.10	0.06~0.12	0.06~0.14	0.06~0.14
		High alloy steel	260~320	PD	PC5300	PC3500	100 (50~160)	0.05~0.11	0.05~0.11	0.05~0.13	0.05~0.15	0.05~0.15
		Hardened high alloy steel	300~450	PD	PC5300	PC5300	70 (30~120)	0.04~0.08	0.06~0.08	0.06~0.10	0.06~0.12	0.06~0.12
M	Stainless steel	Stainless steel	135-275	LD	PD5335	PC5335	120 (80~140)	0.04~0.07	0.04~0.07	0.04~0.07	0.04~0.08	0.04~0.08
				PD	PC5300	PC5300	130 (100~160)	0.04~0.07	0.04~0.07	0.04~0.07	0.04~0.08	0.04~0.08
K	Cast iron	Gray cast iron	150~230	PD	PC5300	PC6510	190 (150~250)	0.04~0.12	0.05~0.14	0.06~0.18	0.10~0.22	0.10~0.26
		Ductile cast iron	150~230	PD	PC5300	PC6510	130 (100~160)	0.04~0.07	0.04~0.08	0.04~0.10	0.05~0.12	0.05~0.12
S	Heat resisting alloy	Ni-heat resisting alloy	130~400	PD	PC5300	PC5300	50 (30~100)	0.04~0.10	0.04~0.10	0.04~0.10	0.04~0.10	0.04~0.10
		Ti-heat resisting alloy	130~400	LD	PC5335	PC5335	60 (40~80)	0.04~0.08	0.04~0.10	0.06~0.12	0.06~0.14	0.06~0.16
				PD	PC5300	PC5300	60 (40~80)	0.04~0.08	0.04~0.10	0.06~0.12	0.06~0.14	0.06~0.16
		High hardened steel	over 400	PD	PC5300	PC5300	40 (20~80)	0.04~0.05	0.04~0.06	0.04~0.08	0.04~0.08	0.04~0.08
N	Aluminium	Aluminium	30~150	ND	H01	H01	300 (250~400)	0.05~0.14	0.06~0.16	0.10~0.20	0.10~0.22	0.12~0.25
		Alloyed copper	150-160	ND	H01	H01	250 (200~300)	0.05~0.14	0.06~0.16	0.10~0.20	0.10~0.22	0.12~0.25

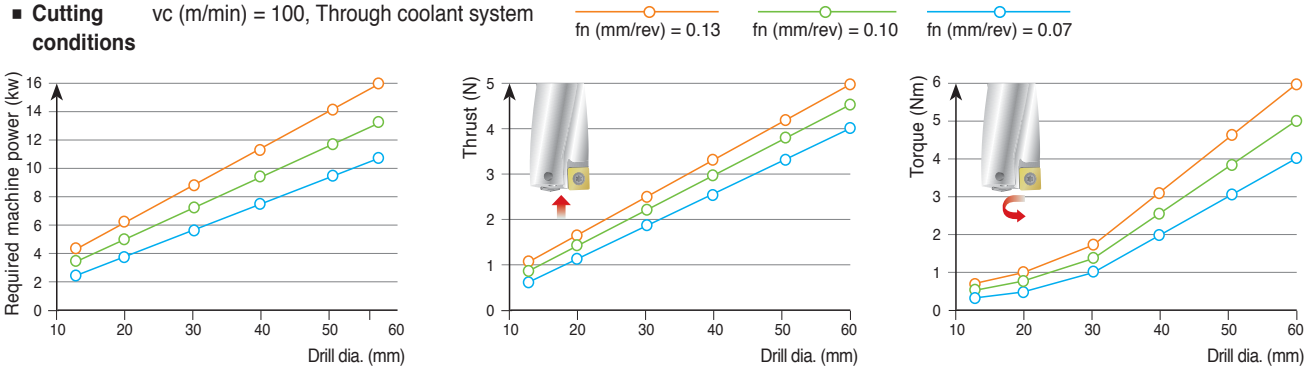
• The Max. feed of 5D holders is 70%~80% of the max. conditions of 2D/3D/4D holders
• In interrupted machining part, reduce 30~50% of feed from the above machining around interrupted part

Required machine power

- The graphs below show the cutting force required in drilling
- Machining with the King Drill and a machine with high rigidity and power

■ **Workpiece** SCM440 (240HB)

■ **Cutting conditions** vc (m/min) = 100, Through coolant system

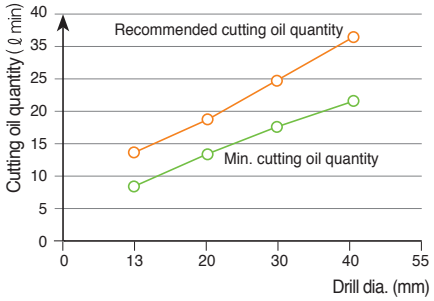


Cutting oil quantity

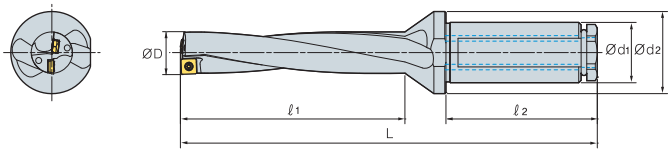
■ **Workpiece** SCM440 (240HB)

■ **Cutting conditions** vc (m/min) = 100, Through coolant system

- The data of the graph above could be changed depending on workpiece and cutting condition



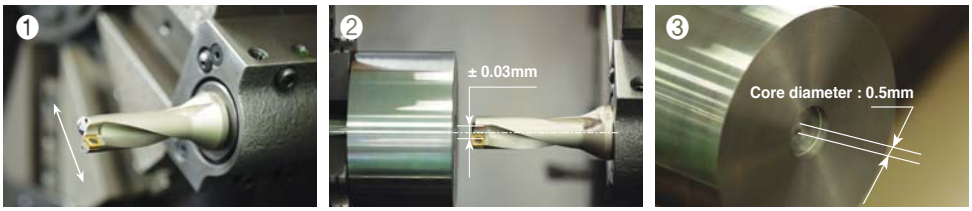
Drill tolerance and hole tolerance



(mm)

Drill dia.		Ø12~Ø29	Ø30~Ø45	Ø46~Ø60.5
2D~3D	Drill tolerance (ØD)	0~ –0.15	0~ –0.15	0~ –0.15
	Hole tolerance	+0.2~ –0.1	+0.25~ –0.1	+0.28~ –0.1
4D~5D	Drill tolerance (ØD)	0~ –0.15	0~ –0.15	0~ –0.15
	Hole tolerance	+0.25~ –0.05	+0.3~ –0.05	+0.33~ –0.05

Notice for setting the drill in the lathe

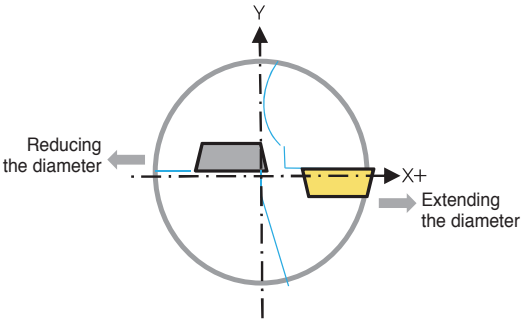


- Set the peripheral insert parallel to the X axis. (based on the side lock)
- If the machined core is 0.5mm after machining 5mm, that is the proper setting

※ Please make sure that the location of the side lock could be different depending on manufacturers of machine

Range of adjusting machining diameter in the lathe

- In machining in the lathe, the King Drill can extend and reduce the machining diameter by adjusting the x-axis. Please refer to the table showing the range of adjusting drilling diameter below
- The more the drilling diameter is extended or reduced, the more the drill loses drilling balance. In this case, reduce the feed or cutting speed in machining
- Reducing the machining diameter excessively could damage the holder



(mm)

Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)	Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)	Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)	Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)
12.0	11.7~12.4	24.5	23.9~25.1	37.0	36.3~37.7	49.5	48.7~50.2
12.5	12.2~12.9	25.0	24.4~25.6	37.5	36.8~38.2	50.0	49.2~50.7
13.0	12.7~13.4	25.5	24.9~26.1	38.0	37.3~38.7	50.5	49.7~51.2
13.5	13.2~13.9	26.0	25.4~26.6	38.5	37.8~39.2	51.0	50.2~51.7
14.0	13.6~14.5	26.5	25.9~27.1	39.0	38.3~39.7	51.5	50.7~52.2
14.5	14.1~15.0	27.0	26.4~27.6	39.5	38.8~40.2	52.0	51.2~52.7
15.0	14.6~15.5	27.5	26.9~28.1	40.0	39.3~40.7	52.5	51.7~53.2
15.5	15.1~16.0	27.8	27.4~28.6	40.5	39.8~41.2	53.0	52.2~53.7
16.0	15.6~16.5	28.5	27.9~29.1	41.0	40.3~41.7	53.5	52.7~54.2
16.5	16.0~17.0	29.0	28.4~29.6	41.5	40.8~42.2	54.0	53.2~54.7
17.0	16.5~17.5	29.5	28.9~30.1	42.0	41.3~42.7	54.5	53.7~55.2
17.5	17.0~18.0	30.0	29.3~30.7	42.5	41.8~43.2	55.0	54.2~55.7
18.0	17.5~18.5	30.5	29.8~31.2	43.0	42.2~43.7	55.5	54.7~56.2
18.5	18.0~19.0	31.0	30.3~31.7	43.5	42.7~44.2	56.0	55.2~56.7
19.0	18.5~19.5	31.5	30.8~32.2	44.0	43.2~44.7	56.5	55.7~57.2
19.5	19.0~20.0	32.0	31.3~32.7	44.5	43.7~45.2	57.0	56.2~57.7
20.0	19.4~20.6	32.5	31.8~33.2	45.0	44.2~45.7	57.5	56.7~58.2
20.5	19.9~21.1	33.0	32.3~33.7	45.5	44.7~46.2	58.0	57.2~58.7
21.0	20.4~21.6	33.5	32.8~34.2	46.0	45.2~46.7	58.5	57.7~59.2
21.5	20.9~22.1	34.0	33.3~34.7	46.5	45.7~47.2	59.0	58.2~59.7
22.0	21.4~22.6	34.5	33.8~35.2	47.0	46.2~47.7	59.5	58.7~60.2
22.5	21.9~23.1	35.0	34.3~35.7	47.5	46.7~48.2	60.0	59.2~60.7
23.0	22.4~23.6	35.5	34.8~36.2	48.0	47.2~48.7	60.5	59.7~61.2
23.5	22.9~24.1	36.0	35.3~36.7	48.5	47.7~49.2		
24.0	23.4~24.6	36.5	35.8~37.2	49.0	48.2~49.7		

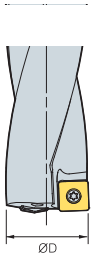
Insert and parts

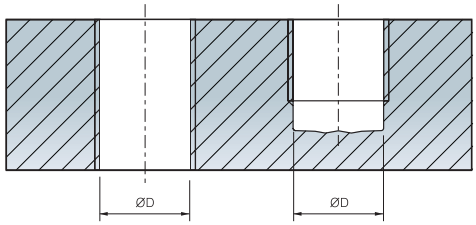
Drill dia. (mm)	Peripheral insert	Central insert	Screw	Wrench	Torque (Nm)
Ø12.0~Ø13.5	SP□T040204-□□	XO□T040204-□□	FTNA0204	TW06P	0.4
Ø13.6~Ø16.0	SP□T050204-□□	XO□T050204-□□	FTNA0204	TW06P	0.4
Ø16.1~Ø19.5	SP□T060205-□□	XO□T060204-□□	FTKA02206S	TW07P	0.8
Ø19.6~Ø23.5	SP□T07T208-□□	XO□T07T205-□□	FTKA02565	TW07S	0.8
Ø23.6~Ø29.5	SP□T090308-□□	XO□T090305-□□	FTKA0307	TW09S	1.2
Ø29.6~Ø35.5	SP□T11T308-□□	XO□T11T306-□□	FTKA03508	TW15S	3
Ø35.6~Ø42.5	SP□T130410-□□	XO□T130406-□□	FTKA0410	TW15S	3
Ø42.6~Ø50.5	SP□T15M510-□□	XO□T15M508-□□	FTNC04511	TW20S	5
Ø50.6~Ø60.5	SP□T180510-□□	XO□T180508-□□	FTNA0511	TW20-100	5

- In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw
- Please make sure to use a Korloy-produced wrench and screw only

King Drill - for machining a tap foundation hole

- There are two types of specifications of tap, metric and inch. The King Drill is available for machining both thru tap and blind tap





Thru tap Blind tap

(mm)

Tap type	Thread	ØD	Designation	Reference
Metric	M14 x 2.0	12.0	K3D12020-04	G14
	M16 x 2.0	14.0	K3D14020-05	G14
	M18 x 2.5	15.5	K3D15520-05	G14
	M20 x 2.5	17.5	K3D17525-06	G14
	M22 x 2.5	19.5	K3D19525-06	G14
	M24 x 3.0	21.0	K3D21025-07	G14
	M27 x 3.0	24.0	K3D24032-09	G14
	M30 x 3.5	26.5	K3D26532-09	G14
	M33 x 4.0	29.0	K3D29032-09	G14
	M36 x 4.0	32.0	K3D32032-11	G15
	M39 x 4.0	35.0	K3D35032-11	G15
	M42 x 4.5	37.5	K3D37540-13	G15
Inch	9/16-12 UNC	12.2	K3D12220-04	G14
	5/8-11 UNC	13.5	K3D13520-04	G14
	3/4-10 UNC	16.5	K3D16525-06	G14
	7/8-9 UNC	19.5	K3D19525-06	G14
	9/16-18 UNF	12.9	K3D12920-04	G14
	5/8-18 UNF	14.5	K3D14520-05	G14
	3/4-16 UNF	17.5	K3D17525-06	G14

Special drill order form

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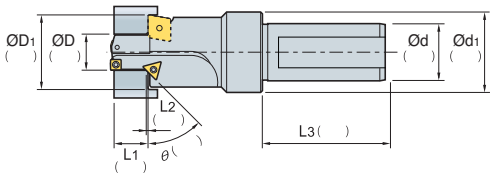

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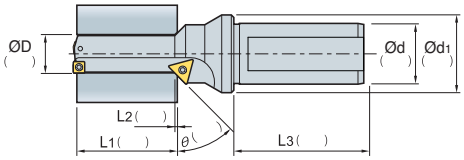

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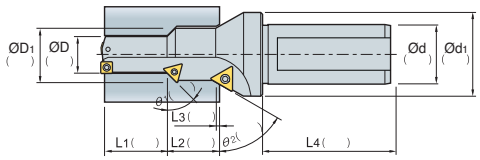

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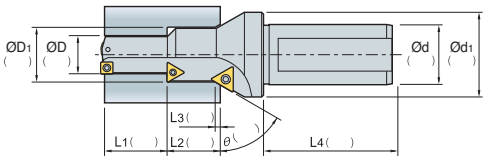

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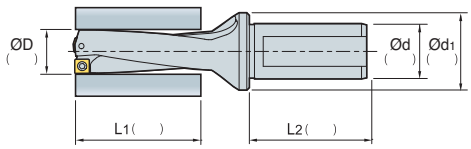
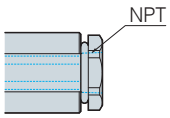


■ Coolant type

☐ Through coolant Plug Type (Standard)



☐ Through coolant Non Plug Type



☐ No coolant



■ Hole type

☐ Blind hole ☐ Thru hole

■ Types of shank

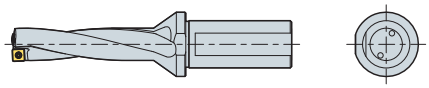
☐  Flat Type

☐  Weldon Type

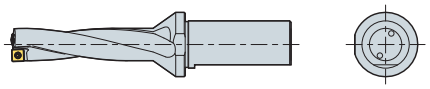
☐  Whistle Notch Type

■ Location of side lock

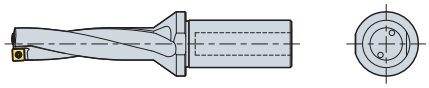
☐ Parallel to peripheral insert (standard)



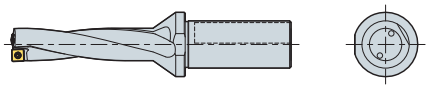
☐ 90°angle to peripheral insert (standard)



☐ 180°angle to peripheral insert (standard)



☐ 270° angle to peripheral insert (standard)

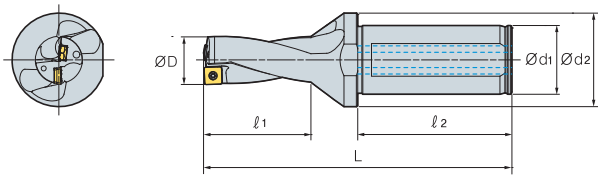


■ Note

- Currently using tool:
- Current cutting condition
  - RPM or vc (m/min):
  - vf (mm/min) or fn (mm/rev):
  - Depth of cut (mm):
- Standard of measuring tool life:
- Currently using machine
  - Machining center:
  - General lathe:
  - CNC lathe:

King Drill-2D





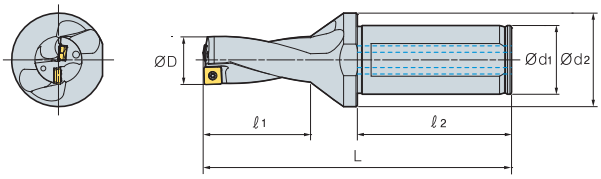
(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2D	12020-04	12.0	20	25	27	50	91	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12520-04	12.5	20	25	27	50	91			
	13020-04	13.0	20	25	29	50	93			
	13520-04	13.5	20	25	29	50	93			
	14020-05	14.0	20	25	31	50	96	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	31	50	96			
	15020-05	15.0	20	25	33	50	99			
	15520-05	15.5	20	25	33	50	99			
	16020-05	16.0	20	25	35	50	101			
	16525-06	16.5	25	34	35	56	107	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	37	56	109			
	17525-06	17.5	25	34	37	56	109			
	18025-06	18.0	25	34	39	56	112			
	18525-06	18.5	25	34	39	56	112			
	19025-06	19.0	25	34	41	56	114			
	19525-06	19.5	25	34	41	56	114			
	20025-07	20.0	25	34	43	56	118	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	43	56	118			
	21025-07	21.0	25	34	45	56	120			
	21525-07	21.5	25	34	45	56	120			
	22025-07	22.0	25	34	47	56	122			
	22525-07	22.5	25	34	47	56	122			
	23025-07	23.0	25	34	49	56	126			
	23525-07	23.5	25	34	49	56	126			
	24032-09	24.0	32	44	51	60	133	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	51	60	133			
	25032-09	25.0	32	44	53	60	135			
	25532-09	25.5	32	44	53	60	135			
	26032-09	26.0	32	44	55	60	137			
	26532-09	26.5	32	44	55	60	137			
	27032-09	27.0	32	44	57	60	140			
	27532-09	27.5	32	44	57	60	140			
	28032-09	28.0	32	44	59	60	143			
	28532-09	28.5	32	44	59	60	143			
	29032-09	29.0	32	44	61	60	145			
	29532-09	29.5	32	44	61	60	145			
	30032-11	30.0	32	44	63	60	150	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	63	60	150			
	31032-11	31.0	32	44	65	60	152			
	31532-11	31.5	32	44	65	60	152			
	32032-11	32.0	32	44	67	60	154			
	32532-11	32.5	32	44	67	60	154			
	33032-11	33.0	32	44	69	60	157			
	33532-11	33.5	32	44	69	60	157			
	34032-11	34.0	32	44	71	60	159			
	34532-11	34.5	32	44	71	60	159			
	35032-11	35.0	32	44	73	60	161			
	35532-11	35.5	32	44	73	60	161			

Applicable inserts **G04~05**

King Drill-2D





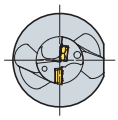
(mm)

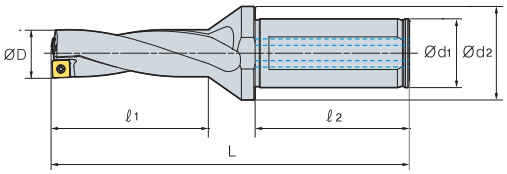
	Designation	ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2D	36040-13	36.0	40	48	76	70	176	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	76	70	176			
	37040-13	37.0	40	48	78	70	178			
	37540-13	37.5	40	48	78	70	178			
	38040-13	38.0	40	48	80	70	181			
	38540-13	38.5	40	48	80	70	181			
	39040-13	39.0	40	48	82	70	183			
	39540-13	39.5	40	48	82	70	183			
	40040-13	40.0	40	48	84	70	186			
	40540-13	40.5	40	48	84	70	186			
	41040-13	41.0	40	48	86	70	188			
	41540-13	41.5	40	48	86	70	188			
	42040-13	42.0	40	48	88	70	191			
	42540-13	42.5	40	48	88	70	191			
	43040-15	43.0	40	58	91	70	196	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	91	70	196			
	44040-15	44.0	40	58	93	70	198			
	44540-15	44.5	40	58	93	70	198			
	45040-15	45.0	40	58	95	70	201			
	45540-15	45.5	40	58	95	70	201			
	46040-15	46.0	40	58	97	70	203			
	46540-15	46.5	40	58	97	70	203			
	47040-15	47.0	40	58	99	70	206			
	47540-15	47.5	40	58	99	70	206			
	48040-15	48.0	40	58	101	70	208			
	48540-15	48.5	40	58	101	70	208			
	49040-15	49.0	40	58	103	70	210			
	49540-15	49.5	40	58	103	70	210			
	50040-15	50.0	40	58	105	70	212			
	50540-15	50.5	40	58	105	70	212			
	51040-18	51.0	40	68	108	70	218	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	108	70	218			
	52040-18	52.0	40	68	110	70	220			
	52540-18	52.5	40	68	110	70	220			
	53040-18	53.0	40	68	112	70	222			
	53540-18	53.5	40	68	112	70	222			
	54040-18	54.0	40	68	114	70	224			
	54540-18	54.5	40	68	114	70	224			
	55040-18	55.0	40	68	116	70	226			
	55540-18	55.5	40	68	116	70	226			
	56040-18	56.0	40	68	118	70	230			
	56540-18	56.5	40	68	118	70	230			
	57040-18	57.0	40	68	121	70	233			
	57540-18	57.5	40	68	121	70	233			
	58040-18	58.0	40	68	124	70	236			
	58540-18	58.5	40	68	124	70	236			
	59040-18	59.0	40	68	127	70	239			
	59540-18	59.5	40	68	127	70	239			
	60040-18	60.0	40	68	130	70	242			
	60540-18	60.5	40	68	130	70	242			

Applicable inserts **G04~05**

King Drill-3D







(mm)

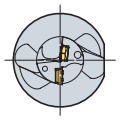
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	12020-04∗	12.0	20	25	39	50	103	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12220-04	12.2	20	25	39	50	103			
	12520-04	12.5	20	25	39	50	103			
	12920-04	12.9	20	25	42	50	106			
	13020-04	13.0	20	25	42	50	106			
	13520-04	13.5	20	25	42	50	106			
	14020-05∗	14.0	20	25	45	50	110	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	45	50	110			
	15020-05	15.0	20	25	48	50	114			
	15520-05∗	15.5	20	25	48	50	114			
	16020-05	16.0	20	25	51	50	117			
	16525-06	16.5	25	34	51	56	123	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	54	56	126			
	17525-06∗	17.5	25	34	54	56	126			
	18025-06	18.0	25	34	57	56	130			
	18525-06	18.5	25	34	57	56	130			
	19025-06	19.0	25	34	60	56	133			
	19525-06∗	19.5	25	34	60	56	133			
	20025-07	20.0	25	34	63	56	138	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	63	56	138			
	21025-07∗	21.0	25	34	66	56	141			
	21525-07	21.5	25	34	66	56	141			
	22025-07	22.0	25	34	69	56	144			
	22525-07	22.5	25	34	69	56	144			
	23025-07	23	25	34	72	56	149			
	23525-07	23.5	25	34	72	56	149			
	24032-09∗	24.0	32	44	75	60	157	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	75	60	157			
	25032-09	25.0	32	44	78	60	160			
	25532-09	25.5	32	44	78	60	160			
	26032-09	26.0	32	44	81	60	163			
	26532-09∗	26.5	32	44	81	60	163			
	27032-09	27.0	32	44	84	60	167			
	27532-09	27.5	32	44	84	60	167			
	28032-09	28.0	32	44	87	60	171			
	28532-09	28.5	32	44	87	60	171			
	29032-09∗	29.0	32	44	90	60	174			
	29532-09	29.5	32	44	90	60	174			

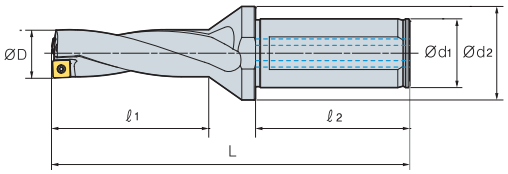
Applicable inserts **G04~05**

The items marked ∗ can machinea tap foundation hole

King Drill-3D







(mm)

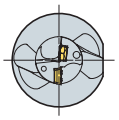
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	30032-11∗	30.0	32	44	93	60	180	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	93	60	180			
	31032-11	31.0	32	44	96	60	183			
	31532-11	31.5	32	44	96	60	183			
	32032-11	32.0	32	44	99	60	186			
	32532-11	32.5	32	44	99	60	186			
	33032-11	33.0	32	44	102	60	190			
	33532-11	33.5	32	44	102	60	190			
	34032-11	34.0	32	44	105	60	193			
	34532-11	34.5	32	44	105	60	193			
	35032-11∗	35.0	32	44	108	60	196			
	35532-11	35.5	32	44	108	60	196			
	36040-13	36.0	40	48	112	70	212	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	112	70	212			
	37040-13	37.0	40	48	115	70	215			
	37540-13	37.5	40	48	115	70	215			
	38040-13	38.0	40	48	118	70	219			
	38540-13	38.5	40	48	118	70	219			
	39040-13	39.0	40	48	121	70	222			
	39540-13	39.5	40	48	121	70	222			
	40040-13	40.0	40	48	124	70	226			
	40540-13	40.5	40	48	124	70	226			
	41040-13	41.0	40	48	127	70	229			
	41540-13	41.5	40	48	127	70	229			
	42040-13	42.0	40	48	130	70	233			
	42540-13	42.5	40	48	130	70	233			
	43040-15	43.0	40	58	134	70	239	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	134	70	239			
	44040-15	44.0	40	58	137	70	242			
	44540-15	44.5	40	58	137	70	242			
	45040-15	45.0	40	58	140	70	246			
	45540-15	45.5	40	58	140	70	246			
	46040-15	46.0	40	58	143	70	249			
	46540-15	46.5	40	58	143	70	249			
	47040-15	47.0	40	58	146	70	253			
	47540-15	47.5	40	58	146	70	253			
	48040-15	48.0	40	58	149	70	256			
	48540-15	48.5	40	58	149	70	256			
	49040-15	49.0	40	58	152	70	259			
	49540-15	49.5	40	58	152	70	259			
	50040-15	50.0	40	58	155	70	262			
	50540-15	50.5	40	58	155	70	262			

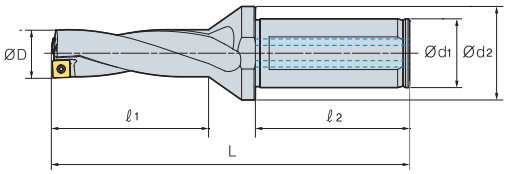
Applicable inserts G04~05

The items marked ∗ can machinea tap foundation hole

King Drill-3D







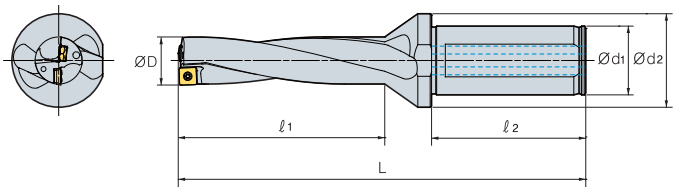
(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	51040-18	51.0	40	68	159	70	269	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	159	70	269			
	52040-18	52.0	40	68	162	70	272			
	52540-18	52.5	40	68	162	70	272			
	53040-18	53.0	40	68	165	70	275			
	53540-18	53.5	40	68	165	70	275			
	54040-18	54.0	40	68	168	70	278			
	54540-18	54.5	40	68	168	70	278			
	55040-18	55.0	40	68	171	70	281			
	55540-18	55.5	40	68	171	70	281			
	56040-18	56.0	40	68	174	70	286			
	56540-18	56.5	40	68	174	70	286			
	57040-18	57.0	40	68	178	70	290			
	57540-18	57.5	40	68	178	70	290			
	58040-18	58.0	40	68	182	70	294			
	58540-18	58.5	40	68	182	70	294			
	59040-18	59.0	40	68	186	70	298			
	59540-18	59.5	40	68	186	70	298			
	60040-18	60.0	40	68	190	70	302			
	60540-18	60.5	40	68	190	70	302			

Applicable inserts **G04~05**

King Drill-4D





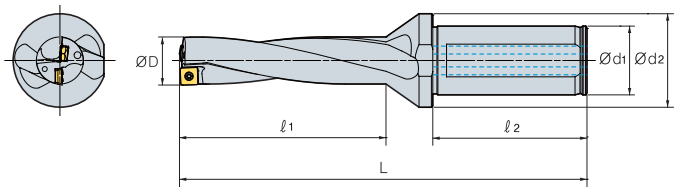
(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4D	12020-04	12.0	20	25	51	50	115	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12520-04	12.5	20	25	51	50	115			
	13020-04	13.0	20	25	55	50	119			
	13520-04	13.5	20	25	55	50	119			
	14020-05	14.0	20	25	59	50	124	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	59	50	124			
	15020-05	15.0	20	25	63	50	129			
	15520-05	15.5	20	25	63	50	129			
	16020-05	16.0	20	25	67	50	133			
	16525-06	16.5	25	34	67	56	139	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	71	56	143			
	17525-06	17.5	25	34	71	56	143			
	18025-06	18.0	25	34	75	56	148			
	18525-06	18.5	25	34	75	56	148			
	19025-06	19.0	25	34	79	56	152			
	19525-06	19.5	25	34	79	56	152			
	20025-07	20.0	25	34	83	56	158	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	83	56	158			
	21025-07	21.0	25	34	87	56	162			
	21525-07	21.5	25	34	87	56	162			
	22025-07	22.0	25	34	91	56	166			
	22525-07	22.5	25	34	91	56	166			
	23025-07	23.0	25	34	95	56	172			
	23525-07	23.5	25	34	95	56	172			
	24032-09	24.0	32	44	99	60	181	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	99	60	181			
	25032-09	25.0	32	44	103	60	185			
	25532-09	25.5	32	44	103	60	185			
	26032-09	26.0	32	44	107	60	189			
	26532-09	26.5	32	44	107	60	189			
	27032-09	27.0	32	44	111	60	194			
	27532-09	27.5	32	44	111	60	194			
	28032-09	28.0	32	44	115	60	199			
	28532-09	28.5	32	44	115	60	199			
	29032-09	29.0	32	44	119	60	203			
	29532-09	29.5	32	44	119	60	203			
	30032-11	30.0	32	44	123	60	210	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	123	60	210			
	31032-11	31.0	32	44	127	60	214			
	31532-11	31.5	32	44	127	60	214			
	32032-11	32.0	32	44	131	60	218			
	32532-11	32.5	32	44	131	60	218			
	33032-11	33.0	32	44	135	60	223			
	33532-11	33.5	32	44	135	60	223			
	34032-11	34.0	32	44	139	60	227			
	34532-11	34.5	32	44	139	60	227			
	35032-11	35.0	32	44	143	60	231			
	35532-11	35.5	32	44	143	60	231			

Applicable inserts **G04~05**

King Drill-4D





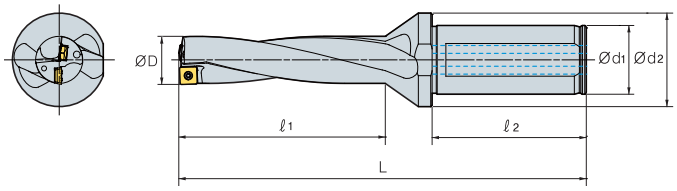
(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4D	36040-13	36.0	40	48	148	70	248	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	148	70	248			
	37040-13	37.0	40	48	152	70	252			
	37540-13	37.5	40	48	152	70	252			
	38040-13	38.0	40	48	156	70	257			
	38540-13	38.5	40	48	156	70	257			
	39040-13	39.0	40	48	160	70	261			
	39540-13	39.5	40	48	160	70	261			
	40040-13	40.0	40	48	164	70	266			
	40540-13	40.5	40	48	164	70	266			
	41040-13	41.0	40	48	168	70	270			
	41540-13	41.5	40	48	168	70	270			
	42040-13	42.0	40	48	172	70	275			
	42540-13	42.5	40	48	172	70	275			
	43040-15	43.0	40	58	177	70	282	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	177	70	282			
	44040-15	44.0	40	58	181	70	286			
	44540-15	44.5	40	58	181	70	286			
	45040-15	45.0	40	58	185	70	291			
	45540-15	45.5	40	58	185	70	291			
	46040-15	46.0	40	58	189	70	295			
	46540-15	46.5	40	58	189	70	295			
	47040-15	47.0	40	58	193	70	300			
	47540-15	47.5	40	58	193	70	300			
	48040-15	48.0	40	58	197	70	304			
	48540-15	48.5	40	58	197	70	304			
	49040-15	49.0	40	58	201	70	308			
	49540-15	49.5	40	58	201	70	308			
	50040-15	50.0	40	58	205	70	312			
	50540-15	50.5	40	58	205	70	312			
	51040-18	51.0	40	68	210	70	320	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	210	70	320			
	52040-18	52.0	40	68	214	70	324			
	52540-18	52.5	40	68	214	70	324			
	53040-18	53.0	40	68	218	70	328			
	53540-18	53.5	40	68	218	70	328			
	54040-18	54.0	40	68	222	70	332			
	54540-18	54.5	40	68	222	70	332			
	55040-18	55.0	40	68	226	70	336			
	55540-18	55.5	40	68	226	70	336			
	56040-18	56.0	40	68	230	70	342			
	56540-18	56.5	40	68	230	70	342			
	57040-18	57.0	40	68	235	70	347			
	57540-18	57.5	40	68	235	70	347			
	58040-18	58.0	40	68	240	70	352			
	58540-18	58.5	40	68	240	70	352			
	59040-18	59.0	40	68	245	70	357			
	59540-18	59.5	40	68	245	70	357			
	60040-18	60.0	40	68	250	70	362			
	60540-18	60.5	40	68	250	70	362			

Applicable inserts **G04~05**

King Drill-5D





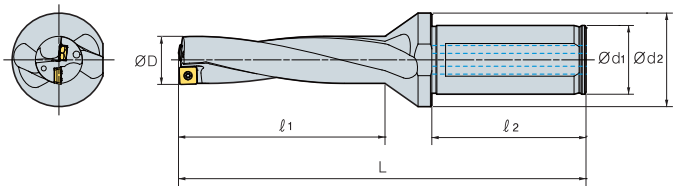
(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K5D	12020-04	12.0	20	25	63	50	127	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12520-04	12.5	20	25	63	50	127			
	13020-04	13.0	20	25	68	50	132			
	13520-04	13.5	20	25	68	50	132			
	14020-05	14.0	20	25	73	50	138	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	73	50	138			
	15020-05	15.0	20	25	78	50	144			
	15520-05	15.5	20	25	78	50	144			
	16020-05	16.0	20	25	83	50	149			
	16525-06	16.5	25	34	83	56	155	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	88	56	160			
	17525-06	17.5	25	34	88	56	160			
	18025-06	18.0	25	34	93	56	166			
	18525-06	18.5	25	34	93	56	166			
	19025-06	19.0	25	34	98	56	171			
	19525-06	19.5	25	34	98	56	171			
	20025-07	20.0	25	34	103	56	178	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	103	56	178			
	21025-07	21.0	25	34	108	56	183			
	21525-07	21.5	25	34	108	56	183			
	22025-07	22.0	25	34	113	56	188			
	22525-07	22.5	25	34	113	56	188			
	23025-07	23.0	25	34	118	56	195			
	23525-07	23.5	25	34	118	56	195			
	24032-09	24.0	32	44	123	60	205	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	123	60	205			
	25032-09	25.0	32	44	128	60	210			
	25532-09	25.5	32	44	128	60	210			
	26032-09	26.0	32	44	133	60	215			
	26532-09	26.5	32	44	133	60	215			
	27032-09	27.0	32	44	138	60	221			
	27532-09	27.5	32	44	138	60	221			
	28032-09	28.0	32	44	143	60	227			
	28532-09	28.5	32	44	143	60	227			
	29032-09	29.0	32	44	148	60	232			
	29532-09	29.5	32	44	148	60	232			
	30032-11	30.0	32	44	153	60	240	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	153	60	240			
	31032-11	31.0	32	44	158	60	245			
	31532-11	31.5	32	44	158	60	245			
	32032-11	32.0	32	44	163	60	250			
	32532-11	32.5	32	44	163	60	250			
	33032-11	33.0	32	44	168	60	256			
	33532-11	33.5	32	44	168	60	256			
	34032-11	34.0	32	44	173	60	261			
	34532-11	34.5	32	44	173	60	261			
	35032-11	35.0	32	44	178	60	266			
	35532-11	35.5	32	44	178	60	266			

Applicable inserts **G04~05**

King Drill-5D





(mm)

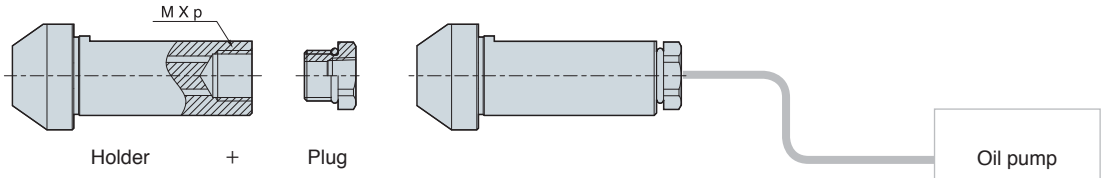
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K5D	36040-13	36.0	40	48	184	70	284	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	184	70	284			
	37040-13	37.0	40	48	189	70	289			
	37540-13	37.5	40	48	189	70	289			
	38040-13	38.0	40	48	194	70	295			
	38540-13	38.5	40	48	194	70	295			
	39040-13	39.0	40	48	199	70	300			
	39540-13	39.5	40	48	199	70	300			
	40040-13	40.0	40	48	204	70	306			
	40540-13	40.5	40	48	204	70	306			
	41040-13	41.0	40	48	209	70	311			
	41540-13	41.5	40	48	209	70	311			
	42040-13	42.0	40	48	214	70	317			
	42540-13	42.5	40	48	214	70	317			
	43040-15	43.0	40	58	220	70	325	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	221	70	326			
	44040-15	44.0	40	58	225	70	330			
	44540-15	44.5	40	58	225	70	330			
	45040-15	45.0	40	58	230	70	336			
	45540-15	45.5	40	58	230	70	336			
	46040-15	46.0	40	58	235	70	341			
	46540-15	46.5	40	58	235	70	341			
	47040-15	47.0	40	58	240	70	347			
	47540-15	47.5	40	58	240	70	347			
	48040-15	48.0	40	58	245	70	352			
	48540-15	48.5	40	58	245	70	352			
	49040-15	49.0	40	58	250	70	357			
	49540-15	49.5	40	58	250	70	357			
	50040-15	50.0	40	58	255	70	362			
	50540-15	50.5	40	58	255	70	362			
	51040-18	51.0	40	68	261	70	371	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	261	70	371			
	52040-18	52.0	40	68	266	70	376			
	52540-18	52.5	40	68	266	70	376			
	53040-18	53.0	40	68	271	70	381			
	53540-18	53.5	40	68	271	70	381			
	54040-18	54.0	40	68	276	70	386			
	54540-18	54.5	40	68	276	70	386			
	55040-18	55.0	40	68	281	70	391			
	55540-18	55.5	40	68	281	70	391			
	56040-18	56.0	40	68	286	70	398			
	56540-18	56.5	40	68	286	70	398			
	57040-18	57.0	40	68	292	70	404			
	57540-18	57.5	40	68	292	70	404			
	58040-18	58.0	40	68	298	70	410			
	58540-18	58.5	40	68	298	70	410			
	59040-18	59.0	40	68	304	70	416			
	59540-18	59.5	40	68	304	70	416			
	60040-18	60.0	40	68	310	70	422			
	60540-18	60.5	40	68	310	70	422			

Applicable inserts **G04~05**

Drill with through coolant system for general lathe and CNC lathe without through coolant system

King Drill (For through coolant system with a lathe)

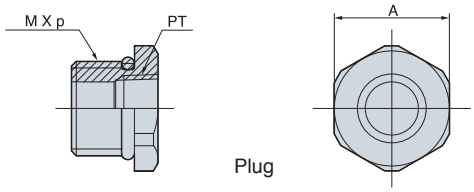
- Through coolant system with drill holder, plug, oil-hole hose and oil-hole pump
- PT TAP in the plug is combined to PT TAP connected to oil hose
- Available to use the drill without a plug in milling machine



• Clamping oil hose to the bottom of plug and connect the oil pump to the holder

(mm)

Tap type	Diameter	Shank dia.	M x p	Plug
K□D120~16020HP-□□	Ø12.0~Ø16.0	Ø20	M12x1.5	PLG12PT18
K□D161~23525HP-□□	Ø16.1~Ø23.5	Ø25	M16x1.5	PLG16PT18
K□D236~35532HP-□□	Ø23.6~Ø35.5	Ø32	M20x2.0	PLG20PT14
K□D356~60940HP-□□	Ø35.6~Ø60.5	Ø40	M27x2.0	PLG27PT38



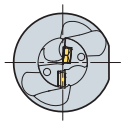
• Plug is assembled

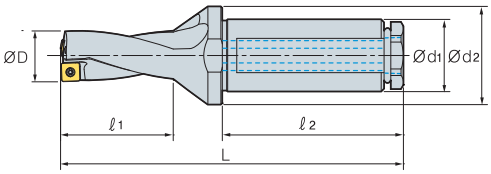
Plug type	M x p	PT tap	A
PLG12PT18	M12x1.5	1/8	16
PLG16PT18	M16x1.5	1/8	19
PLG20PT14	M20x2.0	1/4	26
PLG27PT38	M27x2.0	3/8	35

King Drill-2D

For through coolant system with a lathe







(mm)

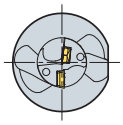
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2D	13020HP-04	13.0	20	25	29	50	93	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	13520HP-04	13.5	20	25	29	50	93			
	14020HP-05	14.0	20	25	31	50	96	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	15020HP-05	15.0	20	25	33	50	99			
	16020HP-05	16.0	20	25	35	50	101			
	17025HP-06	17.0	25	34	37	56	109	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	18025HP-06	18.0	25	34	39	56	112			
	19025HP-06	19.0	25	34	41	56	114			
	20025HP-07	20.0	25	34	43	56	118	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	21025HP-07	21.0	25	34	45	56	120			
	22025HP-07	22.0	25	34	47	56	122			
	23025HP-07	23.0	25	34	49	56	126			
	24032HP-09	24.0	32	44	51	60	133	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	25032HP-09	25.0	32	44	53	60	135			
	26032HP-09	26.0	32	44	55	60	137			
	27032HP-09	27.0	32	44	57	60	140			
	28032HP-09	28.0	32	44	59	60	143			
	29032HP-09	29.0	32	44	61	60	145			

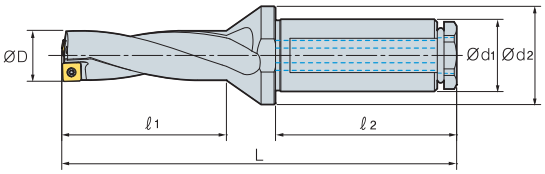
Applicable inserts **G04~05**

King Drill-3D

For through coolant system with a lathe







(mm)

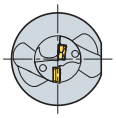
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	13020HP-04	13.0	20	25	42	50	106	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	13520HP-04	13.5	20	25	42	50	106			
	14020HP-05	14.0	20	25	45	50	110	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520HP-05	14.5	20	25	45	50	110			
	15020HP-05	15.0	20	25	48	50	114			
	15520HP-05	15.5	20	25	48	50	114			
	16020HP-05	16.0	20	25	51	50	117			
	16525HP-06	16.5	25	34	51	56	123	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025HP-06	17.0	25	34	54	56	126			
	17525HP-06	17.5	25	34	54	56	126			
	18025HP-06	18.0	25	34	57	56	130			
	18525HP-06	18.5	25	34	57	56	130			
	19025HP-06	19.0	25	34	60	56	133			
	19525HP-06	19.5	25	34	60	56	133			
	20025HP-07	20.0	25	34	63	56	138	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525HP-07	20.5	25	34	63	56	138			
	21025HP-07	21.0	25	34	66	56	141			
	21525HP-07	21.5	25	34	66	56	141			
	22025HP-07	22.0	25	34	69	56	144			
	22525HP-07	22.5	25	34	69	56	144			
	23025HP-07	23.0	25	34	72	56	149			
	23525HP-07	23.5	25	34	72	56	149			
	24032HP-09	24.0	32	44	75	60	157	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532HP-09	24.5	32	44	75	60	157			
	25032HP-09	25.0	32	44	78	60	160			
	25532HP-09	25.5	32	44	78	60	160			
	26032HP-09	26.0	32	44	81	60	163			
	26532HP-09	26.5	32	44	81	60	163			
	27032HP-09	27.0	32	44	84	60	167			
	27532HP-09	27.5	32	44	84	60	167			
	28032HP-09	28.0	32	44	87	60	171			
	28532HP-09	28.5	32	44	87	60	171			
	29032HP-09	29.0	32	44	90	60	174			
	29532HP-09	29.5	32	44	90	60	174			

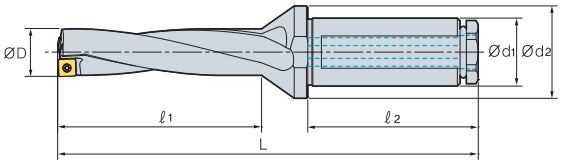
Applicable inserts **G04~05**

King Drill-4D

For through coolant system with a lathe







(mm)

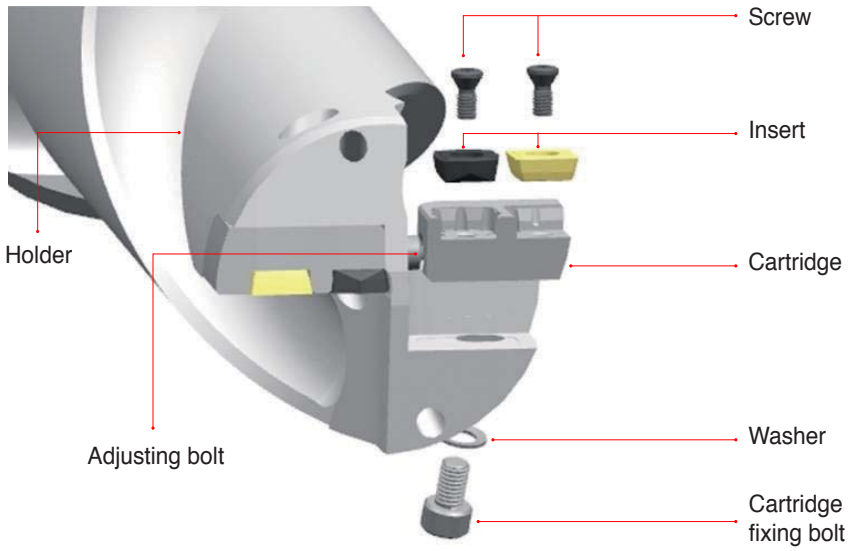
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4D	**13020HP-04**	13.0	20	25	29	50	93	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	13520HP-04	13.5	20	25	29	50	93			
	14020HP-05	14.0	20	25	59	50	124	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	15020HP-05	15.0	20	25	63	50	129			
	16020HP-05	16.0	20	25	67	50	133			
	17025HP-06	17.0	25	34	71	56	143	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	18025HP-06	18.0	25	34	75	56	148			
	19025HP-06	19.0	25	34	79	56	152			
	20025HP-07	20.0	25	34	83	56	158	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	21025HP-07	21.0	25	34	87	56	162			
	22025HP-07	22.0	25	34	91	56	166			
	23025HP-07	23.0	25	34	95	56	172			
	24032HP-09	24.0	32	44	99	60	181	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	25032HP-09	25.0	32	44	103	60	185			
	26032HP-09	26.0	32	44	107	60	189			
	27032HP-09	27.0	32	44	111	60	194			
	28032HP-09	28.0	32	44	115	60	199			
	29032HP-09	29.0	32	44	119	60	203			

Applicable inserts **G04~05**

High rigidity drill produces cost efficiency due to cartridge replacement

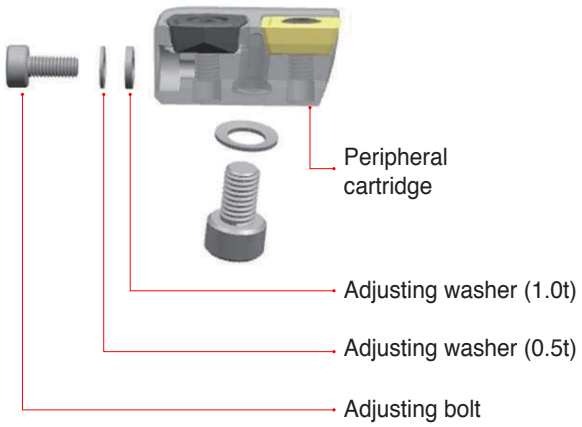
King Drill (For large diameter drilling)

- Cartridge type for Ø61~Ø100 drilling
- Peripheral cartridge can adjust the drilling diameter within 5mm
- Easy to adjust drilling diameter with adjusting bolt





Adjustment of drill diameter

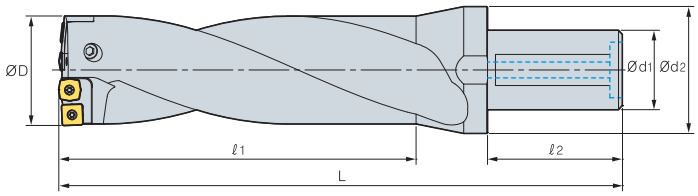


Adjustment Ø (mm)	Adjusting washer	
	Designation	Width (mm)
1	WA0305	0.5
2	WA0310	1.0
3	WA0305+WA0310	1.5
4	WA0310x2	2.0
5	WA0305+WA0310x2	2.5

※ Adjusting washer adjusts the drilling diameter within 5 mm

King Drill

For large diameter drilling



(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Cartridge		Screw	Wrench
								Internal	External		
K2D	616550-11	61~65	50	80	130	80	255	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	140	80	265	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	150	80	275	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	160	80	285	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	170	80	295	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	180	80	305	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	190	80	315	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	200	80	325	KDC95100C	KDC95100P	FTNA0511	TW20-100
K3D	616550-11	61~65	50	80	195	80	320	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	210	80	335	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	225	80	350	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	240	80	365	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	255	80	380	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	270	80	395	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	285	80	410	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	300	80	425	KDC95100C	KDC95100P	FTNA0511	TW20-100
K4D	616550-11	61~65	50	80	260	80	385	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	280	80	405	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	300	80	425	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	320	80	445	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	340	80	465	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	360	80	485	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	380	80	505	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	400	80	525	KDC95100C	KDC95100P	FTNA0511	TW20-100

Applicable inserts **G04~05**

Parts

Cartridge		Range (Ø)	Insert				Screw	Wrench
Internal	External		Designation	Quantity	Designation	Quantity		
KDC6165C	KDC6165P	61 ~ 65	XO□T11T306-□□	2	SP□T11T308-□□	2	FTKA03508	TW15S
KDC6570C	KDC6570P	65 ~ 70	XO□T130406-□□	2	SP□T130410-□□	2	FTKA0410	TW15S
KDC7075C	KDC7075P	70 ~ 75	XO□T130406-□□	2	SP□T130410-□□	2	FTKA0410	TW15S
KDC7580C	KDC7580P	75 ~ 80	XO□T130406-□□	2	SP□T130410-□□	2	FTKA0410	TW15S
KDC8085C	KDC8085P	80 ~ 85	XO□T15M508-□□	2	SP□T15M510-□□	2	FTNC04511	TW20S
KDC8590C	KDC8590P	85 ~ 90	XO□T15M508-□□	2	SP□T15M510-□□	2	FTNC04511	TW20S
KDC9095C	KDC9095P	90 ~ 95	XO□T15M508-□□	2	SP□T15M510-□□	2	FTNC04511	TW20S
KDC95100C	KDC95100P	95 ~ 100	XO□T180508-□□	2	SP□T180510-□□	2	FTNA0511	TW20-100

Cone shaped head indexable drill

TPDC new

- Clamping design
  - One step clamp system → Increased stability
  - Clamping system allowing to change inserts while the holder is attached on the machine → Shortened setting time
- Optimized blade design
  - Excellent chip control → Possibility to use for various types of workpieces
- Helical shaped coolant hole system
  - Wide chip pocket area secured → Better lubrication + chip flow improved
- Material technology
  - Ultra-fine substrate + Multi-layer coating applied → Excellent anti chipping & wear resistance

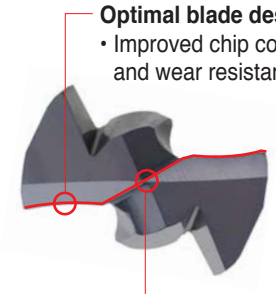
Code system of holder

TPD	C	5D – 150	20 – 75
Top solid piercing drill	Insert type C: Cone type	Aspect ratio (L/D) 3D, 5D, 8D	Drill dia. 150: Ø15.0	Shank dia. 20: Ø20	Flute length (mm)

Code system of insert

TPD	1500	C	P
Top solid piercing drill	Drill dia. 1500: Ø15.00	Insert type C: Cone type	Machining area P: Steel, Universal M: Stainless steel K: Cast iron N: Aluminium C: Carbon fiber Reinforced plastic

Features



Optimal blade design
• Improved chip control and wear resistance

Overlap thinning
• Excellent centering and penetration



Surface treatment
• Good durability

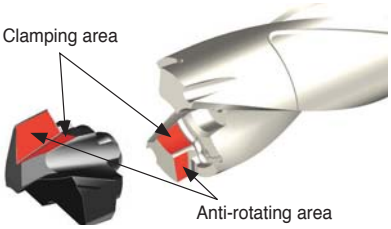
Flute polishing
• Better chip flow

Helical shaped coolant hole system
• Chip flow improved

High helix angle
• Low cutting load and good machinability

Features of clamping system

- One Step Clamp System ➡ Easy and quick tool change with good repeatability
  - Clamping area: Easy and fast tool change
  - Anti-rotating area: Performs as a stopper
  - Clamping and anti-rotating area make an acute angle to prevent insert rotation while machining



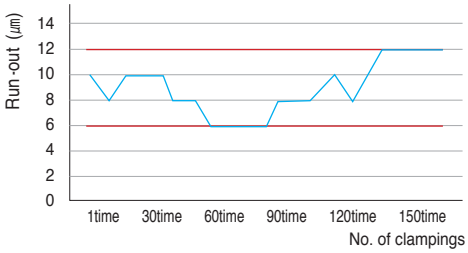
Performance evaluation

Durability test

- **Workpiece** SCM440 (HRC22)
- **Cutting conditions** Drill dia.(mm) = Ø15.0
  vc (m/min) = 90, fn (mm/rev) = 0.25
  ap (mm) = 60, Wet
- **Tools** **Inserts** TPD1500CP (PC5335)
  Holder TPDC5D-15020-75

After using 40 inserts, the setting run-out remains below 15㎛

Sustainability test



Excellent Sustaina-bility

After clamping 150 times, the drill run-out remains

Application examples

- **Use** Part of machine
- **Workpiece** Alloy steel (SCM440, HRC22)
- **Cutting conditions** Drill dia.(mm) = Ø19.0
  vc (m/min) = 100
  fn (mm/rev) = 0.3
  ap (mm) = 90, Wet
- **Tools** **Inserts** TPD1900CP (PC5335)
  Holder TPDC5D-19025-95

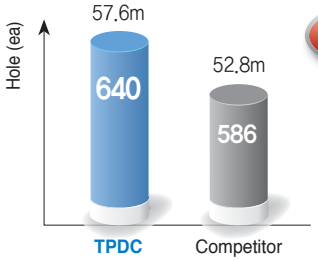


TPDC



Competitor

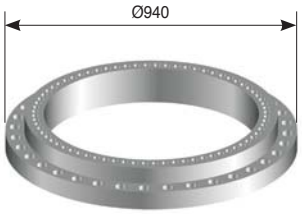
■ Test result



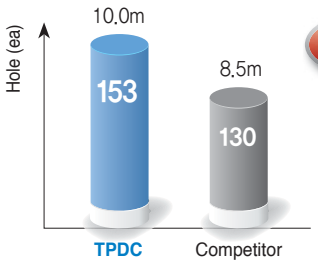
1.1 times more

Lubricative multi-layer coating prevents chipping on cutting edges

- **Use** Part of machine
- **Workpiece** Carbon steel (SM45, HRC40)
- **Cutting conditions** Drill dia.(mm) = Ø18.0
  vc (m/min) = 60
  fn (mm/rev) = 0.15
  ap (mm) = 65, Wet
- **Tools** **Inserts** TPD1800CP (PC5335)
  Holder TPDC5D-18025-90



■ Test result



1.2 times more

Lubricative multi-layer coating enhances wear resistance

Recommended cutting condition

Workpiece			HB	Grade	vc	Depth of cut = 3D, 5D Feed rate (mm/rev) per drill dia. (mm)	
ISO		Workpiece			m/min	Ø12.00~Ø15.99	Ø16.00~Ø25.99
P	Carbon steel	Low carbon steel	80~120	PC5335	110 (80~140)	0.15~0.30	0.20~0.35
		High carbon steel	180~280	PC5335	100 (70~130)	0.15~0.30	0.20~0.35
	Alloy steel	Low alloy steel	140~260	PC5335	110 (80~140)	0.18~0.35	0.23~0.38
		Low pre-hardened steel	200~400	PC5335	75 (50~100)	0.18~0.35	0.23~0.38
		High alloy steel	260~320	PC5335	70 (50~90)	0.18~0.30	0.20~0.35
		High pre-hardened steel	300~450	PC5335	60 (40~80)	0.18~0.30	0.20~0.35

- In case of 8D, reduce the cutting condition 40~50% lower than above after machining the beginning of hole(1.5D)
- In case of interrupted machining, reduce the feed to 0.1~0.15 around the interrupted part

How to make good insert clamping



① Clean the mounting seat with air or cloth

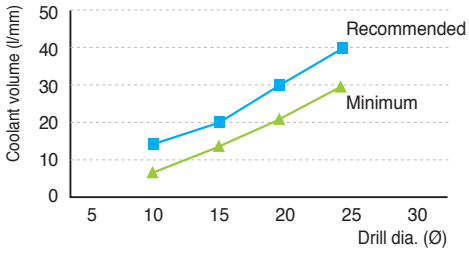
② Put an insert on the holder

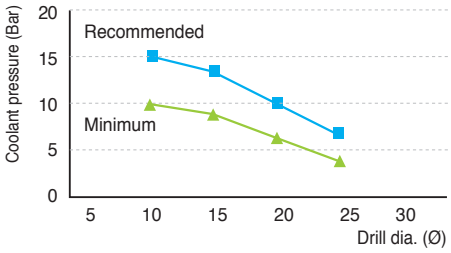
③ A part of wrench and B part of insert must be parallel to each other before clamp the insert
Turn the wrench clockwise to finish clamping

Clamped state

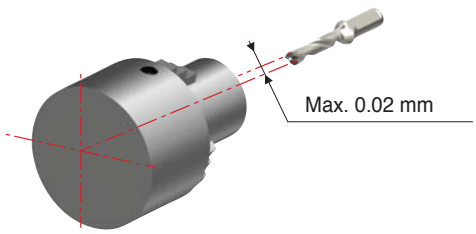
Coolant tip

- **Workpiece** SCM440 (HRC22)
- **Cutting conditions** vc (m/min) = 100, Wet

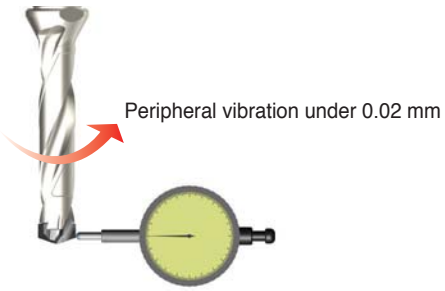




Precautions when setting

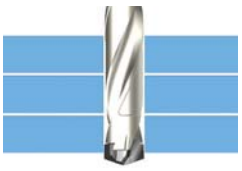
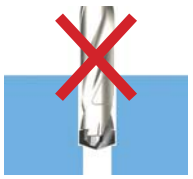


Setting of the horizontal equipment

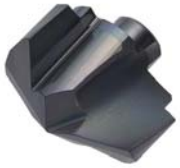


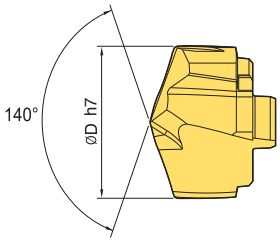
Setting of the vertical equipment

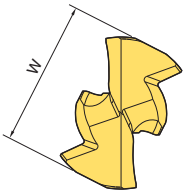
Precautions when drilling

Ramping	Overlapped	Plunging	Boring
			
1. A slope inclined more than 6° is not allowed 2. When entering, reduce the feed to 30~50%	1. Space between panels affects chip evacuation problem 2. Do not make space between panels	Not allowed	Not allowed

TPDC Insert new







(mm)

Designation		Drill dia. (ØD)	W	Grade	Holder	Wrench
TPD	1200CP	12.0	11.4	PC5335	TPDC(3, 5, 8)D-12016-(36, 60, 96)	TPDC-W12
	1220CP	12.2				
	1250CP	12.5			TPDC(3, 5, 8)D-12516-(38, 63, 100)	
	1260CP	12.6				
	1300CP	13.0	12.3	PC5335	TPDC(3, 5, 8)D-13016-(39, 65, 104)	TPDC-W13
	1350CP	13.5			TPDC(3, 5, 8)D-13516-(41, 68, 108)	
	1400CP	14.0	13.4	PC5335	TPDC(3, 5, 8)D-14016-(42, 70, 112)	TPDC-W14
	1420CP	14.2				
	1430CP	14.3				
	1450CP	14.5			TPDC(3, 5, 8)D-14516-(44, 73, 116)	
	1500CP	15.0	14.3	PC5335	TPDC(3, 5, 8)D-15020-(45, 75, 120)	TPDC-W15
	1550CP	15.5				
	1600CP	16.0	15.3	PC5335	TPDC(3, 5, 8)D-16020-(48, 80, 128)	TPDC-W16
	1630CP	16.3				
	1650CP	16.5				
	1670CP	16.7				
	1700CP	17.0	16.3	PC5335	TPDC(3, 5, 8)D-17020-(51, 85, 136)	TPDC-W17
	1750CP	17.5				
	1770CP	17.7				
	1800CP	18.0	17.3	PC5335	TPDC(3, 5, 8)D-18025-(54, 90, 144)	TPDC-W18
	1810CP	18.1				
	1850CP	18.5				
	1860CP	18.6				
	1870CP	18.7				
	1900CP	19.0	18.3	PC5335	TPDC(3, 5, 8)D-19025-(57, 95, 152)	TPDC-W19
	1920CP	19.2				
	1950CP	19.5				
	1970CP	19.7				
	2000CP	20.0	19.2	PC5335	TPDC(3,5,8)D-20025-(60,100,160)	TPDC-W20
	2050CP	20.5				
	2100CP	21.0	20.1	PC5335	TPDC(3,5,8)D-21025-(63,105,168)	TPDC-W21
	2150CP	21.5				
	2200CP	22.0	21	PC5335	TPDC(3,5,8)D-22025-(66,110,176)	TPDC-W22
	2260CP	22.6				
	2270CP	22.7				
	2250CP	22.5				
	2300CP	23.0	21.9	PC5335	TPDC(3,5,8)D-23025-(69,115,184)	TPDC-W23
	2350CP	23.5				
	2400CP	24.0	22.9	PC5335	TPDC(3,5,8)D-24032-(72,120,192)	TPDC-W24
	2450CP	24.5				
	2500CP	25.0	23.9	PC5335	TPDC(3,5,8)D-25032-(75,125,200)	TPDC-W25
	2530CP	25.3				
	2550CP	25.5				
	2580CP	25.8				
	2590CP	25.9				

※ Order made items available

Parts (Recommended torque per wrench)

(mm)

Designation	Drill dia. (ØD)	Torque (Nm)
TPDC-W12	12.00~12.99	2.5
TPDC-W13	13.00~13.99	2.5
TPDC-W14	14.00~14.99	2.5
TPDC-W15	15.00~15.99	2.5
TPDC-W16	16.00~16.99	2.5
TPDC-W17	17.00~17.99	3.5
TPDC-W18	18.00~18.99	3.5

Designation	Drill dia. (ØD)	Torque (Nm)
TPDC-W19	19.00~19.99	3.5
TPDC-W20	20.00~20.99	3.5
TPDC-W21	21.00~21.99	3.5
TPDC-W22	22.00~22.99	3.5
TPDC-W23	23.00~23.99	3.5
TPDC-W24	24.00~24.99	3.5
TPDC-W25	25.00~25.99	3.5

TPDC3D/5D/8D new



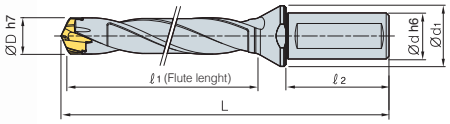


Fig.1

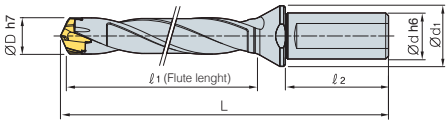


Fig.2

(mm)

Designation		ØD	Ød	Ød$_1$	ℓ$_1$	ℓ$_2$	L	Insert	Fig.
TPDC	3D-12016-36	12.00~12.49	16	20	36	48	99	TPD1200C□-1249C□	1
	3D-12516-38	12.50~12.99	16	20	38	48	101	TPD1250C□-1299C□	1
	3D-13016-39	13.00~13.49	16	20	39	48	103	TPD1300C□-1349C□	1
	3D-13516-41	13.50~13.99	16	20	41	48	105	TPD1350C□-1399C□	1
	3D-14016-42	14.00~14.49	16	20	42	48	106	TPD1400C□-1449C□	1
	3D-14516-44	14.50~14.99	16	20	44	48	107	TPD1450C□-1499C□	1
	3D-15020-45	15.00~15.99	20	25	45	50	113	TPD1500C□-1599C□	2
	3D-16020-48	16.00~16.99	20	25	48	50	117	TPD1600C□-1699C□	2
	3D-17020-51	17.00~17.99	20	25	51	50	120	TPD1700C□-1799C□	2
	3D-18025-54	18.00~18.99	25	33	54	56	132	TPD1800C□-1899C□	2
	3D-19025-57	19.00~19.99	25	33	57	56	135	TPD1900C□-1999C□	2
	3D-20025-60	20.00~20.99	25	33	60	56	138	TPD2000C□-2099C□	2
	3D-21025-63	21.00~21.99	25	33	63	56	141	TPD2100C□-2199C□	2
	3D-22025-66	22.00~22.99	25	33	66	56	145	TPD2200C□-2299C□	2
	3D-23025-69	23.00~23.99	25	33	69	56	149	TPD2300C□-2399C□	2
	3D-24032-72	24.00~24.99	32	43	72	60	159	TPD2400C□-2499C□	2
	3D-25032-75	25.00~25.99	32	43	75	60	162	TPD2500C□-2599C□	2
	5D-12016-60	12.00~12.49	16	20	60	48	123	TPD1200C□-1249C□	1
	5D-12516-63	12.50~12.99	16	20	63	48	126	TPD1250C□-1299C□	1
	5D-13016-65	13.00~13.49	16	20	65	48	129	TPD1300C□-1349C□	1
	5D-13516-68	13.50~13.99	16	20	68	48	132	TPD1350C□-1399C□	1
	5D-14016-70	14.00~14.49	16	20	70	48	134	TPD1400C□-1449C□	1
	5D-14516-73	14.50~14.99	16	20	73	48	136	TPD1450C□-1499C□	1
	5D-15020-75	15.00~15.99	20	25	75	50	143	TPD1500C□-1599C□	2
	5D-16020-80	16.00~16.99	20	25	80	50	149	TPD1600C□-1699C□	2
	5D-17020-85	17.00~17.99	20	25	85	50	154	TPD1700C□-1799C□	2
	5D-18025-90	18.00~18.99	25	33	90	56	168	TPD1800C□-1899C□	2
	5D-19025-95	19.00~19.99	25	33	95	56	173	TPD1900C□-1999C□	2
	5D-20025-100	20.00~20.99	25	33	100	56	178	TPD2000C□-2099C□	2
	5D-21025-105	21.00~21.99	25	33	105	56	183	TPD2100C□-2199C□	2
	5D-22025-110	22.00~22.99	25	33	110	56	189	TPD2200C□-2299C□	2
	5D-23025-115	23.00~23.99	25	33	115	56	195	TPD2300C□-2399C□	2
	5D-24032-120	24.00~24.99	32	43	120	60	207	TPD2400C□-2499C□	2
	5D-25032-125	25.00~25.99	32	43	125	60	212	TPD2500C□-2599C□	2
	8D-12016-96	12.00~12.49	16	20	96	48	159	TPD1200C□-1249C□	1
	8D-12516-100	12.50~12.99	16	20	100	48	163	TPD1250C□-1299C□	1
	8D-13016-104	13.00~13.49	16	20	104	48	168	TPD1300C□-1349C□	1
	8D-13516-108	13.50~13.99	16	20	108	48	173	TPD1350C□-1399C□	1
	8D-14016-112	14.00~14.49	16	20	112	48	176	TPD1400C□-1449C□	1
	8D-14516-116	14.50~14.99	16	20	116	48	180	TPD1450C□-1499C□	1
	8D-15020-120	15.00~15.99	20	25	120	50	188	TPD1500C□-1599C□	2
	8D-16020-128	16.00~16.99	20	25	128	50	197	TPD1600C□-1699C□	2
	8D-17020-136	17.00~17.99	20	25	136	50	205	TPD1700C□-1799C□	2
	8D-18025-144	18.00~18.99	25	33	144	56	222	TPD1800C□-1899C□	2
	8D-19025-152	19.00~19.99	25	33	152	56	230	TPD1900C□-1999C□	2
	8D-20025-160	20.00~20.99	25	33	160	56	238	TPD2000C□-2099C□	2
	8D-21025-168	21.00~21.99	25	33	168	56	246	TPD2100C□-2199C□	2
	8D-22025-176	22.00~22.99	25	33	176	56	255	TPD2200C□-2299C□	2
	8D-23025-184	23.00~23.99	25	33	184	56	264	TPD2300C□-2399C□	2
	8D-24032-192	24.00~24.99	32	43	192	60	279	TPD2400C□-2499C□	2
	8D-25032-200	25.00~25.99	32	43	200	60	287	TPD2500C□-2599C□	2

※ The shank is based on DIN6535 and ISO9677

High precision grinding and superior clamping precision with auto-centering system

TPDB

- High precision clamping system - High precision grinding and superior clamping precision with auto-centering system
- Screw on clamping system - Easy clamping system of TPDB insert
- Sharp cutting edge - Improved chip evacuation, low cutting load, longer tool life with ultra-fine substrate and exclusive coating layer
- Holder with excellent durability - Holder with high rigidity and superb wear resistance due to special surface treatment

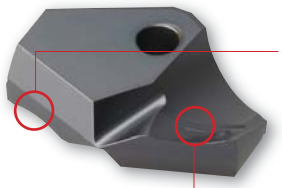
Code system of holder

TPD	B	200	–	25	–	5
Top solid piercing drill	Insert type	Drill dia.		Shank dia.		Aspect ratio
	B: Blade type	200: Ø20.0		25: Ø25		3D, 5D, 8D

Code system of insert

TPD	200	B
Top solid piercing drill	Drill dia.	Insert type
	200: Ø20.0	B: Blade type

Features



Cutting edge with low cutting resistance

Improved chip control due to chip breaker



Screw on clamping system

Flute with excellent chip evacuation

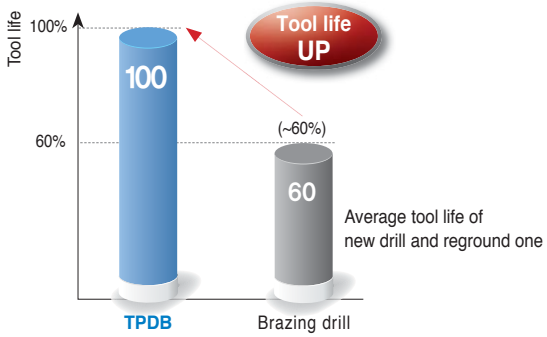
Superior rigidity and wear resistance of holder

Auto-centering system

Tool cost

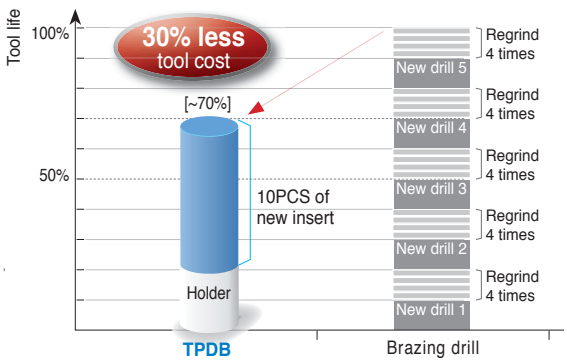
Comparison of 1 insert tool life

- Exclusive coating and substrate
- Usable till the end of wear (no need regrinding)



Comparison of tool cost when machining 1000PCS of workpiece

- 40% longer tool life
- No need regrind
- Less insert change
- 30% less tool cost

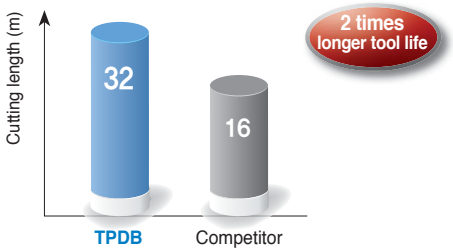


Application example

- **Use** Part of Automobile
- **Workpiece** GDC500
- **Cutting conditions** vc (m/min) = 98, fn (mm/rev) = 0.31
  ap (mm) = 40, Inner coolant system
- **Tools** **Inserts** TPD195B (PC5300)
  Holder TPDB195-25-3
- **Machine** MCT (Vertical)



■ **Test result**

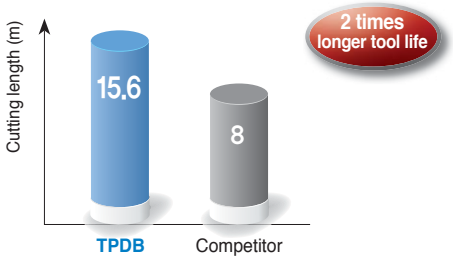


• 200% longer tool life than competitor's

- **Use** Part of Heavy Equipment
- **Workpiece** Hot Forged steel
- **Cutting conditions** vc (m/min) = 85, fn (mm/rev) = 0.2
  ap (mm) = 20, Inner coolant system
- **Tools** **Inserts** TPD210B (PC5300)
  Holder TPDB210-25-3
- **Machine** MCT (Vertical)



■ **Test result**



• 200% longer tool life than competitor's

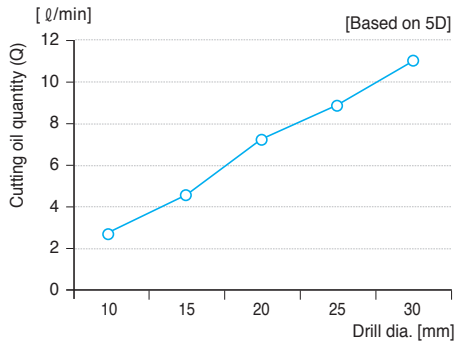
Recommended cutting condition

Workpiece				Grade	vc	Depth of cut = 3D~5D Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB		m/min	10~15.9	16~24.9	25~32.9
P	Carbon steel	Low carbon steel	80~120	PC5300, PC5335	110 (80~140)	0.15~0.30	0.20~0.35	0.25~0.40
		High carbon steel	180~280	PC5300, PC5335	100 (70~130)	0.15~0.30	0.20~0.35	0.25~0.40
	Alloy steel	Low alloy steel	140~260	PC5300	110 (80~140)	0.18~0.35	0.23~0.38	0.28~0.43
		Low pre-hardened steel	200~400	PC5300	75 (50~100)	0.18~0.35	0.23~0.38	0.28~0.43
		High alloy steel	260~320	PC5300	70 (50~90)	0.18~0.30	0.20~0.35	0.25~0.40
		High pre-hardened steel	300~450	PC5300	60 (40~80)	0.18~0.30	0.20~0.35	0.25~0.40
M	Stainless steel	Austenite series	135~275	PC5300	50 (30~70)	0.13~0.25	0.15~0.30	0.17~0.33
		Ferrite series Martensite series	13~275	PC5300	55 (40~70)	0.13~0.25	0.15~0.30	0.17~0.33
K	Cast iron	Gray cast iron	150~230	PC5300	110 (80~140)	0.18~0.35	0.20~0.40	0.25~0.45
		Ductile cast iron	160~260	PC5300	100 (70~130)	0.18~0.35	0.20~0.40	0.25~0.45
S	Heat resisting steel	Ni-heat resisting alloy	130~400	PC5300	40 (20~60)	0.10~0.20	0.12~0.22	0.13~0.25
		Ti-heat resisting alloy	130~400	PC5300	40 (20~60)	0.10~0.20	0.12~0.22	0.13~0.25
		High-hardened steel	Over 400	PC5300	35 (20~50)	0.10~0.20	0.12~0.22	0.13~0.25

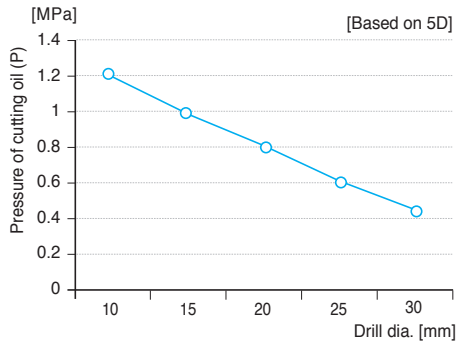
• In case of 8D, reduce the cutting conditions to 40~50% or machine the beginning of hole first.(1.5D)
• In case of interrupted machining, reduce the feed to 30~50% machining around the interrupted part

Technical information

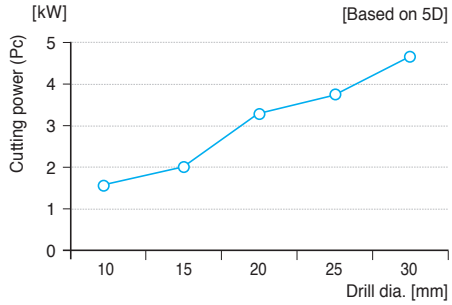
Cutting oil quantity



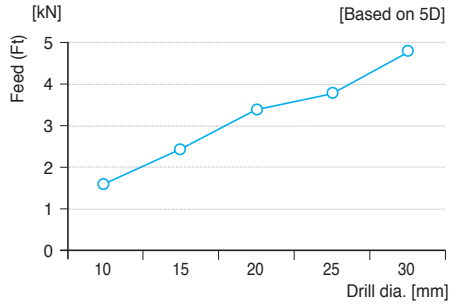
Pressure of cutting oil



Cutting power



Feed



How to clamp a TPDB insert



Clamping an insert on a holder

- Put an insert in the holder
- As the Fig.1, clamp the insert while pushing it to the V shaped groove of the holder
- Screw the insert

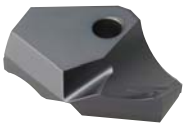


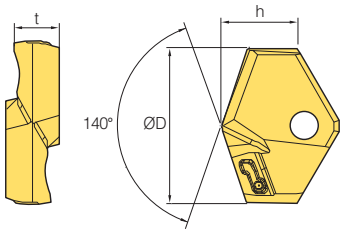


Changing an insert on the machine

- Separate the insert from the holder
- As the Fig.2, clean the insert seat
- Place the insert to the mounting seat
- As the Fig.3, clamp the insert while pushing it to the V shaped groove of the holder

TPDB Insert





(mm)

Designation		Grade	ØD	h	t
TPD	100B~109B	PC5300, PC5335	10.0~10.9	5.5	3.5
	110B~119B	PC5300, PC5335	11.0~11.9	5.8	3.5
	120B~129B	PC5300, PC5335	12.0~12.9	6.3	3.5
	130B~139B	PC5300, PC5335	13.0~13.9	6.5	4.0
	140B~149B	PC5300, PC5335	14.0~14.9	6.8	4.0
	150B~159B	PC5300, PC5335	15.0~15.9	7.0	4.0
	160B~169B	PC5300, PC5335	16.0~16.9	7.7	5.5
	170B~179B	PC5300, PC5335	17.0~17.9	7.9	5.5
	180B~189B	PC5300, PC5335	18.0~18.9	8.1	6.0
	190B~199B	PC5300, PC5335	19.0~19.9	8.3	6.0
	200B~209B	PC5300, PC5335	20.0~20.9	9.7	6.5
	210B~219B	PC5300, PC5335	21.0~21.9	9.4	6.5
	220B~229B	PC5300, PC5335	22.0~22.9	9.6	7.0
	230B~239B	PC5300, PC5335	23.0~23.9	9.8	7.0
	240B~249B	PC5300, PC5335	24.0~24.9	10.7	7.5
	250B~259B	PC5300, PC5335	25.0~25.9	10.9	7.5
	260B~269B	PC5300, PC5335	26.0~26.9	11.0	8.5
	270B~279B	PC5300, PC5335	27.0~27.9	11.8	8.5
	280B~289B	PC5300, PC5335	28.0~28.9	12.6	9.5
	290B~299B	PC5300, PC5335	29.0~29.9	12.9	9.5
	300B~309B	PC5300, PC5335	30.0~30.9	13	10
	310B~319B	PC5300, PC5335	31.0~31.9	13.3	10
	320B~329B	PC5300, PC5335	32.0~32.9	13.5	10

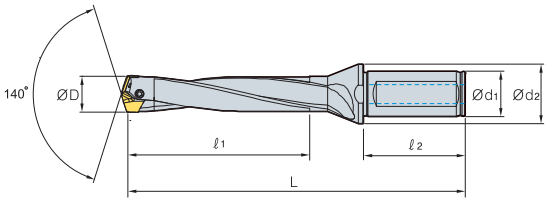
Parts

(mm)

Designation		Drill dia. (ØD)	Screw	Wrench	Torque (NM)
TPD	100B~129B	10.0~12.9	FTNB0209	TW06P	0.4
	130B~149B	13.0~14.9	FTNB02512	TW07S	0.8
	150B~179B	15.0~17.9	FTNB02514	TW07S	0.8
	180B~199B	18.0~19.9	FTNB0316	TW09S	1.2
	200B~239B	20.0~23.9	FTNB0319	TW09S	1.2
	240B~259B	24.0~25.9	FTNB03522	TW15S	3
	260B~279B	26.0~27.9	FTNB03524	TW15S	3
	280B~299B	28.0~29.9	FTNB0426	TW15S	3
	300B~329B	30.0~32.9	FTNB0528	TW20-100	4

TPDB-3D





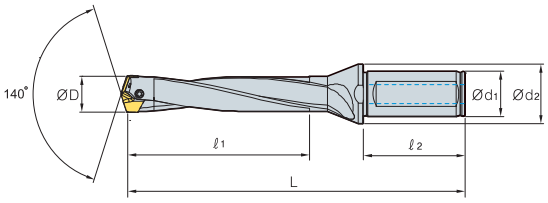
(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-3	10.0~10.4	16	20	30.0	48	95	TPD100B~104B
	105-16-3	10.5~10.9	16	20	31.5	48	96	TPD105B~109B
	110-16-3	11.0~11.4	16	20	33.0	48	98	TPD110B~114B
	115-16-3	11.5~11.9	16	20	34.5	48	99	TPD115B~119B
	120-16-3	12.0~12.4	16	20	36.0	48	102	TPD120B~124B
	125-16-3	12.5~12.9	16	20	37.5	48	104	TPD125B~129B
	130-16-3	13.0~13.4	16	20	39.0	48	107	TPD130B~134B
	135-16-3	13.5~13.9	16	20	40.5	48	109	TPD135B~139B
	140-16-3	14.0~14.4	16	20	42.0	48	111	TPD140B~144B
	145-16-3	14.5~14.9	16	20	43.5	48	114	TPD145B~149B
	150-20-3	15.0~15.4	20	25	45.0	50	118	TPD150B~154B
	155-20-3	15.5~15.9	20	25	46.5	50	120	TPD155B~159B
	160-20-3	16.0~16.4	20	25	48.0	50	122	TPD160B~164B
	165-20-3	16.5~16.9	20	25	49.5	50	124	TPD165B~169B
	170-20-3	17.0~17.4	20	25	51.0	50	127	TPD170B~174B
	175-20-3	17.5~17.9	20	25	52.5	50	129	TPD175B~179B
	180-25-3	18.0~18.4	25	33	54.0	56	137	TPD180B~184B
	185-25-3	18.5~18.9	25	33	55.5	56	139	TPD185B~189B
	190-25-3	19.0~19.4	25	33	57.0	56	142	TPD190B~194B
	195-25-3	19.5~19.9	25	33	58.5	56	144	TPD195B~199B
	200-25-3	20.0~20.4	25	33	60.0	56	146	TPD200B~204B
	205-25-3	20.5~20.9	25	33	61.5	56	148	TPD205B~209B
	210-25-3	21.0~21.4	25	33	63.0	60	151	TPD210B~214B
	215-25-3	21.5~21.9	25	33	64.5	60	153	TPD215B~219B
	220-25-3	22.0~22.4	25	33	66.0	60	155	TPD220B~224B
	225-25-3	22.5~22.9	25	33	67.5	60	157	TPD225B~229B
	230-25-3	23.0~23.4	25	33	69.0	60	160	TPD230B~234B
	235-25-3	23.5~23.9	25	33	70.5	60	162	TPD235B~239B
	240-32-3	24.0~24.4	32	43	72.0	60	168	TPD240B~244B
	245-32-3	24.5~24.9	32	43	73.5	60	170	TPD245B~249B
	250-32-3	25.0~25.4	32	43	75.0	60	173	TPD250B~254B
	255-32-3	25.5~25.9	32	43	76.5	60	175	TPD255B~259B
	260-32-3	26.0~26.9	32	43	78.0	60	177	TPD260B~269B
	270-32-3	27.0~27.9	32	43	81.0	60	182	TPD270B~279B
	280-32-3	28.0~28.9	32	43	84.0	60	186	TPD280B~289B
	290-32-3	29.0~29.9	32	43	87.0	60	191	TPD290B~299B
	300-32-3	30.0~30.9	32	43	90.0	60	194	TPD300B~309B
	310-32-3	31.0~31.9	32	43	93.0	60	199	TPD310B~319B
	320-32-3	32.0~32.9	32	43	96.0	60	201	TPD320B~329B

Applicable inserts **G35**

TPDB-5D





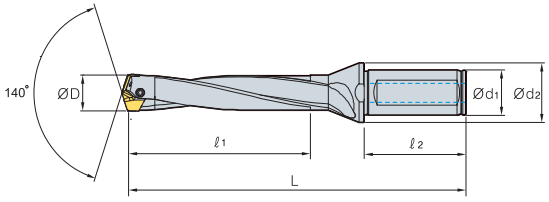
(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-5	10.0~10.4	16	20	50.0	48	115	TPD100B~104B
	105-16-5	10.5~10.9	16	20	52.5	48	117	TPD105B~109B
	110-16-5	11.0~11.4	16	20	55.0	48	120	TPD110B~114B
	115-16-5	11.5~11.9	16	20	57.5	48	123	TPD115B~119B
	120-16-5	12.0~12.4	16	20	60.0	48	126	TPD120B~124B
	125-16-5	12.5~12.9	16	20	62.5	48	129	TPD125B~129B
	130-16-5	13.0~13.4	16	20	65.0	48	133	TPD130B~134B
	135-16-5	13.5~13.9	16	20	67.5	48	136	TPD135B~139B
	140-16-5	14.0~14.4	16	20	70.0	48	139	TPD140B~144B
	145-16-5	14.5~14.9	16	20	72.5	48	143	TPD145B~149B
	150-20-5	15.0~15.4	20	25	75.0	50	148	TPD150B~154B
	155-20-5	15.5~15.9	20	25	77.5	50	151	TPD155B~159B
	160-20-5	16.0~16.4	20	25	80.0	50	154	TPD160B~164B
	165-20-5	16.5~16.9	20	25	82.5	50	157	TPD165B~169B
	170-20-5	17.0~17.4	20	25	85.0	50	161	TPD170B~174B
	175-20-5	17.5~17.9	20	25	87.5	50	164	TPD175B~179B
	180-25-5	18.0~18.4	25	33	90.0	56	173	TPD180B~184B
	185-25-5	18.5~18.9	25	33	92.5	56	176	TPD185B~189B
	190-25-5	19.0~19.4	25	33	95.0	56	180	TPD190B~194B
	195-25-5	19.5~19.9	25	33	97.5	56	183	TPD195B~199B
	200-25-5	20.0~20.4	25	33	100.0	56	186	TPD200B~204B
	205-25-5	20.5~20.9	25	33	102.5	56	189	TPD205B~209B
	210-25-5	21.0~21.4	25	33	105.0	60	193	TPD210B~214B
	215-25-5	21.5~21.9	25	33	107.5	60	196	TPD215B~219B
	220-25-5	22.0~22.4	25	33	110.0	60	199	TPD220B~224B
	225-25-5	22.5~22.9	25	33	112.5	60	202	TPD225B~229B
	230-25-5	23.0~23.4	25	33	115.0	60	206	TPD230B~234B
	235-25-5	23.5~23.9	25	33	117.5	60	209	TPD235B~239B
	240-32-5	24.0~24.4	32	43	120.0	60	216	TPD240B~244B
	245-32-5	24.5~24.9	32	43	122.5	60	219	TPD245B~249B
	250-32-5	25.0~25.4	32	43	125.0	60	223	TPD250B~254B
	255-32-5	25.5~25.9	32	43	127.5	60	226	TPD255B~259B
	260-32-5	26.0~26.9	32	43	130.0	60	229	TPD260B~269B
	270-32-5	27.0~27.9	32	43	135.0	60	236	TPD270B~279B
	280-32-5	28.0~28.9	32	43	140.0	60	242	TPD280B~289B
	290-32-5	29.0~29.9	32	43	145.0	60	249	TPD290B~299B
	300-32-5	30.0~30.9	32	43	150.0	60	254	TPD300B~309B
	310-32-5	31.0~31.9	32	43	155.0	60	261	TPD310B~319B
	320-32-5	32.0~32.9	32	43	160.0	60	265	TPD320B~329B

Applicable inserts **G35**

TPDB-8D





(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-8	10.0~10.4	16	20	80	48	145.0	TPD100B~104B
	105-16-8	10.5~10.9	16	20	84	48	149.0	TPD105B~109B
	110-16-8	11.0~11.4	16	20	88	48	153.0	TPD110B~114B
	115-16-8	11.5~11.9	16	20	92	48	157.0	TPD115B~119B
	120-16-8	12.0~12.4	16	20	96	48	162.0	TPD120B~124B
	125-16-8	12.5~12.9	16	20	100	48	166.5	TPD125B~129B
	130-16-8	13.0~13.4	16	20	104	48	172.0	TPD130B~134B
	135-16-8	13.5~13.9	16	20	108	48	176.5	TPD135B~139B
	140-16-8	14.0~14.4	16	20	112	48	181.0	TPD140B~144B
	145-16-8	14.5~14.9	16	20	116	48	186.5	TPD145B~149B
	150-20-8	15.0~15.4	20	25	120	50	193.0	TPD150B~154B
	155-20-8	15.5~15.9	20	25	124	50	197.5	TPD155B~159B
	160-20-8	16.0~16.4	20	25	128	50	202.0	TPD160B~164B
	165-20-8	16.5~16.9	20	25	132	50	206.5	TPD165B~169B
	170-20-8	17.0~17.4	20	25	136	50	212.0	TPD170B~174B
	175-20-8	17.5~17.9	20	25	140	50	216.5	TPD175B~179B
	180-25-8	18.0~18.4	25	33	144	56	227.0	TPD180B~184B
	185-25-8	18.5~18.9	25	33	148	56	231.5	TPD185B~189B
	190-25-8	19.0~19.4	25	33	152	56	237.0	TPD190B~194B
	195-25-8	19.5~19.9	25	33	156	56	241.5	TPD195B~199B
	200-25-8	20.0~20.4	25	33	160	56	246.0	TPD200B~204B
	205-25-8	20.5~20.9	25	33	164	56	250.5	TPD205B~209B
	210-25-8	21.0~21.4	25	33	168	60	256.0	TPD210B~214B
	215-25-8	21.5~21.9	25	33	172	60	260.5	TPD215B~219B
	220-25-8	22.0~22.4	25	33	176	60	265.0	TPD220B~224B
	225-25-8	22.5~22.9	25	33	180	60	269.5	TPD225B~229B
	230-25-8	23.0~23.4	25	33	184	60	275.0	TPD230B~234B
	235-25-8	23.5~23.9	25	33	188	60	279.5	TPD235B~239B
	240-32-8	24.0~24.4	32	43	192	60	288.0	TPD240B~244B
	245-32-8	24.5~24.9	32	43	196	60	292.5	TPD245B~249B
	250-32-8	25.0~25.4	32	43	200	60	298.0	TPD250B~254B
	255-32-8	25.5~25.9	32	43	204	60	302.5	TPD255B~259B
	260-32-8	26.0~26.9	32	43	208	60	307.0	TPD260B~269B
	270-32-8	27.0~27.9	32	43	216	60	317.0	TPD270B~279B
	280-32-8	28.0~28.9	32	43	224	60	326.0	TPD280B~289B
	290-32-8	29.0~29.9	32	43	232	60	336.0	TPD290B~299B
	300-32-8	30.0~30.9	32	43	240	60	344.0	TPD300B~309B
	310-32-8	31.0~31.9	32	43	248	60	354.0	TPD310B~319B
	320-32-8	32.0~32.9	32	43	256	60	361.0	TPD320B~329B

Applicable inserts **G35**

Convenient and quickly adjustable drill height

WPDC

Indexable Drill Clamped with Center Drill

Code system for drill



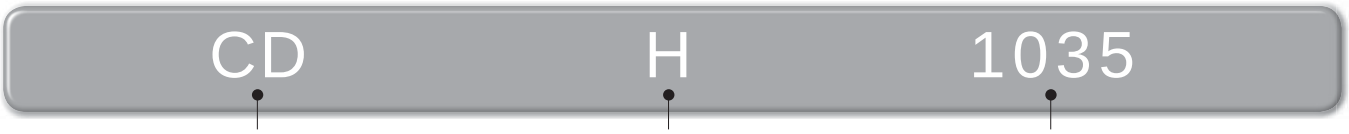
Type	Drill dia.	Shank dia.	Aspect ratio
WPDC: Using W-type I/S center drill NPDC: Using N-type I/S center drill	410: Ø41.0 6570: Ø65~70	32: Ø32 40: Ø40	5: 5D 6.5: 6.5D 8: 8D

Code system for cartridge



Type	Drill dia.	Classification
CWP: Cartridge-WPDC	4145: Ø41~45 450: Ø45.0	C: Central P: Peripheral

Code system for center drill



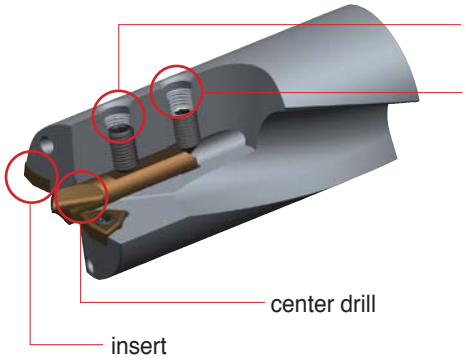
Type	Coolant	Diameter × length of tool
Center Dril	H: Coolant Unmarked: None	0630: Ø6X30 0835: Ø8X35 1035: Ø10X35 1238: Ø12X38 1645: Ø16X45

Grade of center drill



Product name	Coating layer
PVD coating	40H: TiN coating

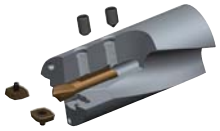
How to clamp the drills



Feature of corn-point system

- Convenient and quick adjustable heights when inserting the center drill
- In case the center drill brakes while in usage, it can be replaced with the bolt for adjusting cone point
- The bolt for adjusting cone point prevents chattering on the center drill

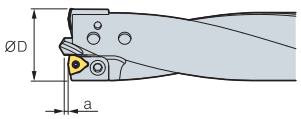
Clamping

❶	❷	❸	❹	❺
				
Place a center drill	Clamp insert and cartridge	Adjust the center drill with the bolt for adjusting cone point	Clamp the center drill firmly with fixing bolt	Reassure the clamp with bolt for adjusting cone point

※ Use safety covers for your safety when clamping the center drill and insert
※ When machining, be careful of the drill disk

Length of the 'a' part of center drill

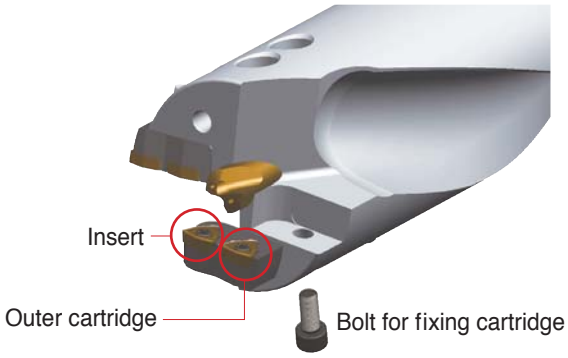
The length of 'a' being too short can cause bad surface finish or high cutting load
On the other hand, the length of 'a' being too long can make tool failure and chattering while drilling



Diameter (ØD)	Length of the 'a' part of center drill		
	Steel	Alloy steel	Non-ferrous metal
25~30	1.2	1.0	1.5
31~40	1.5	1.3	1.8
41~50	1.8	1.5	2.2
51~59	2.2	1.8	2.5
60~75	2.5	2.0	2.8
76~80	3.0	2.5	3.5

Adjusting diameter of cartridge type drill

- Disassemble a cartridge from the holder by loosening the bolt fixed for outer cartridge
- Machine after calculating the hole size on the side of the outer cartridge
- Trim the sharp part after machining
- Clamp the bolt for fixing cartridge without any gap in between the holder and the machined outer cartridge



- **Range of adjustable drill diameter**
  1. Single cartridge type (Drill diameter Ø41~Ø59) ⋯› -1.0 mm
  2. Dual cartridge type (Drill diameter Ø60~Ø80) ⋯› -5.0 mm

- **Diameter of the standard drills is provided with maximum size of standards**
  Ex) WPDC6570-40-6.5 ⋯› Drill diameter 70.0 mm

Ex) How to adjust drill diameter to Ø66.0 machining with WPDC6570-40-8
⋯› To make the drill diameter of outer cartridge to Ø66.0, machine 2.0 mm. (Ø70.0-Ø66.0 = 4 ⋯› 4÷2 = 2 (radius))

Recommended cutting condition

Workpiece				Chip breaker	Grade	vc	Depth of cut = 5D, 6.5D, 8D Feed rate (mm/rev) per drill dia.(mm)					
ISO		Workpiece	HB			m/min	~Ø30	Ø31~Ø40	Ø41~Ø50	Ø51~Ø59	Ø60~Ø75	Ø76~Ø80
P	Carbon steel	Low carbon steel (~0.25%)	80~180	C21N	PC5335	190 (160~220)	0.07~0.11	0.08~0.12	0.10~0.14	0.12~0.16	0.12~0.16	0.12~0.16
		High carbon steel (0.25%~)	180~280	C21N	PC5335	140 (110~170)	0.07~0.11	0.08~0.12	0.10~0.14	0.12~0.16	0.12~0.16	0.12~0.16
	Alloy steel	Low alloy steel	140~260	C21N	PC5335	130 (100~160)	0.08~0.12	0.08~0.12	0.10~0.14	0.12~0.18	0.12~0.18	0.12~0.18
		High alloy steel	50~260	C21N	PC5335	100 (70~130)	0.06~0.10	0.08~0.12	0.08~0.12	0.10~0.16	0.10~0.16	0.10~0.16
M	Stainless steel	Stainless steel	135~275	C21N	PC5335	100 (70~130)	0.06~0.10	0.08~0.12	0.10~0.12	0.12~0.14	0.12~0.14	0.12~0.14
K	Cast iron	Gray cast iron	150~220	C21N	PC5335	160 (130~190)	0.09~0.15	0.10~0.16	0.12~0.2	0.14~0.22	0.14~0.22	0.14~0.22
		Ductile cast iron	200~300	C21N	PC5335	140 (170~110)	0.09~0.15	0.10~0.16	0.12~0.2	0.14~0.22	0.14~0.22	0.14~0.22
		Malleable cast iron	130~230	C21N	PC5335	150 (180~120)	0.09~0.15	0.10~0.16	0.12~0.2	0.14~0.22	0.14~0.22	0.14~0.22
N	Alloyed aluminum	Alloyed aluminum	30~150	C21N	PC5335	300 (250~350)	0.08~0.12	0.10~0.14	0.12~0.16	0.14~0.18	0.14~0.18	0.14~0.18
	Alloyed copper	Alloyed copper	150~160	C21N	PC5335	250 (200~300)	0.08~0.12	0.10~0.14	0.12~0.16	0.14~0.18	0.14~0.18	0.14~0.18
S	Heat resistant alloy	Heat resistant alloy	130~400	C21N	PC5335	50 (70~30)	0.05~0.08	0.05~0.08	0.06~0.10	0.06~0.10	0.06~0.10	0.06~0.10

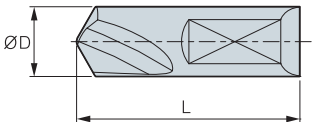
Parts of WPDC type indexable drills

Designation	ØD	Insert			Center drill			Cartridge		
		Insert	Screw	Wrench	Center drill	fixed bolt	cone point bolt	Inner	Outer	Fixed bolt
WPDC250-32-□	25	WC□T030204-C21N	FTKA02206	TW06S	CD0630	KHA0508	KHC0510			
WPDC260~280-32-□	26~28	WC□T040204-C21N	FTNA02555	TW07S		KHA0510				
WPDC290~300-32-□	29~30									
WPDC310~350-32-□	31~35	WC□T050308-C21N	FTKA0307	TW09S	CD0835	KHA0610	KHC0610			
WPDC360~400-32-□	36~40					KHA0612				
WPDC410-40-□	41	WC□T06T308-C21N	FTKA03508	TW15S	CDH1035	KHA0812	KHC0812	CWP4145C	CWP410P	BHA0510
WPDC420-40-□	42								CWP420P	
WPDC430-40-□	43								CWP430P	
WPDC440-40-□	44								CWP440P	
WPDC450-40-□	45								CWP450P	
WPDC460-40-□	46					KHA0815		CWP4650C	CWP460P	BHA0512
WPDC470-40-□	47								CWP470P	
WPDC480-40-□	48								CWP480P	
WPDC490-40-□	49								CWP490P	
WPDC500-40-□	50								CWP500P	
WPDC510-40-□	51	WC□T080408-C21N	FTKA0411K	TW15S	CDH1238	KHA1015	KHC1016	CWP5155C	CWP510P	BHA0612
WPDC520-40-□	52								CWP520P	
WPDC530-40-□	53								CWP530P	
WPDC540-40-□	54								CWP540P	
WPDC550-40-□	55								CWP550P	
WPDC560-40-□	56							CWP5659C	CWP560P	BHA0614
WPDC570-40-□	57								CWP570P	
WPDC580-40-□	58								CWP580P	
WPDC590-40-□	59								CWP590P	
WPDC6065-40-□	60~65	WC□T050308-C21N	FTKA0307	TW09S		KHA1020	KHA1020	CWP6065C	CWP6065P	BHA0510
WPDC6570-40-□	65~70							CWP6570C	CWP6570P	
WPDC7075-40-□	70~75							CWP7075C	CWP7075P	
WPDC7580-40-□	75~80	WC□T06T308-C21N	FTKA03508	TW15S	CDH1645			CWP7580C	CWP7580T	BHA0612

Applicable inserts **G04~05**

Center Drill





(mm)

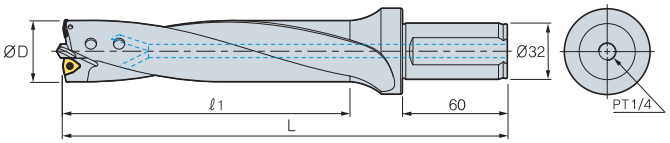
Designation	Grade	ØD	L	Oil-hole
CD0630	PC40H	6	30	×
CD0835	PC40H	8	35	×
CDH1035	PC40H	10	35	○
CDH1238	PC40H	12	38	○
CDH1645	PC40H	16	45	○

• This is HSS with Tin coating

WPDC-5D/6.5D/8D

Standard type





(mm)

Designation		ØD	5D		6.5D		8D		Insert	Center drill
			ℓ1	L	ℓ1	L	ℓ1	L		
WPDC	250-32-□	25	150	240	185	275	220	310	WC□T030204-C21N	CD0630
	260-32-□	26	150	240	185	275	220	310	WC□T040204-C21N	
	270-32-□	27	150	240	185	275	220	310		
	280-32-□	28	150	240	185	275	220	310		
	290-32-□	29	150	240	185	275	220	310		
	300-32-□	30	150	240	185	275	220	310		
	310-32-□	31	175	265	218	308	260	350	WC□T050308-C21N	CD0835
	320-32-□	32	175	265	218	308	260	350		
	330-32-□	33	175	265	218	308	260	350		
	340-32-□	34	175	265	218	308	260	350		
	350-32-□	35	175	265	218	308	260	350		
	360-32-□	36	200	290	250	340	300	390		
	370-32-□	37	200	290	250	340	300	390		
	380-32-□	38	200	290	250	340	300	390		
	390-32-□	39	200	290	250	340	300	390		
	400-32-□	40	200	290	250	340	300	390		

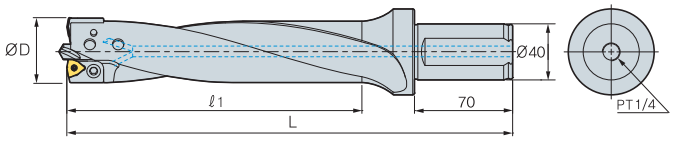
Applicable inserts **G04~05**

⋆ We can provide if you order exact diameter
Ex) machining hole 32.5mm ⋆ 6.5D ⋯› WPDC325-32-6.5

WPDC-5D/6.5D/8D

Single insert catridge type





(mm)

Designation		ØD	5D		6.5D		8D		Insert	Center drill	Cartridge	
			ℓ1	L	ℓ1	L	ℓ1	L			Inner	Outer
WPDC	410-40-□	41	225	330	283	388	340	445	WC□T06T308-C21N	CDH1035	CWP4145C	CWP410P
	420-40-□	42	225	330	283	388	340	445				CWP420P
	430-40-□	43	225	330	283	388	340	445				CWP430P
	440-40-□	44	225	330	283	388	340	445				CWP440P
	450-40-□	45	225	330	283	388	340	445				CWP450P
	460-40-□	46	250	355	315	420	380	485			CWP4650C	CWP460P
	470-40-□	47	250	355	315	420	380	485				CWP470P
	480-40-□	48	250	355	315	420	380	485				CWP480P
	490-40-□	49	250	355	315	420	380	485				CWP490P
	500-40-□	50	250	355	315	420	380	485				CWP500P
	510-40-□	51	275	380	348	453	420	525	WC□T080408-C21N	CDH1238	CWP5155C	CWP510P
	520-40-□	52	275	380	348	453	420	525				CWP520P
	530-40-□	53	275	380	348	453	420	525				CWP530P
	540-40-□	54	275	380	348	453	420	525				CWP540P
	550-40-□	55	275	380	348	453	420	525				CWP550P
	560-40-□	56	300	405	380	485	460	565			CWP5659C	CWP560P
	570-40-□	57	300	405	380	485	460	565				CWP570P
	580-40-□	58	300	405	380	485	460	565				CWP580P
	590-40-□	59	300	405	380	485	460	565				CWP590P

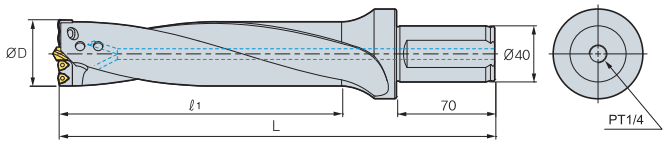
Applicable inserts **G04~05**

* We can provide if you order exact diameter
Ex) machining hole 47.5mm * 5D -> WPDC475-40-5

WPDC-5D/6.5D/8D

Dual insert cartridge type





(mm)

Designation		ØD	5D		6.5D		8D		Insert	Center drill	Cartridge	
			ℓ1	L	ℓ1	L	ℓ1	L			Inner	Outer
WPDC	6065-40-□	60~65	325	430	423	528	520	625	WC□T050308-C21N	CDH1238	CWP6065C	CWP6065P
	6570-40-□	65~70	350	455	455	560	560	665			CWP6570C	CWP6570P
	7075-40-□	70~75	375	480	488	593	600	705			CWP7075C	CWP7075P
	7580-40-□	75~80	400	505	520	625	640	745	WC□T06T308-C21N	CDH1645	CWP7580C	CWP7580P

Applicable inserts **G06**

* We can provide if you order exact diameter
Ex) machining hole 70.5mm * 6.5D -> WPDC705-40-6.5

Highly efficient hole making for various workpieces including automobile components

MSD Plus new

Mach Solid Drill Plus

Code system

MSDP(H) 040 – 5 P – 100L – 5S

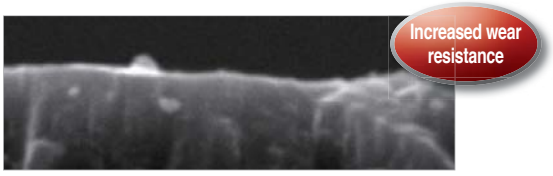
Special type

- **Oil hole**: None: MSDP; With oil hole: MSDPH
- **Drill dia. (ØD)**: 040: Ø4.0
- **Standard type**: Aspect ratio (L/D) 3D, 5D, 7D
- **Special type**: Flute length 100: 100mm
- **Machining area**: P: Carbon steel, alloy steel; M: Stainless steel; K: Cast iron; N: Aluminum, copper alloy
- **Overall length**: 100L: 100mm
- **Shank dia.**: 5S: Ø5

Features

New grade (PC325U)

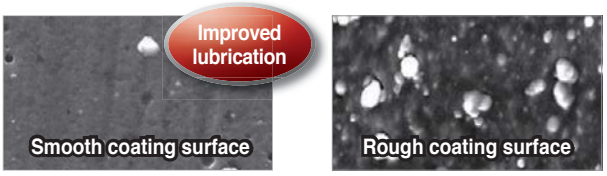
- Lubricative coating layer improves welding resistance at middle to high speed.
- Increase wear resistance in machining carbon steel



PC325U

Surface of coating layer

- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



PC325U Competitor

Chip control

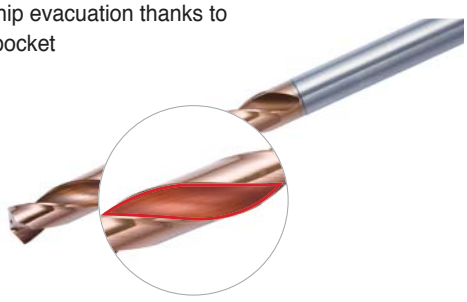
- **Workpiece** SCM440
- **Cutting conditions** vc (m/min) = 90, fn (mm/rev) = 0.2; ap (mm) = 30, wet
- **Tools** MSDPH060-5P (PC325U)



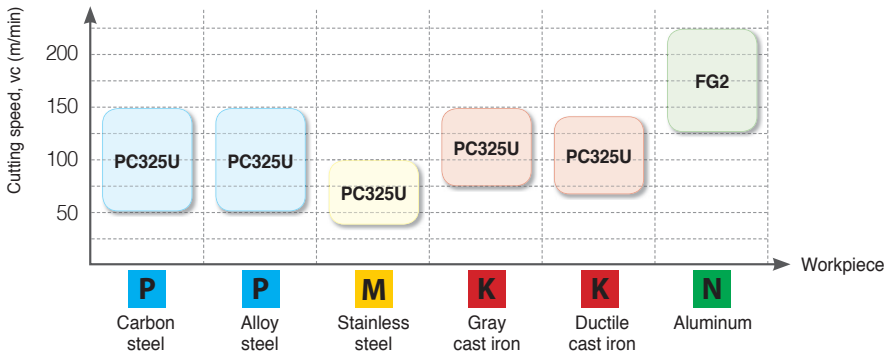
MSD Plus Competitor

Flute shape

- Improved chip evacuation thanks to wider chip pocket

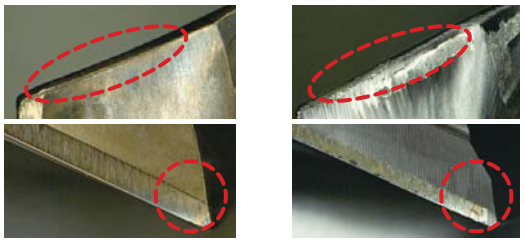


Application area



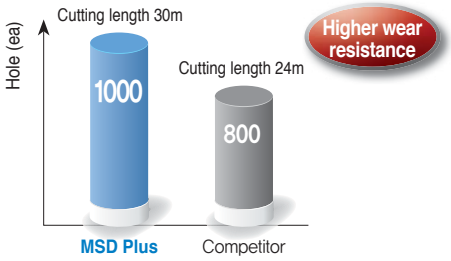
Application examples

- **Use** Part of Automobile
- **Workpiece** SM45C
- **Cutting conditions** vc (m/min) = 124, fn (mm/rev) = 0.15, ap (mm) = 30, Through coolant
- **Tools** MSDP120-5P (PC325U)



MSD Plus | Competitor

Test result

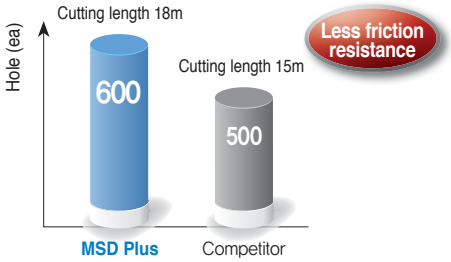


Lubricative coating layer of the new grade PC325U maximizes wear resistance.

- **Use** Part of Automobile
- **Workpiece** SM53C
- **Cutting conditions** vc (m/min) = 60, fn (mm/rev) = 0.25, ap (mm) = 30, External coolant
- **Tools** MSDP120-5P (PC325U)



Test result



Special treatment on coating surface minimized frictional resistance.

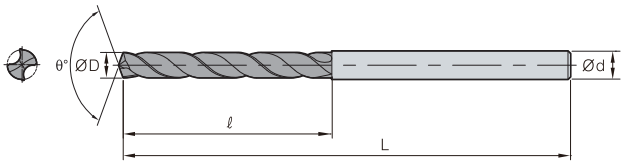
Recommended cutting conditions

Workpiece				Grade	vc (m/min)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece	HB			Ø1.0~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	Carbon steel	Low carbon steel	80~120	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High carbon steel	Over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
	Alloy steel	Low alloy steel	140~260	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Hardened low alloy steel	200~400	PC325U	60 (50~100)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High alloy steel	50~260	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
		Hardened high alloy steel	Over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
M	Stainless steel	Austenite series	135~275	PC325U	45 (25~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
		Ferrite series Martensite series	135~275	PC325U	50 (30~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
K	Cast iron	Gray cast iron	150~230	PC325U	100 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Ductile cast iron	160~260	PC325U	90 (70~140)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
N	Aluminum	Aluminum alloy	30~150	FG2	150 (125~220)	0.24~0.38	0.38~0.53	0.53~0.75	0.61~0.85	0.68~0.98
	Copper alloy	Copper alloy	150~160	FG2	150 (125~220)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied
• In case of external coolant system, reduce the above feed values by 20%

MSDP-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

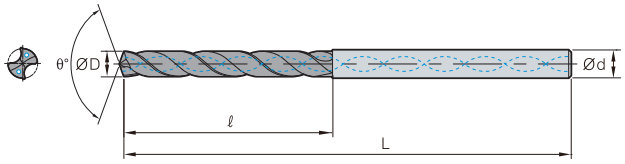
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N	
				ℓ	L	ℓ	L
MSDP	010 - □ P,M,K,N	1.0	3.0	6	45	12	66
	011 - □ P,M,K,N	1.1	3.0	7	45	12	66
	012 - □ P,M,K,N	1.2	3.0	8	45	12	66
	013 - □ P,M,K,N	1.3	3.0	8	45	12	66
	014 - □ P,M,K,N	1.4	3.0	9	45	12	66
	015 - □ P,M,K,N	1.5	3.0	9	45	12	66
	016 - □ P,M,K,N	1.6	3.0	10	45	15	66
	017 - □ P,M,K,N	1.7	3.0	10	45	15	66
	018 - □ P,M,K,N	1.8	3.0	11	45	15	66
	019 - □ P,M,K,N	1.9	3.0	11	45	15	66
	020 - □ P,M,K,N	2.0	3.0	14	53	20	66
	021 - □ P,M,K,N	2.1	3.0	14	53	20	66
	022 - □ P,M,K,N	2.2	3.0	14	53	20	66
	023 - □ P,M,K,N	2.3	3.0	14	53	20	66
	024 - □ P,M,K,N	2.4	3.0	14	53	20	66

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

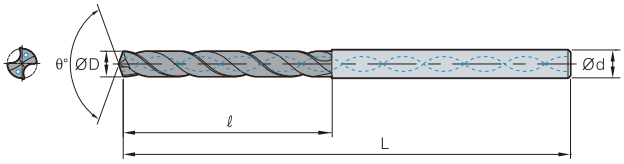
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	025 - □ P,M,K,N	2.5	3.0	14	53	20	66	30	70
	026 - □ P,M,K,N	2.6	3.0	17	53	20	66	30	70
	027 - □ P,M,K,N	2.7	3.0	17	53	20	66	30	70
	028 - □ P,M,K,N	2.8	3.0	17	53	20	66	30	70
	029 - □ P,M,K,N	2.9	3.0	17	53	20	66	30	70
	030 - □ P,M,K,N	3.0	3.0	17	53	20	66	30	70
	031 - □ P,M,K,N	3.1	4.0	20	58	28	74	30	70
	032 - □ P,M,K,N	3.2	4.0	20	58	28	74	30	70
	033 - □ P,M,K,N	3.3	4.0	20	58	28	74	30	70
	034 - □ P,M,K,N	3.4	4.0	20	58	28	74	37.5	75
	035 - □ P,M,K,N	3.5	4.0	20	58	28	74	37.5	75
	036 - □ P,M,K,N	3.6	4.0	22	58	32	74	37.5	75
	037 - □ P,M,K,N	3.7	4.0	22	58	32	74	37.5	75
	038 - □ P,M,K,N	3.8	4.0	22	58	32	74	37.5	75
	039 - □ P,M,K,N	3.9	4.0	22	58	32	74	37.5	75
	040 - □ P,M,K,N	4.0	4.0	22	58	32	74	37.5	75
	041 - □ P,M,K,N	4.1	5.0	24	62	36	82	37.5	75
	042 - □ P,M,K,N	4.2	5.0	24	62	36	82	37.5	75
	043 - □ P,M,K,N	4.3	5.0	24	62	36	82	45	85
	044 - □ P,M,K,N	4.4	5.0	24	62	36	82	45	85
	045 - □ P,M,K,N	4.5	5.0	24	62	36	82	45	85
	046 - □ P,M,K,N	4.6	5.0	26	62	38	82	45	85
	047 - □ P,M,K,N	4.7	5.0	26	62	38	82	45	85
	048 - □ P,M,K,N	4.8	5.0	26	62	38	82	50	90
	049 - □ P,M,K,N	4.9	5.0	26	62	38	82	50	90
	050 - □ P,M,K,N	5.0	5.0	26	62	38	82	50	90
	051 - □ P,M,K,N	5.1	6.0	28	66	44	82	50	90
	052 - □ P,M,K,N	5.2	6.0	28	66	44	82	50	90
	053 - □ P,M,K,N	5.3	6.0	28	66	44	82	50	90
	054 - □ P,M,K,N	5.4	6.0	28	66	44	82	50	90
	055 - □ P,M,K,N	5.5	6.0	28	66	44	82	57	97
	056 - □ P,M,K,N	5.6	6.0	28	66	44	82	57	97
	057 - □ P,M,K,N	5.7	6.0	28	66	44	82	57	97
	058 - □ P,M,K,N	5.8	6.0	28	66	44	82	57	97
	059 - □ P,M,K,N	5.9	6.0	28	66	44	82	57	97
	060 - □ P,M,K,N	6.0	6.0	28	66	44	82	57	97
	061 - □ P,M,K,N	6.1	7.0	34	74	50	91	66	106
	062 - □ P,M,K,N	6.2	7.0	34	74	50	91	66	106
	063 - □ P,M,K,N	6.3	7.0	34	74	50	91	66	106
	064 - □ P,M,K,N	6.4	7.0	34	74	50	91	66	106
	065 - □ P,M,K,N	6.5	7.0	34	74	50	91	66	106
	066 - □ P,M,K,N	6.6	7.0	34	74	50	91	66	106
	067 - □ P,M,K,N	6.7	7.0	34	74	50	91	66	106
	068 - □ P,M,K,N	6.8	7.0	34	74	50	91	66	106
	069 - □ P,M,K,N	6.9	7.0	34	74	50	91	76	116
	070 - □ P,M,K,N	7.0	7.0	34	74	50	91	76	116
	071 - □ P,M,K,N	7.1	8.0	41	79	53	91	76	116
	072 - □ P,M,K,N	7.2	8.0	41	79	53	91	76	116

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

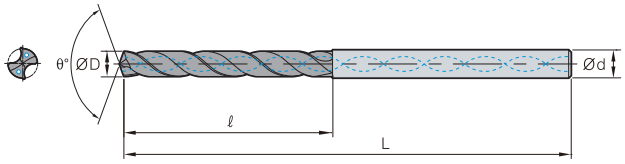
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	073 - □ P,M,K,N	7.3	8.0	41	79	53	91	76	116
	074 - □ P,M,K,N	7.4	8.0	41	79	53	91	76	116
	075 - □ P,M,K,N	7.5	8.0	41	79	53	91	76	116
	076 - □ P,M,K,N	7.6	8.0	41	79	53	91	76	116
	077 - □ P,M,K,N	7.7	8.0	41	79	53	91	76	116
	078 - □ P,M,K,N	7.8	8.0	41	79	53	91	76	116
	079 - □ P,M,K,N	7.9	8.0	41	79	53	91	76	116
	080 - □ P,M,K,N	8.0	8.0	43	84	58	98	87	131
	081 - □ P,M,K,N	8.1	9.0	43	84	58	98	87	131
	082 - □ P,M,K,N	8.2	9.0	43	84	58	98	87	131
	083 - □ P,M,K,N	8.3	9.0	43	84	58	98	87	131
	084 - □ P,M,K,N	8.4	9.0	43	84	58	98	87	131
	085 - □ P,M,K,N	8.5	9.0	43	84	58	98	87	131
	086 - □ P,M,K,N	8.6	9.0	43	84	58	98	87	131
	087 - □ P,M,K,N	8.7	9.0	43	84	58	98	87	131
	088 - □ P,M,K,N	8.8	9.0	43	84	58	98	87	131
	089 - □ P,M,K,N	8.9	9.0	43	84	58	98	87	131
	090 - □ P,M,K,N	9.0	9.0	43	84	58	98	87	131
	091 - □ P,M,K,N	9.1	10.0	47	89	61	105	95	139
	092 - □ P,M,K,N	9.2	10.0	47	89	61	105	95	139
	093 - □ P,M,K,N	9.3	10.0	47	89	61	105	95	139
	094 - □ P,M,K,N	9.4	10.0	47	89	61	105	95	139
	095 - □ P,M,K,N	9.5	10.0	47	89	61	105	95	139
	096 - □ P,M,K,N	9.6	10.0	47	89	61	105	95	139
	097 - □ P,M,K,N	9.7	10.0	47	89	61	105	95	139
	098 - □ P,M,K,N	9.8	10.0	47	89	61	105	95	139
	099 - □ P,M,K,N	9.9	10.0	47	89	61	105	95	139
	100 - □ P,M,K,N	10.0	10.0	47	89	61	105	95	139
	101 - □ P,M,K,N	10.1	11.0	55	95	68	114	106	155
	102 - □ P,M,K,N	10.2	11.0	55	95	68	114	106	155
	103 - □ P,M,K,N	10.3	11.0	55	95	68	114	106	155
	104 - □ P,M,K,N	10.4	11.0	55	95	68	114	106	155
	105 - □ P,M,K,N	10.5	11.0	55	95	68	114	106	155
	106 - □ P,M,K,N	10.6	11.0	55	95	68	114	106	155
	107 - □ P,M,K,N	10.7	11.0	55	95	68	114	106	155
	108 - □ P,M,K,N	10.8	11.0	55	95	68	114	106	155
	109 - □ P,M,K,N	10.9	11.0	55	95	68	114	106	155
	110 - □ P,M,K,N	11.0	11.0	55	95	68	114	106	155
	111 - □ P,M,K,N	11.1	12.0	55	102	71	120	114	163
	112 - □ P,M,K,N	11.2	12.0	55	102	71	120	114	163
	113 - □ P,M,K,N	11.3	12.0	55	102	71	120	114	163
	114 - □ P,M,K,N	11.4	12.0	55	102	71	120	114	163
	115 - □ P,M,K,N	11.5	12.0	55	102	71	120	114	163
	116 - □ P,M,K,N	11.6	12.0	55	102	71	120	114	163
	117 - □ P,M,K,N	11.7	12.0	55	102	71	120	114	163
	118 - □ P,M,K,N	11.8	12.0	55	102	71	120	114	163
	119 - □ P,M,K,N	11.9	12.0	55	102	71	120	114	163
	120 - □ P,M,K,N	12.0	12.0	55	102	71	120	114	163

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

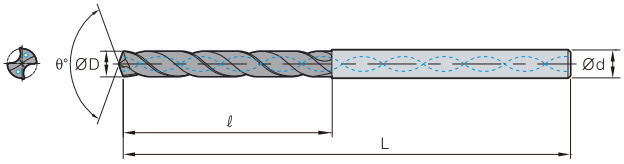
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	121 - □ P,M,K,N	12.1	13.0	60	107	77	124	133	182
	122 - □ P,M,K,N	12.2	13.0	60	107	77	124	133	182
	123 - □ P,M,K,N	12.3	13.0	60	107	77	124	133	182
	124 - □ P,M,K,N	12.4	13.0	60	107	77	124	133	182
	125 - □ P,M,K,N	12.5	13.0	60	107	77	124	133	182
	126 - □ P,M,K,N	12.6	13.0	60	107	77	124	133	182
	127 - □ P,M,K,N	12.7	13.0	60	107	77	124	133	182
	128 - □ P,M,K,N	12.8	13.0	60	107	77	124	133	182
	129 - □ P,M,K,N	12.9	13.0	60	107	77	124	133	182
	130 - □ P,M,K,N	13.0	13.0	60	107	77	124	133	182
	131 - □ P,M,K,N	13.1	14.0	62	107	80	133	133	182
	132 - □ P,M,K,N	13.2	14.0	62	107	80	133	133	182
	133 - □ P,M,K,N	13.3	14.0	62	107	80	133	133	182
	134 - □ P,M,K,N	13.4	14.0	62	107	80	133	133	182
	135 - □ P,M,K,N	13.5	14.0	62	107	80	133	133	182
	136 - □ P,M,K,N	13.6	14.0	62	107	80	133	133	182
	137 - □ P,M,K,N	13.7	14.0	62	107	80	133	133	182
	138 - □ P,M,K,N	13.8	14.0	62	107	80	133	133	182
	139 - □ P,M,K,N	13.9	14.0	62	107	80	133	133	182
	140 - □ P,M,K,N	14.0	14.0	62	107	80	133	133	182
	141 - □ P,M,K,N	14.1	15.0	65	115	85	143	152	204
	142 - □ P,M,K,N	14.2	15.0	65	115	85	143	152	204
	143 - □ P,M,K,N	14.3	15.0	65	115	85	143	152	204
	144 - □ P,M,K,N	14.4	15.0	65	115	85	143	152	204
	145 - □ P,M,K,N	14.5	15.0	65	115	85	143	152	204
	146 - □ P,M,K,N	14.6	15.0	65	115	85	143	152	204
	147 - □ P,M,K,N	14.7	15.0	65	115	85	143	152	204
	148 - □ P,M,K,N	14.8	15.0	65	115	85	143	152	204
	149 - □ P,M,K,N	14.9	15.0	65	115	85	143	152	204
	150 - □ P,M,K,N	15.0	15.0	65	115	85	143	152	204
	151 - □ P,M,K,N	15.1	16.0	68	115	88	143	152	204
	152 - □ P,M,K,N	15.2	16.0	68	115	88	143	152	204
	153 - □ P,M,K,N	15.3	16.0	68	115	88	143	152	204
	154 - □ P,M,K,N	15.4	16.0	68	115	88	143	152	204
	155 - □ P,M,K,N	15.5	16.0	68	115	88	143	152	204
	156 - □ P,M,K,N	15.6	16.0	68	115	88	143	152	204
	157 - □ P,M,K,N	15.7	16.0	68	115	88	143	152	204
	158 - □ P,M,K,N	15.8	16.0	68	115	88	143	152	204
	159 - □ P,M,K,N	15.9	16.0	68	115	88	143	152	204
	160 - □ P,M,K,N	16.0	16.0	68	115	88	143	152	204
	161 - □ P,M,K,N	16.1	17.0	73	123	93	153	171	223
	162 - □ P,M,K,N	16.2	17.0	73	123	93	153	171	223
	163 - □ P,M,K,N	16.3	17.0	73	123	93	153	171	223
	164 - □ P,M,K,N	16.4	17.0	73	123	93	153	171	223
	165 - □ P,M,K,N	16.5	17.0	73	123	93	153	171	223
	166 - □ P,M,K,N	16.6	17.0	73	123	93	153	171	223
	167 - □ P,M,K,N	16.7	17.0	73	123	93	153	171	223
	168 - □ P,M,K,N	16.8	17.0	73	123	93	153	171	223

MSDP(H)-□(P/M/K/N)





Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	169 - □ P,M,K,N	16.9	17.0	73	123	93	153	171	223
	170 - □ P,M,K,N	17.0	17.0	73	123	93	153	171	223
	171 - □ P,M,K,N	17.1	18.0	73	123	98	153	171	223
	172 - □ P,M,K,N	17.2	18.0	73	123	98	153	171	223
	173 - □ P,M,K,N	17.3	18.0	73	123	98	153	171	223
	174 - □ P,M,K,N	17.4	18.0	73	123	98	153	171	223
	175 - □ P,M,K,N	17.5	18.0	73	123	98	153	171	223
	176 - □ P,M,K,N	17.6	18.0	73	123	98	153	171	223
	177 - □ P,M,K,N	17.7	18.0	73	123	98	153	171	223
	178 - □ P,M,K,N	17.8	18.0	73	123	98	153	171	223
	179 - □ P,M,K,N	17.9	18.0	73	123	98	153	171	223
	180 - □ P,M,K,N	18.0	18.0	73	123	98	153	171	223
	181 - □ P,M,K,N	18.1	19.0	79	131	103	153	190	244
	182 - □ P,M,K,N	18.2	19.0	79	131	103	153	190	244
	183 - □ P,M,K,N	18.3	19.0	79	131	103	153	190	244
	184 - □ P,M,K,N	18.4	19.0	79	131	103	153	190	244
	185 - □ P,M,K,N	18.5	19.0	79	131	103	153	190	244
	186 - □ P,M,K,N	18.6	19.0	79	131	103	153	190	244
	187 - □ P,M,K,N	18.7	19.0	79	131	103	153	190	244
	188 - □ P,M,K,N	18.8	19.0	79	131	103	153	190	244
	189 - □ P,M,K,N	18.9	19.0	79	131	103	153	190	244
	190 - □ P,M,K,N	19.0	19.0	79	131	103	153	190	244
	191 - □ P,M,K,N	19.1	20.0	79	131	107	153	190	244
	192 - □ P,M,K,N	19.2	20.0	79	131	107	153	190	244
	193 - □ P,M,K,N	19.3	20.0	79	131	107	153	190	244
	194 - □ P,M,K,N	19.4	20.0	79	131	107	153	190	244
	195 - □ P,M,K,N	19.5	20.0	79	131	107	153	190	244
	196 - □ P,M,K,N	19.6	20.0	79	131	107	153	190	244
	197 - □ P,M,K,N	19.7	20.0	79	131	107	153	190	244
	198 - □ P,M,K,N	19.8	20.0	79	131	107	153	190	244
	199 - □ P,M,K,N	19.9	20.0	79	131	107	153	190	244
	200 - □ P,M,K,N	20.0	20.0	79	131	107	153	190	244

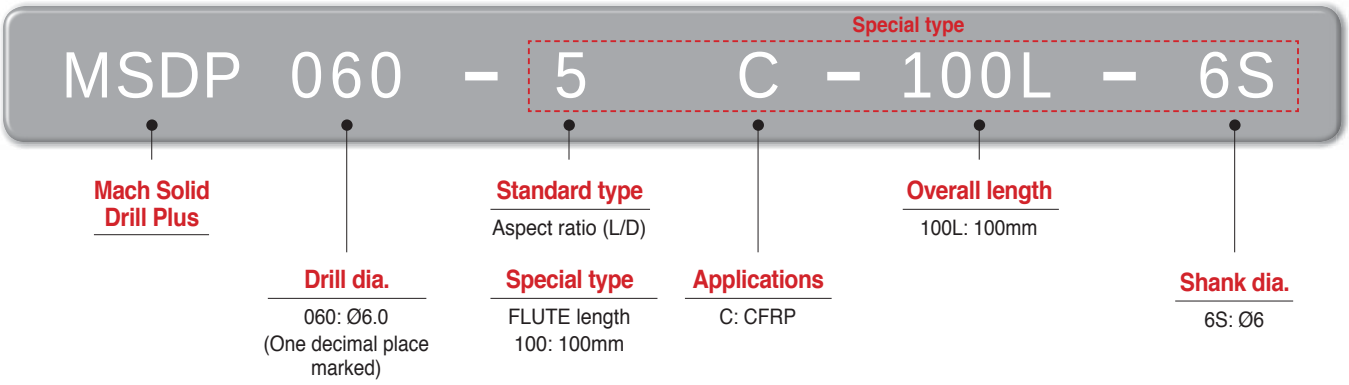
Optimized tool for hole making of CFRP

MSD Plus CFRP new

Mach Solid Drill Plus for Machining CFRP

- Excellent wear resistance thanks due to the new diamond-coated grade, ND2100
- Reduced burrs when machining CFRP thanks to high rake cutting edges

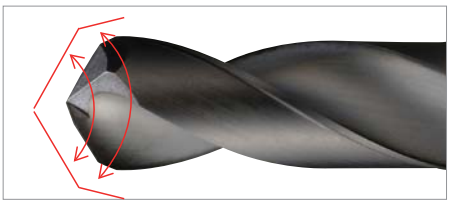
Code system



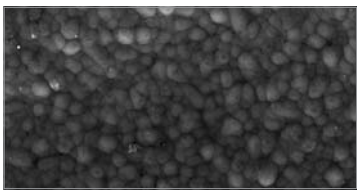
Features

- Reduced thrust around corners thanks to the 2-step point angle
- Reduced burrs when drilling CFRP thanks to high rake cutting edges

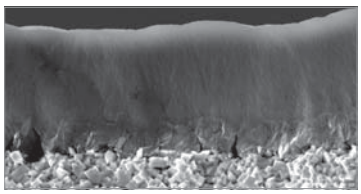




- Diamond Coating specialized in CFRP machining
- Diamond-coated substrate optimized for CFRP cutting

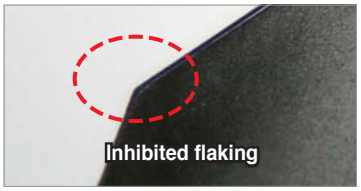


High hardness diamond coating maintains well-cut shapes

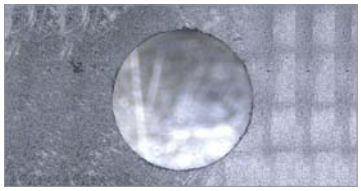


Diamond coating's strong grip to the substrate

- Inhibited burr creation by keeping cutting edges in good shape



Less wear and flaking on the rake surface



Fewer burrs on workpieces

Performance evaluation

- **Workpiece** CFRP
- **Cutting conditions** vc (m/min) = 100, fn (mm/rev) = 0.05, ap (mm) = 10, Air
- **Cutting length** 7.2m (720 holes)
- **Tools** MSDP060-5C (ND2100)

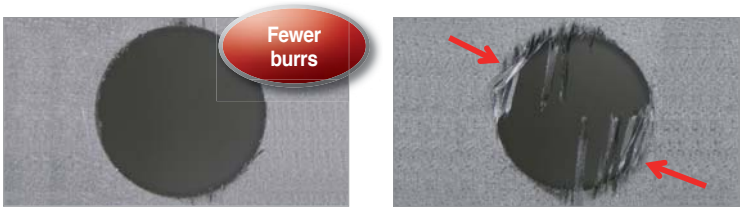
Improved performance quality



MSDP-C Competitor

- **Workpiece** CFRP
- **Cutting conditions** vc (m/min) = 100, fn (mm/rev) = 0.05, ap (mm) = 10, Air
- **Cutting length** 7.2m (720 holes)
- **Tools** MSDP060-5C (ND2100)

Machinability in high quality hole making



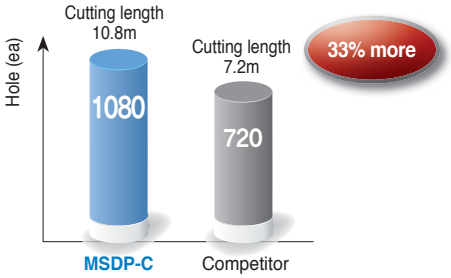
MSDP-C Competitor

Application examples

- **Use** Wing Tail
- **Workpiece** CFRP
- **Cutting conditions** vc (m/min) = 100, fn (mm/rev) = 0.05 ap (mm) = 10, Air
- **Tools** MSDP060-5C (ND2100)



Test result

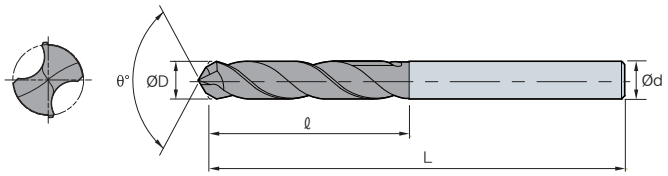


Recommended cutting conditions

Workpiece	Grade	vc (m/min)	Depth of cut = 5D Feed rate (mm/rev) per drill dia. (mm)		
			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
CFRP	ND2100	100 (100~150)	0.03~0.07	0.03~0.07	0.03~0.07

MSDP-5C





Specification	C
Grade	ND2100
Tolerance (drill Dia.)	m7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

C CFRP

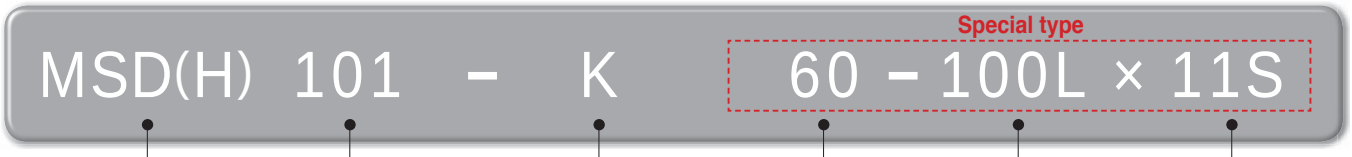
(mm)

Designation		ØD	Ød	5D	
				ℓ	L
MSDP	030-5C	3	6	28	66
	040-5C	4	6	36	74
	0476-5C	4.76	6	44	82
	050-5C	5	6	44	82
	060-5C	6	6	44	82
	0635-5C	6.35	8	53	91
	070-5C	7	8	53	91
	0794-5C	7.94	8	53	91
	080-5C	8	8	53	91
	090-5C	9	10	61	103
	0952-5C	9.52	10	61	103
	100-5C	10	10	61	103
	110-5C	11	12	71	118
	1111-5C	11.11	12	71	118
	120-5C	12	12	71	118
	127-5C	12.7	14	71	124

Various designations of MSD & MSDH enable to do any drilling

Mach Solid Drill

Code system



Oil hole
Solid type: MSD
Coolant: MSDH

Tool dia.
101 = Ø10.1

Applications
P: General - Carbon steel, Alloy steel, Stainless steel, Cast iron
M: Stainless steel
K: Cast iron, Aluminum
N: Aluminum, Brass
ND: Non-ferrous metal

Flute length
60: 60mm

Overall length
100L: 100mm

Shank dia.
11S: Ø11

Features

- **Optimally designed chip pocket**
  - Wide and deep chip pocket improve chip control to minimizing friction during an operation
- **A curvilinear edge**
  - A curvilinear edge offers excellent wear resistance and shock resistance by dispersing the cutting load
- **3D, 5D, 7D Standardization**
  - For example) diameter Ø10mm and depth 30mm and outer coolant system, Take MSD100-3P!
- **MSD: Solid type & MSDH: Through oil-hole type**
  - Various designations of MSD & MSDH enable to do any drilling
- **Low cutting resistance edge**
  - The MSD & MSDH low cutting resistance edge guarantees a better surface roughness and chip control while allowing the drill to center itself
- **Rigid neck of drill**
  - The new design of this drill has an increased rigidity at neck. This prevents breakage of neck on the drill

- **Line-up as per workpiece**
  - P: Steel (Carbon steel, Alloy steel)
    General - Carbon steel, Alloy steel, Stainless steel, Cast iron Low cutting resistance edge, Ultra micro grain substrate, K-Black coating
  - K: Cast iron, Die casting, Ductile cast iron
    Coolant system: Through/Outer (MQL)
  - M: Stainless steel, Reduced built-up edge and cutting resistance
    Coolant system: Through/Outer (MQL)
  - N: Aluminum (Carbide drills), Medium & Low speed cutting performance
    Coolant system: Through/Outer (MQL)
  - ND: Non-ferrous metal, High speed, High efficiency performance
    Improved welding resistance due to applied DLC coating
    Coolant system: Through/Outer (MQL)







Features

- **Low cutting resistance edge**
  - Uniformity in cutting edge treatment: Reinforces repeatable quality in every machined part
  - Protecting workpiece: Low cutting resistance edge operates well in medium to finishing machining, workpiece protection and good surface roughness
  - Better chip breaking: Based on our cutting processes studies, our drills assure better chip breaking in high or low speeds
- **Features of TiAlN Coating**
  - Decreasing of micro particle → Chipping free from macro particle
  - Better hardness and toughness → Covering wide cutting speed and feed rate range
  - Special coating layer at most-outer edge → Special TiAlN with better lubrication guarantees welding resistance
  - Pre-treatment before coating process → Higher adhesion by pre-treatment

Specification line-up

Line-up as per aspect ratio (L: Overall length, D: Tool Dia.)


MSD□□□-7P


MSD□□□-5P


MSD□□□-3P

Line-up as per aspect ratio (Mach Drills: Ø2.5 mm~Ø20 mm)
Various choices as per aspect ratio (3D,5D,7D)
• For example) Solid, Ø10.2 mm, 50 mm
Piercing = 50 ÷ 10.2 ≒ 5 → MSD102-5P

Line-up as per coolant type


MSD Type


MSDH Type

Wide choices for coolant type
• For example) Solid type: MSD,
Through coolant type: MSDH

Line-up as per workpiece

P	General - Carbon steel, Alloy steel, Stainless steel, Cast iron
M	Stainless steel
K	Cast iron, Aluminum
N	Aluminum, Brass
ND	Non-ferrous metal

Cutting condition formula

$$vc = \frac{\pi xDxn}{1000}\ (m/min),\quad fn = \frac{vf}{n}\ (mm/rev)\quad \left[\ n = \frac{vcx1000}{\pi xD}\ (min^{-1}),\quad vf = fn \times n\ (mm/min)\ \right]$$

n: Revolution per minute (min^{-1})
vf: Feed per minute (mm/min)
D: Drill Dia. (mm)
vc: Cutting speed (m/min)
fn: Feed per revolution (mm/rev)
π: 3.1416

Recommended cutting condition

Mach Drill: Solid type [MSD ○○○-□P,M,K]

Workpiece \ Tool dia.		Ø2.5~Ø5.0		Ø5.1~Ø8.0		Ø8.1~Ø10.0		Ø10.1~Ø12.0		Ø12.1~Ø14.0		Ø14.1~Ø20.0	
		vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)
Mild steel, Alloy steel, General steel (Under HRC25)	SCM440	40~70 (55)	0.15 ~0.25	50~110 (65)	0.20 ~0.35	50~110 (70)	0.20 ~0.35	50~120 (75)	0.25 ~0.35	50~120 (75)	0.25 ~0.35	60~120 (80)	0.25 ~0.40
	SM45C	40~80 (60)	0.15 ~0.25	50~120 (70)	0.20 ~0.30	50~120 (75)	0.20 ~0.30	60~120 (80)	0.20 ~0.30	60~120 (80)	0.25 ~0.35	70~120 (90)	0.30 ~0.40
High alloy steel, High carbon steel (Over HRC25)	STD11	15~35 (30)	0.08 ~0.15	20~40 (30)	0.10 ~0.20	20~50 (35)	0.10 ~0.20	20~60 (35)	0.15 ~0.25	20~60 (40)	0.15 ~0.25	30~65 (40)	0.15 ~0.25
Stainless steel	STS	15~30 (25)	0.05 ~0.10	15~45 (25)	0.10 ~0.20	15~50 (30)	0.10 ~0.20	20~60 (35)	0.10 ~0.20	20~65 (35)	0.10 ~0.20	20~70 (40)	0.10 ~0.20
Cast iron	GC	40~90 (70)	0.15 ~0.30	50~120 (80)	0.20 ~0.35	50~120 (80)	0.20 ~0.35	60~130 (90)	0.25 ~0.35	60~130 (95)	0.25 ~0.40	60~140 (95)	0.25 ~0.40
	GCD	40~80 (60)	0.10 ~0.25	50~110 (75)	0.20 ~0.35	50~110 (80)	0.20 ~0.35	50~130 (80)	0.25 ~0.35	50~130 (85)	0.25 ~0.35	60~130 (90)	0.25 ~0.40

Mach Drill: Through oil-hole type [MSDH ○○○-□P,M,K]

Workpiece \ Tool dia.		vc (m/min)	Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
			fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)	fn (mm/rev)
Mild steel, Alloy steel, General steel (Under HRC25)	SCM440	60~140	0.15~0.35	0.15~0.35	0.20~0.35	0.25~0.40	0.30~0.40
	SM45C	60~140	0.15~0.30	0.15~0.30	0.20~0.30	0.25~0.35	0.30~0.40
High alloy steel, High carbon steel (Over HRC25)	STD11	40~80	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
Stainless steel	STS	25~80	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
Cast iron	GC	55~155	0.15~0.35	0.15~0.35	0.20~0.35	0.25~0.40	0.25~0.40
	GCD	55~145	0.10~0.35	0.10~0.35	0.20~0.35	0.25~0.35	0.25~0.40

Note) 1. Decrease cutting speed 30%~40% contrast with recommended condition when machining forged steel
2. Decrease cutting condition considering the overhang of drill, machined rigidity, precision of spindle, clamping and surface of workpiece, etc
3. For longer tool life, Please apply to step feed at every 1.5D
4. Put the drill clamping between edge groove and shank boundary part in order to be located in the suitable position
5. Coolant pressure for through hole type = 3~5kg/cm^3, volume = 2~5l/min

Mach Drills: Through coolant type [MSD(H) ○○○-□N] cemented carbide

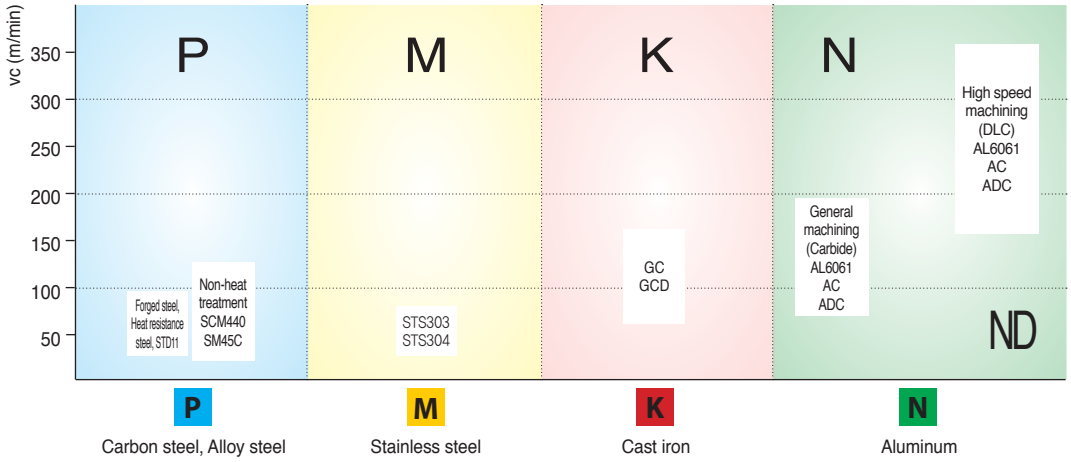
Workpiece \ Tool dia.		Ø2.5~Ø4.0		Ø5.1~Ø10.0		Ø10.1~Ø16.0		Ø16.1~Ø20.0	
		vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)
Aluminum	Alloy steel (Al6061)	60~100	0.20~0.35	90~100	0.30~0.40	100~120	0.30~0.40	100~120	0.30~0.45
	Die-casting (AC,ADC)	60~100	0.20~0.35	90~100	0.30~0.40	100~120	0.30~0.40	100~120	0.30~0.45
Copper alloy (CII00)		60~80	0.08~0.15	60~100	0.10~0.20	80~100	0.10~0.25	80~100	0.10~0.25

Mach Drills : Through coolant type [MSDH ○○○-□ND] DLC coated

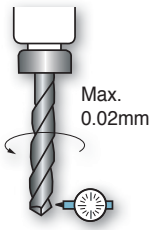
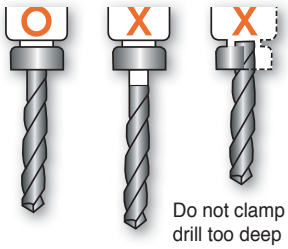
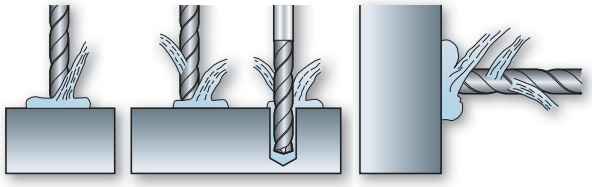
Workpiece \ Tool dia.		Ø2.5~Ø4.0		Ø5.1~Ø10.0		Ø10.1~Ø16.0		Ø16.1~Ø20.0	
		vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)
Aluminum	Alloy steel (Al6061)	80~160	0.08~0.30	80~180	0.12~0.35	80~180	0.15~0.40	80~200	0.15~0.45
	Die-casting (AC,ADC)	80~180	0.08~0.30	80~200	0.12~0.35	80~200	0.15~0.40	80~200	0.15~0.45
Copper alloy (CII00)		80~160	0.08~0.15	80~180	0.10~0.20	80~180	0.10~0.25	80~200	0.10~0.25

Note) Recommended cutting speed is one of the important factors for the drill performance. In case of using further cutting speed or feed rate than recommended conditions to improve the productivity, please apply it after enough tests because it could be occurred some problems like early wear, built-up edge, chipping, fracture, etc

Recommended cutting condition by series

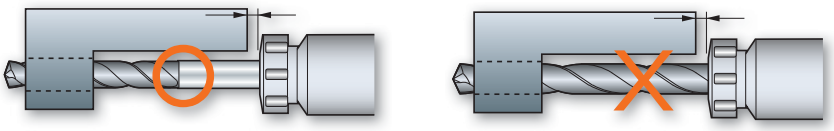


Setting of drills

Outer tolerance	Setting condition	Coolant (External system)
 Max. 0.02mm	 Do not clamp the drill too deep	

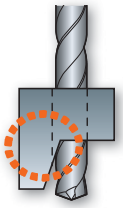
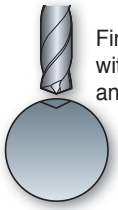
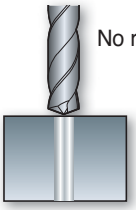
To improve machining method

- **Machining for strength of wheel**



Using short flute length

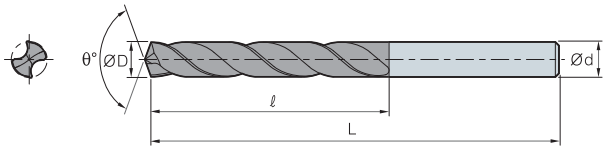
- **Improvement of drilling**

Piercing stage	Circular surface	Inclined surface	Boring
 Decrease feed 1/2	 First, center drilling with large point angle	 First, facing with endmills	 No recommendation

MSD-□(P/M/K/N)

Terminology	P	M	K	N
Grade	PC205F			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal



(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSD	025-□P,M,K,N	2.5	3.0	20	65	25	70	30	75
	026-□P,M,K,N	2.6	3.0	20	65	25	70	30	75
	027-□P,M,K,N	2.7	3.0	20	65	25	70	30	75
	028-□P,M,K,N	2.8	3.0	20	65	25	70	30	75
	029-□P,M,K,N	2.9	3.0	20	65	25	70	30	75
	030-□P,M,K,N	3.0	3.0	20	65	25	70	30	75
	031-□P,M,K,N	3.1	4.0	25	71	34	80	40	86
	032-□P,M,K,N	3.2	4.0	25	71	34	80	40	86
	033-□P,M,K,N	3.3	4.0	25	71	34	80	40	86
	034-□P,M,K,N	3.4	4.0	25	71	34	80	40	86
	035-□P,M,K,N	3.5	4.0	25	71	34	80	40	86
	036-□P,M,K,N	3.6	4.0	25	71	34	80	40	86
	037-□P,M,K,N	3.7	4.0	25	71	34	80	40	86
	038-□P,M,K,N	3.8	4.0	25	71	34	80	40	86
	039-□P,M,K,N	3.9	4.0	25	71	34	80	40	86
	040-□P,M,K,N	4.0	4.0	25	71	34	80	40	86
	041-□P,M,K,N	4.1	5.0	30	77	43	90	50	97
	042-□P,M,K,N	4.2	5.0	30	77	43	90	50	97
	043-□P,M,K,N	4.3	5.0	30	77	43	90	50	97
	044-□P,M,K,N	4.4	5.0	30	77	43	90	50	97
	045-□P,M,K,N	4.5	5.0	30	77	43	90	50	97
	046-□P,M,K,N	4.6	5.0	30	77	43	90	50	97
	047-□P,M,K,N	4.7	5.0	30	77	43	90	50	97
	048-□P,M,K,N	4.8	5.0	30	77	43	90	50	97
	049-□P,M,K,N	4.9	5.0	30	77	43	90	50	97
	050-□P,M,K,N	5.0	5.0	30	77	43	90	50	97
	051-□P,M,K,N	5.1	6.0	35	81	48	96	60	108
	052-□P,M,K,N	5.2	6.0	35	81	48	96	60	108
	053-□P,M,K,N	5.3	6.0	35	81	48	96	60	108
	054-□P,M,K,N	5.4	6.0	35	81	48	96	60	108
	055-□P,M,K,N	5.5	6.0	35	81	48	96	60	108
	056-□P,M,K,N	5.6	6.0	35	81	48	96	60	108
	057-□P,M,K,N	5.7	6.0	35	81	48	96	60	108
	058-□P,M,K,N	5.8	6.0	35	81	48	96	60	108
	059-□P,M,K,N	5.9	6.0	35	81	48	96	60	108
	060-□P,M,K,N	6.0	6.0	35	81	48	96	60	108
	061-□P,M,K,N	6.1	7.0	40	84	56	105	70	120
	062-□P,M,K,N	6.2	7.0	40	84	56	105	70	120
	063-□P,M,K,N	6.3	7.0	40	84	56	105	70	120
	064-□P,M,K,N	6.4	7.0	40	84	56	105	70	120
	065-□P,M,K,N	6.5	7.0	40	84	56	105	70	120
	066-□P,M,K,N	6.6	7.0	40	84	56	105	70	120
	067-□P,M,K,N	6.7	7.0	40	84	56	105	70	120
	068-□P,M,K,N	6.8	7.0	40	84	56	105	70	120

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L×Shank diameter S

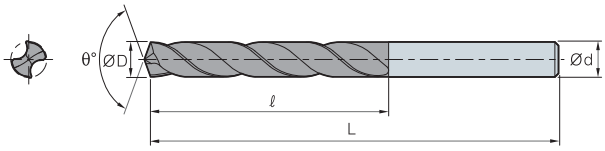
Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length: 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

MSD-□(P/M/K/N)

Terminology	P	M	K	N
Grade	PC205F			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal



(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSD	069-□P,M,K,N	6.9	7.0	40	84	56	105	70	120
	070-□P,M,K,N	7.0	7.0	40	84	56	105	70	120
	071-□P,M,K,N	7.1	8.0	45	90	60	105	80	120
	072-□P,M,K,N	7.2	8.0	45	90	60	110	80	130
	073-□P,M,K,N	7.3	8.0	45	90	60	110	80	130
	074-□P,M,K,N	7.4	8.0	45	90	60	110	80	130
	075-□P,M,K,N	7.5	8.0	45	90	60	110	80	130
	076-□P,M,K,N	7.6	8.0	45	90	60	110	80	130
	077-□P,M,K,N	7.7	8.0	45	90	60	110	80	130
	078-□P,M,K,N	7.8	8.0	45	90	60	110	80	130
	079-□P,M,K,N	7.9	8.0	45	90	60	110	80	130
	080-□P,M,K,N	8.0	8.0	45	90	60	110	80	130
	081-□P,M,K,N	8.1	9.0	48	97	72	125	90	143
	082-□P,M,K,N	8.2	9.0	48	97	72	125	90	143
	083-□P,M,K,N	8.3	9.0	48	97	72	125	90	143
	084-□P,M,K,N	8.4	9.0	48	97	72	125	90	143
	085-□P,M,K,N	8.5	9.0	48	97	72	125	90	143
	086-□P,M,K,N	8.6	9.0	48	97	72	125	90	143
	087-□P,M,K,N	8.7	9.0	48	97	72	125	90	143
	088-□P,M,K,N	8.8	9.0	48	97	72	125	90	143
	089-□P,M,K,N	8.9	9.0	48	97	72	125	90	143
	090-□P,M,K,N	9.0	9.0	48	97	72	125	90	143
	091-□P,M,K,N	9.1	10.0	52	106	75	129	95	150
	092-□P,M,K,N	9.2	10.0	52	106	75	129	95	150
	093-□P,M,K,N	9.3	10.0	52	106	75	129	95	150
	094-□P,M,K,N	9.4	10.0	52	106	75	129	95	150
	095-□P,M,K,N	9.5	10.0	52	106	75	129	95	150
	096-□P,M,K,N	9.6	10.0	52	106	75	129	95	150
	097-□P,M,K,N	9.7	10.0	52	106	75	129	95	150
	098-□P,M,K,N	9.8	10.0	52	106	75	129	95	150
	099-□P,M,K,N	9.9	10.0	52	106	75	129	95	150
	100-□P,M,K,N	10.0	10.0	52	106	75	129	95	150
	101-□P,M,K,N	10.1	11.0	56	111	83	140	105	160
	102-□P,M,K,N	10.2	11.0	56	111	83	140	105	160
	103-□P,M,K,N	10.3	11.0	56	111	83	140	105	160
	104-□P,M,K,N	10.4	11.0	56	111	83	140	105	160
	105-□P,M,K,N	10.5	11.0	56	111	83	140	105	160
	106-□P,M,K,N	10.6	11.0	56	111	83	140	105	160
	107-□P,M,K,N	10.7	11.0	56	111	83	140	105	160
	108-□P,M,K,N	10.8	11.0	56	111	83	140	105	160
	109-□P,M,K,N	10.9	11.0	56	111	83	140	105	160
	110-□P,M,K,N	11.0	11.0	56	111	83	140	105	160
	111-□P,M,K,N	11.1	12.0	60	118	90	148	114	172
	112-□P,M,K,N	11.2	12.0	60	118	90	148	114	172

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

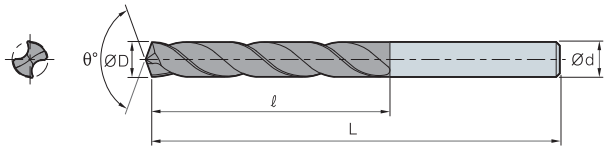
Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length: 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

MSD-□(P/M/K/N)

Terminology	P	M	K	N
Grade	PC205F			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal



(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSD	113-□P,M,K,N	11.3	12.0	60	118	90	148	114	172
	114-□P,M,K,N	11.4	12.0	60	118	90	148	114	172
	115-□P,M,K,N	11.5	12.0	60	118	90	148	114	172
	116-□P,M,K,N	11.6	12.0	60	118	90	148	114	172
	117-□P,M,K,N	11.7	12.0	60	118	90	148	114	172
	118-□P,M,K,N	11.8	12.0	60	118	90	148	114	172
	119-□P,M,K,N	11.9	12.0	60	118	90	148	114	172
	120-□P,M,K,N	12.0	12.0	60	118	90	148	114	172
	121-□P,M,K,N	12.1	13.0	65	125	98	158	124	184
	122-□P,M,K,N	12.2	13.0	65	125	98	158	124	184
	123-□P,M,K,N	12.3	13.0	65	125	98	158	124	184
	124-□P,M,K,N	12.4	13.0	65	125	98	158	124	184
	125-□P,M,K,N	12.5	13.0	65	125	98	158	124	184
	126-□P,M,K,N	12.6	13.0	65	125	98	158	124	184
	127-□P,M,K,N	12.7	13.0	65	125	98	158	124	184
	128-□P,M,K,N	12.8	13.0	65	125	98	158	124	184
	129-□P,M,K,N	12.9	13.0	65	125	98	158	124	184
	130-□P,M,K,N	13.0	13.0	65	125	98	158	124	184
	131-□P,M,K,N	13.1	14.0	70	132	105	167	133	195
	132-□P,M,K,N	13.2	14.0	70	132	105	167	133	195
	133-□P,M,K,N	13.3	14.0	70	132	105	167	133	195
	134-□P,M,K,N	13.4	14.0	70	132	105	167	133	195
	135-□P,M,K,N	13.5	14.0	70	132	105	167	133	195
	136-□P,M,K,N	13.6	14.0	70	132	105	167	133	195
	137-□P,M,K,N	13.7	14.0	70	132	105	167	133	195
	138-□P,M,K,N	13.8	14.0	70	132	105	167	133	195
	139-□P,M,K,N	13.9	14.0	70	132	105	167	133	195
	140-□P,M,K,N	14.0	14.0	70	132	105	167	133	195
	141-□P,M,K,N	14.1	15.0	75	139	108	172	138	202
	142-□P,M,K,N	14.2	15.0	75	139	108	172	138	202
	143-□P,M,K,N	14.3	15.0	75	139	108	172	138	202
	144-□P,M,K,N	14.4	15.0	75	139	108	172	138	202
	145-□P,M,K,N	14.5	15.0	75	139	108	172	138	202
	146-□P,M,K,N	14.6	15.0	75	139	108	172	138	202
	147-□P,M,K,N	14.7	15.0	75	139	108	172	138	202
	148-□P,M,K,N	14.8	15.0	75	139	108	172	138	202
	149-□P,M,K,N	14.9	15.0	75	139	108	172	138	202
	150-□P,M,K,N	15.0	15.0	75	139	108	172	138	202
	151-□P,M,K,N	15.1	16.0	80	146	112	178	144	210
	152-□P,M,K,N	15.2	16.0	80	146	112	178	144	210
	153-□P,M,K,N	15.3	16.0	80	146	112	178	144	210
	154-□P,M,K,N	15.4	16.0	80	146	112	178	144	210
	155-□P,M,K,N	15.5	16.0	80	146	112	178	144	210
	156-□P,M,K,N	15.6	16.0	80	146	112	178	144	210

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

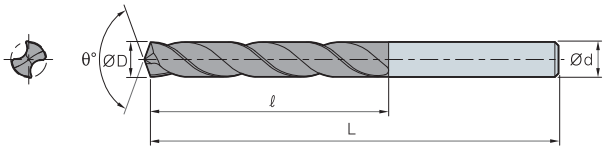
Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length : 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

MSD-□(P/M/K/N)

Terminology	P	M	K	N
Grade	PC205F			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal



(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSD	157-□P,M,K,N	15.7	16.0	80	146	112	178	144	210
	158-□P,M,K,N	15.8	16.0	80	146	112	178	144	210
	159-□P,M,K,N	15.9	16.0	80	146	112	178	144	210
	160-□P,M,K,N	16.0	16.0	80	146	112	178	144	210
	161-□P,M,K,N	16.1	17.0	85	151	120	186	153	220
	162-□P,M,K,N	16.2	17.0	85	151	120	186	153	220
	163-□P,M,K,N	16.3	17.0	85	151	120	186	153	220
	164-□P,M,K,N	16.4	17.0	85	151	120	186	153	220
	165-□P,M,K,N	16.5	17.0	85	151	120	186	153	220
	166-□P,M,K,N	16.6	17.0	85	151	120	186	153	220
	167-□P,M,K,N	16.7	17.0	85	151	120	186	153	220
	168-□P,M,K,N	16.8	17.0	85	151	120	186	153	220
	169-□P,M,K,N	16.9	17.0	85	151	120	186	153	220
	170-□P,M,K,N	17.0	17.0	85	151	120	186	153	220
	171-□P,M,K,N	17.1	18.0	85	153	120	188	162	230
	172-□P,M,K,N	17.2	18.0	85	153	120	188	162	230
	173-□P,M,K,N	17.3	18.0	85	153	120	188	162	230
	174-□P,M,K,N	17.4	18.0	85	153	120	188	162	230
	175-□P,M,K,N	17.5	18.0	85	153	120	188	162	230
	176-□P,M,K,N	17.6	18.0	85	153	120	188	162	230
	177-□P,M,K,N	17.7	18.0	85	153	120	188	162	230
	178-□P,M,K,N	17.8	18.0	85	153	120	188	162	230
	179-□P,M,K,N	17.9	18.0	85	153	120	188	162	230
	180-□P,M,K,N	18.0	18.0	85	153	120	188	162	230
	181-□P,M,K,N	18.1	19.0	88	157	124	193	171	240
	182-□P,M,K,N	18.2	19.0	88	157	124	193	171	240
	183-□P,M,K,N	18.3	19.0	88	157	124	193	171	240
	184-□P,M,K,N	18.4	19.0	88	157	124	193	171	240
	185-□P,M,K,N	18.5	19.0	88	157	124	193	171	240
	186-□P,M,K,N	18.6	19.0	88	157	124	193	171	240
	187-□P,M,K,N	18.7	19.0	88	157	124	193	171	240
	188-□P,M,K,N	18.8	19.0	88	157	124	193	171	240
	189-□P,M,K,N	18.9	19.0	88	157	124	193	171	240
	190-□P,M,K,N	19.0	19.0	88	157	124	193	171	240
	191-□P,M,K,N	19.1	20.0	90	160	130	200	180	250
	192-□P,M,K,N	19.2	20.0	90	160	130	200	180	250
	193-□P,M,K,N	19.3	20.0	90	160	130	200	180	250
	194-□P,M,K,N	19.4	20.0	90	160	130	200	180	250
	195-□P,M,K,N	19.5	20.0	90	160	130	200	180	250
	196-□P,M,K,N	19.6	20.0	90	160	130	200	180	250
	197-□P,M,K,N	19.7	20.0	90	160	130	200	180	250
	198-□P,M,K,N	19.8	20.0	90	160	130	200	180	250
	199-□P,M,K,N	19.9	20.0	90	160	130	200	180	250
	200-□P,M,K,N	20.0	20.0	90	160	130	200	180	250

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

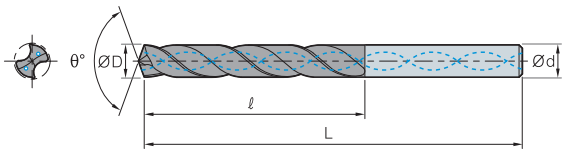
Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length : 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)

Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance (drill Dia.)	h7				
Tolerance (shank Dia.)	h6				
Point angle	140°			135°	140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through				

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



(mm)

Designation		ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND	
				ℓ	L	ℓ	L	ℓ	L
MSDH	025-□P,M,K,N	2.5	3.0	20	65	25	70	30	75
	026-□P,M,K,N	2.6	3.0	20	65	25	70	30	75
	027-□P,M,K,N	2.7	3.0	20	65	25	70	30	75
	028-□P,M,K,N	2.8	3.0	20	65	25	70	30	75
	029-□P,M,K,N	2.9	3.0	20	65	25	70	30	75
	030-□P,M,K,N	3.0	3.0	20	65	25	70	30	75
	031-□P,M,K,N	3.1	4.0	25	71	34	80	40	86
	032-□P,M,K,N	3.2	4.0	25	71	34	80	40	86
	033-□P,M,K,N	3.3	4.0	25	71	34	80	40	86
	034-□P,M,K,N	3.4	4.0	25	71	34	80	40	86
	035-□P,M,K,N	3.5	4.0	25	71	34	80	40	86
	036-□P,M,K,N	3.6	4.0	25	71	34	80	40	86
	037-□P,M,K,N	3.7	4.0	25	71	34	80	40	86
	038-□P,M,K,N	3.8	4.0	25	71	34	80	40	86
	039-□P,M,K,N	3.9	4.0	25	71	34	80	40	86
	040-□P,M,K,N	4.0	4.0	25	71	34	80	40	86
	041-□P,M,K,N	4.1	5.0	30	77	43	90	50	97
	042-□P,M,K,N	4.2	5.0	30	77	43	90	50	97
	043-□P,M,K,N	4.3	5.0	30	77	43	90	50	97
	044-□P,M,K,N	4.4	5.0	30	77	43	90	50	97
	045-□P,M,K,N	4.5	5.0	30	77	43	90	50	97
	046-□P,M,K,N	4.6	5.0	30	77	43	90	50	97
	047-□P,M,K,N	4.7	5.0	30	77	43	90	50	97
	048-□P,M,K,N	4.8	5.0	30	77	43	90	50	97
	049-□P,M,K,N	4.9	5.0	30	77	43	90	50	97
	050-□P,M,K,N	5.0	5.0	30	77	43	90	50	97
	051-□P,M,K,N	5.1	6.0	35	81	48	96	60	108
	052-□P,M,K,N	5.2	6.0	35	81	48	96	60	108
	053-□P,M,K,N	5.3	6.0	35	81	48	96	60	108
	054-□P,M,K,N	5.4	6.0	35	81	48	96	60	108
	055-□P,M,K,N	5.5	6.0	35	81	48	96	60	108
	056-□P,M,K,N	5.6	6.0	35	81	48	96	60	108
	057-□P,M,K,N	5.7	6.0	35	81	48	96	60	108
	058-□P,M,K,N	5.8	6.0	35	81	48	96	60	108
	059-□P,M,K,N	5.9	6.0	35	81	48	96	60	108
	060-□P,M,K,N	6.0	6.0	35	81	48	96	60	108
	061-□P,M,K,N	6.1	7.0	40	84	56	105	70	120
	062-□P,M,K,N	6.2	7.0	40	84	56	105	70	120
	063-□P,M,K,N	6.3	7.0	40	84	56	105	70	120
	064-□P,M,K,N	6.4	7.0	40	84	56	105	70	120
	065-□P,M,K,N	6.5	7.0	40	84	56	105	70	120
	066-□P,M,K,N	6.6	7.0	40	84	56	105	70	120
	067-□P,M,K,N	6.7	7.0	40	84	56	105	70	120
	068-□P,M,K,N	6.8	7.0	40	84	56	105	70	120

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

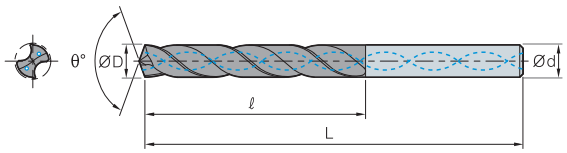
Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length: 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)

Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance (drill Dia.)	h7				
Tolerance (shank Dia.)	h6				
Point angle	140°		135°		140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through				

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



(mm)

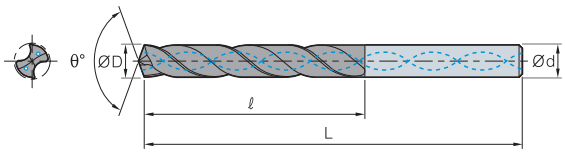
Designation		ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND	
				ℓ	L	ℓ	L	ℓ	L
MSDH	069-□P,M,K,N	6.9	7.0	40	84	56	105	70	120
	070-□P,M,K,N	7.0	7.0	40	84	56	105	70	120
	071-□P,M,K,N	7.1	8.0	45	90	60	105	80	120
	072-□P,M,K,N	7.2	8.0	45	90	60	110	80	130
	073-□P,M,K,N	7.3	8.0	45	90	60	110	80	130
	074-□P,M,K,N	7.4	8.0	45	90	60	110	80	130
	075-□P,M,K,N	7.5	8.0	45	90	60	110	80	130
	076-□P,M,K,N	7.6	8.0	45	90	60	110	80	130
	077-□P,M,K,N	7.7	8.0	45	90	60	110	80	130
	078-□P,M,K,N	7.8	8.0	45	90	60	110	80	130
	079-□P,M,K,N	7.9	8.0	45	90	60	110	80	130
	080-□P,M,K,N	8.0	8.0	45	90	60	110	80	130
	081-□P,M,K,N	8.1	9.0	48	97	72	125	90	143
	082-□P,M,K,N	8.2	9.0	48	97	72	125	90	143
	083-□P,M,K,N	8.3	9.0	48	97	72	125	90	143
	084-□P,M,K,N	8.4	9.0	48	97	72	125	90	143
	085-□P,M,K,N	8.5	9.0	48	97	72	125	90	143
	086-□P,M,K,N	8.6	9.0	48	97	72	125	90	143
	087-□P,M,K,N	8.7	9.0	48	97	72	125	90	143
	088-□P,M,K,N	8.8	9.0	48	97	72	125	90	143
	089-□P,M,K,N	8.9	9.0	48	97	72	125	90	143
	090-□P,M,K,N	9.0	9.0	48	97	72	125	90	143
	091-□P,M,K,N	9.1	10.0	52	106	75	129	95	150
	092-□P,M,K,N	9.2	10.0	52	106	75	129	95	150
	093-□P,M,K,N	9.3	10.0	52	106	75	129	95	150
	094-□P,M,K,N	9.4	10.0	52	106	75	129	95	150
	095-□P,M,K,N	9.5	10.0	52	106	75	129	95	150
	096-□P,M,K,N	9.6	10.0	52	106	75	129	95	150
	097-□P,M,K,N	9.7	10.0	52	106	75	129	95	150
	098-□P,M,K,N	9.8	10.0	52	106	75	129	95	150
	099-□P,M,K,N	9.9	10.0	52	106	75	129	95	150
	100-□P,M,K,N	10.0	10.0	52	106	75	129	95	150
	101-□P,M,K,N	10.1	11.0	56	111	83	140	105	160
	102-□P,M,K,N	10.2	11.0	56	111	83	140	105	160
	103-□P,M,K,N	10.3	11.0	56	111	83	140	105	160
	104-□P,M,K,N	10.4	11.0	56	111	83	140	105	160
	105-□P,M,K,N	10.5	11.0	56	111	83	140	105	160
	106-□P,M,K,N	10.6	11.0	56	111	83	140	105	160
	107-□P,M,K,N	10.7	11.0	56	111	83	140	105	160
	108-□P,M,K,N	10.8	11.0	56	111	83	140	105	160
	109-□P,M,K,N	10.9	11.0	56	111	83	140	105	160
	110-□P,M,K,N	11.0	11.0	56	111	83	140	105	160
	111-□P,M,K,N	11.1	12.0	60	118	90	148	114	172
	112-□P,M,K,N	11.2	12.0	60	118	90	148	114	172

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length: 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)



Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance (drill Dia.)	h7				
Tolerance (shank Dia.)	h6				
Point angle	140°		135°		140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through				

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy

(mm)

Designation		ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND	
				ℓ	L	ℓ	L	ℓ	L
MSDH	113-□P,M,K,N	11.3	12.0	60	118	90	148	114	172
	114-□P,M,K,N	11.4	12.0	60	118	90	148	114	172
	115-□P,M,K,N	11.5	12.0	60	118	90	148	114	172
	116-□P,M,K,N	11.6	12.0	60	118	90	148	114	172
	117-□P,M,K,N	11.7	12.0	60	118	90	148	114	172
	118-□P,M,K,N	11.8	12.0	60	118	90	148	114	172
	119-□P,M,K,N	11.9	12.0	60	118	90	148	114	172
	120-□P,M,K,N	12.0	12.0	60	118	90	148	114	172
	121-□P,M,K,N	12.1	13.0	65	125	98	158	124	184
	122-□P,M,K,N	12.2	13.0	65	125	98	158	124	184
	123-□P,M,K,N	12.3	13.0	65	125	98	158	124	184
	124-□P,M,K,N	12.4	13.0	65	125	98	158	124	184
	125-□P,M,K,N	12.5	13.0	65	125	98	158	124	184
	126-□P,M,K,N	12.6	13.0	65	125	98	158	124	184
	127-□P,M,K,N	12.7	13.0	65	125	98	158	124	184
	128-□P,M,K,N	12.8	13.0	65	125	98	158	124	184
	129-□P,M,K,N	12.9	13.0	65	125	98	158	124	184
	130-□P,M,K,N	13.0	13.0	65	125	98	158	124	184
	131-□P,M,K,N	13.1	14.0	70	132	105	167	133	195
	132-□P,M,K,N	13.2	14.0	70	132	105	167	133	195
	133-□P,M,K,N	13.3	14.0	70	132	105	167	133	195
	134-□P,M,K,N	13.4	14.0	70	132	105	167	133	195
	135-□P,M,K,N	13.5	14.0	70	132	105	167	133	195
	136-□P,M,K,N	13.6	14.0	70	132	105	167	133	195
	137-□P,M,K,N	13.7	14.0	70	132	105	167	133	195
	138-□P,M,K,N	13.8	14.0	70	132	105	167	133	195
	139-□P,M,K,N	13.9	14.0	70	132	105	167	133	195
	140-□P,M,K,N	14.0	14.0	70	132	105	167	133	195
	141-□P,M,K,N	14.1	15.0	75	139	108	172	138	202
	142-□P,M,K,N	14.2	15.0	75	139	108	172	138	202
	143-□P,M,K,N	14.3	15.0	75	139	108	172	138	202
	144-□P,M,K,N	14.4	15.0	75	139	108	172	138	202
	145-□P,M,K,N	14.5	15.0	75	139	108	172	138	202
	146-□P,M,K,N	14.6	15.0	75	139	108	172	138	202
	147-□P,M,K,N	14.7	15.0	75	139	108	172	138	202
	148-□P,M,K,N	14.8	15.0	75	139	108	172	138	202
	149-□P,M,K,N	14.9	15.0	75	139	108	172	138	202
	150-□P,M,K,N	15.0	15.0	75	139	108	172	138	202
	151-□P,M,K,N	15.1	16.0	80	146	112	178	144	210
	152-□P,M,K,N	15.2	16.0	80	146	112	178	144	210
	153-□P,M,K,N	15.3	16.0	80	146	112	178	144	210
	154-□P,M,K,N	15.4	16.0	80	146	112	178	144	210
	155-□P,M,K,N	15.5	16.0	80	146	112	178	144	210
	156-□P,M,K,N	15.6	16.0	80	146	112	178	144	210

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

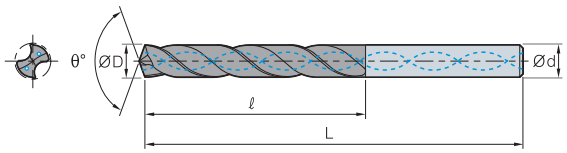
Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length: 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

MSDH-□(P/M/K/N)

Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance (drill Dia.)	h7				
Tolerance (shank Dia.)	h6				
Point angle	140°		135°		140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through				

P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy



(mm)

Designation		ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND	
				ℓ	L	ℓ	L	ℓ	L
MSDH	157-□P,M,K,N	15.7	16.0	80	146	112	178	144	210
	158-□P,M,K,N	15.8	16.0	80	146	112	178	144	210
	159-□P,M,K,N	15.9	16.0	80	146	112	178	144	210
	160-□P,M,K,N	16.0	16.0	80	146	112	178	144	210
	161-□P,M,K,N	16.1	17.0	85	151	120	186	153	220
	162-□P,M,K,N	16.2	17.0	85	151	120	186	153	220
	163-□P,M,K,N	16.3	17.0	85	151	120	186	153	220
	164-□P,M,K,N	16.4	17.0	85	151	120	186	153	220
	165-□P,M,K,N	16.5	17.0	85	151	120	186	153	220
	166-□P,M,K,N	16.6	17.0	85	151	120	186	153	220
	167-□P,M,K,N	16.7	17.0	85	151	120	186	153	220
	168-□P,M,K,N	16.8	17.0	85	151	120	186	153	220
	169-□P,M,K,N	16.9	17.0	85	151	120	186	153	220
	170-□P,M,K,N	17.0	17.0	85	151	120	186	153	220
	171-□P,M,K,N	17.1	18.0	85	153	120	188	162	230
	172-□P,M,K,N	17.2	18.0	85	153	120	188	162	230
	173-□P,M,K,N	17.3	18.0	85	153	120	188	162	230
	174-□P,M,K,N	17.4	18.0	85	153	120	188	162	230
	175-□P,M,K,N	17.5	18.0	85	153	120	188	162	230
	176-□P,M,K,N	17.6	18.0	85	153	120	188	162	230
	177-□P,M,K,N	17.7	18.0	85	153	120	188	162	230
	178-□P,M,K,N	17.8	18.0	85	153	120	188	162	230
	179-□P,M,K,N	17.9	18.0	85	153	120	188	162	230
	180-□P,M,K,N	18.0	18.0	85	153	120	188	162	230
	181-□P,M,K,N	18.1	19.0	88	157	124	193	171	240
	182-□P,M,K,N	18.2	19.0	88	157	124	193	171	240
	183-□P,M,K,N	18.3	19.0	88	157	124	193	171	240
	184-□P,M,K,N	18.4	19.0	88	157	124	193	171	240
	185-□P,M,K,N	18.5	19.0	88	157	124	193	171	240
	186-□P,M,K,N	18.6	19.0	88	157	124	193	171	240
	187-□P,M,K,N	18.7	19.0	88	157	124	193	171	240
	188-□P,M,K,N	18.8	19.0	88	157	124	193	171	240
	189-□P,M,K,N	18.9	19.0	88	157	124	193	171	240
	190-□P,M,K,N	19.0	19.0	88	157	124	193	171	240
	191-□P,M,K,N	19.1	20.0	90	160	130	200	180	250
	192-□P,M,K,N	19.2	20.0	90	160	130	200	180	250
	193-□P,M,K,N	19.3	20.0	90	160	130	200	180	250
	194-□P,M,K,N	19.4	20.0	90	160	130	200	180	250
	195-□P,M,K,N	19.5	20.0	90	160	130	200	180	250
	196-□P,M,K,N	19.6	20.0	90	160	130	200	180	250
	197-□P,M,K,N	19.7	20.0	90	160	130	200	180	250
	198-□P,M,K,N	19.8	20.0	90	160	130	200	180	250
	199-□P,M,K,N	19.9	20.0	90	160	130	200	180	250
	200-□P,M,K,N	20.0	20.0	90	160	130	200	180	250

※ Order made items: MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece: SM45C, Machined diameter: Ø10.1mm, Flute length: 60mm, Total length: 80mm, Shank diameter: Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece: STS303, Machined diameter: Ø10.12mm, Flute length: Flute length:60mm, Total length: 80mm, Shank diameter: Ø11 → MSD1012 - M × 60 - 80L × 11S

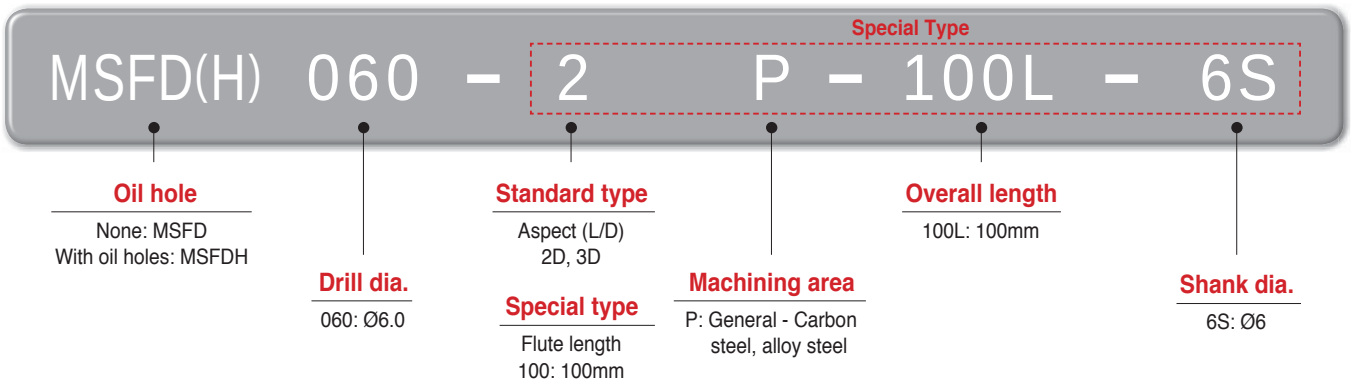
The best tool for ramped, curved or flat workpieces

MSFD new

Mach Solid Flat Drill

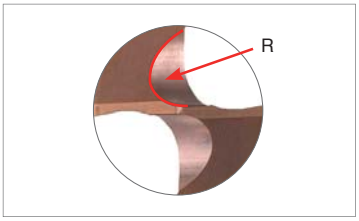
- High quality hole making capability with 180°-point angle
- Improved anti chipping and welding resistance by edge honing and chamfering
  Minimized creation of burrs compared to general drills

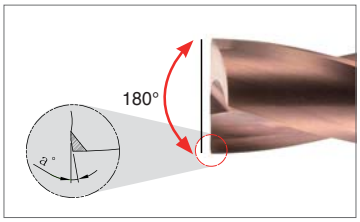
Code system



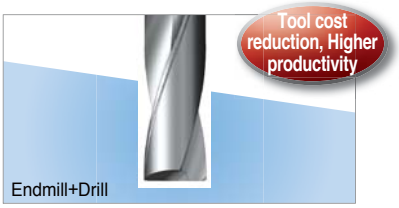
Features

- Excellent straightness with its 180°-point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Widened chip pockets by the use of 'R' shape on the thinning part

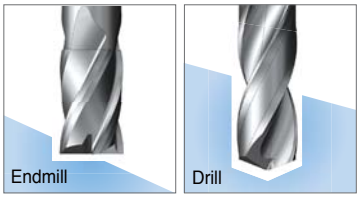




- Multi-functional capability - end milling and drilling using a single MSFD



MSFD



Conventional tools used and their application



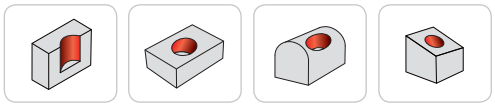
MSFD



Competitor

Wide applications

• A wide range of applications and improved cutting performance



Performance evaluation

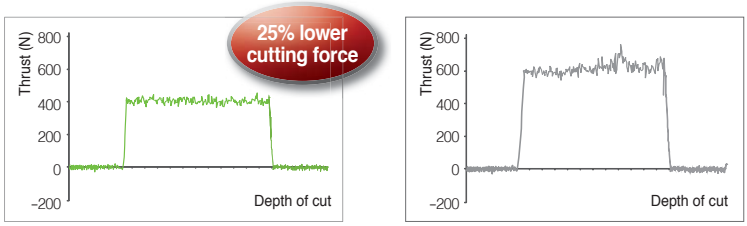
- **Workpiece** SM48C
- **Cutting conditions** vc (m/min) = 80, fn (mm/min) = 0.10, ap (mm) = 15, wet
- **Cutting length** 7.2m (600 holes)
- **Tools** MSFD060-2P (PC325U)



MSFD
Prolongs tool life

Competitor

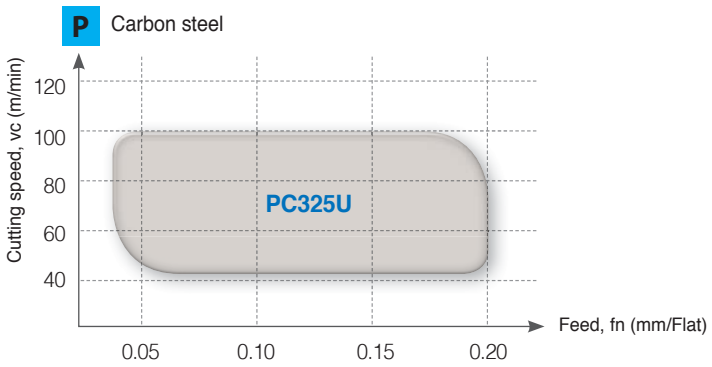
- **Workpiece** SM45C
- **Cutting conditions** vc (m/min) = 70, fn (mm/min) = 0.10, ap (mm) = 15, wet
- **Tools** MSDP060-3P (PC325U)



MSFD (Average thrust of 160N)
Stable hole size consistency and better surface finish

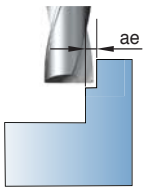
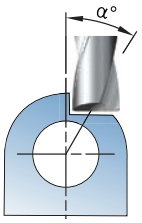
Competitor (Average thrust of 214N)

Application range

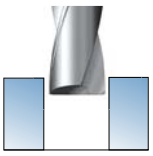
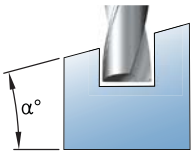




Application methods

Application type	Recommended machining conditions
	• Radial depth of cuts should be less than half the drill radius • In case of increasing depth of cuts, divide the machining process into two passes
	• Use the tool within 30° from the center of the curve • Reduce the feed rate when the tool penetrates the workpiece to the end part

Workpiece (Ø)	Slope angle (α°)	Performance	Applied (fn)
≤ Ø100	≤ 20°	◎	100%
	20°< ~40°	○	80%
	≥ 40°	△	60%

Application type	Recommended machining conditions
	• Reduce the feed rate by half the recommended condition when the tool enters the workpiece • Reduce the feed rate by half the recommended condition when the tool penetrates the workpiece to the end part • Recommended depth of cut is under 2D
	• Recommended slope angle range is under 30° • In case of machining at slope angle over 30°, reduce thefeed rate when the tool enters the workpiece

Slope angle (α°)	Performance	Applied (fn)
≤ 20°	◎	100%
20°< ~40°	○	80%
≥ 40°	△	60%

Recommended cutting conditions

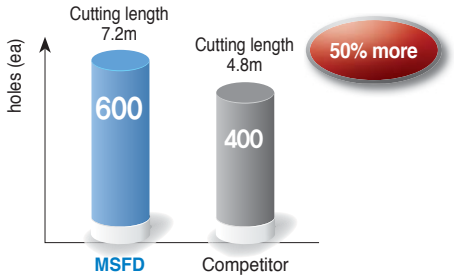
Workpiece			Grade	Cutting speed, vc (m/min)	Feed (Depth of cut = 2D~3D)		
					Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece materials	Hardness (HB)			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
P	Carbon steel	Low carbon steel	80~120	PC325U	75 (60~90)	0.03~0.10	0.05~0.15	0.10~0.20
		High carbon steel	180~280	PC325U	75 (60~80)	0.03~0.10	0.05~0.15	0.10~0.20
	Alloy steel	Low alloy steel	140~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20
		High alloy steel	50~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20

Application examples

- **Workpiece** Carbon steel (SM45C)
- **Cutting conditions** vc (m/min) = 80
fn (mm/min) = 0.1
ap (mm) = 12, wet
- **Tools** MSFD060-2P (PC325U)



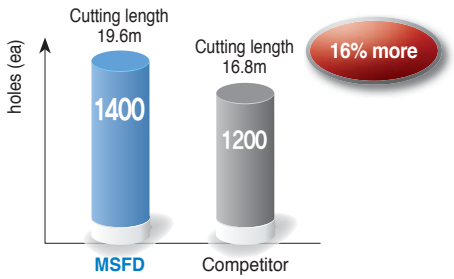
■ **Test result**



- **Workpiece** Alloy steel (SCM440)
- **Cutting conditions** vc (m/min) = 100
fn (mm/min) = 0.1
ap (mm) = 14, wet
- **Tools** MSFDH060-3P (PC325U)

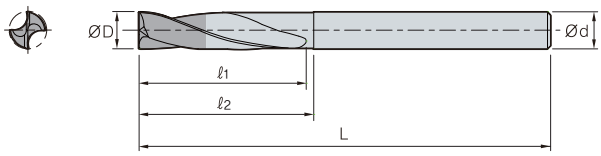


■ **Test result**



MSFD-2P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

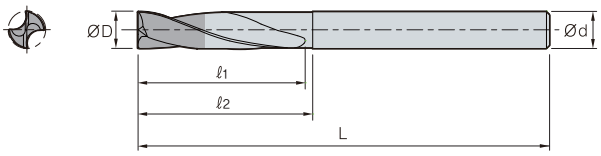
P Steel

(mm)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFD	025-2P	2.5	4.0	10.5	11.5	50
	026-2P	2.6	4.0	10.9	11.9	50
	027-2P	2.7	4.0	11.3	12.3	50
	028-2P	2.8	4.0	11.8	12.8	50
	029-2P	2.9	4.0	12.2	13.2	50
	030-2P	3.0	6.0	12.6	13.6	50
	031-2P	3.1	6.0	13.0	14.0	50
	032-2P	3.2	6.0	13.4	14.4	50
	033-2P	3.3	6.0	13.9	14.9	50
	034-2P	3.4	6.0	14.3	15.3	50
	035-2P	3.5	6.0	14.7	15.7	50
	036-2P	3.6	6.0	15.1	16.1	50
	037-2P	3.7	6.0	15.5	16.5	50
	038-2P	3.8	6.0	16.0	17.0	50
	039-2P	3.9	6.0	16.4	17.4	50
	040-2P	4.0	6.0	16.8	17.8	50
	041-2P	4.1	6.0	17.2	18.2	60
	042-2P	4.2	6.0	17.6	18.6	60
	043-2P	4.3	6.0	18.1	19.1	60
	044-2P	4.4	6.0	18.5	19.5	60
	045-2P	4.5	6.0	18.9	19.9	60
	046-2P	4.6	6.0	19.3	20.3	60
	047-2P	4.7	6.0	19.7	20.7	60
	048-2P	4.8	6.0	20.2	21.2	60
	049-2P	4.9	6.0	20.6	21.6	60
	050-2P	5.0	6.0	21.0	22.0	60
	051-2P	5.1	6.0	21.4	22.4	60
	052-2P	5.2	6.0	21.8	22.8	60
	053-2P	5.3	6.0	22.3	23.3	60
	054-2P	5.4	6.0	22.7	23.7	60
	055-2P	5.5	6.0	23.1	24.1	60
	056-2P	5.6	6.0	23.5	24.5	60
	057-2P	5.7	6.0	23.9	24.9	60
	058-2P	5.8	6.0	24.4	25.4	60
	059-2P	5.9	6.0	24.8	25.8	60
	060-2P	6.0	6.0	25.2	26.2	60
	061-2P	6.1	8.0	25.6	26.6	70
	062-2P	6.2	8.0	26.0	27.0	70
	063-2P	6.3	8.0	26.5	27.5	70
	064-2P	6.4	8.0	26.9	27.9	70
	065-2P	6.5	8.0	27.3	28.3	70
	066-2P	6.6	8.0	27.7	28.7	70
	067-2P	6.7	8.0	28.1	29.1	70
	068-2P	6.8	8.0	28.6	29.6	70
	069-2P	6.9	8.0	29.0	30.0	70

MSFD-2P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

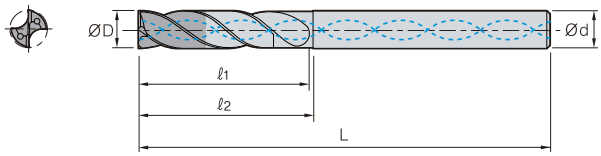
P Steel

(mm)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFD	070-2P	7.0	8.0	29.4	30.4	70
	071-2P	7.1	8.0	29.8	30.8	70
	072-2P	7.2	8.0	30.2	31.2	70
	073-2P	7.3	8.0	30.7	31.7	70
	074-2P	7.4	8.0	31.1	32.1	70
	075-2P	7.5	8.0	31.5	32.5	70
	076-2P	7.6	8.0	31.9	32.9	70
	077-2P	7.7	8.0	32.3	33.3	70
	078-2P	7.8	8.0	32.8	33.8	70
	079-2P	7.9	8.0	33.2	34.2	70
	080-2P	8.0	8.0	33.6	34.6	70
	081-2P	8.1	10.0	34.0	35.0	80
	082-2P	8.2	10.0	34.4	35.4	80
	083-2P	8.3	10.0	34.9	35.9	80
	084-2P	8.4	10.0	35.3	36.3	80
	085-2P	8.5	10.0	35.7	36.7	80
	086-2P	8.6	10.0	36.1	37.1	80
	087-2P	8.7	10.0	36.5	37.5	80
	088-2P	8.8	10.0	37.0	38.0	80
	089-2P	8.9	10.0	37.4	38.4	80
	090-2P	9.0	10.0	37.8	38.8	80
	091-2P	9.1	10.0	38.2	39.2	80
	092-2P	9.2	10.0	38.6	39.6	80
	093-2P	9.3	10.0	39.1	40.1	80
	094-2P	9.4	10.0	39.5	40.5	80
	095-2P	9.5	10.0	39.9	40.9	80
	096-2P	9.6	10.0	40.3	41.3	80
	097-2P	9.7	10.0	40.7	41.7	80
	098-2P	9.8	10.0	41.2	42.2	80
	099-2P	9.9	10.0	41.6	42.6	80
	100-2P	10.0	10.0	42.0	43	80
	101-2P	10.1	12.0	42.4	43.4	90
	102-2P	10.2	12.0	42.8	43.8	90
	103-2P	10.3	12.0	43.3	44.3	90
	104-2P	10.4	12.0	43.7	44.7	90
	105-2P	10.5	12.0	44.1	45.1	90
	106-2P	10.6	12.0	44.5	45.5	90
	107-2P	10.7	12.0	44.9	45.9	90
	108-2P	10.8	12.0	45.4	46.4	90
	109-2P	10.9	12.0	45.8	46.8	90
	110-2P	11.0	12.0	46.2	47.2	90
	111-2P	11.1	12.0	46.6	47.6	90
	112-2P	11.2	12.0	47.0	48.0	90
	113-2P	11.3	12.0	47.5	48.5	90
	114-2P	11.4	12.0	47.9	48.9	90
	115-2P	11.5	12.0	48.3	49.3	90
	116-2P	11.6	12.0	48.7	49.7	90
	117-2P	11.7	12.0	49.1	50.1	90
	118-2P	11.8	12.0	49.6	50.6	90
	119-2P	11.9	12.0	50.0	51.0	90
	120-2P	12.0	12.0	50.4	51.4	90

MSFDH-3P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

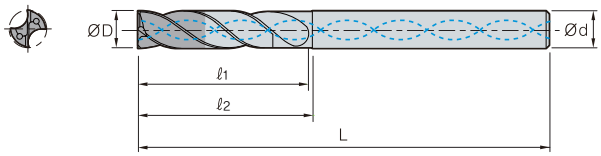
P Steel

(mm)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDH	025-3P	2.5	3.0	17	18	58
	026-3P	2.6	3.0	17	18	58
	027-3P	2.7	3.0	17	18	58
	028-3P	2.8	3.0	17	18	58
	029-3P	2.9	3.0	17	18	58
	030-3P	3.0	6.0	20	21	62
	031-3P	3.1	6.0	20	21	62
	032-3P	3.2	6.0	20	21	62
	033-3P	3.3	6.0	20	21	62
	034-3P	3.4	6.0	20	21	62
	035-3P	3.5	6.0	20	21	62
	036-3P	3.6	6.0	20	21	62
	037-3P	3.7	6.0	20	21	62
	038-3P	3.8	6.0	24	25	66
	039-3P	3.9	6.0	24	25	66
	040-3P	4.0	6.0	24	25	66
	041-3P	4.1	6.0	24	25	66
	042-3P	4.2	6.0	24	25	66
	043-3P	4.3	6.0	24	25	66
	044-3P	4.4	6.0	24	25	66
	045-3P	4.5	6.0	24	25	66
	046-3P	4.6	6.0	24	25	66
	047-3P	4.7	6.0	24	25	66
	048-3P	4.8	6.0	28	29	66
	049-3P	4.9	6.0	28	29	66
	050-3P	5.0	6.0	28	29	66
	051-3P	5.1	6.0	28	29	66
	052-3P	5.2	6.0	28	29	66
	053-3P	5.3	6.0	28	29	66
	054-3P	5.4	6.0	28	29	66
	055-3P	5.5	6.0	28	29	66
	056-3P	5.6	6.0	28	29	66
	057-3P	5.7	6.0	28	29	66
	058-3P	5.8	6.0	28	29	66
	059-3P	5.9	6.0	28	29	66
	060-3P	6.0	6.0	28	29	66
	061-3P	6.1	8.0	34	35	79
	062-3P	6.2	8.0	34	35	79
	063-3P	6.3	8.0	34	35	79
	064-3P	6.4	8.0	34	35	79
	065-3P	6.5	8.0	34	35	79
	066-3P	6.6	8.0	34	35	79
	067-3P	6.7	8.0	34	35	79
	068-3P	6.8	8.0	34	35	79
	069-3P	6.9	8.0	34	35	79
	070-3P	7.0	8.0	34	35	79
	071-3P	7.1	8.0	41	42	79
	072-3P	7.2	8.0	41	42	79

MSFDH-3P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	30°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDH	073-3P	7.3	8.0	41	42	79
	074-3P	7.4	8.0	41	42	79
	075-3P	7.5	8.0	41	42	79
	076-3P	7.6	8.0	41	42	79
	077-3P	7.7	8.0	41	42	79
	078-3P	7.8	8.0	41	42	79
	079-3P	7.9	8.0	41	42	79
	080-3P	8.0	8.0	41	42	79
	081-3P	8.1	10.0	47	48	89
	082-3P	8.2	10.0	47	48	89
	083-3P	8.3	10.0	47	48	89
	084-3P	8.4	10.0	47	48	89
	085-3P	8.5	10.0	47	48	89
	086-3P	8.6	10.0	47	48	89
	087-3P	8.7	10.0	47	48	89
	088-3P	8.8	10.0	47	48	89
	089-3P	8.9	10.0	47	48	89
	090-3P	9.0	10.0	47	48	89
	091-3P	9.1	10.0	47	48	89
	092-3P	9.2	10.0	47	48	89
	093-3P	9.3	10.0	47	48	89
	094-3P	9.4	10.0	47	48	89
	095-3P	9.5	10.0	47	48	89
	096-3P	9.6	10.0	47	48	89
	097-3P	9.7	10.0	47	48	89
	098-3P	9.8	10.0	47	48	89
	099-3P	9.9	10.0	47	48	89
	100-3P	10.0	10.0	47	48	89
	101-3P	10.1	12.0	55	56	102
	102-3P	10.2	12.0	55	56	102
	103-3P	10.3	12.0	55	56	102
	104-3P	10.4	12.0	55	56	102
	105-3P	10.5	12.0	55	56	102
	106-3P	10.6	12.0	55	56	102
	107-3P	10.7	12.0	55	56	102
	108-3P	10.8	12.0	55	56	102
	109-3P	10.9	12.0	55	56	102
	110-3P	11.0	12.0	55	56	102
	111-3P	11.1	12.0	55	56	102
	112-3P	11.2	12.0	55	56	102
	113-3P	11.3	12.0	55	56	102
	114-3P	11.4	12.0	55	56	102
	115-3P	11.5	12.0	55	56	102
	116-3P	11.6	12.0	55	56	102
	117-3P	11.7	12.0	55	56	102
	118-3P	11.8	12.0	55	56	102
	119-3P	11.9	12.0	55	56	102
	120-3P	12.0	12.0	55	56	102

High precision results when machining deep holes

MLD Plus new

Mach Long Solid Drill Plus

Code system

MLD 0600N – 10 P – 100L – 10S

Special type

- **Mach Long Solid Drill Plus (MLD Plus)**
- **Drill dia. (ØD)**: 0600: Ø6.00
- **Standard type**: Aspect ratio (L/D) 10D, 15D, 20D, 25D
- **Special type**: Flute length 100: 100mm
- **Machining area**: P: Carbon steel, alloy steel; K: Cast iron; N: Aluminum, copper alloy
- **Overall length**: 100L: 100mm
- **Shank dia.**: 10S: Ø10

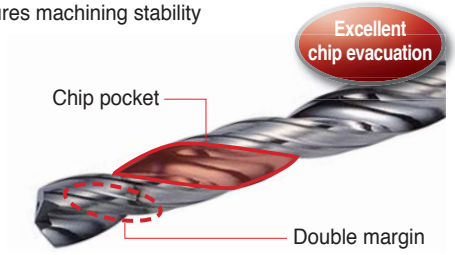
Features

Cutting edge and flute shape

- Straight cutting edge provides better rigidity
- Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
- Double margin secures machining stability

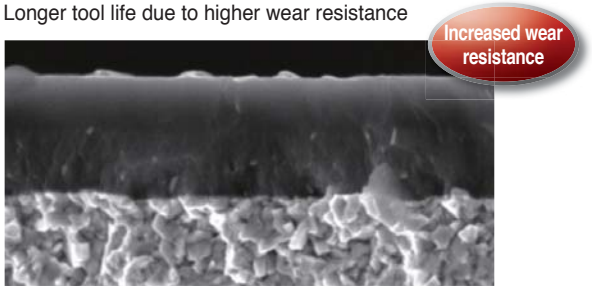


Cutting edge shape



New grade (PC315G)

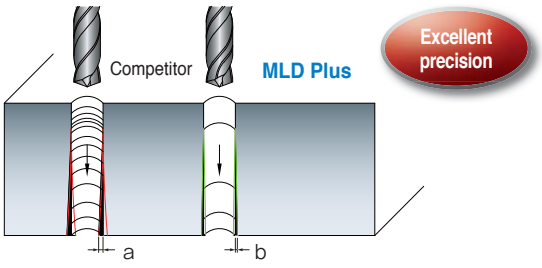
- Ultra-fine substrate and new coating applied
- Lubricative coating layer improves chip evacuation with lower frictional resistance
- Longer tool life due to higher wear resistance



PC315G

Degree of machining precision

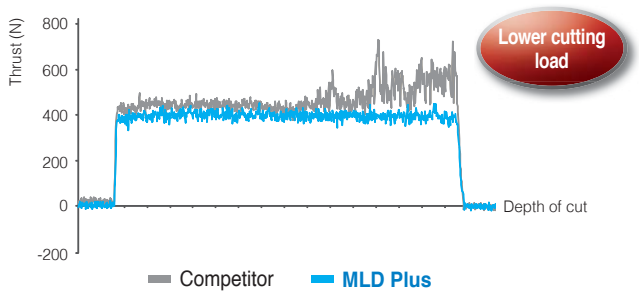
- Improved machining precision
  - Bent holes reduced, Inside hole surface roughness improved
  - Hole size uniformity increased
- Improved point shape
  - Precise location secured



Reduced bent holes compared to competitors (a > b)

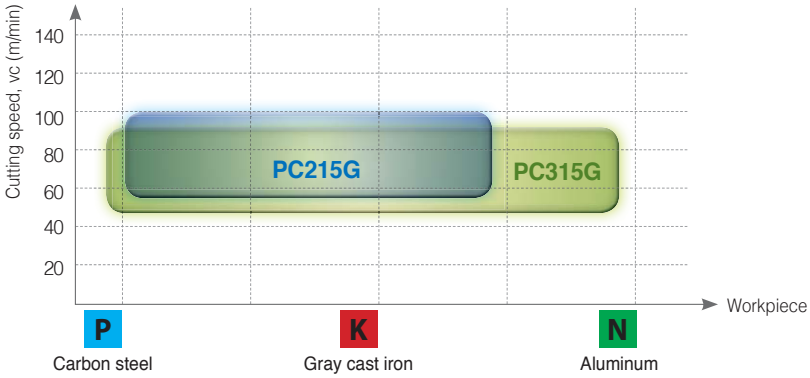
Cutting load

- **Workpiece** SM45C
- **Cutting conditions** Drill Dia.(m) = Ø6.0, vc (m/min) = 70, fn (mm/rev) = 0.12, ap (mm) = 60, wet
- **Tools** MLD0600N-20P



Application area

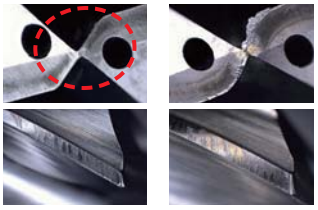
- **PC215G** – Excellent performance when machining cast iron and alloy steel at high speed
- **PC315G** – Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed



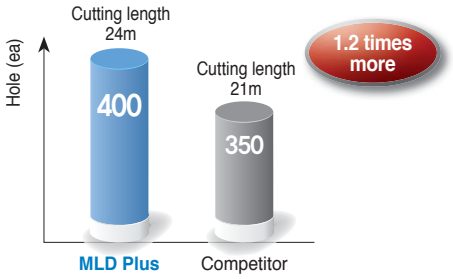
Application examples

- **Use** Part of Automobile
- **Workpiece** SM45C
- **Cutting conditions** vc (m/min) = 70, fn (mm/rev) = 0.12, ap (mm) = 60, Through coolant
- **Tools** MLD0400N-20P (PC315G)





Test result

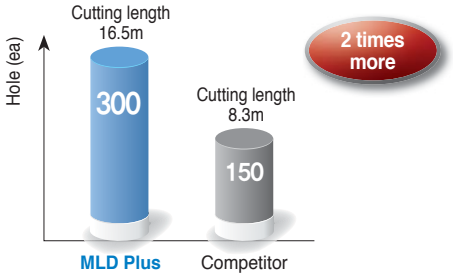


New grade PC315G's coating layer has been applied to improve wear resistance when machining carbon steel materials

- **Use** Part of Automobile
- **Workpiece** SCM440H
- **Cutting conditions** vc (m/min) = 70, fn (mm/rev) = 0.12, ap (mm) = 55, Through coolant
- **Tools** MLD0507N-15P (PC315G)



Test result



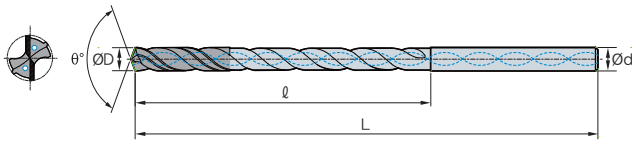
Double margin has been applied to improve stability and machining precision

Recommended cutting condition

Workpiece				Grade	vc (m/min)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia.(mm)		
ISO		Workpiece	HB	Recommended		Ø3.0~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø10.0
P	Carbon steel	Low carbon steel	80~120	PC315G	80 (60~90)	0.10~0.15	0.15~0.20	0.20~0.25
		High carbon steel	180~280	PC315G	70 (60~80)	0.10~0.15	0.15~0.20	0.20~0.25
	Alloy steel	Low alloy steel	140~260	PC215G	80 (60~90)	0.10~0.15	0.12~0.17	0.15~0.20
		Low carbon steel	50~260	PC215G	70 (60~80)	0.08~0.15	0.10~0.15	0.15~0.20
K	Cast iron	Gray cast iron	150~230	PC215G	80 (60~100)	0.10~0.20	0.15~0.20	0.15~0.20
		Ductile cast iron	160~260	PC215G	70 (60~80)	0.10~0.20	0.15~0.20	0.15~0.20
N	Aluminum	Aluminum alloy	30~150	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25
	Copper alloy	Copper alloy	150~160	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25

MLD-□□(P/K/N)





Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

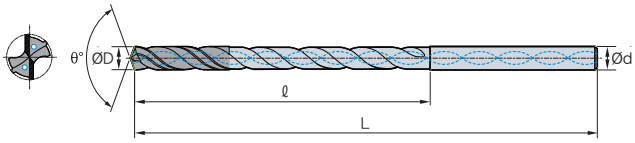
P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	10D		15D		20D		25D	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0300N-□□P,K,N	3.0	3.0	40	90	55	105	70	120	-	-
	0310N-□□P,K,N	3.1	4.0	45	100	60	125	80	140	-	-
	0320N-□□P,K,N	3.2	4.0	45	100	60	125	80	140	-	-
	0330N-□□P,K,N	3.3	4.0	45	100	60	125	80	140	-	-
	0340N-□□P,K,N	3.4	4.0	50	100	65	125	85	140	-	-
	0350N-□□P,K,N	3.5	4.0	50	100	65	125	85	140	-	-
	0360N-□□P,K,N	3.6	4.0	50	100	65	125	85	140	-	-
	0370N-□□P,K,N	3.7	4.0	50	100	65	125	85	140	-	-
	0380N-□□P,K,N	3.8	4.0	50	100	75	125	90	140	-	-
	0390N-□□P,K,N	3.9	4.0	50	100	75	125	90	140	-	-
	0400N-□□P,K,N	4.0	4.0	50	100	75	125	90	140	115	165
	0410N-□□P,K,N	4.1	5.0	55	115	75	140	100	165	120	190
	0420N-□□P,K,N	4.2	5.0	55	115	75	140	100	165	120	190
	0430N-□□P,K,N	4.3	5.0	60	115	85	140	110	165	135	190
	0440N-□□P,K,N	4.4	5.0	60	115	85	140	110	165	135	190
	0450N-□□P,K,N	4.5	5.0	60	115	85	140	110	165	135	190
	0460N-□□P,K,N	4.6	5.0	60	115	85	140	110	165	135	190
	0470N-□□P,K,N	4.7	5.0	60	115	85	140	110	165	135	190
	0480N-□□P,K,N	4.8	5.0	65	115	90	140	115	165	140	190
	0490N-□□P,K,N	4.9	5.0	65	115	90	140	115	165	140	190

MLD-□□(P/K/N)





Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

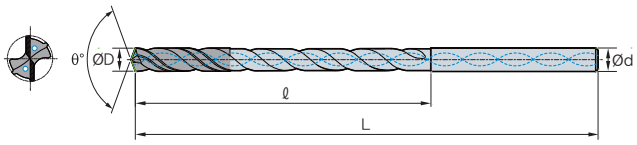
P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	10D		15D		20D		25D	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0500N-□□P,K,N	5.0	5.0	65	115	90	140	115	165	140	190
	0510N-□□P,K,N	5.1	6.0	70	128	95	160	120	190	150	220
	0520N-□□P,K,N	5.2	6.0	70	128	95	160	120	190	150	220
	0530N-□□P,K,N	5.3	6.0	70	128	95	160	120	190	150	220
	0540N-□□P,K,N	5.4	6.0	78	128	110	160	140	190	170	220
	0550N-□□P,K,N	5.5	6.0	78	128	110	160	140	190	170	220
	0560N-□□P,K,N	5.6	6.0	78	128	110	160	140	190	170	220
	0570N-□□P,K,N	5.7	6.0	78	128	110	160	140	190	170	220
	0580N-□□P,K,N	5.8	6.0	78	128	110	160	140	190	170	220
	0590N-□□P,K,N	5.9	6.0	78	128	110	160	140	190	170	220
	0600N-□□P,K,N	6.0	6.0	78	128	110	160	140	190	170	220
	0610N-□□P,K,N	6.1	7.0	87	140	120	175	155	210	190	250
	0620N-□□P,K,N	6.2	7.0	87	140	120	175	155	210	190	250
	0630N-□□P,K,N	6.3	7.0	87	140	120	175	155	210	190	250
	0640N-□□P,K,N	6.4	7.0	87	140	120	175	155	210	190	250
	0650N-□□P,K,N	6.5	7.0	87	140	120	175	155	210	190	250
	0660N-□□P,K,N	6.6	7.0	87	140	120	175	155	210	190	250
	0670N-□□P,K,N	6.7	7.0	87	140	120	175	155	210	190	250
	0680N-□□P,K,N	6.8	7.0	90	140	125	175	160	210	200	250
	0690N-□□P,K,N	6.9	7.0	90	140	125	175	160	210	200	250

MLD-□□(P/K/N)





Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(mm)

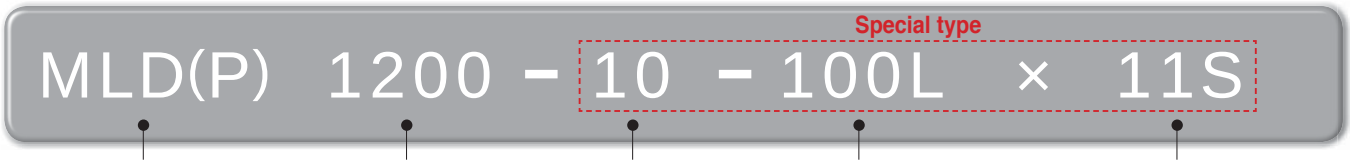
Designation		ØD	Ød	10D		15D		20D		25D	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0700N-□□P,K,N	7.0	7.0	90	140	125	175	160	210	200	250
	0710N-□□P,K,N	7.1	8.0	100	155	135	195	170	230	-	-
	0720N-□□P,K,N	7.2	8.0	100	155	135	195	170	230	-	-
	0730N-□□P,K,N	7.3	8.0	100	155	135	195	170	230	-	-
	0740N-□□P,K,N	7.4	8.0	100	155	135	195	170	230	-	-
	0750N-□□P,K,N	7.5	8.0	100	155	135	195	170	230	-	-
	0760N-□□P,K,N	7.6	8.0	105	155	145	195	180	230	-	-
	0770N-□□P,K,N	7.7	8.0	105	155	145	195	180	230	-	-
	0780N-□□P,K,N	7.8	8.0	105	155	145	195	180	230	-	-
	0790N-□□P,K,N	7.9	8.0	105	155	145	195	180	230	-	-
	0800N-□□P,K,N	8.0	8.0	105	155	145	195	180	230	-	-
	0810N-□□P,K,N	8.1	9.0	110	165	155	210	195	260	-	-
	0820N-□□P,K,N	8.2	9.0	110	165	155	210	195	260	-	-
	0830N-□□P,K,N	8.3	9.0	110	165	155	210	195	260	-	-
	0840N-□□P,K,N	8.4	9.0	110	165	155	210	195	260	-	-
	0850N-□□P,K,N	8.5	9.0	110	165	155	210	195	260	-	-
	0860N-□□P,K,N	8.6	9.0	115	165	160	210	210	260	-	-
	0870N-□□P,K,N	8.7	9.0	115	165	160	210	210	260	-	-
	0880N-□□P,K,N	8.8	9.0	115	165	160	210	210	260	-	-
	0890N-□□P,K,N	8.9	9.0	115	165	160	210	210	260	-	-
	0900N-□□P,K,N	9.0	9.0	115	165	160	210	210	260	-	-
	0910N-□□P,K,N	9.1	10.0	125	190	170	240	-	-	-	-
	0920N-□□P,K,N	9.2	10.0	125	190	170	240	-	-	-	-
	0930N-□□P,K,N	9.3	10.0	125	190	170	240	-	-	-	-
	0940N-□□P,K,N	9.4	10.0	125	190	170	240	-	-	-	-
	0950N-□□P,K,N	9.5	10.0	125	190	170	240	-	-	-	-
	0960N-□□P,K,N	9.6	10.0	130	190	180	240	-	-	-	-
	0970N-□□P,K,N	9.7	10.0	130	190	180	240	-	-	-	-
	0980N-□□P,K,N	9.8	10.0	130	190	180	240	-	-	-	-
	0990N-□□P,K,N	9.9	10.0	130	190	180	240	-	-	-	-
	1000N-□□P,K,N	10.0	10.0	130	190	180	240	-	-	-	-

Stable deep hole drilling with specially designed low cutting resistance

Mach Long Solid Drill

- Over 20D deep hole drilling is possible without step drilling
- The stable hole drilling due to specially designed low cutting resistance
- Special chip pocket has designed for effective chip evacuation
- Optimized design for drill rigidity to prevent the bending of the drill when entering operation
- The lubrication & thermal resistance of coating has been increased by adapting new TiAlN

Code system



Type
Mach Long Drill: MLD
Pilot Drills For MLD: MLDP

Tool dia.
1200 = Ø12.00

MLDP
FLUTE length
10 = 10 mm

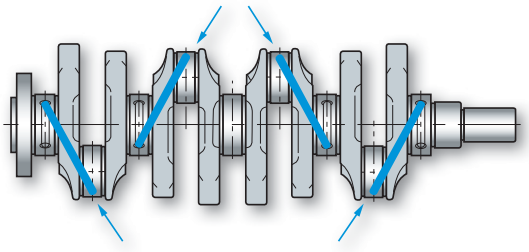
MLD
Depth of drilling
10 = D X 10

Overall length
100L: 100 mm

Shank dia.
11S: Ø11

Mach long drills-deep hole drilling

- **Mach Long Drills are ideal for.....**
  - Deep and inclined hole drilling of crank shaft
  - Deep hole drilling of cam shaft
  - Deep hole drilling of mold and machinery
    → Deep hole drilling aspect ratio over 15D
- **Advantages of MLD**
  - Shorting cycle time for better productivity
  - Tool guide bush is not required
  - Reduce idle time by prolonged tool life
  - Green coolant solutions (MQL) to protect environment



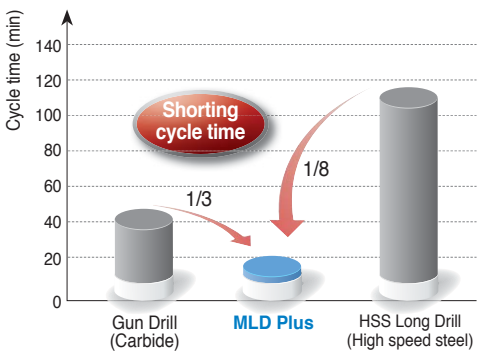
Application example (Oil hole for crank shaft, 20D)

MLD productivity: MLD0680-20 (Ø6.8 mm x 140 x 170L x 7S)

Tool	vc (m/min)	fn (mm/rev)	n (min^{-1})	vf (mm/min)	Coolant	Step operation
Gun Drills (Carbide)	100	0.04	4,683	187	Through coolant oil	No required
High Speed Steel Long Drills	15	0.10	703	70	Outer coolant oil	15mm/9times
Mach Long Drills	80	0.14	3,747	525	MQL- Air 0.5MPa, Oil 20cc/h	No required

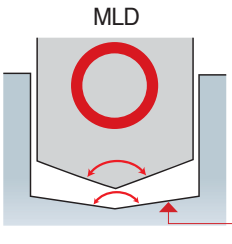
Cycle time

- Decreasing cycle time up to 1/3~1/8 times
- Increasing productivity by process reduction
- It is easy to reduce running cost
- Improving of effective working condition
- Drill guide bush is not required



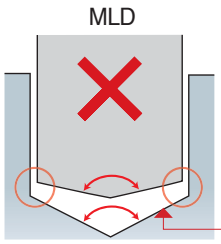
Function of MLD & MLDP

• Relationship of point angle between MLD & MLDP



Point angle of MLD < Point angle of foundation hole
→ Stable machining

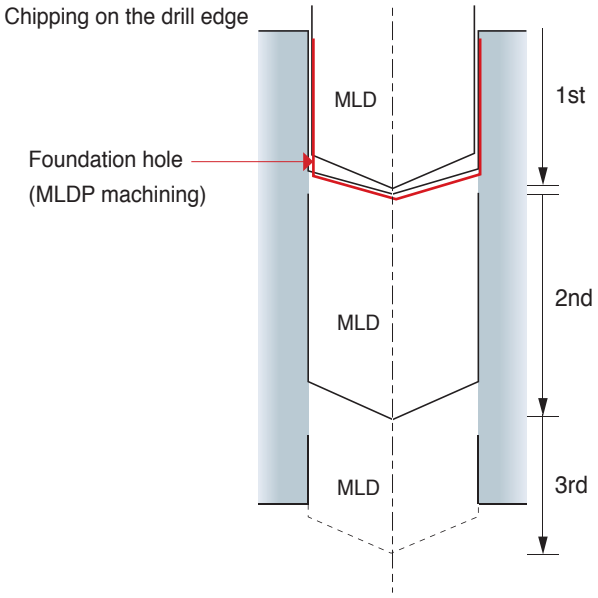
Large point angle of Pilot Drill: Stable condition



Point angle of MLD > Point angle of foundation hole
→ Chipping on the drill edge

Small point angle of Pilot Drill: Unstable condition

• To make the optimal of MLD



1st. Pilot drilling
- vc (m/min) = Normal
- fn (mm/rev) = Normal

2nd. Deep drilling by MLD
Approach the drill 1mm less than the depth of MLDP drilling.
- vc (m/min) = 15
- fn (mm/rev) = 0.5

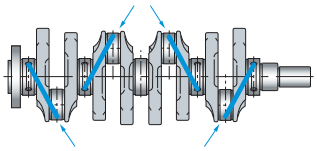
2nd. MLD drilling (Machining stage)
- vc (m/min) = Normal
- fn (mm/rev) = Normal

3rd. MLD drilling (Piercing stage)
- vc (m/min) = Normal
- fn (mm/rev) = Normal feed/2

Application example

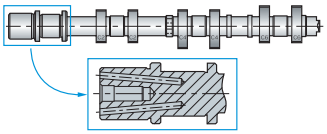
- **Use** Part of Automobile
- **Workpiece** SCM440H, HB255~330
- **Cutting conditions** vc (m/min) = 70, fn (mm/rev) = 0.18
  MQL (30cc/hour), Air (MPa) = 0.7
- **Tools** MLD0600-22A (Ø6 mm, Aspect ratio 18D)
- **Machine** Horizontal milling machine
- **Tool life** 1000 holes



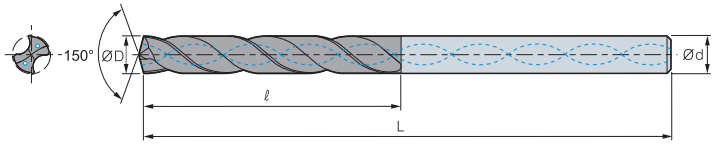


- **Use** Part of Automobile
- **Workpiece** GC250
- **Cutting conditions** vc (m/min) = 63, fn (mm/rev) = 0.1
  water-soluble cutting fluid (3kg/cm², 2ℓ/min)
- **Tools** MLD0400-25A (Ø4 mm, Aspect ratio 16D)
- **Machine** Rotary milling machine
- **Tool life** 440 holes





MLDP Mach pilot drills with oil hole



Grade	PC205F/PC325U
Tolerance (drill Dia.)	x6
Tolerance (shank Dia.)	h6
Point angle	150°
Twist angle	30°
Thinning	X type
Coolant	Through

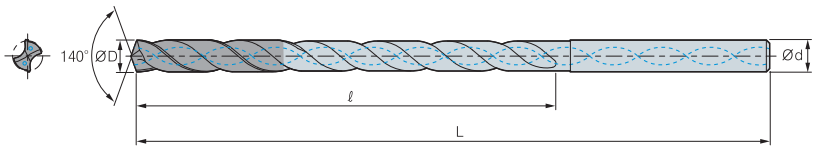
(mm)

Designation		ØD	Ød	5(ℓ / ØD = 5)		7(ℓ / ØD = 7)	
				ℓ	L	ℓ	L
MLDP	0300-□	3.0	3.0	25	70	30	75
	0400-□	4.0	4.0	34	80	40	86
	0500-□	5.0	5.0	43	90	50	97
	0600-□	6.0	6.0	48	96	60	108
	0700-□	7.0	7.0	56	105	70	120
	0800-□	8.0	8.0	60	110	80	130
	0900-□	9.0	9.0	72	125	90	143
	1000-□	10.0	10.0	75	129	95	150

※ Order made items: MLDP□□□□ × Flute length - Total length L × Shank diameter S
Ex.1) Machined diameter: Ø5.8 mm, Flute length: 50 mm, Total length: 100 mm, MLDP0580 × 50-100L × 6S

※ Precautions needed by tooling as NMLD and MLDP are one set

MLD Mach long drill



Grade	PC205F
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	140°
Twist angle	30°
Thinning	X type
Coolant	Through

(mm)

Designation		ØD	Ød	20(ℓ / ØD = 20)		25(ℓ / ØD = 25)	
				ℓ	L	ℓ	L
MLD	0300-□	3.0	3.0	60	110	75	120
	0400-□	4.0	4.0	80	130	100	150
	0500-□	5.0	5.0	100	150	125	175
	0600-□	6.0	6.0	120	170	150	200
	0700-□	7.0	7.0	140	190	175	225
	0800-□	8.0	8.0	160	210	200	250
	0900-□	9.0	9.0	180	230	-	-
	1000-□	10.0	10.0	200	250	-	-

※ Order made items: MLD□□□□-Aspect ratio
Ex.1) Machined diameter: Ø5.3 mm, Flute length: 120 mm, Total length: 180 mm, MLD0530-22 (Aspect ratio)

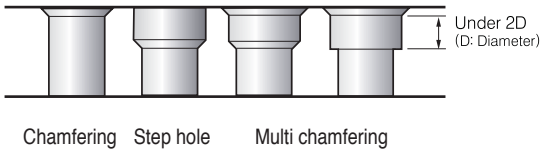
※ The last alphabet of the code refers to whether the product has been upgraded

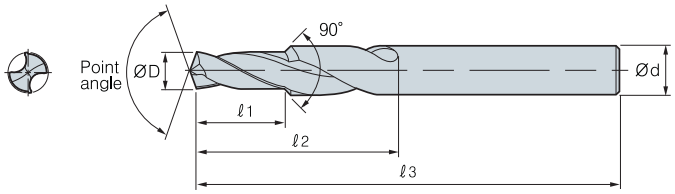
Tolerance code

Drill dia. (ØD)		h6	h7	x6
Over	Under			
-	3	0~-0.006	0~-0.010	+0.020~+0.026
3	6	0~-0.008	0~-0.012	+0.028~+0.036
6	10	0~-0.009	0~-0.015	+0.034~+0.043
10	14	0~-0.011	0~-0.018	+0.040~+0.051
14	18	0~-0.011	0~-0.018	+0.045~+0.056
18	24	0~-0.013	0~-0.021	+0.054~+0.067

Code system for mach step drill

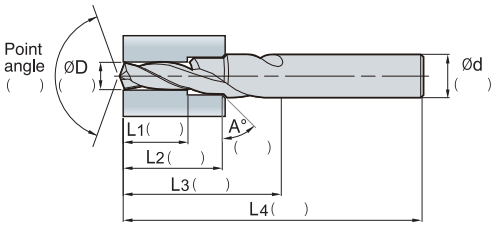
MSD(H)S	Tool Dia.	×	Effective flute length	–	Flute length	–	Overall length (L)	×	Shank Dia. (S)
Solid type: MSDS Oil-hole type: MSDHS	ØD		ℓ1		ℓ2		(ℓ3)L		(Ød)S





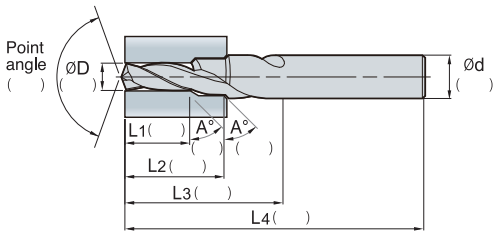
☐ Multi chamfering

(**Coolant**: Through system ☐ External system ☐)



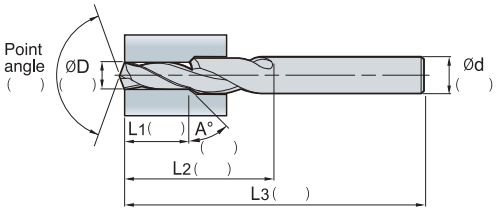
☐ Multi chamfering

(**Coolant**: Through system ☐ External system ☐)



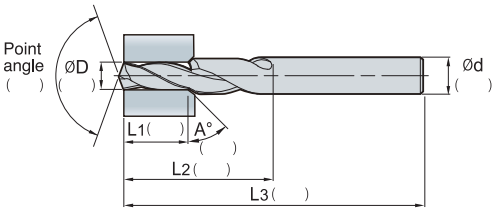
☐ Step hole

(**Coolant**: Through system ☐ External system ☐)



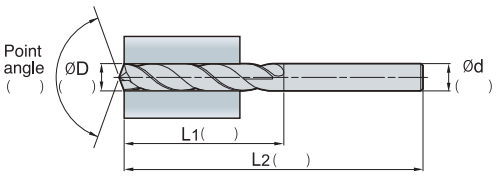
☐ Chamfering

(**Coolant**: Through system ☐ External system ☐)



☐ Drilling

(**Coolant**: Through system ☐ External system ☐)

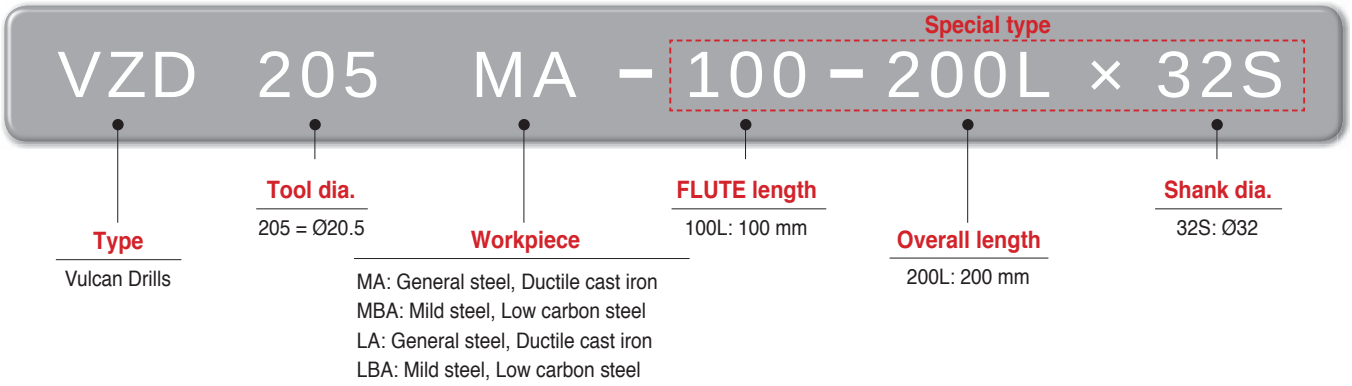


High feed and precision machining with our specially designed point edge

Vulcan Drill

- High feed and precision machining due to specially designed point edge
- Vulcan drills ensure longer tool life under high speed condition because of increased thermal & wear resistance. It also uses a PVD coating with an exclusive substrate to help maintain reduced frictional resistance
- Low cutting resistance by the best design of clearance angle is possible to increase feed
- Smoother chip control due to improved chip breakage
- Rmax: 6~25s, Hole tolerance: IT8 ~ 10
- Strong shock resistance ensures long tool life under the heavy interrupted machining

Code system



Application for vulcan drill

• General steel, Alloy steel, Mild steel, Dice steel, Stainless steel, Cast iron, Ductile cast iron, Non-ferrous metal, etc

Notice

• **Unsuitable drilling**

- Avoid the inclination or unevenness of entering and piercing section of hole as possible
- Reduce the feed 0.1~0.15mm/rev when drilling at inclined and unevenness

• **Clamping of workpiece**

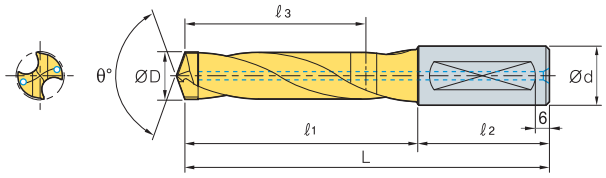
- In case of wide flat panel or rotation by horizontal component, please clamp to be prevented bending of central part of workpiece for high efficiency

Recommended cutting condition

Form	Workpiece	Hardness	~Ø15		~Ø20		~Ø40	
			vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)
MA LA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (65)	0.15~0.30 (0.20)	40~90 (65)	0.20~0.40 (0.30)	40~90 (70)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	40~90 (60)	0.10~0.25 (0.20)	40~90 (60)	0.15~0.35 (0.25)	40~90 (65)	0.20~0.40 (0.30)
	Mold steel	HB250	40~70 (50)	0.10~0.25 (0.20)	40~70 (50)	0.15~0.30 (0.25)	40~70 (50)	0.20~0.35 (0.30)
	Stainless steel	HB250	30~50 (45)	0.10~0.20 (0.15)	30~50 (45)	0.15~0.25 (0.20)	30~50 (45)	0.20~0.30 (0.25)
	Ductile cast iron	-	50~100 (70)	0.20~0.35 (0.30)	50~100 (70)	0.20~0.40 (0.35)	50~100 (70)	0.25~0.50 (0.40)
MBA LBA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (75)	0.20~0.40 (0.30)	40~90 (75)	0.20~0.40 (0.30)	40~90 (80)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	35~80 (55)	0.15~0.30 (0.25)	35~80 (55)	0.15~0.30 (0.25)	40~80 (60)	0.15~0.40 (0.30)

Vulcan Drill (VZD) MA, MAB

Type	MA	MBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	



(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135MA, MBA	12.6~13.5	16	110	62	48	44
	136~145MA, MBA	13.6~14.5	16	115	67	48	48
	146~155MA, MBA	14.6~15.5	20	125	75	50	55
	156~165MA, MBA	15.6~16.5	20	130	80	50	59
	166~175MA, MBA	16.6~17.5	20	135	85	50	63
	176~185MA, MBA	17.6~18.5	20	140	90	50	66
	186~195MA, MBA	18.6~19.5	25	155	99	56	74
	196~205MA, MBA	19.6~20.5	25	155	99	56	73
	206~215MA, MBA	20.6~21.5	25	155	99	56	72
	216~225MA, MBA	21.6~22.5	25	160	104	56	76
	226~235MA, MBA	22.6~23.5	25	160	104	56	74
	236~245MA, MBA	23.6~24.5	32	170	110	60	79
	246~255MA, MBA	24.6~25.5	32	170	110	60	78
	256~265MA, MBA	25.6~26.5	32	175	115	60	82
	266~275MA, MBA	26.6~27.5	32	175	115	60	80
	276~285MA, MBA	27.6~28.5	32	180	120	60	84
	286~295MA, MBA	28.6~29.5	32	185	125	60	88
	296~305MA, MBA	29.6~30.5	32	185	125	60	87
	306~315MA, MBA	30.6~31.5	40	205	135	70	95
	316~325MA, MBA	31.6~32.5	40	210	140	70	98
	326~335MA, MBA	32.6~33.5	40	215	145	70	101
	336~345MA, MBA	33.6~34.5	40	220	150	70	104
	346~355MA, MBA	34.6~35.5	40	225	155	70	107
	356~365MA, MBA	35.6~36.5	40	225	155	70	110
	366~375MA, MBA	36.6~37.5	40	230	160	70	113
	376~385MA, MBA	37.6~38.5	40	235	165	70	116
	386~395MA, MBA	38.6~39.5	40	240	170	70	119
	396~405MA, MBA	39.6~40.5	40	245	175	70	122

※ VZD□□□MA: For General steel, Ductile cast iron
MBA: For Mild steel, Low carbon steel

※ Order made items: VZD□□□M□ × Flute length - Total length L

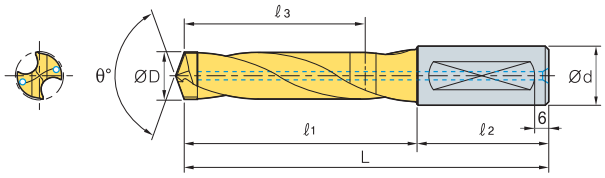
Ex.1) MA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186MA × 110-200L

Ex.2) MA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863MA × 110-200L

Ex.3) MA Type, Machined diameter: Ø18.6, Standard
--- VZD186MA

Vulcan Drill (VZD) LA, LBA

Type	LA	LBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	



(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135LA, LBA	12.6~13.5	16	140	92	48	74
	136~145LA, LBA	13.6~14.5	16	145	97	48	78
	146~155LA, LBA	14.6~15.5	20	155	105	50	85
	156~165LA, LBA	15.6~16.5	20	165	115	50	94
	166~175LA, LBA	16.6~17.5	20	170	120	50	98
	176~185LA, LBA	17.6~18.5	20	175	125	50	101
	186~195LA, LBA	18.6~19.5	25	190	134	56	109
	196~205LA, LBA	19.6~20.5	25	195	139	56	113
	206~215LA, LBA	20.6~21.5	25	195	139	56	112
	216~225LA, LBA	21.6~22.5	25	200	144	56	116
	226~235LA, LBA	22.6~23.5	25	210	154	56	124
	236~245LA, LBA	23.6~24.5	32	220	160	60	129
	246~255LA, LBA	24.6~25.5	32	225	165	60	133
	256~265LA, LBA	25.6~26.5	32	230	170	60	137
	266~275LA, LBA	26.6~27.5	32	235	175	60	141
	276~285LA, LBA	27.6~28.5	32	240	180	60	144
	286~295LA, LBA	28.6~29.5	32	245	185	60	148
	296~305LA, LBA	29.6~30.5	32	255	195	60	157
	306~315LA, LBA	30.6~31.5	40	275	205	70	166
	316~325LA, LBA	31.6~32.5	40	280	210	70	172
	326~335LA, LBA	32.6~33.5	40	280	215	70	173
	336~345LA, LBA	33.6~34.5	40	290	220	70	177
	346~355LA, LBA	34.6~35.5	40	295	225	70	181
	356~365LA, LBA	35.6~36.5	40	300	230	70	183
	366~375LA, LBA	36.6~37.5	40	305	235	70	188
	376~385LA, LBA	37.6~38.5	40	315	245	70	193
	386~395LA, LBA	38.6~39.5	40	320	250	70	198
	396~405LA, LBA	39.6~40.5	40	325	255	70	203

※ VZD□□□LA: For General steel, Ductile cast iron
LBA: For Mild steel, Low carbon steel

※ Order made items: VZD□□□M□ × Flute length - Total length L

Ex.1) LA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186LA × 110-200L

Ex.2) LA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863LA × 110-200L

Ex.3) LA Type, Machined diameter: Ø18.6, Standard
--- VZD186LA

High quality solid drill for high performance

SSD Plus new

- Improved chip control thanks to the new flute design
- Higher quality machining achieved from improved surface finish and forming
- Increased productivity thanks to stable tool life
- A variety of workpiece materials available including mild steel and non-ferrous

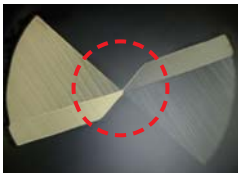
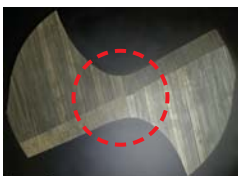
Code system

Special type

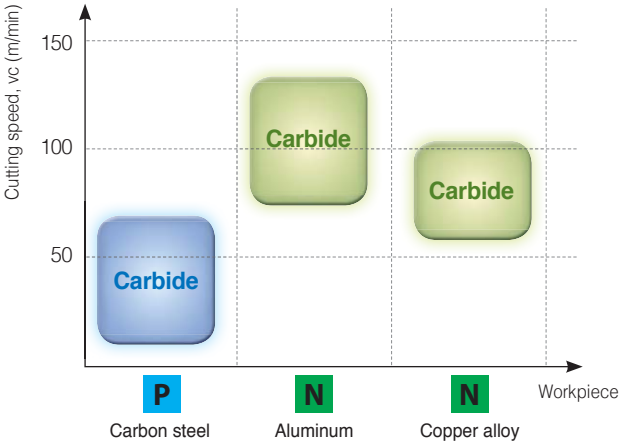
SSDP 010 - 10 - 60L - 6S

Type	Tool dia.	FLUTE length	Overall length	Shank dia.
Solid Spiral Drill Plus	010 = Ø1.0	10: 10 mm	60L: 60 mm	6S: Ø6.0

Features

Division	Shape	Application area
SSD Plus (SSDP)		P, N
existing SSD		N

Application area

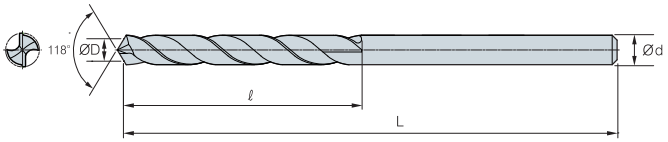


Recommended cutting condition

Workpiece				Grade	vc (m/min)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia.(mm)			
ISO		Workpiece	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø15.0
P	Carbon steel	Low carbon steel	80~120	Carbide	35 (20~65)	0.02~0.06	0.04~0.08	0.06~0.12	0.10~0.16
N	Aluminum	Aluminum alloy	30~150		100 (94~120)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18
	Copper alloy	Copper alloy	150~160		80 (65~95)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18

SSDP





Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

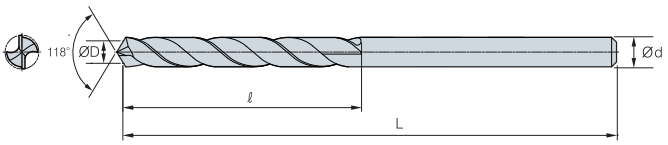
(mm)

Designation		ØD = Ød	ℓ	L
SSDP	010	1.0	10	32
	011	1.1	10	32
	012	1.2	10	32
	013	1.3	10	32
	014	1.4	10	32
	015	1.5	13	35
	016	1.6	13	35
	017	1.7	13	35
	018	1.8	13	35
	019	1.9	13	35
	020	2.0	18	40
	021	2.1	18	40
	022	2.2	18	40
	023	2.3	18	40
	024	2.4	18	40
	025	2.5	22	45
	026	2.6	22	45
	027	2.7	22	45
	028	2.8	22	45
	029	2.9	22	45
	030	3.0	25	50
	031	3.1	25	50
	032	3.2	25	50
	033	3.3	28	50
	034	3.4	28	50
	035	3.5	28	50
	036	3.6	30	55
	037	3.7	30	55
	038	3.8	30	55
	039	3.9	30	55
	040	4.0	30	55
	041	4.1	34	60
	042	4.2	34	60
	043	4.3	34	60
	044	4.4	34	60
	045	4.5	34	60
	046	4.6	38	65
	047	4.7	38	65

Designation		ØD = Ød	ℓ	L
SSDP	048	4.8	38	65
	049	4.9	38	65
	050	5.0	38	65
	051	5.1	38	65
	052	5.2	38	65
	053	5.3	38	65
	054	5.4	38	65
	055	5.5	38	65
	056	5.6	40	75
	057	5.7	40	75
	058	5.8	40	75
	059	5.9	40	75
	060	6.0	40	75
	061	6.1	40	75
	062	6.2	40	75
	063	6.3	40	75
	064	6.4	40	75
	065	6.5	40	75
	066	6.6	46	80
	067	6.7	46	80
	068	6.8	46	80
	069	6.9	46	80
	070	7.0	46	80
	071	7.1	46	80
	072	7.2	46	80
	073	7.3	46	80
	074	7.4	46	80
	075	7.5	46	80
	076	7.6	50	85
	077	7.7	50	85
	078	7.8	50	85
	079	7.9	50	85
	080	8.0	50	85
	081	8.1	50	85
	082	8.2	50	85
	083	8.3	50	85
	084	8.4	50	85
	085	8.5	50	85

SSDP





Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(mm)

Designation		ØD = Ød	ℓ	L
SSDP	086	8.6	50	95
	087	8.7	50	95
	088	8.8	50	95
	089	8.9	50	95
	090	9.0	50	95
	091	9.1	50	95
	092	9.2	50	95
	093	9.3	50	95
	094	9.4	50	95
	095	9.5	50	95
	096	9.6	50	100

Designation		ØD = Ød	ℓ	L
SSDP	097	9.7	50	100
	098	9.8	50	100
	099	9.9	50	100
	100	10.0	50	100
	105	10.5	60	115
	110	11.0	60	115
	115	11.5	65	120
	120	12.0	65	120
	125	12.5	65	125
	130	13.0	65	125
	150	15.0	70	130

Burnishing Drill

Recommended cutting condition

Workpiece	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia.(mm)				
		Ø2.0~Ø3.0	Ø3.5~Ø5.0	Ø5.5~Ø8.0	Ø8.5~Ø12	Ø12.5~Ø18
Aluminum alloy, Copper alloy	30~60	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Aluminum alloy for die castings	50~80	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Cast iron (GC) Ductile cast	25~60	0.01~0.04	0.02~0.08	0.05~0.12	0.05~0.20	0.05~0.30
Iron (GCD)	20~50	0.01~0.03	0.02~0.05	0.03~0.08	0.04~0.12	0.05~0.15

Burnishing Drill-BDS



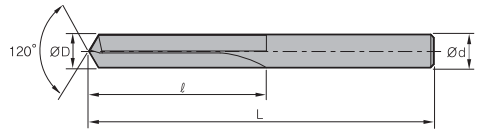


Fig.1

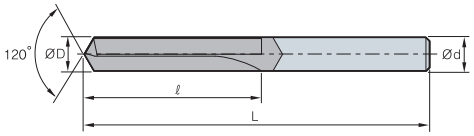


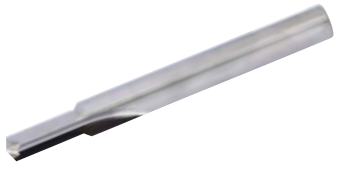
Fig.2

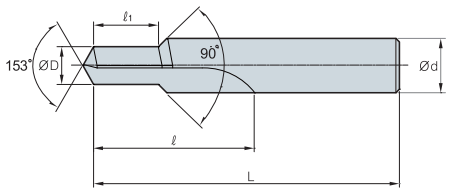
(mm)

Designation		ØD	Ød	ℓ	L	Fig.
BDS	040S	4.0	4.0	35	80	1
	050S	5.0	5.0	40	85	1
	060S	6.0	6.0	50	95	1
	070S	7.0	7.0	55	100	1
	080S	8.0	8.0	65	110	1
	090S	9.0	9.0	70	120	1
	100S	10.0	10.0	80	130	1
	110S	11.0	11.0	90	140	1
	120B	12.0	12.0	95	150	2
	130B	13.0	16.0	105	160	2
	140B	14.0	16.0	110	170	2
	150B	15.0	16.0	120	185	2
	160B	16.0	16.0	125	190	2

Step Burnishing Drill-BDT

For tapping a foundation hole





(mm)

Designation		ØD	Ød	ℓ	ℓ1	L	Tap
BDT	M05080-ℓ1	4.2	6.0	35	9~15	90	M5XP0.8
	M06100-ℓ1	5.0	7.0	40	11~18	95	M6XP1.0
	M08125-ℓ1	6.8	10.0	50	15~24	105	M8XP1.25
	M10125-ℓ1	8.8	12.0	55	17~30	110	M10XP1.25
	M10150-ℓ1	8.5	12.0	55	17~30	110	M10XP1.5
	M12125-ℓ1	10.8	14.0	60	19~36	120	M12XP1.25
	M12150-ℓ1	10.5	14.0	60	19~36	120	M12XP1.5
	M12175-ℓ1	10.3	14.0	60	19~36	120	M12XP1.75

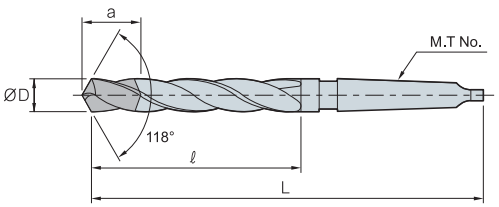
Top Solid Drill

Recommended cutting condition

Diameter	Cutting condition	Ductile cast iron	Gray cast iron	Soft steel
Ø8~Ø10	vc (m/min)	30 (20~35)	40 (20~60)	100 (50~150)
	fn (mm/rev)	0.30 (0.20~0.40)	0.30 (0.20~0.40)	0.15 (0.10~0.20)
Ø10.1~Ø15	vc (m/min)	50 (30~70)	60 (30~80)	130 (70~200)
	fn (mm/rev)	0.35 (0.30~0.40)	0.35 (0.30~0.40)	0.15 (0.10~0.20)
Ø15.1~Ø25	vc (m/min)	60 (50~60)	75 (50~100)	150 (100~250)
	fn (mm/rev)	0.35 (0.30~0.45)	0.40 (0.30~0.50)	0.15 (0.10~0.20)

Top Solid Drill-TSDM





(mm)

Designation		ØD	L	ℓ	a	M.T No
TSDM	080~085	8.0~8.5	168	85	25	1
	086~090	8.6~9.0	172	88	25	1
	091~095	9.1~9.5	175	92	26	1
	096~100	9.6~10.0	178	95	26	1
	101~105	10.1~10.5	182	98	26	1
	106~110	10.6~11.0	185	102	26	1
	111~115	11.1~11.5	188	105	26	1
	116~120	11.6~12.0	192	108	26	1
	121~125	12.1~12.5	195	112	26	1
	126~130	12.6~13.0	198	115	26	2
	131~135	13.1~13.5	202	118	27	2
	136~140	13.6~14.0	205	122	27	2
	141~145	14.1~14.5	222	122	27	2
	146~150	14.6~15.0	225	125	27	2
	151~155	15.1~15.5	228	125	27	2
	156~160	15.6~16.0	230	130	27	2
	161~165	16.1~16.5	232	132	27	2
	166~170	16.6~17.0	234	135	27	2
	171~180	17.1~18.0	240	140	27	2
	181~190	18.1~19.0	245	145	27	2
	191~200	19.1~20.0	250	150	30	2
	201~210	20.1~21.0	255	155	30	2
	211~220	21.1~22.0	260	160	30	2
	221~230	22.1~23.0	265	165	30	2
	231~250	23.1~25.0	285	165	34	3

※ Ordrer form : TSDM125

High accuracy hole machining for aluminum alloy

PCD Drill

- High accuracy hole machining for aluminum alloy
- Drilling tolerance: IT7~8 class
- Recommendation with high accuracy and high spindle machine

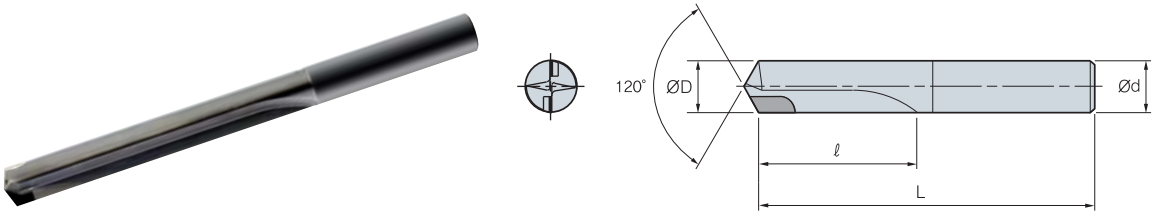
Code system



Recommended cutting condition

Workpiece	vc (m/min)	fn (mm/rev)
Aluminum alloy	50~250	0.05~0.20 0.10~0.40

PDD



(mm)

Designation		ØD	Ød	ℓ	L
PDD	0500	5.0	5.0	30	80
	0550	5.5	5.5	30	80
	0600	6.0	6.0	30	80
	0650	6.5	6.5	40	95
	0700	7.0	7.0	40	95
	0750	7.5	7.5	45	100
	0800	8.0	8.0	45	100
	0850	8.5	8.5	50	110
	0900	9.0	9.0	50	110
	0950	9.5	9.5	55	115
	1000	10.0	10.0	55	115
	1050	10.5	10.5	60	120
	1100	11.0	11.0	60	120
	1150	11.5	11.5	65	125
	1200	12.0	12.0	65	125

Stable performance and hole quality with our unique cutting edge and guide pad available regrinding

Gun Drill

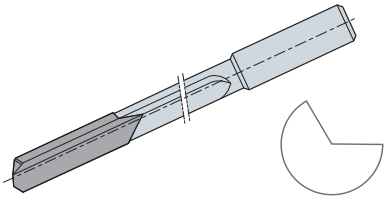
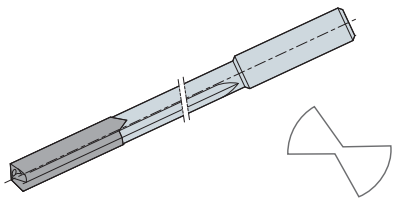
- High efficiency in deep hole machining
- High accuracy (Hole tolerance: IT9, surface finish: Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can recycle as change part of carbide
- Depending on request, the drills can change geometry of cutting edge and drive specification
- For ordering, please check length of drill

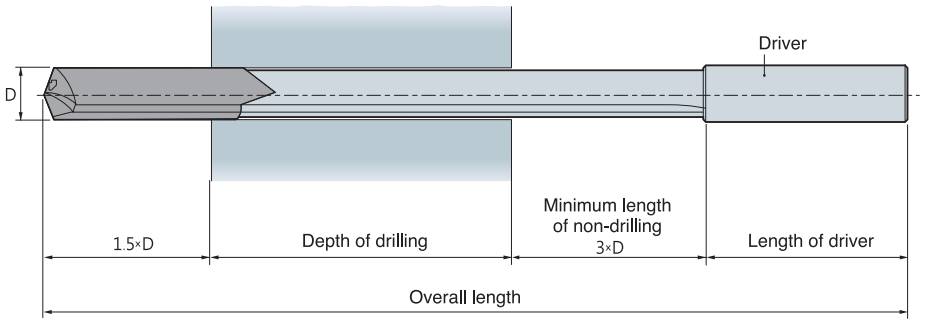
Code system

KGD S 12.05 – 1500 / D30

KORLOY Gun Drill	Lib type	Drill dia.	Length of drill	Drive no.
	S: Single T: Twin	Ø12.05	1500 mm	D30

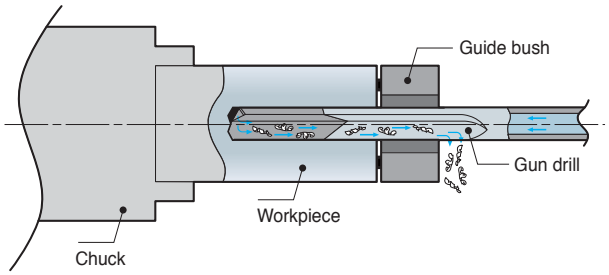
Features

	Single lip type	Twin lip type
Shape		
Drill Dia.	Ø2.0~Ø33.0	Ø6.0~Ø26.5
Depth of drilling	≥ 2,000 mm	≥ 1,000 mm
Tolerance	IT9	IT10
Surface finish	Ra 0.1~3.0 μm	Ra 1.0~4.0 μm
Application	For all kinds of workpiece machining	• Workpieces with good chip evacuation • Machining of at higher feed than single lip type's



- Refer to the code system and the above drawing when ordering
- Refer to the page 68 for the size of a driver
- The overall length can be chosen by order

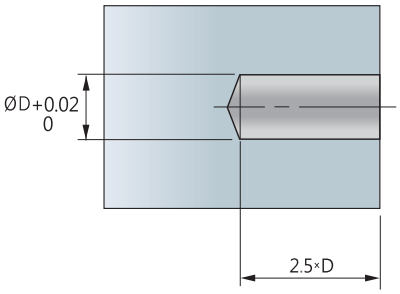
Application of Gun Drill on exclusive machine



• The guide bush is necessary for centering before gun-drilling

Application of Gun Drill on machining center

1 Machining of a pilot hole

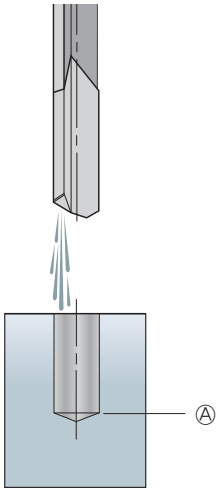


1. A pilot hole is necessary in machining on a machining center instead of a guide bush
2. The diameter of the pilot hole should be 0.01~0.02 (H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 2.5×D
3. Use Mach Drill (MSD) for machining of a pilot hole



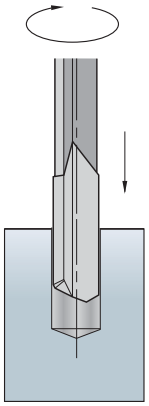
MSD

2 Moving the Gun Drill to the pilot hole



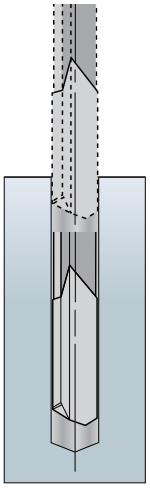
1. The Gun Drill should not drill before entering the pilot hole
2. Coolant is necessary for gun drilling

3 Start Gun Drilling



1. Rotate the spindle
2. Machine with drilling to vertical axis

4 After Gun Drilling



1. Return the drill
2. Stop drilling and supplying coolant
3. Remove the Gun Drill

Recommended cutting condition

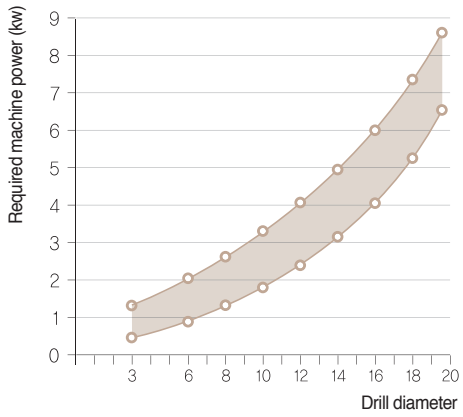
Workpiece	Hardness (HB)	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia.(mm)					
			~Ø4	~Ø6	~Ø10	~Ø14	~Ø24	Ø25~
Carbon steel Alloy steel	~150	100~150	0.005~0.015	0.010~0.025	0.015~0.035	0.020~0.050	0.030~0.070	0.040~0.080
	150~250	80~120	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.030~0.060	0.030~0.060
	250~350	50~100	0.005~0.010	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.020~0.040
	350~	~30	-	0.005~0.010	0.005~0.010	0.010~0.020	0.020~0.035	0.020~0.035
Stainless steel	~250	50~80	0.005~0.015	0.010~0.020	0.010~0.020	0.010~0.030	0.020~0.035	0.020~0.040
	250~350	40~50	-	0.005~0.015	0.010~0.015	0.010~0.020	0.010~0.020	0.010~0.020
Cast iron	~220	80~100	0.010~0.0120	0.020~0.040	0.030~0.050	0.040~0.080	0.080~0.120	0.100~0.150
	220~	40~80	0.005~0.010	0.005~0.015	0.010~0.020	0.015~0.030	0.020~0.050	0.025~0.070
Aluminum alloy	-	180~250	0.010~0.020	0.020~0.040	0.030~0.060	0.040~0.080	0.100~0.180	0.150~0.200
Light alloy	-	120~200	0.005~0.010	0.010~0.020	0.020~0.025	0.020~0.030	0.030~0.040	0.040~0.060

Technical information

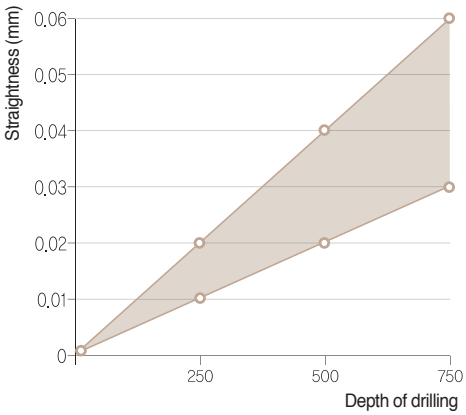
The factors below determine the straightness of hole

• Drill diameter and depth of drilling • Cutting condition and kind of application • Kind of workpiece and machine • Drill bush

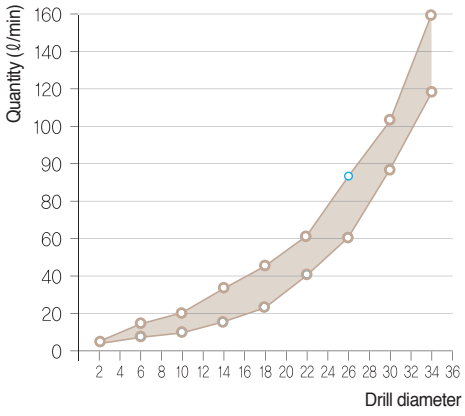
Required machine power



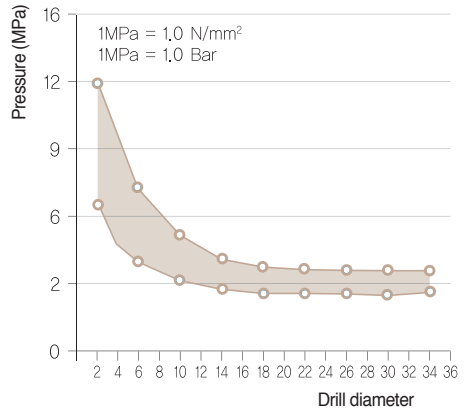
Straightness



Quantity of coolant



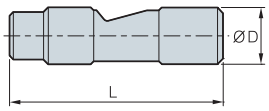
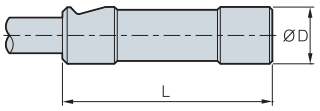
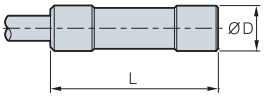
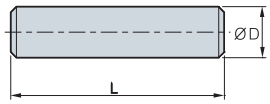
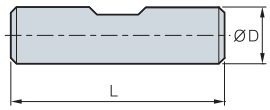
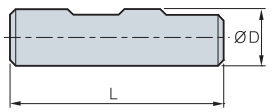
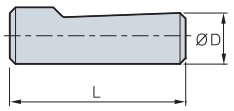
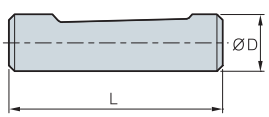
Pressure of coolant



The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc

- **Pressure and quantity of coolant** - High pressure of coolant ensures excellent chip evacuation and cooling the cutting edge
- **Use a filter for removing impurities** - The diameter of a filter should be less than 20㎛. Impurities could make bad flow of coolant, wear on a tool, and high load on the cooling pump
- **Temperature of coolant** - Proper temperature of coolant: 20°C~22°C / Do not use coolant at 50°C above

Driver standard

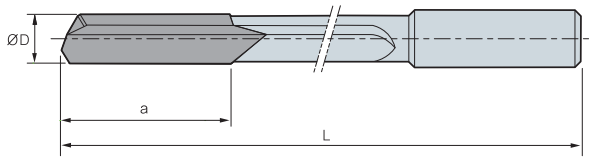
Type	Shape	No.	ØD×L		Carbide type	
			ØD×L	Thread	Tipped	Solid
Central clamping surface 15°		D01	10x40		●	●
		D02	16x45		●	
		D03	19.05x69.8		●	
		D04	25x70		●	
		D05	25.4x69.8		●	
Frontal clamping surface 15°		D06	16x50		●	
Central clamping tapered		D07	12.7x38.1		●	●
		D08	16x70			
		D09	19.05x69.8		●	
		D10	20x70			
Cylindrical DIN1835A DIN6535HA		D11	4x28		●	●
		D12	6x36		●	●
		D13	10x40		●	●
		D14	16x48		●	●
		D15	20x50		●	
		D16	25x56		●	
Weldon DIN1835B		D17	10x40		●	●
		D18	12x45		●	●
		D19	16x48		●	●
		D20	20x50		●	●
Weldon DIN6535HB		D21	25x56		●	
		D22	32x60		●	
		D23	40x70			
Whistle Notch DIN1835E		D24	10x40		●	●
		D25	12x45		●	●
		D26	16x48		●	●
		D27	20x50		●	●
		D28	25x56		●	
		D29	32x60		●	
Whistle notch DIN6535HE		D30	10x40		●	●
		D31	12x45		●	●
		D32	16x48		●	●
		D33	20x50		●	●

* Special types are available for quotation with shape and size information

Gun Drill-KGDS

Single Lip type

Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.



(mm)

Designation		ØD	a
KGDS	O.OO-□□□□ / D□□	2.00~2.49	18
	O.OO-□□□□ / D□□	2.50~2.99	18
	O.OO-□□□□ / D□□	3.00~3.49	19
	O.OO-□□□□ / D□□	3.50~3.99	19
	O.OO-□□□□ / D□□	4.00~4.49	23
	O.OO-□□□□ / D□□	4.50~4.99	23
	O.OO-□□□□ / D□□	5.00~5.49	24
	O.OO-□□□□ / D□□	5.50~5.99	26
	O.OO-□□□□ / D□□	6.00~6.49	27
	O.OO-□□□□ / D□□	6.50~6.99	28
	O.OO-□□□□ / D□□	7.00~7.49	29
	O.OO-□□□□ / D□□	7.50~7.99	30
	O.OO-□□□□ / D□□	8.00~8.49	31
	O.OO-□□□□ / D□□	8.50~8.99	31
	O.OO-□□□□ / D□□	9.00~8.49	31
	O.OO-□□□□ / D□□	9.50~9.99	31
	O.OO-□□□□ / D□□	10.00~10.49	31
	O.OO-□□□□ / D□□	10.50~10.99	32
	O.OO-□□□□ / D□□	11.00~11.49	35
	O.OO-□□□□ / D□□	11.50~11.99	35
	O.OO-□□□□ / D□□	12.00~12.49	38
	O.OO-□□□□ / D□□	12.50~12.99	38
	O.OO-□□□□ / D□□	13.00~13.99	38
	O.OO-□□□□ / D□□	14.00~14.99	38
	O.OO-□□□□ / D□□	15.00~15.99	39
	O.OO-□□□□ / D□□	16.00~16.99	39
	O.OO-□□□□ / D□□	17.00~17.99	40
	O.OO-□□□□ / D□□	18.00~18.99	41
	O.OO-□□□□ / D□□	19.00~19.99	41
	O.OO-□□□□ / D□□	20.00~20.99	44
	O.OO-□□□□ / D□□	21.00~21.99	46
	O.OO-□□□□ / D□□	22.00~22.99	49
	O.OO-□□□□ / D□□	23.00~23.99	51
	O.OO-□□□□ / D□□	24.00~24.99	52
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	O.OO-□□□□ / D□□	30.00~30.99	59
	O.OO-□□□□ / D□□	31.00~31.99	61
	O.OO-□□□□ / D□□	32.00~32.99	61

※ When ordering, please mark the overall length and driver number (or drawing)

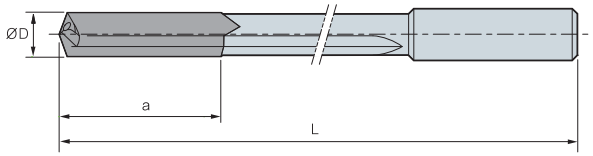
Available overall length

Designation	Drill Dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDS	2.00~2.99	○	○			
	3.00~3.49	○	○	○		
	3.50~32.99	○	○	○	○	○

Gun Drill-KGDT

Twin Lip type

Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.



(mm)

Designation		ØD	a
KGDT	O.OO-□□□□ / D□□	6.00~6.49	35
	O.OO-□□□□ / D□□	6.50~6.99	35
	O.OO-□□□□ / D□□	7.00~7.49	38
	O.OO-□□□□ / D□□	7.50~7.99	38
	O.OO-□□□□ / D□□	8.00~8.49	38
	O.OO-□□□□ / D□□	8.50~8.99	38
	O.OO-□□□□ / D□□	9.00~8.49	40
	O.OO-□□□□ / D□□	9.50~9.99	40
	O.OO-□□□□ / D□□	10.00~10.49	40
	O.OO-□□□□ / D□□	10.50~10.99	40
	O.OO-□□□□ / D□□	11.00~11.49	45
	O.OO-□□□□ / D□□	11.50~11.99	45
	O.OO-□□□□ / D□□	12.00~12.49	45
	O.OO-□□□□ / D□□	12.50~12.99	48
	O.OO-□□□□ / D□□	13.00~13.99	48
	O.OO-□□□□ / D□□	14.00~14.99	48
	O.OO-□□□□ / D□□	15.00~15.99	48
	O.OO-□□□□ / D□□	16.00~16.99	50
	O.OO-□□□□ / D□□	17.00~17.99	50
	O.OO-□□□□ / D□□	18.00~18.99	50
	O.OO-□□□□ / D□□	19.00~19.99	50
	O.OO-□□□□ / D□□	20.00~20.99	55
	O.OO-□□□□ / D□□	21.00~21.99	55
	O.OO-□□□□ / D□□	22.00~22.99	55
	O.OO-□□□□ / D□□	23.00~23.99	60
	O.OO-□□□□ / D□□	24.00~24.99	60
	O.OO-□□□□ / D□□	25.00~25.99	65
	O.OO-□□□□ / D□□	26.00~26.50	65

※ When ordering, please mark the overall length and driver number (or drawing)

Available overall length

Designation	Drill Dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDT	6.00~26.50	○	○	○		

Mass production and High performance

Indexable Reamer

- Suitable for mass production and high performance
- Using PCD or coated insert for high speed machining
- Excellent high accuracy and adjustable machining hole
- Using accuracy chucking system (Hydraulic, rotating type arbor)
- Using inner coolant type machine to evacuate chips
- Using suitable holder and insert
- As insert setting, using setting fixture (KIRSD-210)

Code system

IR T 12.000 – 16 135 – 16

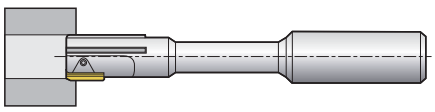
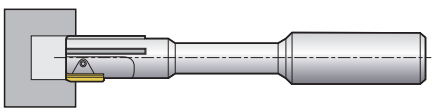
Type	Application	Reamer dia.	Shank Dia.	length	Insert size
Indexable Reamer	T: Throughout hole machining B: Blind hole machining	12.000: Ø12.0	16: Ø16	135: 135	15: 15.0×3.0 16: 16.0×3.5 17: 17.0×4.5 22: 22.0×6.5

Insert code system

RI 16 – B 06

Type	Insert size	Insert reed type	Angle of C/B
Reamer Insert	15: 15.0×3.0 16: 16.0×3.5 17: 17.0×4.5 22: 22.0×6.5	A: Excellent surface finish, low cutting condition B: General surface finish, high cutting condition C: Aluminum and copper alloy D: Blind hole, low feed	00: 0°, Cast iron 06: 6°, General steel 12: 12°, Stainless, Al

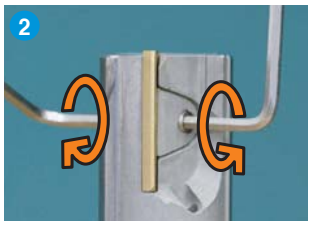
Application

Throughout hole machining (IRT type)	Stuffed hole machining (IRB type)
	

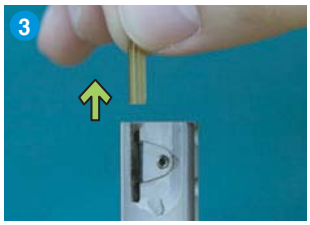
How to set an insert



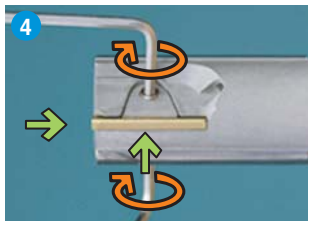
1. Screw the wedge screw counter clockwise with the exclusive wrench



2. Screw the clamp screw
   ① Top side: counter clockwise
   ② Lower side: clockwise



3. Remove the insert and clean the pocket



4. Put the insert up to the edge stopper and clamp the insert
   ① Top side: clockwise
   ② Lower side: counterclockwise

Exclusive fixture

- Designation: KIRSD-210
- Maximum diameter of reamer: Ø60×210 mm
- The fixture is also available for setting special reamer and mono tool
- Special reamers (out of maximum setting range) are available quotation



How to set an insert with fixture



1. Adjust the gauge to '0'



2. Rotate the reamer for the insert to touch the gauge



3. Set the back taper and adjust the insert height with screw the wedge screw
   ① Top side of insert: +0.015~ +0.020 mm
   ② Bottom side of insert: +0.005~ +0.010 mm
   ③ Back taper: 0.010~0.015 mm

Back taper

- Ensures low cutting load and excellent surface finish with good chip evacuation
- Inaccurate back taper could cause unstable machining with wear of insert
- The size of back taper of insert down side should be less to 0.010~0.015 mm than one of insert upper side

Insert setting with a micrometer





- Lathe with both centers or bench center are also available

Notice: The setting with a micrometer is not recommended due to chipping on the cutting edge

Recommended cutting condition

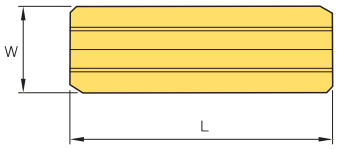
Workpiece	Insert type		Feed rate (mm/rev) per drill dia. (mm)	Cutting speed vc (m/min)		
	Rake angle	Lead type		Coated	Uncoated	Cermet
Carbon steel General steel	6	A	0.1~0.4	60~80	40~60	110~160
		B	0.1~0.3	80~120	60~80	
		D	0.05~0.2			
Mild steel Alloy steel	6	A	0.1~0.4	40~60	20~40	110~160
		B	0.1~0.3	80~120	60~80	
		D	0.05~0.2			
High alloy steel Tool steel	6	A	0.1~0.4	20~60	20~40	20~60
		B	0.1~0.3	40~80	40~60	40~80
		D	0.05~0.2			
Stainless steel	12	A	0.1~0.3	40~60	20~40	40~60
		B	0.1~0.2	60~80	40~60	60~80
		D	0.05~0.2			
Cast iron	0.6	A	0.1~0.3	60~100	40~60	
		B	0.1~0.25	80~120	60~80	
		D	0.05~0.2			
Alloyed aluminum	12	B	0.1~0.3		160~200	
		C	0.15~0.3		150~250	
		D	0.05~0.2		110~200	
Alloyed copper	0	B	0.1~0.2		80~100	
		D	0.05~0.2			
Non-ferrous alloy	0	B	0.1~0.3		10~70	

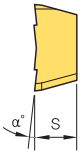
Parts

Reamer size	Clamp 	Wedge 	Clamp Screw 	Wedge Screw  (NYLOK)	Clamp Wrench 	Wedge Wrench 
10.0~11.9	CV 15	AW2430	DHA0308	HSO306	HW15L	HW15L
12.0~17.9	CV 16	AW2435				
18.0~27.9	CV 17	AW3240	DHA0409	HS0406	HW20L	HW20L
28.0~31.9	CV 22	AW3260				

Indexable Reamer Insert





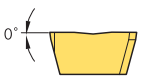
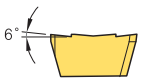
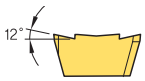


(mm)

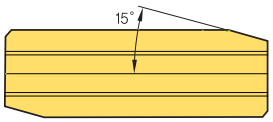
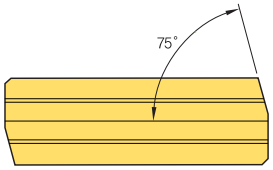
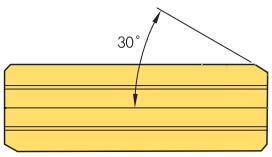
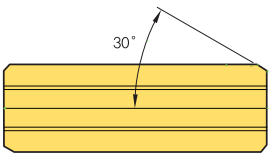
Designation		Grade			Dimensions			Reed type	Rake angle (α°)
		K10 (Uncoated)	BPK110 (TiAlN)	BPK210 (TiN)	L	W	S		
RI	15-A06			O	15	3.0	1.5	A	6°
	15-A12	O			15	3.0	1.5	A	12°
	15-B06		O	O	15	3.0	1.5	B	6°
	15-B12		O		15	3.0	1.5	B	12°
	16-A06			O	16	3.5	1.5	A	6°
	16-A12	O			16	3.5	1.5	A	12°
	16-B06		O	O	16	3.5	1.5	B	6°
	16-B12		O		16	3.5	1.5	B	12°
	17-A06			O	17	4.5	2.0	A	6°
	17-A12	O			17	4.5	2.0	A	12°
	17-B06		O	O	17	4.5	2.0	B	6°
	17-B12		O		17	4.5	2.0	B	12°
	22-A06			O	22	6.5	3.0	A	6°
	22-A12	O			22	6.5	3.0	A	12°
	22-B06		O	O	22	6.5	3.0	B	6°
	22-B12		O		22	6.5	3.0	B	12°

※ ○This is recommended grade as for insert type

Angle of chip breaker

Division	00	06	12
Shape			
Application	For cast iron machining	For general machining	For stainless and aluminum machining

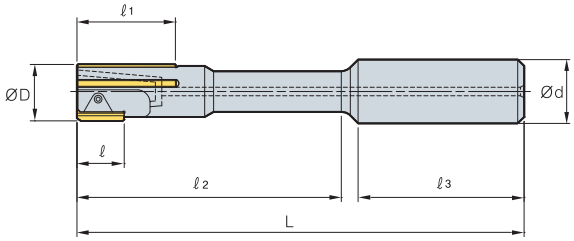
Insert lead type

Type	Shape	Working condition	Type	Shape	Working condition
A		For excellent surface, low cutting condition	C		For aluminum and copper alloy machining
B		For general application, high cutting condition	D		For blind hole machining, low feed

Indexable Reamer-IRT

Throughout hole





(mm)

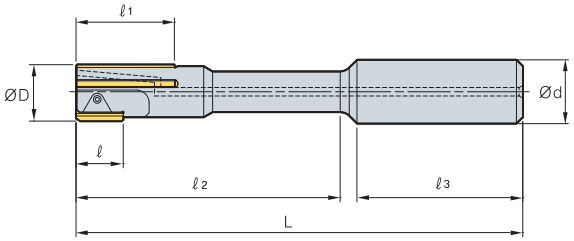
	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRT	10.000-16125-15	10	15	30	75	45	125	16	RI 15
	11.000-16125-15	11	15	30	75	45	125	16	RI 15
	12.000-16135-16	12	16	30	85	45	135	16	RI 16
	13.000-16135-16	13	16	30	85	45	135	16	RI 16
	14.000-16135-16	14	16	30	85	45	135	16	RI 16
	15.000-16135-16	15	16	30	85	45	135	16	RI 16
	16.000-20155-16	16	16	30	100	50	155	20	RI 16
	17.000-20155-16	17	16	30	100	50	155	20	RI 16
	18.000-20155-17	18	17	30	100	50	155	20	RI 17
	19.000-20155-17	19	17	30	100	50	155	20	RI 17
	20.000-25165-17	20	17	30	110	56	165	25	RI 17
	21.000-25165-17	21	17	30	110	56	165	25	RI 17
	22.000-25165-17	22	17	30	110	56	165	25	RI 17
	23.000-25165-17	23	17	30	110	56	165	25	RI 17
	24.000-25165-17	24	17	30	110	56	165	25	RI 17
	25.000-25165-17	25	17	30	110	56	165	25	RI 17
	26.000-25165-17	26	17	30	110	56	165	25	RI 17
	27.000-25165-17	27	17	30	110	56	165	25	RI 17
	28.000-32165-22	28	22	30	110	56	165	32	RI 22
	29.000-32165-22	29	22	30	110	56	165	32	RI 22
	30.000-32165-22	30	22	30	110	56	165	32	RI 22
	31.000-32165-22	31	22	30	110	56	165	32	RI 22

Applicable inserts **G82**

Indexable Reamer-IRB

Stuffed hole





(mm)

	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRB	10.000-16125-15	10	15	30	75	45	125	16	RI 15
	11.000-16125-15	11	15	30	75	45	125	16	RI 15
	12.000-16135-16	12	16	30	85	45	135	16	RI 16
	13.000-16135-16	13	16	30	85	45	135	16	RI 16
	14.000-16135-16	14	16	30	85	45	135	16	RI 16
	15.000-16135-16	15	16	30	85	45	135	16	RI 16
	16.000-20155-16	16	16	30	100	50	155	20	RI 16
	17.000-20155-16	17	16	30	100	50	155	20	RI 16
	18.000-20155-17	18	17	30	100	50	155	20	RI 17
	19.000-20155-17	19	17	30	100	50	155	20	RI 17
	20.000-25165-17	20	17	30	110	56	165	25	RI 17
	21.000-25165-17	21	17	30	110	56	165	25	RI 17
	22.000-25165-17	22	17	30	110	56	165	25	RI 17
	23.000-25165-17	23	17	30	110	56	165	25	RI 17
	24.000-25165-17	24	17	30	110	56	165	25	RI 17
	25.000-25165-17	25	17	30	110	56	165	25	RI 17
	26.000-25165-17	26	17	30	110	56	165	25	RI 17
	27.000-25165-17	27	17	30	110	56	165	25	RI 17
	28.000-32165-22	28	22	30	110	56	165	32	RI 22
	29.000-32165-22	29	22	30	110	56	165	32	RI 22
	30.000-32165-22	30	22	30	110	56	165	32	RI 22
	31.000-32165-22	31	22	30	110	56	165	32	RI 22

Applicable inserts **G82**

Chucking/Machine Reamer

Recommended cutting condition

Workpiece	Hardness (HB)	Cutting condition	Diameter		
			~Ø9	Ø10~25	Ø26~60
Steel	~100kg/mm^2	vc (m/min)	8~12	8~12	8~12
		fn (mm/rev)	0.15~0.25	0.20~0.40	0.30~0.50
	100~140kg/mm^2	vc (m/min)	5~10	5~10	5~10
		fn (mm/rev)	0.10~0.20	0.15~0.25	0.20~0.40
Cast iron	HB~220	vc (m/min)	6~12	6~12	8~15
		fn (mm/rev)	0.15~0.30	0.30~0.50	0.40~0.80
	HB 220~	vc (m/min)	5~10	5~10	8~12
		fn (mm/rev)	0.10~0.20	0.20~0.35	0.30~0.50
Brass	HB 50~120	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Bronze	HB 60~100	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Alloyed aluminum	HB 90~120	vc (m/min)	15~25	15~25	20~30
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.70
Synthetic resins	-	vc (m/min)	15~30	20~35	30~40
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.50

Chucking Reamer-SCRS



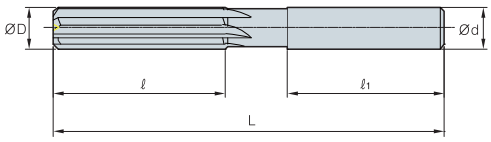


Fig.1

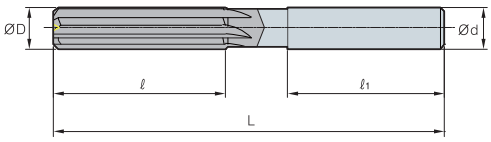


Fig.2

(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRS	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

Chucking Reamer-SCRH



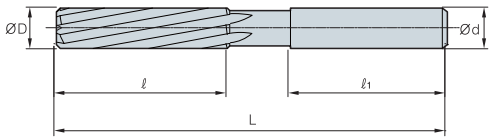


Fig.1

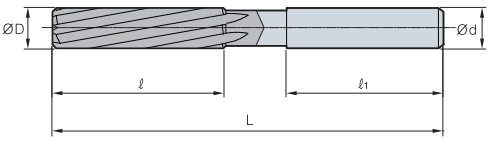


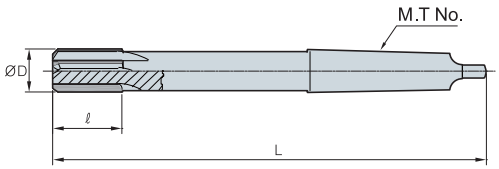
Fig.2

(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRS	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

Chucking Reamer-TCRS



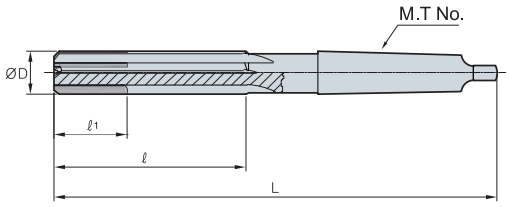


(mm)

Designation		No. of flute	ØD	ℓ	L	M.T No.
TCRS	070	4	7.0	20	150	1
	080	4	8.0	20	150	1
	090	4	9.0	20	160	1
	100	4	10.0	25	160	1
	110	4	11.0	25	170	1
	120	4	12.0	25	170	1
	130	4	13.0	25	180	1
	140	6	14.0	25	190	1
	150	6	15.0	30	200	2
	160	6	16.0	30	200	2
	180	6	18.0	30	220	2
	200	6	20.0	40	230	2
	250	6	25.0	40	260	3
	280	8	28.0	40	270	3
	300	8	30.0	50	290	3

Chucking Reamer-TMRS





(mm)

Designation		No. of flute	ØD	ℓ	ℓ_1	L	M.T No.
TMRS	070	4	7.0	60	60	150	1
	080	4	8.0	70	70	150	1
	090	4	9.0	70	70	160	1
	100	4	10.0	75	75	170	1
	110	4	11.0	75	75	170	1
	120	4	12.0	80	40	180	1
	130	4	13.0	85	40	190	1
	140	6	14.0	90	45	210	1
	150	6	15.0	90	45	215	2
	160	6	16.0	100	50	220	2
	180	6	18.0	105	50	225	2
	200	6	20.0	120	50	240	2
	250	6	25.0	130	50	270	3
	280	8	28.0	140	50	280	3
	300	8	30.0	150	50	290	3

PCD Reamer

Code system

PDR 2 070

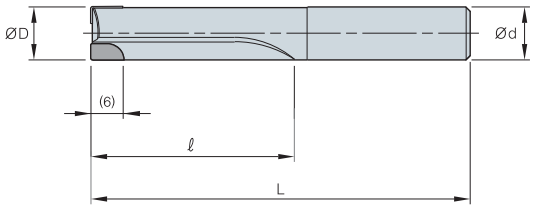
Type	No. of flute	Diameter
PCD Reamer	2: 2flute	070: Ø7.0

Recommended cutting condition (For high speed and high precision machining)

Workpiece	vc (m/min)	fn (mm/rev)
Aluminum alloy	50~250	0.05~0.20

PCD Reamer-PDR





(mm)

Designation		No. of flute	ØD	Ød	ℓ	L
PDR	2050	2	5.0	6.0	30	65
	2060	2	6.0	6.0	40	75
	2070	2	7.0	8.0	40	75
	2080	2	8.0	8.0	40	75
	2090	2	9.0	10.0	40	85
	2100	2	10.0	10.0	40	85
	2120	2	12.0	12.0	50	95
	2140	2	14.0	16.0	50	95
	2150	2	15.0	16.0	50	100
	4160	4	16.0	16.0	50	100
	4180	4	18.0	20.0	60	110
	4200	4	20.0	20.0	60	110

Cermet Reamer

- Cermet reamer realizes high performance in high hardness steel machining (lower performance in casting machining)
- High machinability and wear resistance extend the tool life
- Over 30% higher productivity, surface roughness, and tool life than carbide reamer

Code system

KCR 100 – 070 – 130L

KORLOY Cermet Reamer	Diameter	Flute length	Overall length
	100	070	130L

Recommended cutting condition

Workpiece	Hardness	fz (mm/t)	vc (m/min)
Carbon steel	Under 30HRC	0.1~0.4	50~80
High carbon steel, Alloy steel	30~40HRC	0.1~0.4	80~120
	40~50HRC	0.1~0.4	50~80
Alloy steel	More than 50HRC	0.05~0.2	30~60

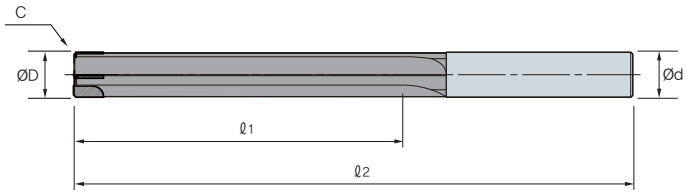
Application examples



■ **Cutting condition**
- Workpiece: S55CR
- Hardness: 23~30HRC
- fn(mm/rev): 0.4
- vc(m/min): 20

Cermet Reamer-KCR

Standard type

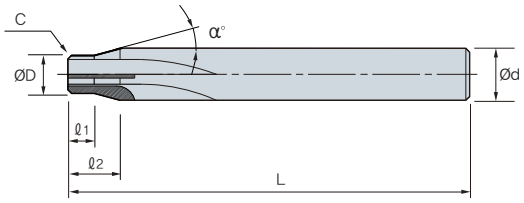


(mm)

Designation		No. of flute	ØD	Ød	ℓ1	L
KCR	060~079-25-70L	2	6.0~7.9	8	25	70
	080~099-035-90L	2	8.0~9.9	10	35	90
	100~119-050-100L	4	10.0~11.9	12	50	100
	120~159-060-110L	4	12.0~15.9	12	60	110
	160~199-060-110L	4	16.0~19.9	16	60	110
	200~259-060-110L	4	20.0~25.9	20	60	110
	260~300-070-130L	4	26.0~30	25	70	130

• The length of flute and overhang length of reamer are available for quotation • The maximum overhang length is 150mm

Special type



(mm)

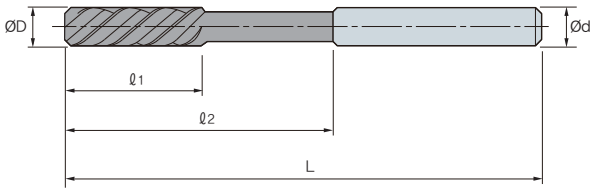
Designation		No. of flute	ØD	Ød	ℓ1	ℓ2	L	α°
KCR	□□□~□□□-□□□L	2~4	8.0~25.9	12~30	7~18	2~15	70	10°~60°

Broach Reamer

- Optimal for thru hole machining with high precision with long tool life
- High helix angle (45 degree) improves machinability
- Superior surface roughness and high precision
- Strong cutting edge and excellent chip evacuation
- Dia. Ø3.0~Ø25.0

Broach Reamer-HBRE





(mm)

Designation		No. of flute	ØD	Ød	ℓ1	ℓ2	L	Type
HBRE	030	3	3.0	3.0	20	40	70	Solid
	040	3	4.0	4.0	25	40	70	Solid
	060	4	6.0	6.0	30	50	80	Solid
	080	4	8.0	8.0	30	60	100	Solid
	100	4	10.0	10.0	30	60	100	Solid
	120	4	12.0	12.0	40	70	120	Top Solid
	160	6	16.0	16.0	40	80	130	Top Solid
	200	6	20.0	20.0	50	90	150	Top Solid
	250	6	25.0	25.0	50	90	150	Top Solid

H

BRAZED TOOLS



Technical Information for Brazed Tools

H02 KORLOY Ultra-Fine Grades: F-Series
H03 Corrosion & Magnetism Proof Grade: IN-Series

General Cutting Tools

H04 Cemented Carbide, Cermet Blank
H05 Square Blank
H07 Round bar Blank
H07 Ring Blank
H08 Helix Blank
H09 Square Bits
H10 Auto Tool Bits
H11 Chuck Jaw

Mining & Construction Tools

H12 Cemented Carbide Blank for Taper Bits
H13 Cemented Carbide Blank for Cross Bits
H13 Taper Bits
H13 Boring Crown Blank
H13 Bits for Construction

Rotating Brazing Tools

H14 Rotating Brazing Tool
H15 Special Rotating Brazing Tools Order Form

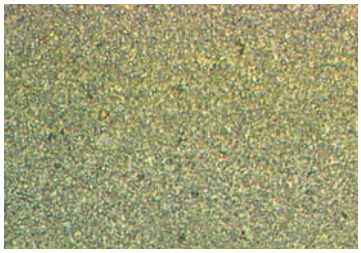
KORLOY ultra-fine grades “F-Series”

Features

In general, when we compare cemented carbide to high speed steel, cemented carbide has higher hardness but is more brittle than high speed steel. To neutralize the difference, KORLOY has developed an ultra fine cemented carbide grade “F-Series”± (WC size under 0.5㎛). It provides improved toughness and plastic deformation resistance against cemented carbide having coarse grain sizes. The main coverage for ultra fine cemented carbide is endmilling of difficult-to-cut materials like high temp alloys

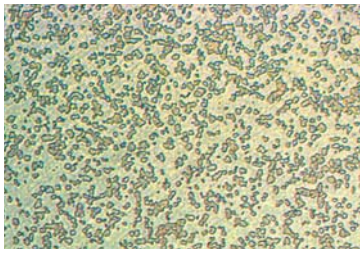
● Micro structure of “F-Series”

FA1



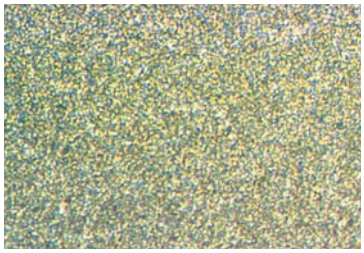
Since it is a grade focused on toughness, it is possible to make endmill, side cutter, gun drill, reamer etc. It has superior quality on toughness and anti built-up edge properties

FCC



It has been modified from FA1 to increase thermal shock resistance, thus FCC has proper properties to machine stainless steel and hard to machine materials at medium to high speed milling

FS1



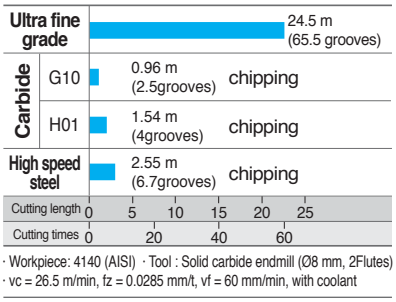
As a ultra fine grade having high hardness and superior toughness at the same time, it is the 1st recommended grade of KORLOY to make sharp cutting edge to cut difficult-to-cut material

Cutting performance

● Special features

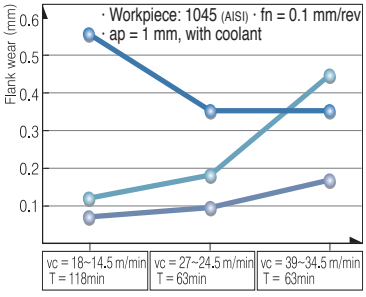
Grade	Characteristics			ISO classification	Wear resistance	Toughness
	Specific Gravity	Hardness (HRA)	TRS (kgf/mm²)			
FS1	14.4	92.4	250	Z10	⦿	○
FCC	12.6	91.5	250	Z10	⦿	○
FA1	14.1	91.2	300	Z20	○	⦿
FG2	14.3	92.7	350	Z10	⦿	○

● Chipping resistance



· Workpiece: 4140 (AISI) · Tool : Solid carbide endmill (Ø8 mm, 2Flutes)
· vc = 26.5 m/min, fz = 0.0285 mm/t, vf = 60 mm/min, with coolant

● Wear resistance

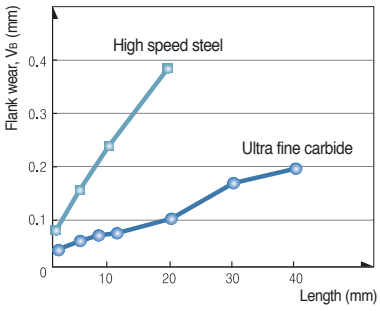


AISI: American Iron and Steel Institute

Guide of grade selection

Workpiece	Non-ferrous metal Steel, Cast iron
1st Recommended grade	FS1, FG2, FCC, FA1
Application tool	Drill, Endmill

- **Workpiece:** SM55C (HRC20)
- **Helix angle:** 30°
- **Tool**: Ø10 mm, 2 Flutes (SSE2100)
- **RPM** = 1,100 min-1
- **Cutting speed** = 35 m/mim
- **Axial depth** = 12 mm
- **Feed** = 0.1 mm/t
- **Radial depth** = 1 mm
- Downward cutting, Without coolant



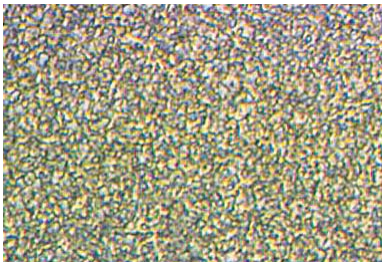
KORLOY corrosion & magnetism proof grades, "IN-Series"

Features

- Outstanding corrosion resistance: several hundred times better performance than general carbide grade (Test have been performed at 30% NHO3, comparing KORLOY G5 and IN-Series)
- Excellent hardness & toughness: Over (H_RA) 85 hardness, Over (TRS) 200 toughness
- Several grades: 3 different kind of grades for specific application, respectively

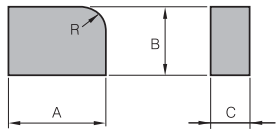
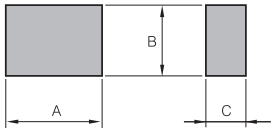
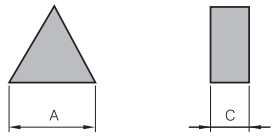
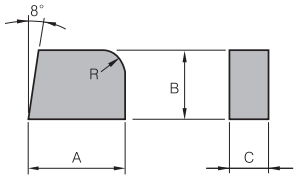
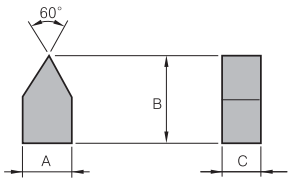
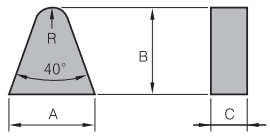
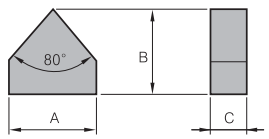
Grade	Specific gravity (g/cm^3)	Hardness (H_RA)	TRS (kgf/mm^2)	Magnetic saturation ($Gauss \cdot cm^3/g$)	Use
IN10	14.4	91.5	230	0	Mechanical Seal, Sliter Knife Anti-corrosive alloy, Magnetism proof alloy
IN20	14.5	91.0	230	90	Mechanical Seal, Sliter Knife Anti-corrosive alloy
IN40	13.5	85.5	230	0	Mold for magnetic powder Anticorrosive-Magnetism proof alloy

● Micro structure of "IN-Series"



Use

For anti-corrosive	For magnetism proof
• Parts for plant of corrosion-high pressure • Parts for sea water pump • Die/punch in high temperature • Mechanical seal	• Tape sliter • Mold for magnetic powder • Parts for VTR

Inserts	Designation	A	B	C	R	Uncoated							Cermet	Available blank
						ST10	ST20	GR35	U20	H01	H05	G10	CN2000	
	01- 0	10	6	3	4									31 Type 32 Type 45 Type 46 Type
	1	13	9	3	5									
	2	16	11	4	5		●							
	3	19	13	5	5		●							
	4	22	15	6	8									
	5	25	17	7	8									
	6	30	20	8	8									
	02- 0	10	6	3	-		●		●	●		●		41 Type 42 Type
	1	13	9	3	-		●		●	●		●		
	2	16	11	4	-		●		●	●		●		
	3	19	13	5	-	●	●		●	●		●		
	4	22	15	6	-		●		●	●		●		
	5	25	17	7	-		●			●		●		
	6	30	20	8	-		●							
	03- 0	10	-	3	-									37 Type 38 Type 47 Type 48 Type
	1	12	-	3	-									
	2	15	-	4	-									
	3	18	-	5	-									
	4	24	-	6	-									
	5	24	-	7	-									
	6	28	-	8	-									
	04- 0	10	6	3	4									33 Type 34 Type
	1	13	9	3	5		●							
	2	16	11	4	5									
	3	19	13	5	5		●							
	4	22	15	6	8									
	5	25	17	7	8									
	6	30	20	8	8									
	05- 1	5	8	3	-		●		●					49 Type 50 Type 51 Type 52 Type
	2	6	10	4	-		●		●					
	3	7	12	5	-		●		●					
	4	9	16	6	-		●							
	5	10	18	7	-									
	6	11	20	8	-									
	06- 0	10	10	3	2		●		●	●				36 Type 39 Type 40 Type
	1	13	13	3	2.5		●		●	●		●		
	2	16	16	4	3	●	●		●	●		●		
	3	19	19	5	4		●	●	●	●		●		
	4	22	22	6	4	●	●		●	●		●		
	5	25	25	7	5		●		●	●		●		
	6	30	30	8	6									
	07- 0	10	10	3	-									35 Type
	1	13	13	3	-									
	2	16	16	4	-									
	3	19	19	5	-									
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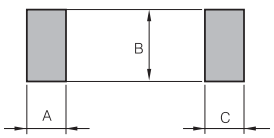
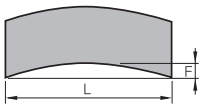
	6	30	25	8	-									
	08- 1	3	8	3	-		●		●					43 Type
	3	4	13	4	-	●	●		●	●		●		
	4	5	15	5	-	●	●		●	●		●		
	5	6	17	6	-	●	●		●			●		
	6	8	20	8	-		●							

RB



■ Bending tolerance



L		F-max
Standard	Tolerance	
~30	+1.0 - 0	0.15
31~50	+1.5 - 0	0.25
51~100	+3.0 - 0	0.30

※ Code system RB 15 04 □
Length Width Thickness

(mm)

Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	303□	3	3									
	304□	3	4									
	305□	3	5									
	306□	3	6									
	307□	3	7									
	308□	3	8									
	309□	3	9									
	310□	3	10									
RB	403□	4	3									
	404□	4	4									
	405□	4	5									
	406□	4	6									
	407□	4	7									
	408□	4	8									
	409□	4	9									
	410□	4	10									
RB	503□	5	3									
	504□	5	4									
	505□	5	5									
	506□	5	6									
	507□	5	7									
	508□	5	8									
	509□	5	9									
	510□	5	10									
RB	603□	6	3									
	604□	6	4									
	605□	6	5									
	606□	6	6									
	607□	6	7									
	608□	6	8									
	609□	6	9									
	610□	6	10									
RB	703□	7	3									
	704□	7	4									
	705□	7	5									

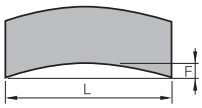
(mm)

Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	706□	7	6									
	707□	7	7									
	708□	7	8									
	709□	7	9									
	710□	7	10									
RB	803□	8	3									
	804□	8	4									
	805□	8	5									
	806□	8	6									
	807□	8	7									
	808□	8	8									
	809□	8	9									
	810□	8	10									
RB	903□	9	3									
	904□	9	4									
	905□	9	5									
	906□	9	6									
	907□	9	7									
	908□	9	8									
	909□	9	9									
	910□	9	10									
RB	1003□	10	3									
	1004□	10	4									
	1005□	10	5									
	1006□	10	6									
	1007□	10	7									
	1008□	10	8									
	1009□	10	9									
	1010□	10	10									
RB	1504□	15	4									
	1505□	15	5									
RB	2003□	20	3									
	2004□	20	4									
	2005□	20	5									
	2006□	20	6									

RB



■ Bending tolerance



L		F-max
Standard	Tolerance	
~30	+1.0 - 0	0.15
31~50	+1.5 - 0	0.25
51~100	+3.0 - 0	0.30

※ Code system RB 15 04 □
Length Width Thickness

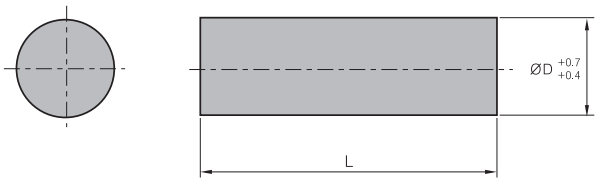
(mm)

Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	2007□	20	7									
	2008□	20	8									
	2009□	20	9									
	2010□	20	10									
RB	3003□	30	3									
	3004□	30	4									
	3005□	30	5									
	3006□	30	6									
	3007□	30	7									
	3008□	30	8									
	3009□	30	9									
	3010□	30	10									
RB	4003□	40	3									
	4004□	40	4									
	4005□	40	5									
	4006□	40	6									
	4007□	40	7									
	4008□	40	8									
	4009□	40	9									
	4010□	40	10									
RB	5003□	50	3									
	5004□	50	4									
	5005□	50	5									
	5006□	50	6									
	5007□	50	7									
	5008□	50	8									
	5009□	50	9									
	5010□	50	10									
RB	6003□	60	3									
	6004□	60	4									
	6005□	60	5									
	6006□	60	6									
	6007□	60	7									
	6008□	60	8									
	6009□	60	9									

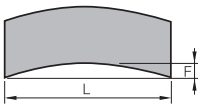
(mm)

Designation		L	W	T = □								Grades
				3	4	5	6	7	8	9	10	G10
RB	6010□	60	10									
RB	7003□	70	3									
	7004□	70	4									
	7005□	70	5									
	7006□	70	6									
	7007□	70	7									
	7008□	70	8									
	7009□	70	9									
	7010□	70	10									
RB	8003□	80	3									
	8004□	80	4									
	8005□	80	5									
	8006□	80	6									
	8007□	80	7									
	8008□	80	8									
	8009□	80	9									
	8010□	80	10									
RB	9003□	90	3									
	9004□	90	4									
	9005□	90	5									
	9006□	90	6									
	9007□	90	7									
	9008□	90	8									
	9009□	90	9									
	9010□	90	10									
RB	10003□	100	3									
	10004□	100	4									
	10005□	100	5									
	10006□	100	6									
	10007□	100	7									
	10008□	100	8									
	10009□	100	9									
	10010□	100	10									

SR Round bars blank



■ Bending tolerance



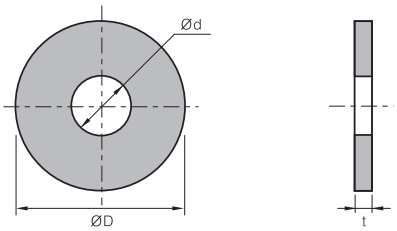
L		F-max
Standard	Tolerance	
~30	+1.5 - 0	0.10
31~40	+1.5 - 0	0.15
41~50	+1.5 - 0	0.20
51~100	+2.5 - 0	0.25

※ Code system SR 03 □
Diamerer Length

(mm)

Designation		ØD	T = □							Grades	
			30	40	50	60	70	80	90	100	ST20	G10
SR	03□	3										
	04□	4										
	05□	5										
	06□	6										
	07□	7										
	08□	8										
	09□	9										
	10□	10										
	11□	11										
	12□	12										

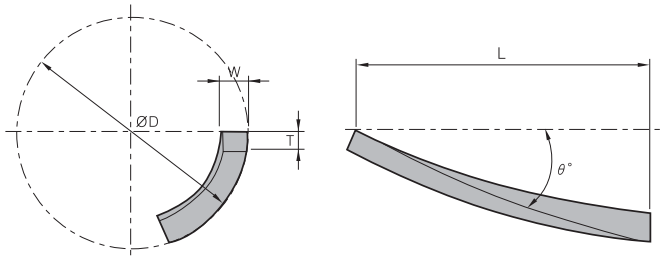
RT Ring blank



(mm)

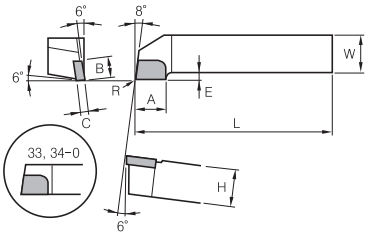
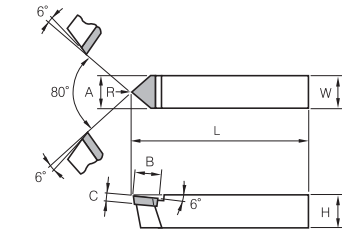
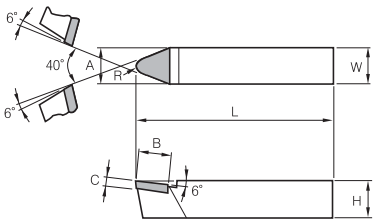
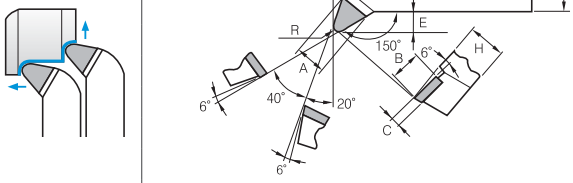
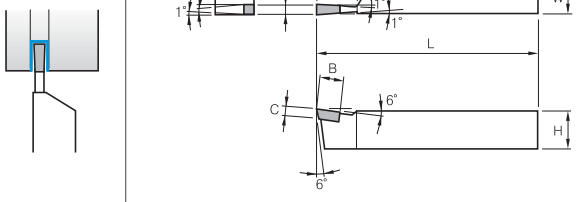
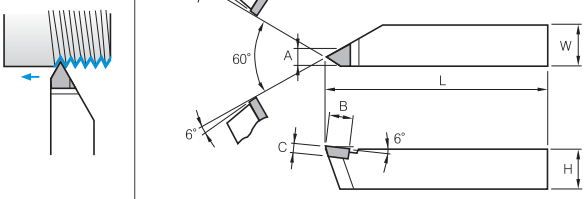
Designation	ØD	Ød	t
ØD×Ød×t	Ø7.2~Ø200	Ø2.7~Ø150	0.8~10

ST Helix blank

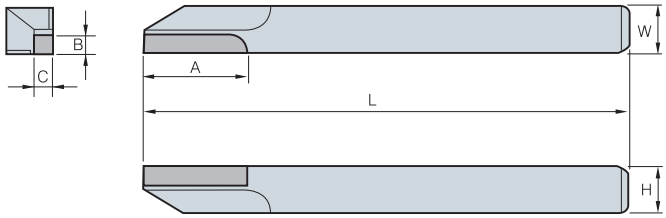


(mm)

Designation		Available endmill (ØD)	L	T	W	θ°
ST	14	Ø13, 14	30	2.3	4.0	23° 44′
	15	Ø15	30	2.3	4.0	25° 13′
	18	Ø18	32	2.3	4.5	25° 13′
	20	Ø20	32	2.8	5.5	24° 09′
	24	Ø23, 24	37	2.8	5.5	25° 13′
	26	Ø26, 27	37	3.3	6.5	24° 24′
	30	Ø29, 30, 31	42	3.8	7.0	25° 13′
	32	Ø32, 33	47	3.8	7.0	26° 41′
	35	Ø34, 35, 36	52	3.8	7.0	24° 36′
	38	Ø37, 38	57	3.8	7.0	23° 51′
	40	Ø39, 40, 41, 42	62	4.3	7.5	24° 57′
	45	Ø43, 44, 45, 46, 47	67	4.3	7.5	25° 13′
	50	Ø48, 49, 50	67	4.3	7.5	24° 09′

Feed direction	Figure	Designation	A	B	C	(R)	W	H	L	E	F	Available blank
33 type (Right hand)/34 type (Left hand)		**33, 34 - 0**	10	6	3	0.3	10	10	80	0		04-0
		1	13	9	3	0.5	13	13	100	4		04-1
		2	16	11	4	0.5	16	16	120	4		04-2
		3	19	13	5	0.5	19	19	140	5		04-3
		4	22	15	6	1	25	25	160	5		04-4
		5	25	17	7	1	25	30	180	5		04-5
		6	30	20	8	1	35	35	200	6		04-6
35 type		**35 - 0**	10	10	3	0.3	10	10	80			07-0
		1	13	13	3	0.5	13	13	100			07-1
		2	16	16	4	0.5	16	16	120			07-2
		3	18	19	5	0.5	19	19	140			07-3
		4	25	20	6	1	25	25	160			07-4
		5	25	22	7	1	25	30	180			07-5
		6	30	25	8	1	30	35	200			07-6
36 type		**36 - 0**	10	10	3	2	10	10	80			06-0
		1	13	13	3	2.5	13	13	100			06-1
		2	16	16	4	3	16	16	120			06-2
		3	18	18	5	4	19	19	140			06-3
		4	22	22	6	4	25	25	160			06-4
		5	25	25	7	5	25	30	180			06-5
		6	30	30	8	6	30	35	200			06-6
39 type (Right hand)/40 type (Left hand)		**39, 40 - 0**	10	10	3	2	10	10	80	5		06-0
		1	13	13	3	2.5	13	13	100	7		06-1
		2	16	16	4	3	16	16	120	10		06-2
		3	19	19	5	4	19	19	140	12		06-3
		4	22	22	6	4	25	25	160	13		06-4
		5	25	25	7	5	25	30	180	15		06-5
		6	30	30	8	6	30	35	200	16		06-6
43 type		**43 - 1**	3	8	3		10	16	100		13	08-1
		2	3	8	3		13	19	120		16	08-1
		3	4	13	4		16	22	140		20	08-3
		4	5	15	5		18	25	160		25	08-4
		5	6	17	6		22	32	180		30	08-5
		6	8	20	8		25	38	200		40	08-6
49 type (Right hand)/50 type (Left hand)		**49, 50 - 1**	5	8	3		13	13	100			05-1
		2	6	10	4		16	16	120			05-2
		3	7	12	5		19	19	140			05-3
		4	9	16	6		25	25	160			05-4

PBX100



(mm)

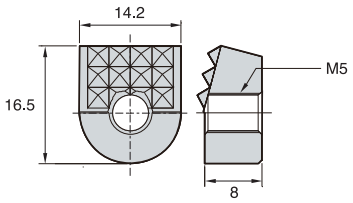
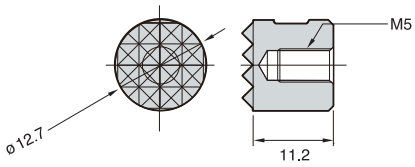
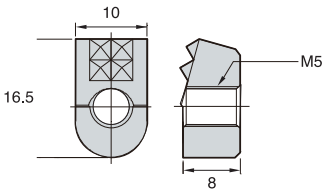
Designation		A	B	C	W	H	L
PBX -	105	20	2.0	2.0	5	5	125
	106	20	2.5	2.5	6	6	140
	107	20	3.0	3.0	7	7	150
	108	20	3.0	3.0	8	8	150
	109	20	3.5	3.5	9	9	150
	110	20	4.0	4.0	10	10	150
	112	20	4.0	4.0	12	12	150
	116	20	4.0	4.0	16	16	150

Chuck Jaw new

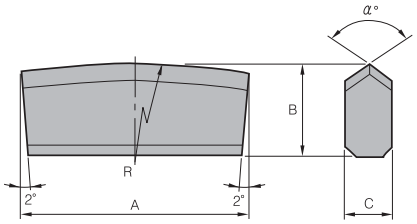
Features

- Chuck Jaw strongly clamps rough workpiece in turning and milling (including MCT)
- Can chuck any types of workpiece

Stock information

Designation	Geometry	Dimension
CJ 04		
CJ 12		
CJ 21		
CJ 22		
CJ 23		
CJ 31		
CJ 32		
CJ 41		
CJ 42		

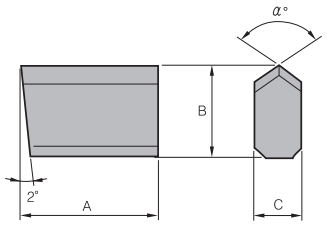
For taper bits 1000 type



(mm)

Designation		A	B	C	α°	R
1000 -	124	24	10	6	100	80
	126	26	10	6	100	80
	128	28	10	6	100	80
	130	30	10	6	100	80
	132	32	10	6	100	80
	232	32	10	6	100	80
	234	34	12	8	110	120
	236	36	12	8	110	120
	238	38	12	8	110	120
	240	40	12	8	110	120
	242	42	12	8	110	120
	332	32	14	8	110	120
	334	34	14	8	110	120
	336	36	14	8	110	120
	338	38	14	8	110	120
	340	40	14	8	110	120
	342	42	14	8	110	120
	434	34	15	10	110	120
	436	36	15	10	110	120
	438	38	15	10	110	120
	440	40	15	10	110	120
	442	42	15	10	110	120
	444	44	15	10	110	120
	446	46	15	10	110	120
	534	34	18	10	110	120
	536	36	18	10	110	120
	538	38	18	10	110	120
	540	40	18	10	110	120
	542	42	18	10	110	120
	544	44	18	10	110	120
	546	46	18	10	110	120

For cross bits 2000 type

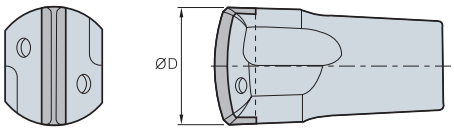


(mm)

Designation		A	B	C	α°	R
2000 -	110	10	10	6	100	
	111	11	10	6	100	
	112	12	10	6	100	
	113	13	10	6	100	
	114	14	10	6	100	
	115	15	12	6	100	
	210	10	12	6	100	
	211	11	12	6	100	
	212	12	12	6	100	
	213	13	12	6	100	
	214	14	12	6	100	
	215	15	14	8	100	
	312	12	14	8	100	
	313	13	14	8	100	
	314	14	14	8	100	
	315	15	14	8	100	
	316	16	14	8	100	
	317	17	14	8	100	
	318	18	14	8	100	

When ordering special items, Please point out the designation, grades, quantity. Available for tailor made

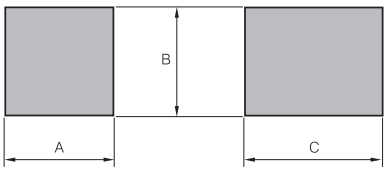
TB For taper bits



(mm)

Designation		ØD
TB	20	20
	32	32
	34	34
	36	36
	38	38
	39	39
	40	40

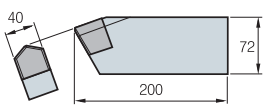
TB Boring crown blank

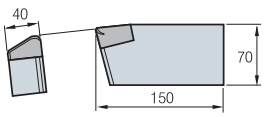


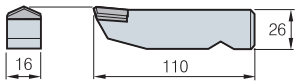
(mm)

Designation		A	B	C
BT	1	5	5	8
	2	6	6	9
	3	8	8	10
	4	7	10	15

Bits for construction

Configuration	Dimensions
Earth auger bits	

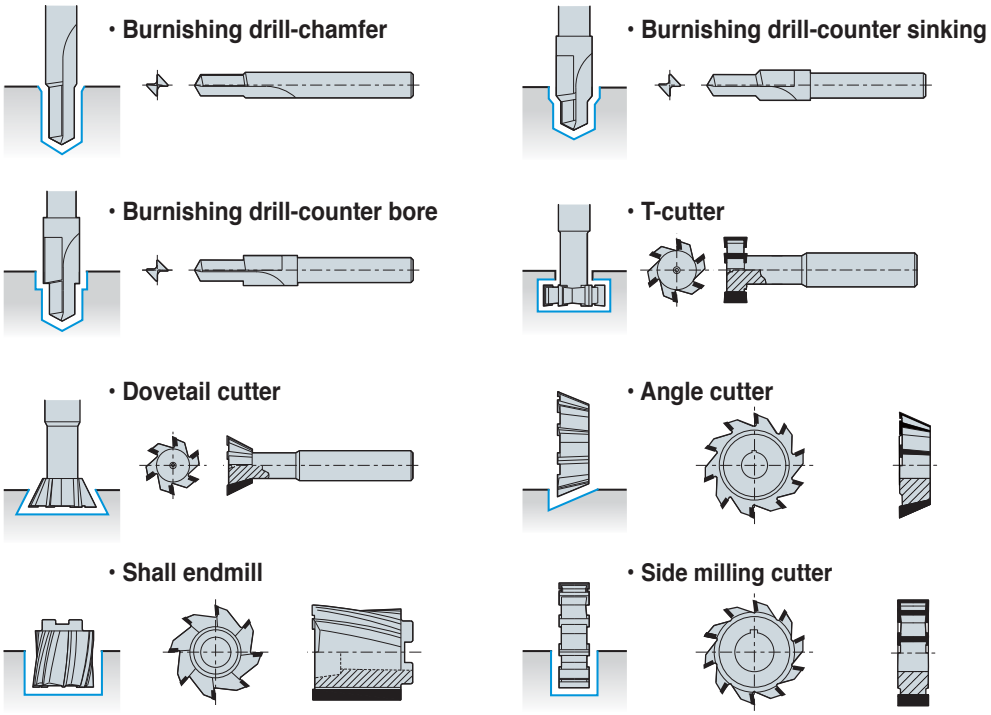
Configuration	Dimensions
Casing bits	

Configuration	Dimensions
Rod bits	

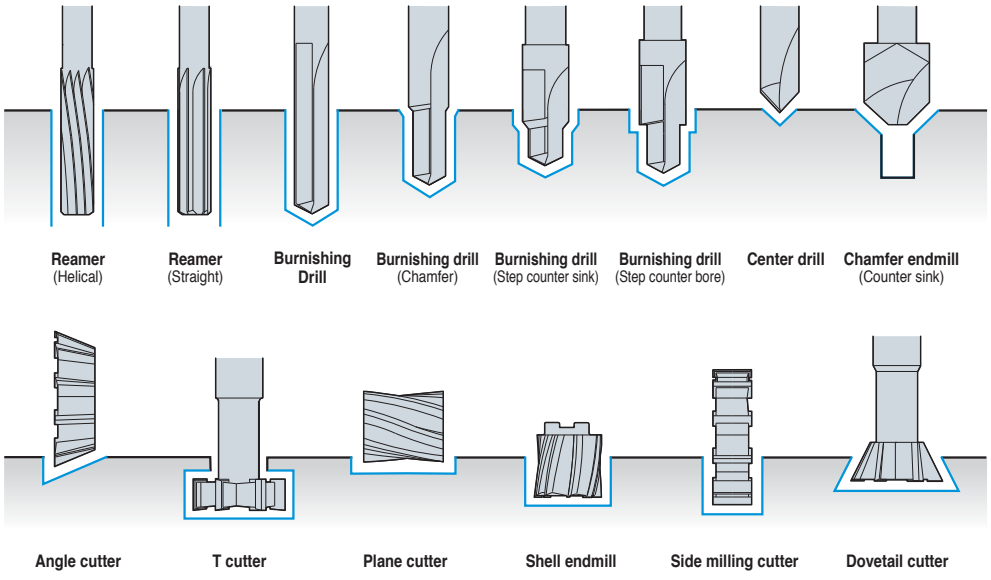
Features

- For various applications
- Precise accuracy. Easy to order for special types
- Suitable for small tools. Short delivery time
- Reasonable tool cost. Reusable after sharpening

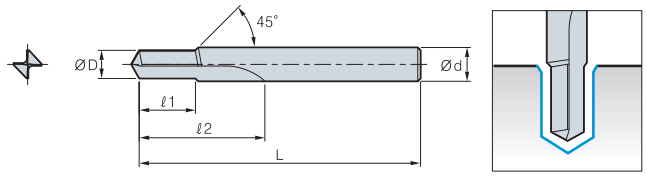
Cutting process type



Cutting processes and type



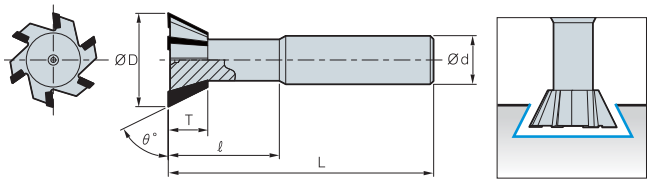
Burnishing Drill-Chamfer



(mm)

Designation	ØD	ℓ1	ℓ2	L	Ød
BDC					

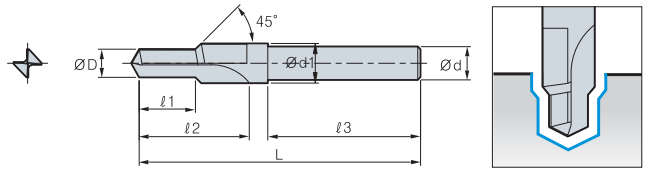
Dovetail Cutter



(mm)

Designation	ØD	ℓ	θ°	ℓ1	L	Ød	No. of Flute
DC							

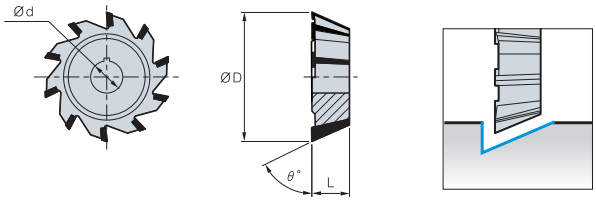
Burnishing Drill-Step



(mm)

Designation	ØD	Ød1	ℓ1	ℓ2	ℓ3	L	Ød
BDS							

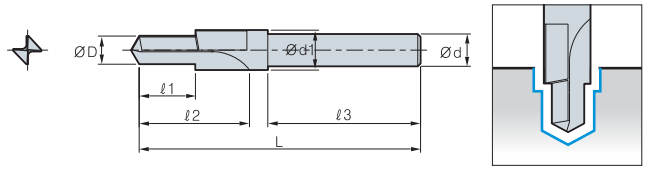
Angle Cutter



(mm)

Designation	ØD	θ°	Ød	L	No. of Flute
AC					

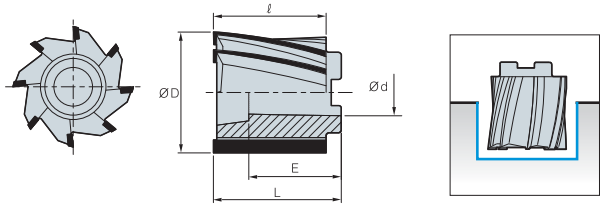
Burnishing Drill-Counter Bore



(mm)

Designation	ØD	Ød2	ℓ1	ℓ2	ℓ3	L	Ød
BDCB							

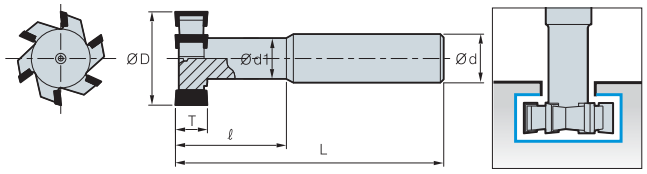
Shall Endmill



(mm)

Designation	ØD	Ød	ℓ	E	L	No. of Flute
SEM						

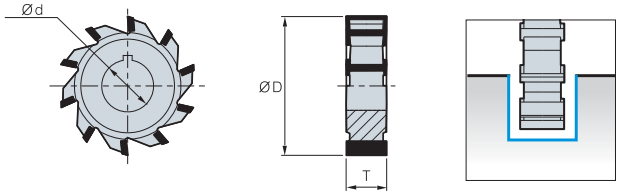
T-Cutter



(mm)

Designation	ØD	Ød1	T	ℓ	L	Ød	No. of Flute
TC							

Side Milling Cutter



(mm)

Designation	ØD	Ød	T	No. of Flute
SMC				

TOOLING SYSTEM



Tooling System

I 02 DBT Series
I 03 HSK Tooling System
I 04 Balancing System
I 05 Tooling System Index
I 06 DHE Series
I 10 DSC Series
I 17 CPM Series
I 19 NPM Series
I 21 DCS/DC/TC
I 22 Collet Chuck Series
I 24 SDC Series
I 29 GSK Series
I 31 DSK Series
I 34 GERC
I 37 DST Series
I 39 NPU
I 40 DTN Series
I 42 TCA Tap Adaptor
I 43 TER Tap Collet
I 44 Side Lock Arbor Series
I 46 Face Mill Arbor Series
I 49 Angular Head Series
I 57 FBH/B Series
I 61 TBC/FBC Series
I 64 FBB
I 65 DBC
I 66 KMB
I 67 SMB
I 68 SMH
I 69 Modular System
I 70 Modular Arbor
I 72 EXT Bar
I 73 RDC Bar
I 74 DAMPING PRO
I 81 Others



For high speed machining

DBT Series

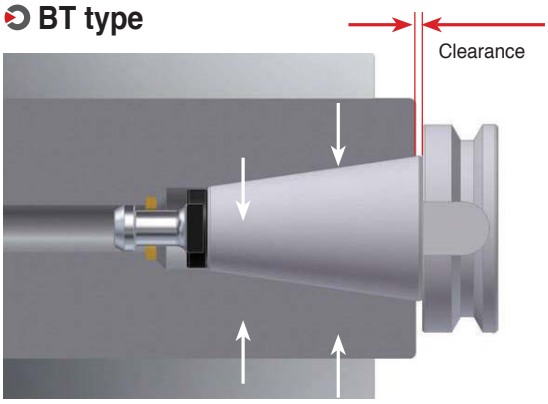
2 face constrained system of taper and shank face for excellent surface roughness and high quality finish in heavy cutting at high speed



Features of 2 face constrained system

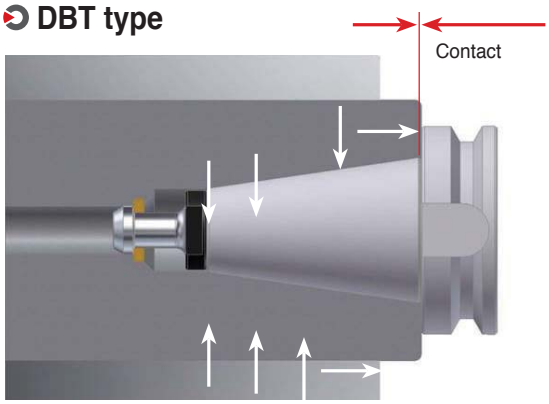
- Stable machining can be possible at high speed
- Improvement of tool-life for machine spindle and cutting tool
- Prevention for corrosion of taper porsion of both machine spindle and tool holder by heavy duty machining vibration
- Guarantee for the most suitable machining and high accuracy

BT type



The clearance between spindle and face of shank

DBT type

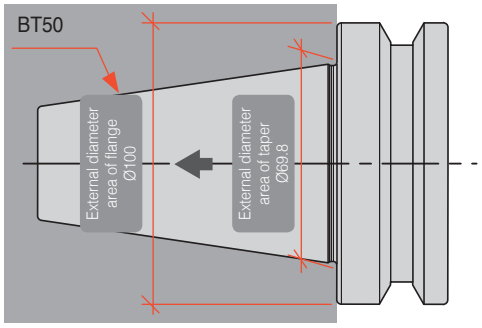


Perfect contact of both faces Better precision/less vibration

Higher stability and precision

Stability and precision increase due to the close contact between taper face and wide external diameter of flange at DBT shank than at BT shank

Shank	Taper		Flange
BT30	Ø31.7	→	Ø46
BT40	Ø44.4	→	Ø63
BT50	Ø69.8	→	Ø100



Difference between taper face contact and flange contact at its external diameter

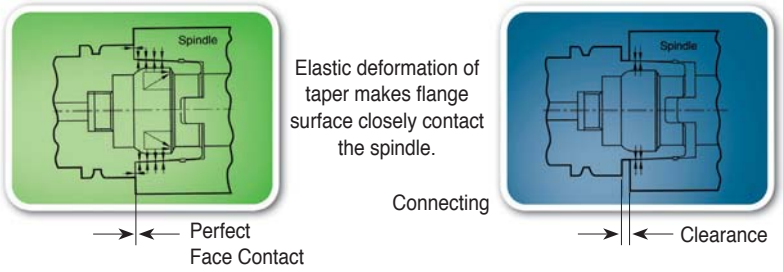
Various models

Tapping	Milling		Face milling	Angular head
				
BT-DST	BT-NPM	BT-DHE	BT-FMA	BT-KAG

HSK Tooling System

Features of HSK 2 face constrained toolholder

The 7/24 taper shank for multi-purpose has been pointed out that its performance is inappropriate in terms of repeatability, joint stiffness and high speed machining. Drawbacks of 7/24 taper shank had been eliminated by using new two face contact

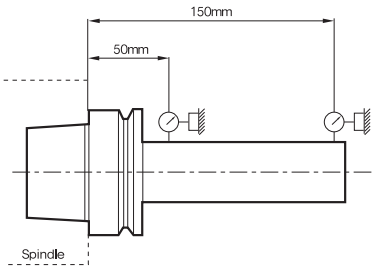


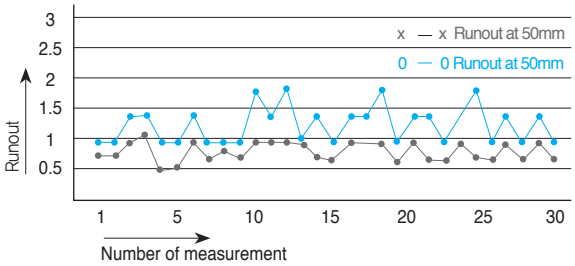


HSK shank -Perfect 2-surface constrained system

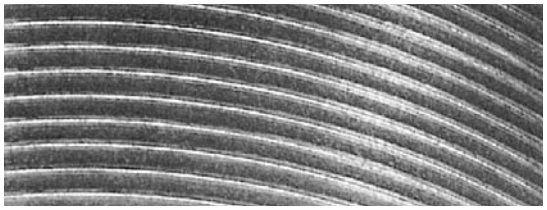
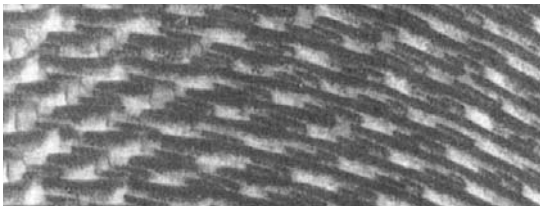
Excellent repeatability-run out accuracy

As taper of holder will deform elastically following the profile of the spindle shape, there is no eccentricity between the spindle and the other. Also, due to perfect face contact between flange surface of the holder and spindle face, bending strength of the holder is very high, which makes radial and axial and accuracy very high





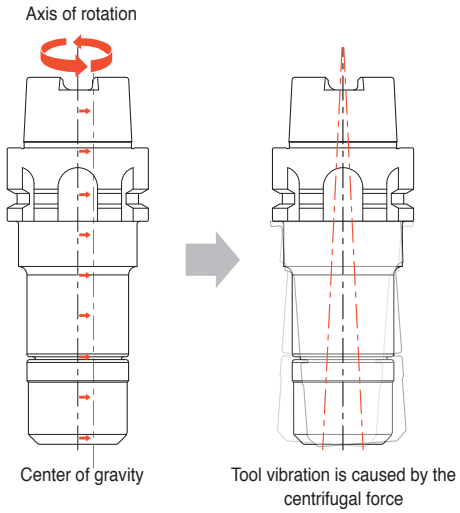
High rigidity against bending load

HSK 63	BT 40
	

Balancing System

Imbalance

- **Cause of imbalance**
  Imbalance occurs due to the asymmetry of tool geometries and spindle run-out
- **Difficulties of imbalance**
  Shorter tool life, inferior surface roughness and noise are caused by vibration during rotation and damage on spindle bearing
- **Need for balancing**
  Balancing is needed to prevent unbalance for better surface roughness, precision and tool life

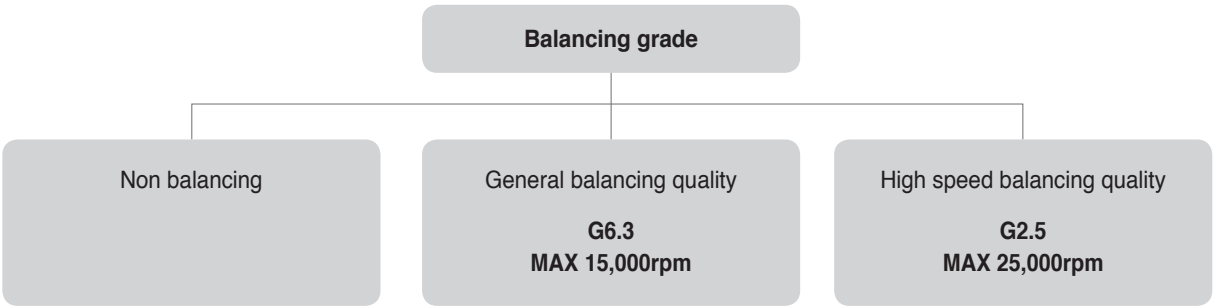


※ A case that the tool's center of gravity deviates from the rotation axis

The most optimal accuracy at high speed

- Without bending from rotation of an unbalanced load, High accuracy and rigidity are maintained
- Excellent Balance (≤ G1.0 or 0.5 g·mm/kg)
- Tool life, surface finish, dimension of accuracy and productivity can be realized at high speed

Balancing grade standard



Various balancing quality available



Hydraulic Expansion Chuck	Shrinking Chuck	Champion Milling Chuck	Milling Chuck
DHE  I 7	DSC  I 11	CPM  I 18	NPM  I 20
Collet Chuck	**Collet Chuck**	**High Speed Synchro Slim Chuck**	**Collet Chuck**
SDC  I 24	SDC/S  I 28	GSK  I 29	DSK  I 32
High Speed Synchro Tapping Chuck	**Drill Chuck**	**Tap Chuck**	**Side Lock Arbor**
DST  I 38	NPU  I 39	DTN  I 41	SLA  I 44
Face Mill Arbor	**Angular Head Series**	**Angular Head Series**	**Angular Head Series**
FMA, FMC  I 46	MAH  I 51	HRAG  I 52	KHU  I 53
Angular Head Series	**Angular Head Series**	**Angular Head Series**	**Boring Tool**
KAG  I 54	KAH  I 55	KAC  I 56	FBH/B  I 58
Boring Tool	**Boring Tool**	**Boring Tool**	**Boring Tool**
TBC, FBC  I 63	DBC  I 65	KMB  I 66	SMB  I 67
Boring Tool	**Modular System Arbors**	**Modular System Extention Bar**	**Modular System Reducer Bar**
SMH  I 68	MD  I 70	EXT  I 72	RDC  I 73
DAMPING PRO			
FMA/FMC  I 76			

Hydraulic expansion chuck

DHE Series



- Ideal for mold making and machining automobile components & precise parts due to high precision machining
- Improved surface roughness due to vibration proof by hydraulic chamber
- Reduced replacement time and tiredness of worker with the use of T wrench for removal
- Applicable shank diameter: Ø3-32

Code system

BT40 - DHE 20 - 140

- BT40 — Spindle
- DHE — Hydraulic expansion chuck
- 20 — Max. Chucking dia.
- 140 — Length

Features

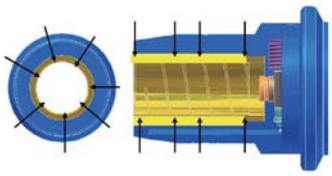
High accuracy provides long tool life due to reduced wear and hydraulic room enhances a surface roughness by lessening vibrations

- RUN OUT: under 5 ㎛
- L = 3 x ØD
- Shank: Tolerance of ØD: h6



Internal sealing structure (Durability)

- Internal sealing system protects the chuck against dust, cutting oil, lubricant and chips getting into it
  - Maintaining clamping force and accuracy for a long time



With simple t-wrench,very easy to change a tool

- Clamping structure for easy operation (Convenience)
  - Decrease of worker's fatigue
  - Improving machine capacity



Shank	Grade	Max.rpm
BT50, SK50, HSK100A	G6.3	10,000
BT40, SK40, HSK63A		15,000
BT30, HSK50A, SK30		20,000
HSK40A	-	25,000



Stable clamping

The clearance between holder and tool is fixed by hydraulic pressure



BT-DHE

MAS403-BT



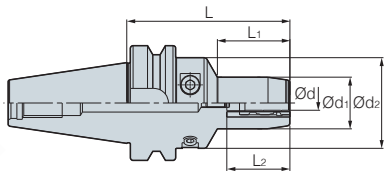


Fig. 1

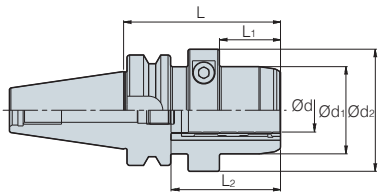


Fig. 2

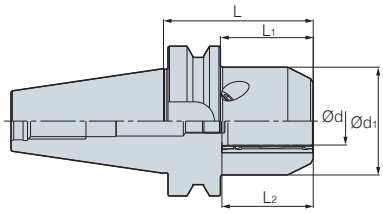


Fig. 3

(mm)

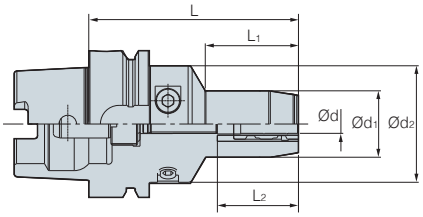
Designation			Ød	L	Ød1	Ød2	L1	L2	Adjust screw	Fig.	kg
BT30 -	DHE 6 -	65	6	65	29	45	33	30~39.8	M5	1	0.7
	DHE 8 -	65	8	65	31	45	33	30~39.8	M5	1	0.7
	DHE 10 -	65	10	65	32	45	34	35~44.8	M5	1	0.7
	DHE 12 -	65	12	65	35	45	34	41~50.8	M5	1	0.7
	DHE 14 -	90	14	90	36	45	40	43~52.8	M5	1	0.9
	DHE 16 -	90	16	90	40	45	45	46~55.8	M5	1	1.0
	DHE 18 -	90	18	90	42	45	40	49~58.8	M5	1	1.0
	DHE 20 -	90	20	90	44	45	45	49~58.8	M5	1	1.1
BT40 -	DHE 6 -	90	6	90	29	50	40	30~39.8	M5	1	1.4
		140	6	140	29	50	40	30~39.8	M5	1	2.2
	DHE 8 -	90	8	90	31	50	40	30~39.8	M5	1	1.4
		140	8	140	31	50	40	30~39.8	M5	1	2.2
	DHE 10 -	90	10	90	33	50	40	35~44.8	M5	1	1.5
		140	10	140	33	50	40	35~44.8	M5	1	2.2
	DHE 12 -	90	12	90	35	50	40	41~50.8	M10	1	1.5
		140	12	140	35	50	40	41~50.8	M10	1	2.3
	DHE 14 -	90	14	90	36	50	40	43~52.8	M10	1	1.5
		140	14	140	36	50	40	43~52.8	M10	1	2.3
	DHE 16 -	90	16	90	40	50	45	46~55.8	M10	1	1.5
		140	16	140	40	50	45	46~55.8	M10	1	2.3
	DHE 18 -	90	18	90	42	50	45	49~58.8	M10	1	1.5
		140	18	140	42	50	45	49~58.8	M10	1	2.3
	DHE 20 -	90	20	90	44	50	47	49~58.8	M10	1	1.5
		140	20	140	44	50	47	49~58.8	M10	1	2.3
	DHE 25 -	90	25	90	50	70	35	58~67.8	M16	2	1.9
	DHE 32 -	90	32	90	63	80	35	58~67.8	M16	2	2.0
BT50 -	DHE 6 -	90	6	90	29	50	34	30~39.8	M5	1	3.9
		140	6	140	29	50	40	30~39.8	M5	1	4.5
	DHE 8 -	90	8	90	31	50	34	30~39.8	M5	1	3.9
		140	8	140	31	50	40	30~39.8	M5	1	4.5
	DHE 10 -	90	10	90	33	50	34	35~44.8	M5	1	3.9
		140	10	140	33	50	34	35~44.8	M5	1	4.5
	DHE 12 -	90	12	90	35	50	34	41~50.8	M10	1	4.0
		140	12	140	35	50	34	41~50.8	M10	1	4.6
	DHE 14 -	90	14	90	36	50	34	43~52.8	M10	1	4.0
		140	14	140	36	50	34	43~52.8	M10	1	4.6
	DHE 16 -	90	16	90	40	50	34	46~55.8	M10	1	4.1
		140	16	140	40	50	34	46~55.8	M10	1	4.7
	DHE 18 -	90	18	90	42	50	40	49~58.8	M10	1	4.1
		140	18	140	42	50	45	19~58.8	M10	1	4.7
	DHE 20 -	90	20	90	44	50	34	49~58.8	M10	1	4.2
		140	20	140	44	50	47	49~58.8	M10	1	4.7
	DHE 25 -	90	25	90	66	-	52	58~67.8	M16	3	4.7
	DHE 32 -	90	32	90	72	-	52	58~67.8	M16	3	4.8

Spare Part 19 Collet 18~9

• L2 : Insertion depth of tool (Min.~max.) • Through coolant system available

HSK-DHE





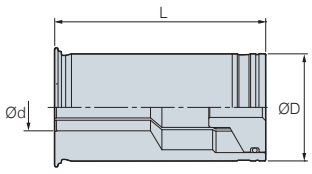
(mm)

Designation		Ød	L	Ød1	Ød2	L1	L2	Adjust Screw	kg
HSK63A -	DHE 6 - 75	6	75	29	50	34	30~39.8	M5	1.0
	DHE 8 - 75	8	75	31	50	34	30~39.8	M5	1.0
	DHE 10 - 85	10	85	33	50	40	35~44.8	M5	1.2
	DHE 12 - 90	12	90	35	50	40	41~50.8	M5	1.2
	DHE 16 - 95	16	95	40	50	45	46~55.8	M10	1.3
	DHE 20 - 100	20	100	44	50	50	49~58.8	M10	1.4
	150	20	150	44	50	50	49~58.8	M10	2.0
HSK100A -	DHE 20 - 105	20	105	44	50	50	49~58.8	M10	2.8
	DHE 25 - 115	25	115	50	63	62	58~67.8	M16	3.3
	DHE 32 - 115	32	115	63	75	62	58~67.8	M16	3.8

• L2 : Insertion depth of tool (Min.~max.) • Through coolant system is optional

DHC Collet (General type)



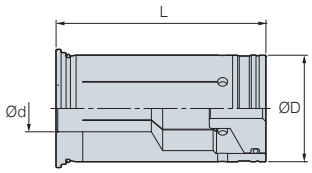


(mm)

Designation	ØD	Ød	L
DHC12 - 3, 4, 5, 6, 8	12	3, 4, 5, 6, 8	47
DHC20 - 3, 4, 5 , 6, 8, 10, 12, 14, 16	20	3, 4, 5, 6, 8, 10, 12, 14, 16	52
DHC32 - 6, 8, 10, 12, 14, 16, 18, 20, 25	32	6, 8, 10, 12, 14, 16, 18, 20, 25	63

DHC Collet (Accuracy type)



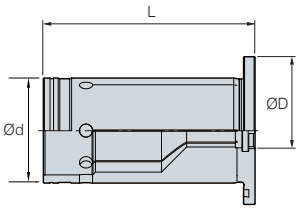


(mm)

Designation	ØD	Ød	L
DHC12 - 3(P), 4(P), 5(P), 6(P), 8(P)	12	3, 4, 5, 6, 8	47
DHC20 - 3(P), 4(P), 5(P), 6(P), 8(P), 10(P), 12(P), 14(P), 16(P)	20	3, 4, 5, 6, 8, 10, 12, 14, 16	52
DHC32 - 6(P), 8(P), 10(P), 12(P), 14(P), 16(P), 18(P), 20(P), 25(P)	32	6, 8, 10, 12, 14, 16, 18, 20, 25	63

DHJ Collet (Jet coolant)





(mm)

Designation	ØD	Ød	L
DHJ20 - 6, 8, 10, 12, 14, 16	20	6, 8, 10, 12, 14, 16	50

Parts

Spare Parts					
Chuck		Clamp screw	Wrench	Chuck	Adjust screw
Type				Type	
BT30/SK30/HSK50	DHE 6, 8, 10, 12	DHE-M8 (C)	DHETW-4	DHE 6, 8, 10	DHE-M5 (ADJ)
	DHE 14, 16, 18, 20	DHE-M10 (C)	DHETW-5		
BT40/BT50/SK40/SK50 HSK63A/HSK100A	DHE 6, 8, 10, 12, 14, 16, 18, 20	DHE-M10 (C)	DHETW-5	DHE 12, 14, 16, 18, 20	DHE-M10 (ADJ)
	DHE 25, 32	DHE-M12 (C)	DHETW-6	DHE 25, 32	DHE-M16 (ADJ)

Shrinking chuck

DSC

- Use of specially heat-treated steel
- High precision machining and clamping
- Increased precision and longer tool life due to minimized overhang when machining deep grooves
- Applicable shank diameter: Ø3-32



Code System

BT50 - DSC 6 - S - 165 - S

Shank type	Holder type	Tool Dia.	Type	Length	Special
BT, HSK, SK, ST, CS, CM	DSC: Shrinking chuck SLK: 2piece holder Collet		S: Silm M: Middle NON: General		S: Curve type NON: General

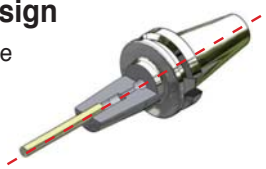
Mono curve type

- Integral DSC with excellent precision and balancing
- Long but stable holder design

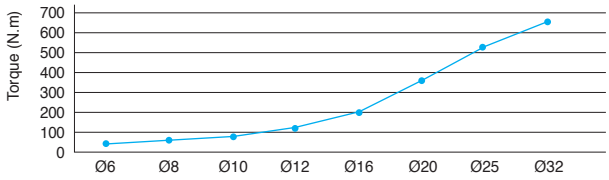


Symmetric design

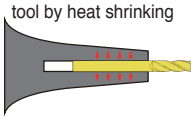
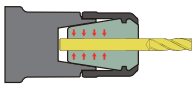
- High clamping force



High clamping force

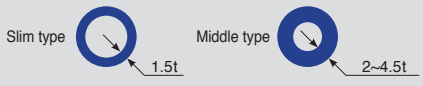


- 30% stronger Clamping Force
- Run-Out (≤ 0.003 mm)
- Higher Power transmission Clamping Force by Inner-Size

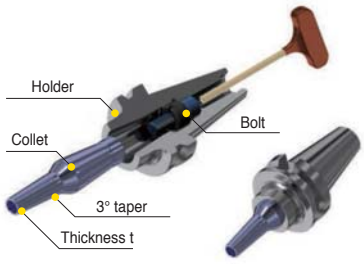
Shrinking chuck	Collet chuck
Fix the clearance between holder and tool by heat shrinking	Fix the tool by elasticity of collet
	
Thermal expansion ▶ Thermal shrinking	Elastic deformation
Highly strong clamping	Strong clamping

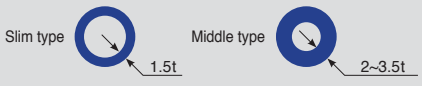
Mono type

Figure	Accuracy
	 Run-out 3 ㎛



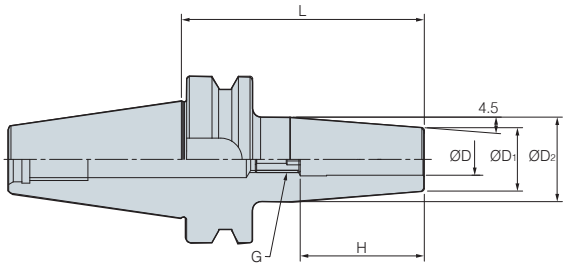
2-pieces type

Figure	Accuracy
	 Run-out 5 ㎛



BT-DSC





(mm)

Designation			ØD	L	ØD1	ØD2	H	G	kg	MAX RPM
BT30 -	DSC3 -	60	3	60	11	18.5	82	-	0.6	25,000
	DSC4 -	60	4	60	13	20.5	82	-	0.6	25,000
BT40 -	DSC6 -	90	6	90	21	27	36	M5	1.2	20,000
		120	6	120	21	27	36	M5	1.2	20,000
		160	6	160	21	27	36	M5	1.4	20,000
	DSC8 -	90	8	90	21	27	36	M5	1.2	20,000
		120	8	120	21	27	36	M5	1.2	20,000
		160	8	160	21	27	36	M5	1.4	20,000
	DSC10 -	90	10	90	24	32	42	M8	1.2	20,000
		120	10	120	24	32	42	M8	1.2	20,000
		160	10	160	24	32	42	M8	1.6	20,000
	DSC12 -	90	12	90	24	32	47	M8	1.2	20,000
		120	12	120	24	32	47	M8	1.2	20,000
		160	12	160	24	32	47	M8	1.6	20,000
	DSC16 -	90	16	90	27	34	50	M12	1.3	20,000
		120	16	120	27	34	50	M12	1.3	20,000
		160	16	160	27	34	50	M12	1.7	20,000
	DSC20 -	90	20	90	33	42	52	M12	1.3	20,000
		120	20	120	33	42	52	M12	1.5	20,000
		160	20	160	33	42	52	M12	2.1	20,000

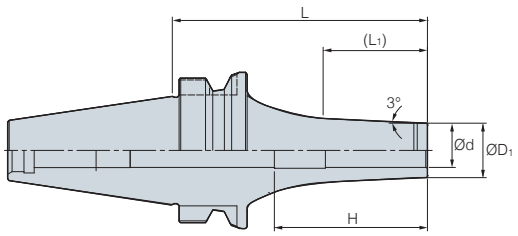
Adjust screw I 16

• Through coolant system available

BT-DSC/M

Mono Curve type





(mm)

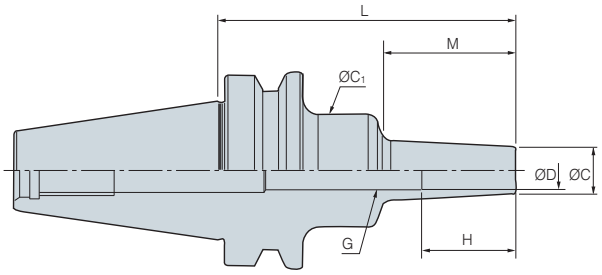
Designation			ØD	L	L1	ØD1	ØC1	H	G	kg	MAX RPM
BT30 -	DSC3M -	75S	3	75	29.8	8	25	97	-	0.6	25,000
	DSC4M -	75S	4	75	31.8	10	25	97	-	0.6	25,000
	DSC6M -	75S	6	75	28.9	12	30	97	-	0.6	25,000
	DSC8M -	75S	8	75	28.9	14	32	97	-	0.6	25,000
	DSC10M -	75S	10	75	30.66	16	32	45	-	0.6	25,000

• Not able to use the adjust screw • Through coolant system available

BT-DSC/M

Mono type





(mm)

Designation		ØD	L	ØD1	ØC1	M	H	kg
BT40 -	DSC6M - 95	6	95	10	26	42	18	1.2
	120	6	120	10	26	67	18	1.2
	160	6	160	10	36	97	18	1.5
	DSC8M - 95	8	95	13	36	42	24	1.2
	120	8	120	13	36	67	24	1.2
	160	8	160	13	36	97	24	1.5
	DSC10M - 95	10	95	16	36	42	30	1.2
	120	10	120	16	36	67	30	1.2
	160	10	160	16	36	97	30	1.5
	DSC12M - 95	12	95	19	36	42	30	1.2
	120	12	120	19	36	67	30	1.2
	160	12	160	19	36	97	30	1.5
	DSC16M - 95	16	95	24	50	42	32	1.2
	120	16	120	24	50	67	32	1.2
	160	16	160	24	50	97	32	1.5
	DSC20M - 95	20	95	29	50	42	40	1.2
	120	20	120	29	50	67	40	1.2
	160	20	160	29	50	97	40	1.5
BT50 -	DSC6M - 110	6	110	10	26	42	18	3.5
	160	6	160	10	36	97	18	4
	DSC8M - 110	8	110	13	36	42	24	3.5
	160	8	160	13	36	97	24	4
	DSC10M - 110	10	110	16	36	42	30	3.5
	160	10	160	16	36	97	30	4
	DSC12M - 110	12	110	19	36	42	30	3.5
	160	12	160	19	50	97	30	4
	DSC16M - 110	16	110	24	50	42	32	3.5
	160	16	160	24	50	97	32	4
	DSC20M - 110	20	110	29	50	42	40	3.5
	160	20	160	29	50	97	40	4

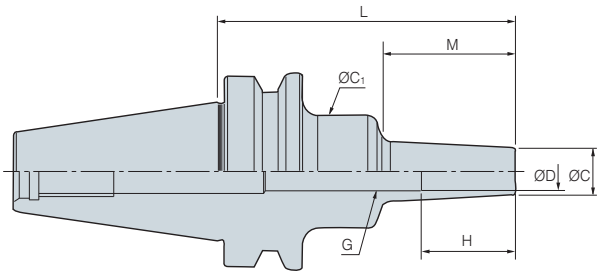
Adjust screw I16

• Through coolant system available

BT-DSC/S

Mono Slim type





(mm)

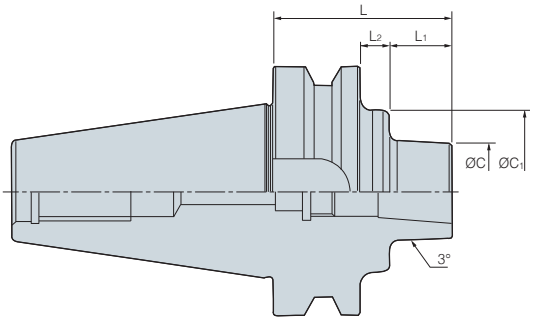
Designation			ØD	L	ØD1	ØC1	M	H
BT30 -	DSC6S -	60	6	60	9	20	22	18
		80	6	80	9	20	42	18
		120	6	120	9	25	67	18
BT40 -	DSC6S -	95	6	95	9	26	42	18
		120	6	120	9	26	67	18
		160	6	160	9	36	97	18
	DSC8S -	95	8	95	11	36	42	24
		120	8	120	11	36	67	24
		160	8	160	11	36	97	24
	DSC10S -	95	10	95	13	36	42	30
		120	10	120	13	36	67	30
		160	10	160	13	36	97	30
	DSC12S -	95	12	95	15	36	42	30
		120	12	120	15	36	67	30
		160	12	160	15	36	97	30
BT50 -	DSC6S -	110	6	110	9	26	42	18
		160	6	160	9	36	97	18
	DSC8S -	110	8	110	11	36	42	24
		160	8	160	11	36	97	24
	DSC10S -	110	10	110	13	36	42	30
		160	10	160	13	36	97	30
	DSC12S -	110	12	110	15	36	42	30
		160	12	160	15	36	97	30

• Not able to use the adjust screw • Through coolant system available

BT-SLK

2-pieces type





(mm)

Designation			L	ØC	L_1	L_2	$ØC_1$
BT30 -	SLK12 -	35	35	38	13	-	-
BT40 -	SLK12 -	45	45	38	18	-	-
		45F	45	41	18	-	-
		75	75	38	48	-	-
		75F	75	41	48	-	-
		135F	135	41	108	-	-
BT50 -	SLK12 -	75	75	38	25	12	65
		75F	75	41	25	12	65
		105F	105	41	55	12	65
		135F	135	41	85	12	65
		225	225	38	150	37	65
		315	315	38	150	127	90

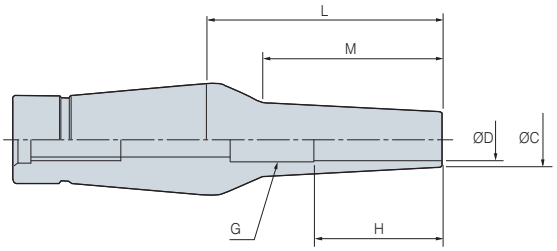
Adjust screw I 16

• Through coolant system available • PULL STUD BOLT is needed for BT30-SLK12-35

CS/CM

2-pieces type





(mm)

Designation			ØD	ØC	L	M	H
CS12 -	6 -	36	6	9	35	22	18
		55	6	9	55	42	18
		80	6	9	80	67	18
		110	6	9	110	97	18
	8 -	35	8	11	35	22	24
		55	8	11	55	42	24
		80	8	11	80	67	24
		110	8	11	110	97	24
	10 -	35	10	13	35	22	30
		55	10	13	55	42	30
		80	10	13	80	67	30
		110	10	13	110	97	30
	12 -	35	12	15	35	22	30
		55	12	15	55	42	30
		80	12	15	80	67	30
		110	12	15	110	97	30

• Not able to use the adjust screw • Through coolant system available

(mm)

Designation			ØD	ØC	L	M	H
CM12 -	6 -	35	6	12	35	22	18
		55	6	12	55	42	18
		80	6	12	80	67	18
	8 -	35	8	14	35	22	24
		55	8	14	55	42	24
		80	8	14	80	67	24
	10 -	35	10	16	35	22	30
		55	10	16	55	42	30
		80	10	16	80	67	30
	12 -	35	12	20	35	22	30
		55	12	20	55	42	30
		80	12	20	80	67	30

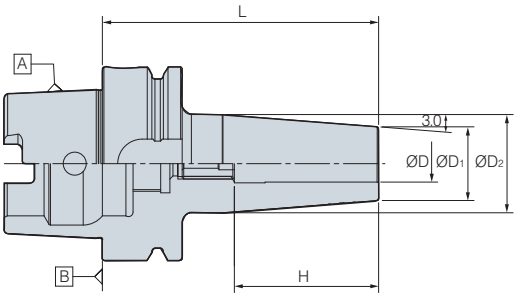
Adjust screw I 16

• Through coolant system available

HSK-DSC/M

Mono type





(mm)

Designation		ØD	L	ØD1	ØC1	M	H
HSK63A -	DSC6M - 95	6	95	10	26	42	18
	DSC8M - 95	8	95	13	36	42	24
	DSC10M - 120	10	120	16	36	67	30
	DSC12M - 120	12	120	19	36	67	30
	DSC16M - 120	16	120	24	50	67	32

• Not able to use the adjust screw • Through coolant system is optional

Parts

Spare parts											
Type		DSC6	DSC8	DSC10	DSC12	DSC14	DSC16	DSC18	DSC20	DSC25	DSC32
Adjust screw		M520C		M820C		M1230C					

Champion milling chuck

CPM



- Improved tool life by blocking dust and lubricant leaking with perfect sealing structure on O-ring and Nut
- Available through coolant system with CTC set
- Length regulator is inserted in CPM, user can adjust length conveniently

Code system

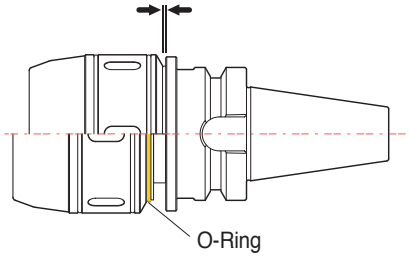
BT40 - CPM 32 - 105

BT40	CPM	32	105
Spindle	Champion milling chuck	Max. chucking dia.	Length

Prevention of grease leak and dust proof

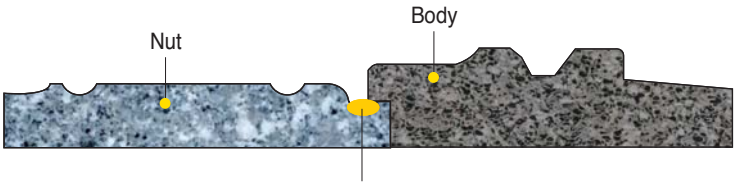
CPM has O-Ring on nuts to absorb cutting vibration for stable operation and prevents inflow of debris

Face contact for stable machining and dust proof

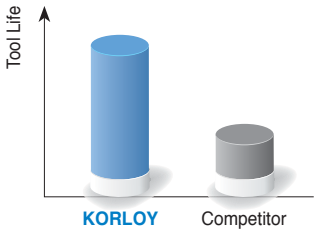


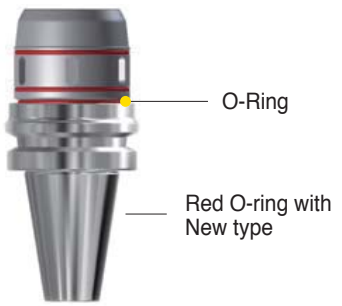
Correlation of oil leaking and tool life

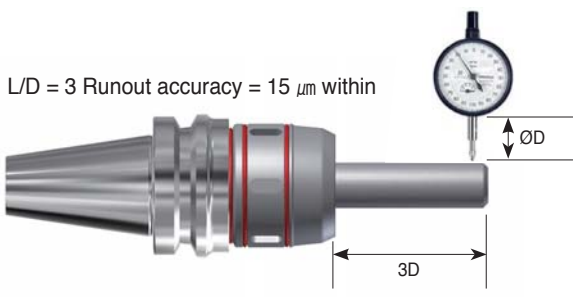
Obvious increase of tool life after applying dust proof system



O-Ring: Blocking lubricant leakage and dust entry → **Enhanced tool life**

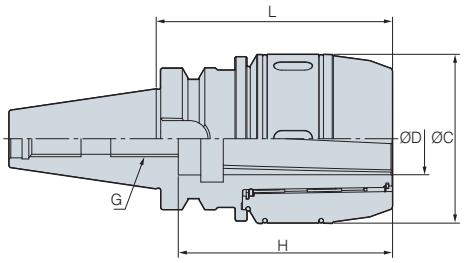






BT-CPM





(mm)

Designation			ØD	L	ØC	H	G	Collet	kg
BT30 -	CPM20 -	80	20	80	54	80	M16	DC20, DSC20	1.1
BT40 -	CPM20 -	90	20	90	54	80	M16	DC20, DSC20	2.3
	CPM32 -	90	32	90	75	85	M16	DC32, DCS32	2.8
		105	32	105	75	95	M16	DC32, DCS32	2.9
BT50 -	CPM32 -	105	32	105	75	95	M24	DC32, DCS32	5.0
		135	32	135	75	95	M24	DC32, DCS32	5.8
		165	32	165	75	95	M24	DC32, DCS32	6.8

• Order-made sets available • Through coolant system is optional

New power milling chuck

NPM

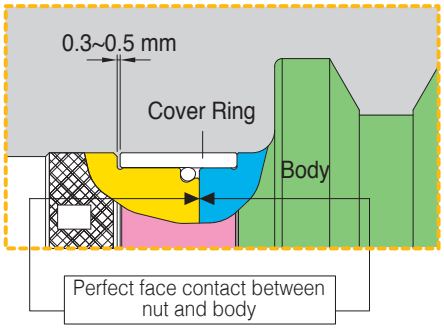
- Strong clamping over 500kgf·m (on NPM42 basis)
- DUST BLOCK functions for blocking foreign substance
- Jet coolant available
- High precision within 15㎛ at L/D = 3
- Applicable shank diameter: D6-42



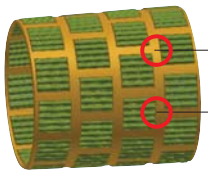
Code system



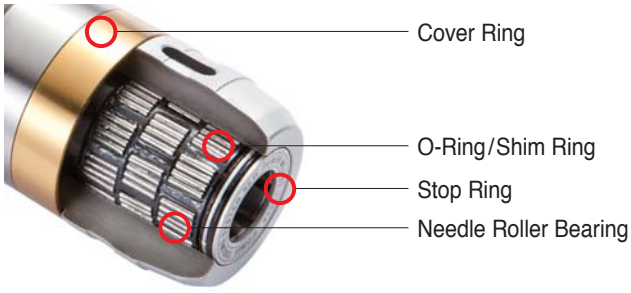
Improvement of durability by preventing minute dust, chips and coolant



• Adopted Stop Ring on Head parts
- Preventing minute dust by Shim&O-Ring



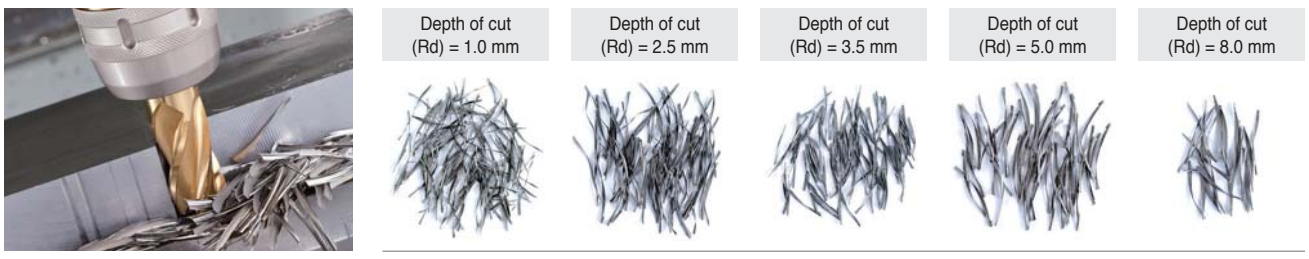
- Specially designed Steel Bearing for prevention of damage
- Strong Clamping by spreading the force



Needle Roller Bearing

Stable machining from heavy to fine

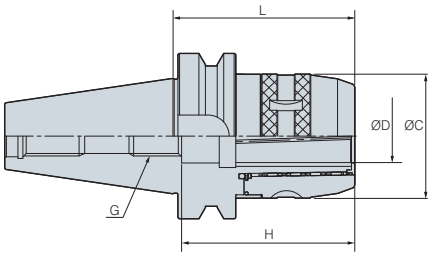
Perfect face contact and Powerful clamping force strengthen both Cutting force and Absorbtion of vibration.



Possible machining from heavy milling to fine finishing

BT-NPM





(mm)

Designation			ØD	L	ØC	H	G	Collet	kg
BT30 -	NPM20 -	85	20	85	54	85	M16	DC20, DSC20	1.1
BT40 -		85	20	85	54	85	M16	DC20, DSC20	2.3
		100	20	100	54	85	M16	DC20, DSC20	2.3
	NPM25 -	85	25	85	61	85	M16	DC25, DSC25	2.5
	NPM32 -	90	32	90	75	87	M16	DC32, DCS32	2.8
		110	32	110	75	95	M16	DC32, DCS32	2.9
		135	32	135	75	95	M16	DC32, DCS32	3.5
BT50 -	NPM20 -	95	20	95	54	85	M24	DC20, DSC20	4.3
		125	20	125	54	85	M24	DC20, DSC20	4.8
		165	20	165	54	85	M24	DC20, DSC20	5.3
	NPM32 -	110	32	110	75	105	M24	DC32, DCS32	5.0
		135	32	135	75	105	M24	DC32, DCS32	5.8
		165	32	165	75	105	M24	DC32, DCS32	6.8
	NPM42 -	110	42	110	90	125	M24	DC42, DCS42	5.4
		135	42	135	90	125	M24	DC42, DCS42	6.6
		165	42	165	90	125	M24	DC42, DCS42	8.0

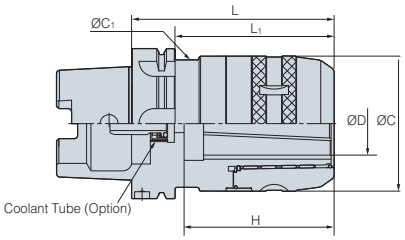
Applicable collet I21

• Through coolant system available is optional

• In case of L ≤ 90, chucks with over 90mm are recommended for medium cutting by short cap

HSK-NPM





(mm)

Designation			ØD	L	L_1	ØC	Collet	kg
HSK63A -	NPM20 -	100	20	95	54	75	DC20, DSC20	1.1
	NPM32 -	120	42	135	90	90	DC42, DCS42	6.6
HSK100A -	NPM32 -	130	42	165	90	90	DC42, DCS42	8.0

Applicable collet I21

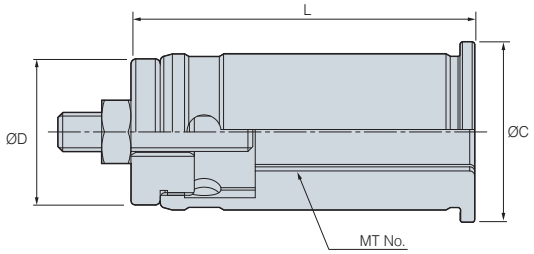
• Through coolant system is optional

Parts

Division	Spare parts		
	Option		
	Collet	Spanner	Through coolant system
Type			
NPM20	DC20, DCS20	57-60	CTC20-20
NPM32	DC32, DCS32	75-79	CTC32-32
NPM42	DC42, DCS42	92-96	CTC42-42

DCS Straight Collet



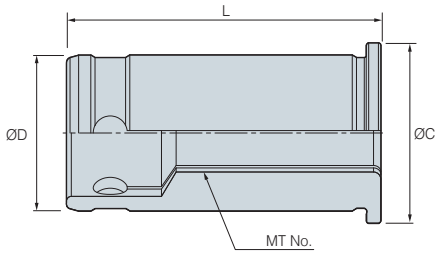


(mm)

Designation	ØD	Ød	ØC	L	kg
DCS20 - 6, 8, 10, 12, 16	20	6, 8, 10, 12, 16	26	55	0.2
DCS25 - 6, 8, 10, 12, 16, 20	25	6, 8, 10, 12, 16, 20	29	66.5	0.3
DCS32 - 6, 8, 10, 12, 14, 16, 19, 20, 25	32	6, 8, 10, 12, 14, 16, 19, 20, 25	38	70	0.4
DCS42 - 6, 8, 10, 12, 16, 20, 25, 32	42	6, 8, 10, 12, 16, 20, 25, 32	48	75	0.7

DC Straight Collet



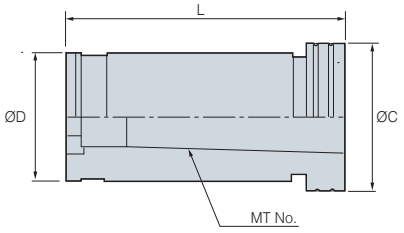


(mm)

Designation	ØD	Ød	ØC	L	kg
DC20 - 6, 8, 10, 12, 14, 16	20	6, 8, 10, 12, 14, 16	26	55	0.2
DC25 - 6, 8, 10, 12, 16, 20	25	6, 8, 10, 12, 16, 20	29	61.5	0.3
DC32 - 6, 8, 10, 12, 14, 16, 19, 20, 25	32	6, 8, 10, 12, 14, 16, 19, 20, 25	38	70	0.4
DC42 - 6, 8, 10, 12, 16, 20, 25, 32	42	6, 8, 10, 12, 16, 20, 25, 32	48	75	0.7

TC Taper Collet





(mm)

Designation	MT No.	ØD	ØC	L
TC20 - 1	MT1	20	26	60
TC20 - 2	MT2	20	26	72
TC25 - 1	MT1	25	32	60
TC25 - 2	MT2	25	32	72
TC32 - 1	MT1	32	38	60
TC32 - 2	MT2	32	38	72

Designation	MT No.	ØD	ØC	L
TC32 - 3	MT3	32	38	90
TC42 - 1	MT1	42	48	60
TC42 - 2	MT2	42	48	72
TC42 - 3	MT3	42	48	90
TC42 - 4	MT4	42	48	112.5

Collet Chuck Series

- High Accuracy and Powerful clamping force
- Convenient tool change
- Various models
- Chucking Diameter Ø1.0~Ø26.0mm



Collet Chuck Series

Collet chuck	High speed collet chuck	High speed slim collet chuck
		
SDC/P - Max. Chucking dia.: Ø26.0 mm - For use of drilling, Reaming, Endmilling and tapping etc	DSK - Max. Chucking dia.: Ø25.0 mm - Balanced G6.3 - Max. Revolution: 15,000 rpm	GSK - Max. Chucking dia.: Ø25.0 mm - Balanced G2.5 - Max. Revolution: 25,000 rpm

High Precision Collet

- Accuracy type: 5 ㎛ (GER-B)
- High accuracy type: 2 ㎛ (GER-HP)
- Through Coolant type



- Accuracy type
- High accuracy type



- Through Coolant type



Collet chuck

SDC/P

- ER collet chuck, standard type for general machining
- Applicable shank diameter: Ø1.0~26.0

First-class nut (SWISS Made)



Easy clamping of collets



Special hardening treatment



For SDC/P
(General machining)



High speed collet chuck

DSK

- Available for machining at max.15,000RPM and balancing of G6.3
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability
- Applicable shank diameter: Ø1.8~25



Standard type & Precision type	Designation	Arbor	Max chucking	Run-out
	HC6-Ød	10.5	6.0	Standard type 5μm Precision type 3μm
	HC10-Ød	15.5	10.0	
	HC13-Ød	20.1	13.0	
	HC16-Ød	24.6	16.0	
	HC20-Ød	29.1	20.0	
	HC25-Ød	35.6	25.0	

8° HC collet



Minimized tool vibration during operation

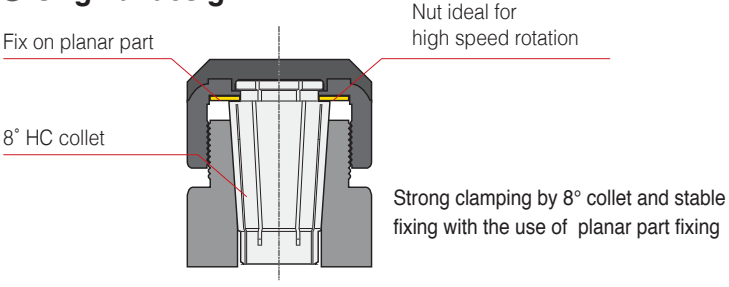
Great speed slim collet chuck

GSK

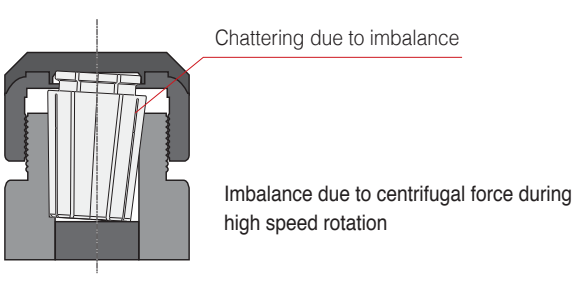
- Available for machining at max.25,000RPM and balancing of G6.3
- Increased productivity due to high speed machining
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability by pressing collet uniformly
- Applicable shank diameter: Ø1.8~25



Original design



GSK



Competitor

BT-SDC/P



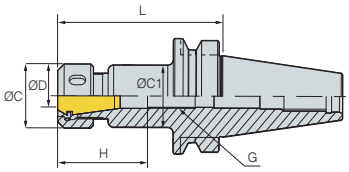


Fig. 1

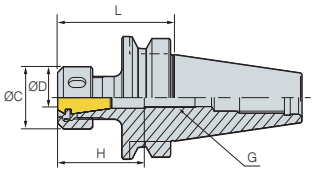


Fig. 2

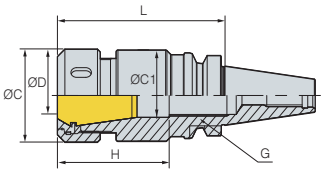


Fig. 3

(mm)

Designation			ØD	L	H	Collet/Step	G	ØC	ØC1	Fig.
BT30 -	SDC7P -	70	1.0~7.0	70	33	GERC11/0.5	M7	18	17	1
		100	1.0~7.0	100	33	GERC11/0.5	M7	18	17	1
	SDC10P -	50	1.0~10.0	50	44.5	GERC16/1.0	M10	32	-	2
		70	1.0~10.0	70	44.5	GERC16/1.0	M10	32	31	1
		100	1.0~10.0	100	44.5	GERC16/1.0	M10	32	31	1
	SDC13P -	50	1.0~13.0	50	49	GERC20/1.0	M7	35	-	2
		70	1.0~13.0	70	49	GERC20/1.0	M13	35	34	1
		100	1.0~13.0	100	49	GERC20/1.0	M13	35	34	1
	SDC16P -	50	1.0~16.0	50	50	GERC25/1.0	M7	42	-	2
		70	1.0~16.0	70	50	GERC25/1.0	M18	42	41	1
		100	1.0~16.0	100	50	GERC25/1.0	M18	42	41	1
	SDC20P -	60	1.0~20.0	60	60	GERC32/1.0	M7	50	-	2
		90	1.0~20.0	90	60	GERC32/1.0	M22	50	49	3
		120	1.0~20.0	120	60	GERC32/1.0	M22	50	49	3
BT40 -	SDC7P -	70	1.0~7.0	70	33	GERC11/0.5	M7	18	17	1
		90	1.0~7.0	90	33	GERC11/0.5	M7	18	17	1
		130	1.0~7.0	130	33	GERC11/0.5	M7	18	17	1
	SDC10P -	70	1.0~10.0	70	44.5	GERC16/1.0	M10	32	31	1
		90	1.0~10.0	90	44.5	GERC16/1.0	M10	32	31	1
		130	1.0~10.0	130	44.5	GERC16/1.0	M10	32	31	1
	SDC13P -	70	1.0~13.0	70	49	GERC20/1.0	M13	35	34	1
		90	1.0~13.0	90	49	GERC20/1.0	M13	35	34	1
		130	1.0~13.0	130	49	GERC20/1.0	M13	35	34	1
		150	1.0~13.0	150	49	GERC20/1.0	M13	35	34	1
	SDC16P -	70	1.0~16.0	70	50	GERC25/1.0	M18	42	41	1
		90	1.0~16.0	90	50	GERC25/1.0	M18	42	41	1
		130	1.0~16.0	130	50	GERC25/1.0	M18	42	41	1
	SDC20P -	70	1.0~20.0	70	60	GERC32/1.0	M22	50	-	2
		90	1.0~20.0	90	60	GERC32/1.0	M22	50	49	1
		130	1.0~20.0	130	60	GERC32/1.0	M22	50	49	1
		150	1.0~20.0	150	60	GERC32/1.0	M22	50	49	1
	SDC26P -	90	3.0~26.0	90	71	GERC40/1.0	M28	63	62	1

Spare Part I 26

• Through coolant system is optional • Collets in the right size are recommended for oil hole type

BT-SDC/P



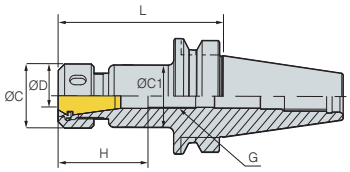


Fig. 1

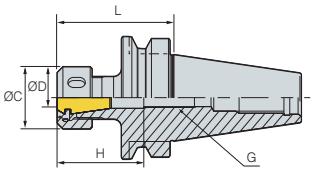


Fig. 2

(mm)

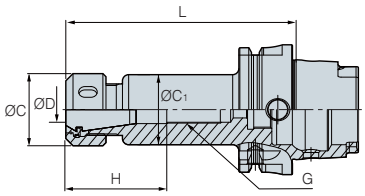
Designation		ØD	L	H	Collet/Step	G	ØC	ØC1	Fig.
BT50 -	SDC10P - 100	1.0~10.0	100	44.5	GERC16/1.0	M10	32	31	1
	120	1.0~10.0	120	44.5	GERC16/1.0	M10	32	31	1
	160	1.0~10.0	160	44.5	GERC16/1.0	M10	32	31	1
	SDC13P - 100	1.0~13.0	100	49	GERC20/1.0	M13	35	34	1
	130	1.0~13.0	130	49	GERC20/1.0	M13	35	34	1
	160	1.0~13.0	160	49	GERC20/1.0	M13	35	34	1
	180	1.0~13.0	180	49	GERC20/1.0	M13	35	34	1
	SDC16P - 100	1.0~16.0	100	50	GERC25/1.0	M18	42	41	1
	160	1.0~16.0	160	50	GERC25/1.0	M18	42	41	1
	SDC20P - 70	1.0~20.0	70	60	GERC32/1.0	M22	50	-	2
	100	1.0~20.0	100	60	GERC32/1.0	M22	50	49	1
	130	1.0~20.0	130	60	GERC32/1.0	M22	50	49	1
	160	1.0~20.0	160	60	GERC32/1.0	M22	50	49	1
	180	1.0~20.0	180	60	GERC32/1.0	M22	50	49	1
	SDC26P - 160	3.0~26.0	160	71	GERC40/1.0	M28	63	62	1

Spare Part I 26

• Through coolant system is optional • Collets in the right size are recommended for oil hole type

HSK-SDC/P





(mm)

Designation		ØD	L	H	Collet/Step	G	ØC	ØC1
HSK63A -	SDC10P - 100	1.0~10.0	100	44.5	GER16/1.0	M10	32	31
	SDC13P - 100	1.0~13.0	100	49	GER20/1.0	M7	35	34
	SDC16P - 100	1.0~16.0	100	50	GER25/1.0	M7	42	41
	SDC20P - 110	1.0~20.0	110	60	GER32/1.0	M7	50	49
HSK100A -	SDC16P - 110	1.0~16.0	110	50	GER25/1.0	M13	42	41
	SDC20P - 120	2.0~20.0	120	60	GER32/1.0	M10	50	49

Spare Part I26

• Through coolant system is optional • Collets in the right size are recommended for oil hole type

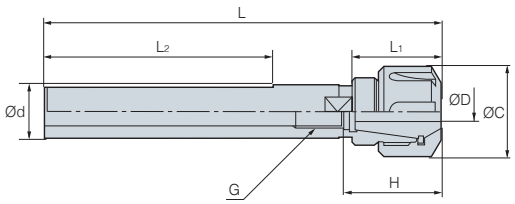
Parts

Division	Spare parts			
	Basic		Option	
	Sleeve bearing nut	Adjust screw	Spanner	Collet
Type				
SDC7	RN11	BN0716F	20-22	GER/ER 11-ØD
SDC10	RN16	BN1025F	32-35	GER/ER 16-ØD
SDC13	RN20	BN1325F	35-38	GER/ER 20-ØD
SDC16	RN25	BN1830F	42-46	GER/ER 25-ØD
SDC20	RN32	BN2230F	48-52	GER/ER 32-ØD
SDC26	RN40	BN2838F	62-65	GER/ER 40-ØD

• NOTES : In case of the RU20 nut, order a 35-38 spanner. In case of the R20 nut, a S-30 spanner

S-SDC





(mm)

Designation			ØD	Ød	ØC	L	L1	L2	H	Collet/Step	G	kg
S16 -	SDC7 -	120M	1.0~7.0	16	19	120	-	-	33	GER11/0.5	M7	0.2
		120T	1.0~7.0	16	19	120	-	73	33	GER11/0.5	M7	0.2
	SDC10 -	150T	1.0~10.0	16	28	150	46.5	83	34.5	GER16/1.0	M10	0.2
S20 -	SDC10 -	150M	1.0~10.0	20	28	150	26.5	-	34.5	GER16/1.0	M10	0.3
		150T	1.0~10.0	20	28	150	26.5	83	34.5	GER16/1.0	M10	0.3
	SDC13 -	150M	1.0~13.0	20	35	150	50	-	49	GER20/1.0	M13	0.3
		150T	1.0~13.0	20	35	150	50	83	49	GER20/1.0	M13	0.3
S25 -	SDC10 -	150M	1.0~10.0	25	28	150	-	-	34.5	GER16/1.0	M10	0.5
		150T	1.0~10.0	25	28	150	-	83	34.5	GER16/1.0	M10	0.5
	SDC13 -	150M	1.0~13.0	25	35	150	-	-	49	GER20/1.0	M13	0.5
		150T	1.0~13.0	25	35	150	-	83	49	GER20/1.0	M13	0.5
S32 -	SDC13 -	150M	1.0~13.0	32	35	150	-	-	49	GER20/1.0	M13	0.7
		150T	1.0~13.0	32	35	150	-	83	49	GER20/1.0	M13	0.7
	SDC20 -	165M	2.0~20.0	32	50	165	-	-	60	GER32/1.0	M22	0.7
		165T	2.0~20.0	32	50	165	-	83	60	GER32/1.0	M22	0.7

Spare Part I28

• Through coolant system is optional

S-SDC/S



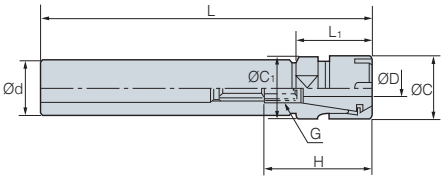


Fig. 1

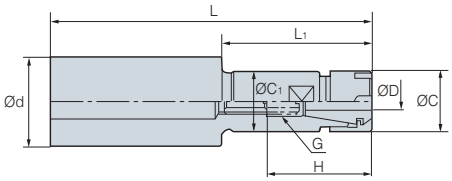


Fig. 2

(mm)

Designation			ØD	Ød	ØC	L	L_1	H	Collet/Step	G	kg
S16 -	SDC7S -	100M	1.0~7.0	16	16	100	-	33	GER11/0.5	M7	0.2
		150M	1.0~7.0	16	16	150	-	33	GER11/0.5	M7	0.2
	SDC10S -	100M	1.0~10.0	16	22	100	50	44.5	GER16/1.0	M10	0.3
		150M	1.0~10.0	16	22	150	50	44.5	GER16/1.0	M10	0.3
S20 -	SDC7S -	100M	1.0~7.0	20	16	100	30	35	GER11/0.5	M7	0.3
		150M	1.0~7.0	20	16	150	80	35	GER11/0.5	M7	0.3
	SDC10S -	100M	1.0~10.0	20	22	100	50	44.5	GER16/1.0	M10	0.3
		150M	1.0~10.0	20	22	150	50	44.5	GER16/1.0	M10	0.3
		200M	1.0~10.0	20	22	200	50	44.5	GER16/1.0	M10	0.4
	SDC13S -	100M	1.0~13.0	20	28	100	50	49	GER20/1.0	M13	0.3
		150M	1.0~13.0	20	28	150	50	49	GER20/1.0	M13	0.3
S25 -	SDC7S -	100M	1.0~7.0	25	16	100	30	33	GER11/0.5	M7	0.4
		150M	1.0~7.0	25	16	150	80	33	GER11/0.5	M7	0.4
	SDC10S -	100M	1.0~10.0	25	22	100	30	44.5	GER16/1.0	M10	0.4
		150M	1.0~10.0	25	22	150	80	44.5	GER16/1.0	M10	0.4
	SDC13S -	100M	1.0~13.0	25	28	100	-	49	GER20/1.0	M13	0.5
		150M	1.0~13.0	25	28	150	-	49	GER20/1.0	M13	0.5
	SDC16S -	100M	1.0~16.0	25	35	100	50	50	GER25/1.0	M18	0.5
		150M	1.0~16.0	25	35	150	50	50	GER25/1.0	M18	0.5
		200M	1.0~16.0	25	35	200	50	50	GER25/1.0	M18	0.7
S32 -	SDC16S -	120M	1.0~16.0	32	35	120	-	50	GER25/1.0	M18	1
		150M	1.0~16.0	32	35	150	-	50	GER25/1.0	M18	1

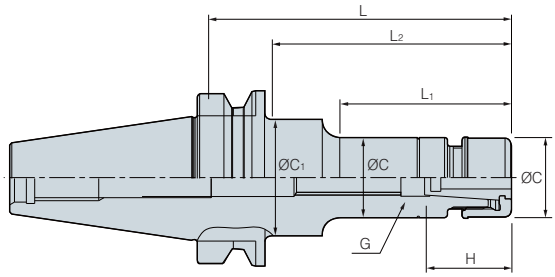
• Through coolant system is optional

Parts

Division	Spare parts			
	Basic		Option	
	Nut	Adjust screw	Spanner	(G)ER collet
Type				
SDC7S	R11M	BN0716F	M11M	(G)ER 11-ØD
SDC10S	R16M	BN1025F	M16M	(G)ER 16-ØD
SDC13S	R20M	BN1325F	M20M	(G)ER 20-ØD
SDC16S	R25M	BN1830F	M25M	(G)ER 25-ØD

BT-GSK





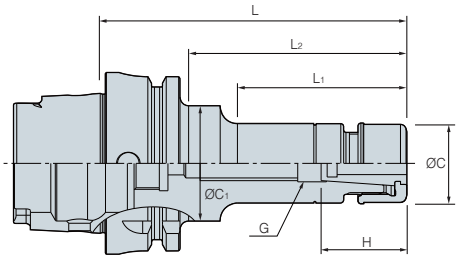
(mm)

Designation			ØD	L	L_1	L_2	H	Collet / Step	G	ØC	$ØC_1$	kg	MAX RPM
BT30 -	GSK6 -	60	1.0~6.0	60	33	33	35	HC6/0.5	M8	19.5	19.5	0.7	25,000
		90	1.0~6.0	90	56	65	35	HC6/0.5	M8	19.5	32	0.8	25,000
	GSK10 -	60	2.0~10.0	60	35	35	50	HC10/0.5	M12	27	27	0.9	25,000
		90	2.0~10.0	90	65	65	50	HC10/0.5	M12	27	27	1.0	25,000
	GSK13 -	60	3.0~13.0	60	36	36	43	HC13/1.0	M12	35	35	0.6	25,000
	GSK16 -	60	3.0~16.0	60	37	37	60	HC16/0.5	M12	40	40	1.1	25,000
		90	3.0~16.0	90	67	67	60	HC16/0.5	M18	40	40	1.2	25,000
	GSK25 -	90	16.0~25.0	90	67.5	67.5	63.5	HC25/0.5	M12	55	55	1.1	25,000
BT40 -	GSK6 -	90	1.0~6.0	90	51	61	35	HC6/0.5	M8	19.5	32	1.1	20,000
		120	1.0~6.0	120	60	90	35	HC6/0.5	M8	19.5	32	1.4	20,000
		150	1.0~6.0	150	60	120	35	HC6/0.5	M8	19.5	25	1.5	20,000
	GSK10 -	90	2.0~6.0	90	48	60	50	HC10/0.5	M12	27	40	1.2	20,000
		120	2.0~6.0	120	73	90	50	HC10/0.5	M12	27	40	1.4	20,000
		150	2.0~6.0	150	73	118	50	HC10/0.5	M12	27	34.5	1.6	20,000
	GSK13 -	90	3.0~13.0	90	59	59	43	HC13/1.0	M15	35	35	1.4	20,000
	GSK16 -	90	3.0~16.0	90	58	58	60	HC16/0.5	M18	40	40	1.5	20,000
		120	3.0~16.0	120	88	88	60	HC16/0.5	M18	40	40	1.7	20,000
		150	3.0~16.0	150	118	118	60	HC16/0.5	M18	40	40	1.9	20,000
	GSK20 -	90	4.0~20.0	90	60	60	70	HC20/0.5	M22	48	48	1.6	20,000
		120	4.0~20.0	120	90	90	70	HC20/0.5	M22	48	48	2.0	20,000
	GSK25-	90	16.0~25.0	90	61	61	75	HC25/0.5	M28	55	55	1.8	20,000
		120	16.0~25.0	120	91	91	85	HC25/0.5	M28	55	55	2.0	20,000
BT50 -	GSK6 -	105	1.0~6.0	105	55	64	35	HC6/0.5	M8	19.5	32	3.8	15,000
		135	1.0~6.0	135	60	92	35	HC6/0.5	M8	19.5	32	3.9	15,000
		165	1.0~6.0	165	60	114	35	HC6/0.5	M8	19.5	32	4.0	15,000
	GSK10 -	105	2.0~10.0	105	57	57	50	HC10/0.5	M12	27	27	3.8	15,000
		135	2.0~10.0	135	70	92	50	HC10/0.5	M12	27	32	4.0	15,000
		165	2.0~10.0	165	75	114	50	HC10/0.5	M12	27	36	4.2	15,000
	GSK13 -	135	3.0~13.0	135	92	92	43	HC13/1.0	M15	35	35	4.2	15,000
	GSK16 -	105	3.0~16.0	105	62	62	60	HC16/0.5	M18	40	40	4.1	15,000
		135	3.0~16.0	135	92	92	60	HC16/0.5	M18	40	40	4.3	15,000
		165	3.0~16.0	165	40	122	60	HC16/0.5	M18	40	50	4.5	15,000
	GSK20 -	105	4.0~20.0	105	62	62	70	HC20/0.5	M22	48	-	4.3	15,000
		135	4.0~20.0	135	92	92	70	HC20/0.5	M22	48	-	4.6	15,000
		165	4.0~20.0	165	122	122	70	HC20/0.5	M22	48	-	5.0	15,000
	GSK25 -	105	16.0~25.0	105	62	62	85	HC25/0.5	M28	55	55	4.8	15,000
		135	16.0~25.0	135	92	92	85	HC25/0.5	M28	55	55	5.2	15,000
		165	16.0~25.0	165	122	122	85	HC25/0.5	M28	55	55	5.6	15,000

Spare Part I30

HSK-GSK





(mm)

Designation			ØD	L_1	L_2	H	Collet/Step	G	ØC	$ØC_1$	MAX RPM
HSK63A -	GSK6 -	100	1.0~6.0	51	61	35	HC6/0.5	M8	19.5	32	20,000
	GSK10 -	105	2.0~6.0	73	118	50	HC10/0.5	M12	27	34.5	20,000
	GSK16 -	120	3.0~16.0	58	58	60	HC16/0.5	M18	40	40	20,000
	GSK20 -	120	4.0~20.0	60	60	70	HC20/0.5	M22	48	48	20,000
HSK100A -	GSK6 -	120	1.0~6.0	55	64	35	HC6/0.5	M8	19.5	32	15,000
	GSK10 -	120	2.0~10.0	57	57	50	HC10/0.5	M12	27	27	15,000
	GSK16 -	140	3.0~16.0	62	62	60	HC16/0.5	M18	40	40	15,000
	GSK25 -	155	16.0~25.0	62	62	85	HC25/0.5	M28	55	55	15,000

Parts

Division	Spare parts		
	Basic		
	Nut	Adjust screw	Extractor
Type			
GSK6	GN6	M820C	GSK-6CE
GSK10	GN10	M1230C	GSK-10CE
GSK13	GN13	BN1530F	GSK-13CE
GSK16	GN16	BN1830F	GSK-16CE
GSK20	GN20	BN2230F	GSK-20CE
GSK25	GN25	BN2838F	GSK-25CE

Spanner (Option)



Designation
GSK6
GSK10
GSK13
GSK16
GSK20
GSK25

Slim type collet chuck

DSK

- Balancing G6.3 available for machining at max.15,000RPM
- Minimized tool vibration during operation by using collet 8°
- Swiss made high precision nut enhances stability
- Applicable shank diameter: Ø1.8~25



Code system

BT30 - DSK 10 - 90

- BT30 — Spindle
- DSK — High speed slim collet chuck
- 10 — Max. clamping dia.
- 90 — Length

First-class nut (SWISS made)

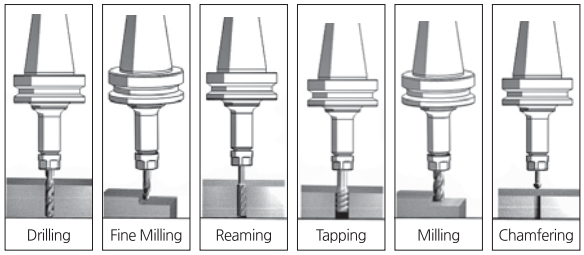


Easy clamping of collet

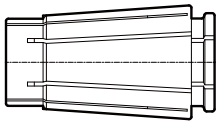


Special hardening treatment

Multifunctional applications



Collet

Standard type & Precision type	Designation	Diameter	Max chucking	Run-out
	HC6-Ød	10.5	6.0	Standard type 5μm Precision type 3μm
	HC10-Ød	15.5	10.0	
	HC13-Ød	20.1	13.0	
	HC16-Ød	24.6	16.0	
	HC20-Ød	29.1	20.0	
	HC25-Ød	35.6	25.0	

8° HC collet



Minimized tool vibration during operation

Spanner (Option)



Spanner

Designation	Chuck
DSS-6	DSK-6
DSS-10	DSK-10
DSS-16	DSK-16
DSS-20	DSK-20
DSS-25	DSK-25

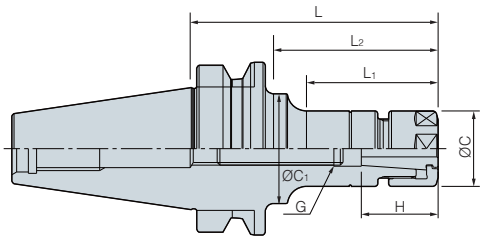


Collet Extractor

Designation	Chuck
DSS-6	DSK-6
DSS-10	DSK-10
DSS-16	DSK-16
DSS-20	DSK-20
DSS-25	DSK-25

BT-DSK





(mm)

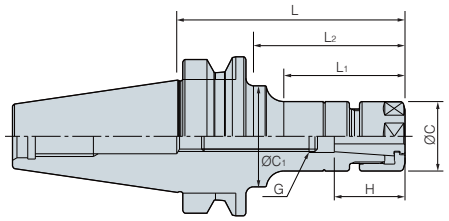
Designation			ØD	L	L_1	L_2	H	Collet / Step	G	ØC	$ØC_1$	kg	MAX RPM
BT30 -	DSK6 -	60	1.0~6.0	60	33	33	35	HC6/0.5	M8	19.5	19.5	0.7	15,000
		90	1.0~6.0	90	56	65	35	HC6/0.5	M8	19.5	32	0.8	15,000
	DSK10-	60	2.0~10.0	60	35	35	50	HC10/0.5	M12	27.5	27.5	0.9	15,000
		90	2.0~10.0	90	65	65	50	HC10/0.5	M12	27.5	27.5	1.0	15,000
	DSK13 -	60	3.0~13.0	60	36	36	43	HC13/0.5	M12	33	33	0.6	15,000
	DSK16 -	60	3.0~16.0	60	37	37	60	HC16/0.5	M12	40	40	1.1	15,000
		90	3.0~16.0	90	67	67	60	HC16/0.5	M18	40	40	1.2	15,000
	DSK25 -	90	16.0~25.0	90	67.5	67.5	63.5	HC25/0.5	M12	55	55	1.1	15,000
BT40 -	DSK6 -	90	1.0~6.0	90	51	61	35	HC6/0.5	M8	19.5	32	1.1	10,000
		120	1.0~6.0	120	60	90	35	HC6/0.5	M8	19.5	32	1.4	10,000
		150	1.0~6.0	150	60	120	35	HC6/0.5	M8	19.5	25	1.5	10,000
	DSK10 -	90	2.0~6.0	90	48	60	50	HC10/0.5	M12	27.5	40	1.2	10,000
		120	2.0~6.0	120	73	90	50	HC10/0.5	M12	27.5	40	1.4	10,000
		150	2.0~6.0	150	73	118	50	HC10/0.5	M12	27.5	34.5	1.6	10,000
	DSK13 -	90	3.0~13.0	90	59	59	43	HC13/1.0	M15	33	33	1.4	10,000
	DSK16 -	90	3.0~16.0	90	58	58	60	HC16/0.5	M18	40	40	1.5	10,000
		120	3.0~16.0	120	88	88	60	HC16/0.5	M18	40	40	1.7	10,000
		150	3.0~16.0	150	118	118	60	HC16/0.5	M18	40	40	1.9	10,000
	DSK20 -	90	4.0~20.0	90	60	60	70	HC20/0.5	M22	46.5	48.5	1.6	10,000
		120	4.0~20.0	120	90	90	70	HC20/0.5	M22	46.5	48.5	2.0	10,000
	DSK25 -	90	16.0~25.0	90	61	61	75	HC25/0.5	M28	55	55	1.8	10,000
		120	16.0~25.0	120	91	91	85	HC25/0.5	M28	55	55	2.0	10,000

Spare Part I33

• Through coolant system is optional • Coolant collets are recommended when using the coolant system

BT-DSK





(mm)

Designation			ØD	L	L_1	L_2	H	Collet / Step	G	ØC	$ØC_1$	kg	MAX RPM
BT50 -	DSK6 -	105	1.0~6.0	105	55	64	35	HC6/0.5	M8	19.5	32	3.8	8,000
		135	1.0~6.0	135	60	92	35	HC6/0.5	M8	19.5	32	3.9	8,000
		165	1.0~6.0	165	60	114	35	HC6/0.5	M8	19.5	32	4.0	8,000
	DSK10 -	105	2.0~10.0	105	57	57	50	HC10/0.5	M12	27.5	27.5	3.8	8,000
		135	2.0~10.0	135	70	92	50	HC10/0.5	M12	27.5	32	4.0	8,000
		165	2.0~10.0	165	75	114	50	HC10/0.5	M12	27.5	36	4.2	8,000
	DSK13 -	135	3.0~13.0	135	92	92	43	HC13/1.0	M15	33	33	4.2	8,000
	DSK16 -	105	3.0~16.0	105	62	62	60	HC16/0.5	M18	40	40	4.1	8,000
		135	3.0~16.0	135	92	92	60	HC16/0.5	M18	40	40	4.3	8,000
		165	3.0~16.0	165	40	122	60	HC16/0.5	M18	40	50	4.5	8,000
	DSK20 -	105	4.0~20.0	105	62	62	70	HC20/0.5	M22	48.5	-	4.3	8,000
		135	4.0~20.0	135	92	92	70	HC20/0.5	M22	48.5	-	4.6	8,000
		165	4.0~20.0	165	122	122	70	HC20/0.5	M22	48.5	-	5.0	8,000
	DSK25 -	105	16.0~25.0	105	62	62	85	HC25/0.5	M28	55	55	4.8	8,000
		135	16.0~25.0	135	92	92	85	HC25/0.5	M28	55	55	5.2	8,000
		165	16.0~25.0	165	122	122	85	HC25/0.5	M28	55	55	5.6	8,000

• Through coolant system is optional • Coolant collets are recommended when using the coolant system

Parts

Division	Spare parts		
	Option		
	Nut	Adjust screw	Spanner
Type			
DSK6	DN6	BN0825F	DSS-6
DSK10	DN10	BN1225F	DSS10
DSK16	DN16	BN1830F	DSS16
DSK20	DN20	BN2230F	DSS20
DSK25	DN25	BN2838F	DSS25

GER Collet_GER

GERC new

- Corrosion resistant collet to micro unit
- High tech coating for long lasting precision
- Longer tool life and higher productivity



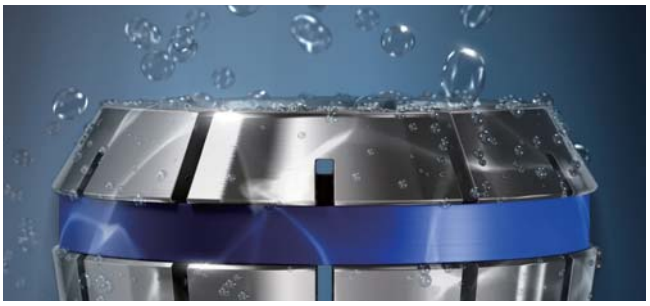
Code system

GERC - 16 6.0 - HP

GERC	16	6.0	HP
Spindle GER Collet	Clamping range	HP: Precision Non: General	HP: Precision Non: General

Special coating technology

Unlike GERC collets, Conventional non-coated collets have the following features:
Non-coated collets are affected by corrosion due to high humidity, cutting fluid, cleaner, salt, gas and many other factors, which in result deteriorates whole quality of machining



When a collet gets rusty, the tool life is shortened and precision considerably decreases. To prevent this problem, surface treatment by micro unit was applied to GERC collets for effective protection and long lasting precision



GERC



Competitor

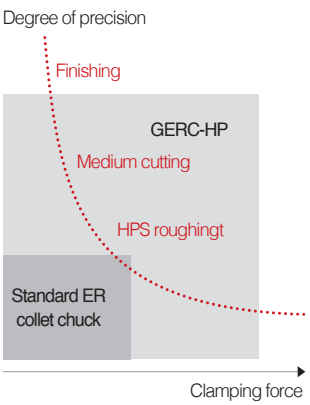
Two samples of collets after 4 months of use:
Left: GERC collet, Right: Non-coated

GERC-HP

A precision type collet chuck is expensive than standard one, but still it has more advantages in long term cost and efficiency. Using GERC-HP can minimize pricy reworking due to smaller tolerance with maximum precision

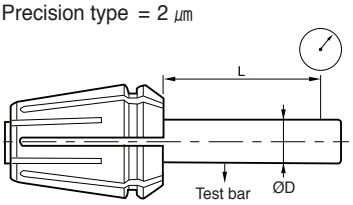


Precision type
collet 2 ㎛



Precision (L/D = 3)

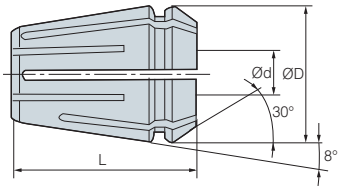
Standard type = 5 ㎛
Precision type = 2 ㎛



GERC Collet

Accuracy type/High Accuracy type





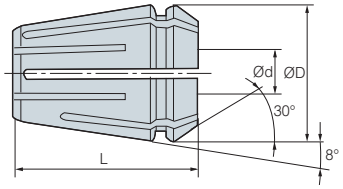
(mm)

Designation		ER size	ØD	L	Ød (Max.)	Distance (mm)	Tolerance	
							Standard type	Precision type (HP)
GER11 -	Ød(HP)	11	11.5	18.0	7.0	0.5	5 μm	2 μm
GER16 -	Ød(HP)	16	17.0	27.5	10.0	1.0		
GER20 -	Ød(HP)	20	21.0	31.5	13.0	1.0		
GER25 -	Ød(HP)	25	26.0	34.0	16.0	1.0		
GER32 -	Ød(HP)	32	33.0	40.0	20.0	1.0		
GER40 -	Ød(HP)	40	41.0	46.0	26.0	1.0		

ER Collet

Trough coolant type





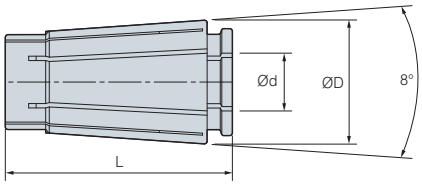
(mm)

Designation		ER size	ØD	L	Ød (Max.)	Min. pi of water proof type	Distance (mm)	Tolerance
ER11 -	Ød	11	11.5	18.0	7.0	-	0.5	10 μm
ER16 -	Ød(C)	16	17.0	27.5	10.0	4.0	1.0	
ER20 -	Ød(C)	20	21.0	31.5	13.0	6.0	1.0	
ER25 -	Ød(C)	25	26.0	34.0	16.0	6.0	1.0	
ER32 -	Ød(C)	32	33.0	40.0	20.0	8.0	1.0	
ER40 -	Ød(C)	40	41.0	46.0	26.0	10.0	1.0	

HC Slim Collet

General & Accuracy type





(mm)

Designation		ØD	L	Ød (Max.)	Distance (mm)	Tolerance	
						Standard type	Precision type (HP)
HC6 -	Ød(P)	10.5	25.0	6.0	1.0	5 μm	3 μm
HC10 -	Ød(P)	15.6	30.5	10.0	1.0		
HC13 -	Ød(P)	20.1	39.0	13.0	1.0		
HC16 -	Ød(P)	24.6	45.0	16.0	1.0		
HC20 -	Ød(P)	29.2	54.3	20.0	1.0		
HC25 -	Ød(P)	35.7	57.0	25.0	1.0		

GERC Collet

Accuracy type



(mm)

Designation	Ød	Distance	Collet amount	Tolerance
GERC11 1.0-7.0mm/0.5mm	1.0-7.0	0.5	13pcs	5 μm
GERC16 1.0-10.0mm/1.0mm	1.0-10.0	1.0	10pcs	5 μm
GERC20 2.0-13.0mm/1.0mm	2.0-13.0	1.0	12pcs	5 μm
GERC25 2.0-16.0mm/1.0mm	2.0-16.0	1.0	15pcs	5 μm
GERC32 3.0-20.0mm/1.0mm	3.0-20.0	1.0	18pcs	5 μm
GERC40 4.0-26.0mm/1.0mm	4.0-26.0	1.0	23pcs	5 μm

ER Collet

General type



(mm)

Designation	Ød	Distance	Collet amount	Tolerance
ER11(SET)	1.5-7.0	0.5	12pcs	10 μm
ER16(SET)	2.0-10.0	1.0	10pcs	10 μm
ER20(SET)	2.0-13.0	1.0	12pcs	10 μm
ER25(SET)	2.0-16.0	1.0	15pcs	10 μm
ER32(SET)	3.0-20.0	1.0	18pcs	10 μm
ER40(SET)	6.0-26.0	1.0	21pcs	15 μm

High speed synchro tapping chuck

DST new

- Tapping chuck for high speed machining
- Specially designed structure for absorbing thrust load and preventing damage on the tap
- Through coolant system available
- Applicable range: M1-M22



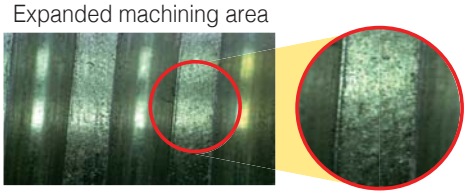
Code system

BT40 - DST 20 - 100

Spindle	Tapping holder	Max. Chucking dia.	Length

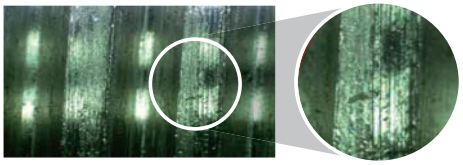
Excellent performance, precise machining

Expanded machining area

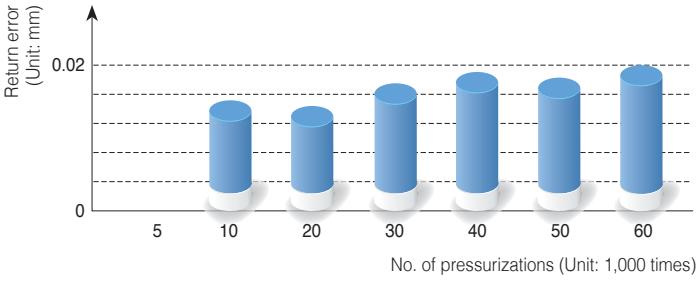


DST22
(vc = 100 m/min)

Excellent cutting face



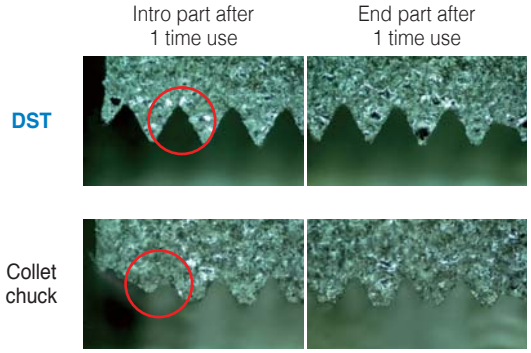
Conventional one



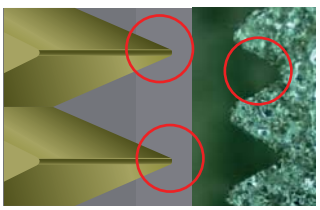


Exclusive collet for tapping
- At tapping work use of TER collet
- DST3: Use of ER11 collet

Comparison of thread figures

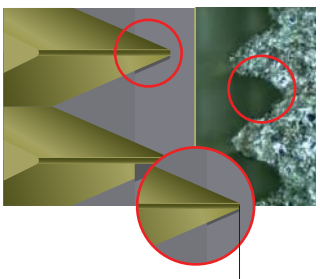


Synchro tap chuck(DST7)



The threads have a good figure, and didn't get out of its shape

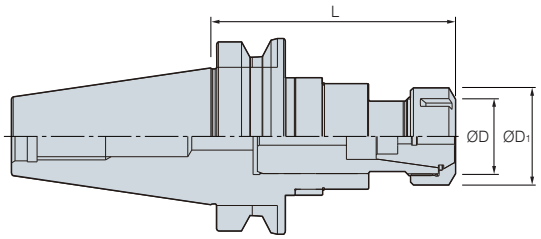
General collet chuck



The thread is out of its shape due to synchronization error

BT-DST





(mm)

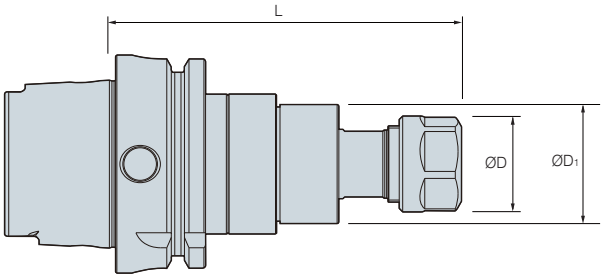
Designation			ØD	ØD1	L	Collet	Tapping range	F-	F+
BT30 -	DST3 -	70	26	19	70	ER11	M1~M3	0.5	0.5
	DST10 -	95	40.4	28	95	TER16	M3~M10	0.5	0.5
BT40 -	DST10 -	100	40.4	28	100	TER16	M3~M10	0.5	0.5
	DST22 -	110	60	49.5	110	TER32	M6~M22	0.7	0.7
BT50 -	DST10 -	110	60	49.5	110	TER16	M3~M10	0.5	0.5
	DST22 -	130	60	49.5	125	TER32	M6~M22	0.7	0.7

Applicable collet I 35, I 43

• Through coolant system is optional

HSK-DST





(mm)

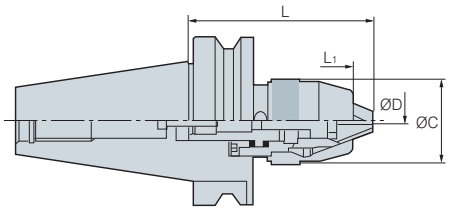
Designation			ØD	ØD1	L	Collet	Tapping range	F-	F+
HSK63A -	DST10 -	100	40.4	28	100	TER16	M3~M10	0.5	0.5
	DST22 -	130	60	49.5	130	TER32	M6~M22	0.7	0.7

Applicable collet I 43

• Through coolant system is optional

BT-NPU





(mm)

Designation			ØD (Clamping range)	ØC	L	L1	kg
BT30 -	NPU8 -	97	0~8	38	97	8.5	0.8
	NPU13 -	125	1~13	50	125	12.5	1.5
BT40 -	NPU8 -	87	0~8	38	87	8.5	1.3
	NPU13 -	105	1~13	50	105	12.5	1.7
	NPU1a3 -	130	1~13	50	130	12.5	2.0
BT50 -	NPU13 -	115	1~13	50	115	12.5	4.4
	NPU13 -	130	1~13	50	130	12.5	4.6
	NPU13 -	190	1~13	50	190	12.5	5.4

• Through coolant system not available

Parts

Division	Spare parts		
	Basic		Option
	Chuck	Bolt	Spanner
Type			
NPU08	NPU08	BX0820	NPU0836
NPU13	NPU13	BX0825	NPU1348

Tapping holder

DTN

- Compact design and slim type
- Improvement of tapping force
- Tapping range M3 ~ M38



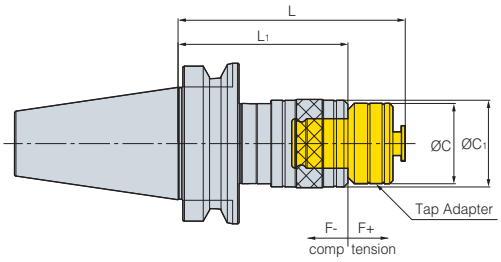
Code system

BT40 - DTN 22 - 130

Spindle	Tapping holder	Max. chucking dia.	Length

Easy exchange of TCA (Tap adaptor)

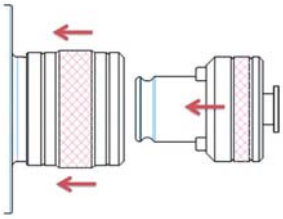
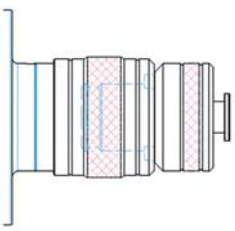
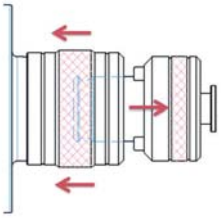
Convenient one-touch exchange type for high precision and longer tool life
Contraction of length is possible by axial floating way



Improved cutting result

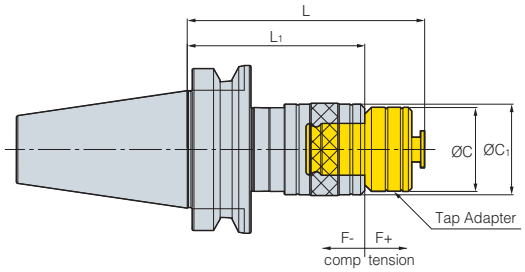


How to clamp TCA and a tap holder

Before installation	After installation	Disassembly
		
1. Insert TCA pushing the cover of tap holder 2. Clamp the TCA in the Key groove and firmly	1. The cover of tap holder is placed correctly	1. Seaparate the TCA pushing the cover of tap holder

BT-DTN





(mm)

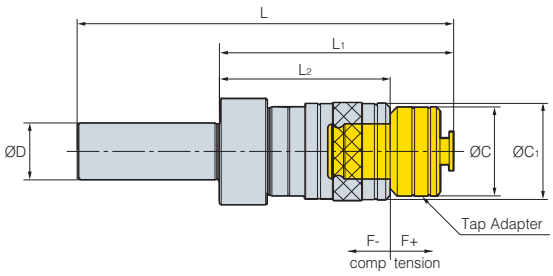
Designation			Tapping range	L	L_1	ØC	$ØC_1$	Adaptor	F-	F+	kg
BT30 -	DTN12 -	85	M3~M12	85	60	32	39	TCA1-M	4	10	0.7
BT40 -	DTN12 -	90	M3~M12	90	65	32	39	TCA1-M	4	10	1.2
		120	M3~M12	120	95	32	39	TCA1-M	4	10	1.4
	DTN22 -	130	M8~M22	130	96	50	56	TCA2-M	12.5	12.5	1.7
		160	M8~M22	160	126	50	56	TCA2-M	12.5	12.5	2.1
BT50 -	DTN12 -	100	M3~M12	100	75	32	39	TCA1-M	4	10	3.7
		130	M3~M12	130	105	32	39	TCA1-M	4	10	3.9
	DTN22 -	140	M8~M22	140	104	50	56	TCA2-M	12.5	12.5	4.2
		170	M8~M22	170	134	50	56	TCA2-M	12.5	12.5	4.7
	DTN38 -	185	M16~M38	185	140	72	81	TCA3-M	20	20	5.7
		215	M16~M38	215	170	72	81	TCA3-M	20	20	6.6

Tap Adapter (TCA) I 42

• Through coolant system not available • Tap adaptor is optional

S-DTN





(mm)

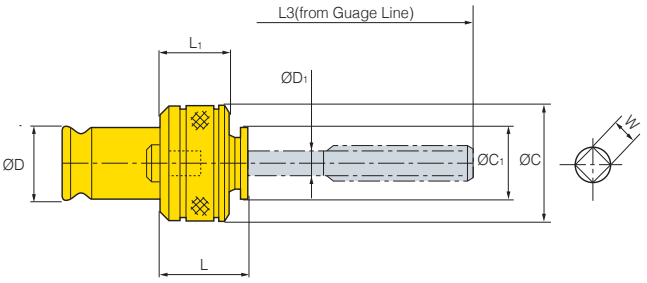
Designation			Tapping range	ØD	L	L_1	L_2	ØD	ØD	F-	F+	Adaptor
S32 -	DTN12 -	90	M3-M12	32	170	90	65	32	39	4	10	TCA1
S32 -	DTN22 -	130	M8-M24	32	210	130	96	50	56	12.5	12.5	TCA2

Tap Adapter (TCA) I 42

• Through coolant system not available • Tap adaptor is optional

TCA Tap Adaptor





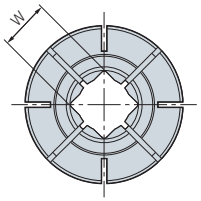
(mm)

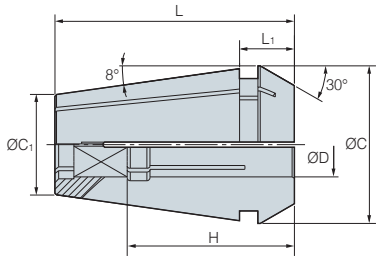
Designation		ØD	ØC	L	L1	kg
TCA1 -	M3	4	3.2	24	22	0.2
	M4	5	4	24	22	0.2
	M5	5.5	4.5	24	22	0.2
	M6, 1/4U	6	4.5	24	22	0.2
	M8	6.2	5	25	22	0.2
	M10, 3/8U	7	5.5	25	22	0.2
	M11	8	6	39	22	0.2
	M12	8.5	6.5	26	22	0.2
TCA2 -	M8	6.2	5	38	28	0.6
TCS2 -	M10	7	5.5	38	28	0.6
TCA2 -	M12	8.5	6.5	39	28	0.6
	M14, 3/4U	10.5	8	41	28	0.6
	P1/4	11	9	31	28	0.6
TCS2 -	M16	12.5	10	43	28	0.6
TCA2 -	M18, P3/8	14	11	44	28	0.6
	M20	15	12	45	28	0.6
	M22	17	13	46	28	0.6
	P1/2	18	14	36	28	0.6
	M24	19	15	46	28	1.8
TCA3 -	M16	12.5	10	35	37	1.8
	M18	14	11	37	37	1.8
	M20	15	12	37	37	1.8
	M22	17	13	38	37	1.8
	M24	19	15	44	37	1.8
	M27, 1U	20	15	62	37	1.8
	M30, P3/4	23	17	62	37	1.8
	M33	25	19	66	37	1.8
	M36, M38	28	21	68	37	1.8

• DIN standard products can be ordered • Through coolant system not available

TER Tap Collet







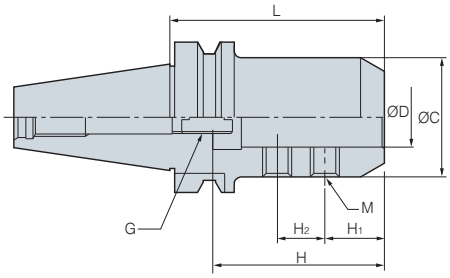
(mm)

Designation		Tapping Range	ØD	W	ØC	ØC1	L	L1	H
TER16 -	4x3.2	M3	4	3.2	16.74	10.1	27.5	6.3	18
	5x4	M4	5	4	16.74	10.1	27.5	6.3	18
	5.5x4.5	M5	5.5	4.5	16.74	10.1	27.5	6.3	18
	6x4.5	M6,U1/4	6	4.5	16.74	10.1	27.5	6.3	18
	6.2x5	M7, M8	6.2	5	16.74	10.1	27.5	6.3	18
	7x5.5	M9, M10, U3/8	7	5.5	16.74	10.1	27.5	6.3	18
TER20 -	5x4	M4	5	4	20.74	13.2	31.5	7.2	18
	5.5x4.5	M5	5.5	4.5	20.74	13.2	31.5	7.2	18
	6x4.5	M6,U1/4	6	4.5	20.74	13.2	31.5	7.2	18
	6.2x5	M7, M8	6.2	5	20.74	13.2	31.5	7.2	18
	7x5.5	M9, M10, U3/8	7	5.5	20.74	13.2	31.5	7.2	18
	8x6	M11, U7/16, P1/8	8	6	20.74	-	-	-	-
	8.5x6.5	M12	8.5	6.5	20.74	13.2	31.5	7.2	22
TER25 -	5x4	M4	5	4	25.74	17.6	34	7.5	18
	5.5x4.5	M5	5.5	4.5	25.74	17.6	34	7.5	18
	6x4.5	M6	6	4.5	25.74	17.6	34	7.5	18
	6.2x5	M7, M8	6.2	5	25.74	17.6	34	7.5	18
	7x5.5	M9, M10, U3/8	7	5.5	25.74	17.6	34	7.5	18
	8.5x6.5	M12	8.5	6.5	25.74	17.6	34	7.5	22
TER32 -	6x4.5	M6,U1/4	6	4.5	32.74	23.1	40	8.2	18
	6.2x5	M7, M8	6.2	5	32.74	23.1	40	8.2	18
	7x5.5	M9, M10, U3/8	7	5.5	32.74	23.1	40	8.2	18
	8X6	M11, U7/16, P1/8	8	6	32.74	23.1	40	8.2	22
	8.5x6.5	M12	8.5	6.5	32.74	23.1	40	8.2	22
	10.5x8	M14, U9/16	10.5	8	32.74	23.1	40	8.2	25
	12.5x10	M16	12.5	10	32.74	23.1	40	8.2	25
	14x11	M18, P3/8	14	11	32.74	23.1	40	8.2	25
	15x12	M20	15	12	32.74	23.1	40	8.2	25
	17x13	M22, U7/8	17	13	32.74	23.1	40	8.2	25
	11x9	P1/4	11	9	32.74	23.1	40	8.2	25
	12x9	U5/8	12	9	32.74	23.1	40	8.2	25
	9x7	U1/2	9	7	32.74	23.1	40	8.2	22

• Water proof tapping is possible with the use of RTJW and nuts (limited to the right sizes)

BT-SLA





(mm)

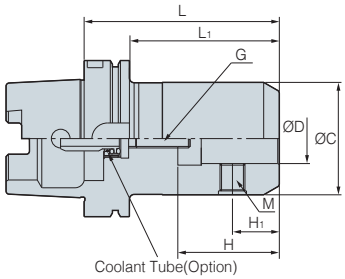
Designation			ØD	L	ØC	H	H_1	H_2	M	G	kg
BT30 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	1.1
	SLA20 -	90	20	90	50	70	25	20	M12	M12	1.2
	SLA25 -	90	25	90	50	70	25	20	M12	M12	1.2
BT40 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	1.5
	SLA20 -	90	20	90	50	70	25	20	M12	M12	1.8
	SLA25 -	90	25	90	50	70	25	20	M12	M12	2.0
	SLA32 -	90	32	90	60	80	25	25	M14	M12	2.2
		105	32	105	60	80	25	25	M14	M12	2.4
	SLA40 -	105	40	105	80	80	25	25	M16	M12	2.4
BT50 -	SLA16 -	90	16	90	40	70	25	20	M10	M12	4.2
	SLA20 -	105	20	105	50	70	25	20	M12	M12	4.4
	SLA25 -	105	25	105	50	70	25	20	M12	M12	4.4
		135	25	135	50	70	25	20	M12	M12	4.7
	SLA32 -	105	32	105	60	80	25	25	M14	M12	4.8
		135	32	135	60	80	25	25	M14	M12	5.4
		165	32	165	60	80	25	25	M14	M12	6.2
	SLA40 -	105	40	105	90	80	25	25	M16	M12	5.2
		150	40	150	90	80	25	25	M16	M12	5.8
	SLA42 -	105	42	105	90	80	25	25	M16	M12	5.8

Spare Part I 45

• Through coolant system is optional

HSK-SLA





(mm)

Designation			ØD	L	ØC	H	H1	M	G	kg
HSK63A -	SLA20 -	100	20	100	52	51	25	M16	M12	2.0
	SLA25 -	105	25	105	65	59	25	M18	M12	2.7
	SLA32 -	105	32	105	72	63	30	M20	M12	2.9
HSK100A -	SLA20 -	105	20	105	52	51	25	M16	M12	3.9
	SLA25 -	110	25	110	65	59	25	M18	M12	4.0
	SLA32 -	125	32	125	72	63	30	M20	M12	4.3

• Through coolant system is optional

Parts

Division	Spare parts				
	Basic			Option	
	Set screw		Adjust screw	Wrench	
Type					
	DBT/BT type	HSK/SK type		DBT/BT type	HSK/SK type
SLA16	BTF1010	BTF1414-1.5	M1230C	LW-5	LW-6
SLA19	BTF1212-1.5	BTF1616-1.5		LW-6	LW-8
SLA20					
SLA25		BTF1818-1.5			
SLA32	BTF1414-1.5	BTF2020-1.5		LW-6	LW-10
SLA40	BTF1624-1.5			LW-8	
SLA42					

BT-FMA



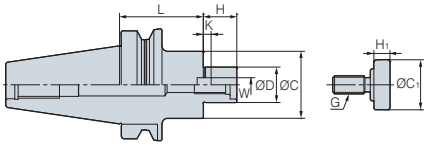


Fig. 1

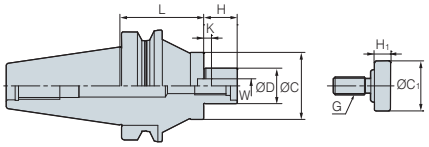


Fig. 2

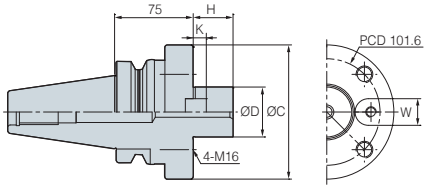


Fig. 3

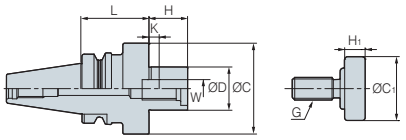


Fig. 4

(mm)

	Designation		Cutter dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
BT30 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	1.2	4
BT40 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	1.4	1
	FMA25.4 -	90	80	25.4	90	50	22	9.5	5	M12	3.1	1
	FMA31.75 -	45	100	31.75	45	60	30	12.7	7	M16	1.6	1
	FMA31.75 -	90	100	31.75	90	60	30	12.7	7	M16	3.0	1
	FMA38.1 -	60	125	38.1	60	80	34	15.87	9	M20	2.9	4
BT50 -	FMA25.4 -	45	80	25.4	45	50	22	9.5	5	M12	3.8	1
	FMA25.4 -	90	80	25.4	90	50	22	9.5	5	M12	4.5	1
	FMA25.4 -	150	80	25.4	150	50	22	9.5	5	M12	5.5	2
	FMA31.75 -	45	100	31.75	45	60	30	12.7	7	M16	4.6	1
	FMA31.75 -	75	100	31.75	75	60	30	12.7	7	M16	5.2	1
	FMA31.75 -	105	100	31.75	105	60	30	12.7	7	M16	6.0	2
	FMA38.1 -	45	125	38.1	45	80	34	15.87	9	M20	4.3	1
	FMA38.1 -	75	125	38.1	75	80	34	15.87	9	M20	5.5	1
	FMA50.8 -	45	160	50.8	45	100	36	19.05	10	M24	4.8	1
	FMA50.8 -	75	160	50.8	75	100	36	19.05	10	M24	6.8	1
	FMA47.625 -	75	200	47.625	75	128	38	25.4	12.5	-	7.5	3

• Through coolant system is optional • The weight above exclude the face cutter

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Key bolt	Wrench bolt	Wrench
Type					
FMA22	K8.0	MBA-M10	BX0310	-	LW-8
FMA22.225	K8.0	MBA-M10	BX0310	-	LW-8
FMA25.4	K9.5	MBA-M12	BX0412	BX1230	LW-10
FMA31.75	K12.7	MBA-M16	BX0516	-	LW-14
FMA38.1	K15.87	MBA-M20	BX0616	-	LW-17
FMA50.8	K19.05	MBA-M24	BX0820	-	LW-19
FMA47.625	K25.4	-	BX1020	BX1645	-
S-FMA25.4	-	-	-	-	LW-10
S-FMA31.75	-	-	-	-	LW-14

BT-FMC



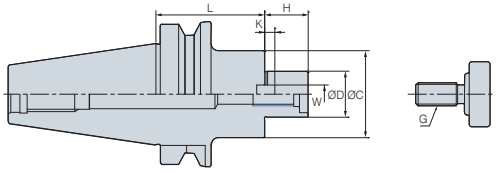


Fig. 1

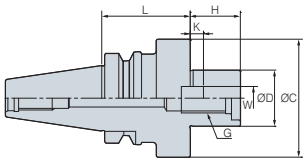


Fig. 2

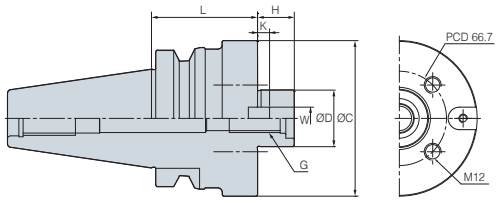


Fig. 3

(mm)

	Designation		Cutter dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
BT30 -	FMC16 -	45	40	16	45	38	17	8	5.0	M8	0.7	1
	FMC22 -	45	50/63	22	45	48	19	10	5.6	M10	0.8	2
	FMC27 -	50	80	27	50	60	21	12	6.3	M12	1.2	2
BT40 -	FMC16 -	60	40	16	60	38	17	8	5.0	M8	1.2	1
	FMC22 -	45	50/63	22	45	48	19	10	5.6	M10	1.2	1
	FMC22 -	90	50/63	22	90	48	19	10	5.6	M10	1.2	1
	FMC27 -	60	80	27	60	60	21	12	6.3	M12	1.8	2
	FMC27 -	90	80	27	90	60	21	12	6.3	M12	3.2	2
	FMC32 -	60	100	32	60	78	24	14	7.0	M16	2.3	2
	FMC40 -	50	125/160	40	50	89	27	15.87	8.0	M20	3.3	3
BT50 -	FMC16 -	60	40	16	60	38	17	8	5.0	M8	3.9	1
	FMC22 -	60	50/63	22	60	48	19	10	5.6	M10	4.1	1
	FMC27 -	40	80	27	40	60	21	12	6.3	M12	4.1	1
	FMC27 -	90	80	27	90	60	21	12	6.3	M12	5.5	1
	FMC27 -	150	80	27	150	60	21	12	6.3	M12	6.1	1
	FMC32 -	45	100	32	45	78	24	14	7.0	M16	4.2	1
	FMC32 -	75	100	32	75	78	24	14	7.0	M16	4.2	1
	FMC32 -	105	100	32	105	78	24	14	7.0	M16	4.2	1
	FMC40 -	50	125/160	40	50	89	27	15.87	8.0	M20	4.6	3

• Through coolant system is optional • The weight above exclude the face cutter

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Key bolt	Wrench bolt	Wrench
Type					
FMC 16	K8.0	-	BX0310	BX0830	LW-6
FMC 22	K10.0	-	BX0412	BX1030	LW-8
FMC 25.4	K9.5	-	BX0516	BX1230	LW-10
FMC 27	K12.0	MBA-M12	BX0616	-	LW-10
FMC 32	K14.0	MBA-M16	BX0616	-	LW-14
FMC38.1	K15.87	MBA-M16	BX0616	-	LW-14
FMC40	K15.87	MBA-M20	BX0616	-	LW-17

HSK-FMC



Fig. 1

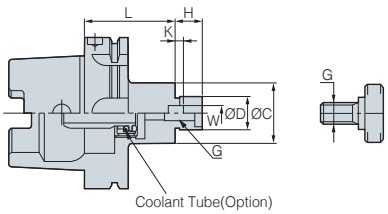


Fig. 2

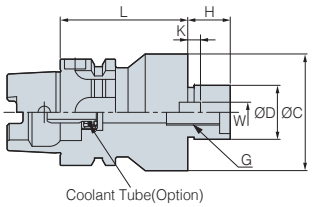
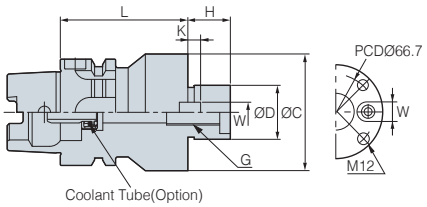


Fig. 3



(mm)

Designation			Cuttter dia.	ØD	L	ØC	H	W	K	G	kg	Fig.
HSK50A -	FMC16 -	40	40	16	40	38	17	8	5	M8	0.8	1
	FMC22 -	50	50/63	22	50	48	19	10	5.6	M10	0.9	1
HSK63A -	FMC16 -	50	40	16	50	38	17	8	5.0	M8	1.1	1
	FMC22 -	50	50/63	22	50	48	19	10	5.6	M10	1.2	1
	FMC27 -	60	80	27	60	60	21	12	6.3	M12	1.4	1
	FMC32 -	60	100	32	60	78	24	14	7.0	M16	1.8	2
	FMC40 -	60	125/160	40	60	89	27	15.87	8.0	M20	2	3

• Through coolant system is optional • The weight above exclude the face cutter

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Key bolt	Wrench bolt	Wrench
Type					
FMC 16	K8.0	-	BX0310	BX0830	LW-6
FMC 22	K10.0	-	BX0412	BX1030	LW-8
FMC 25.4	K9.5	-	BX0516	BX1230	LW-10
FMC 27	K12.0	MBA-M12	BX0616	-	LW-10
FMC 32	K14.0	MBA-M16	BX0616	-	LW-14
FMC38.1	K15.87	MBA-M16	BX0616	-	LW-14
FMC40	K15.87	MBA-M20	BX0616	-	LW-17

Available for various angles

ANGULAR HEAD



Features

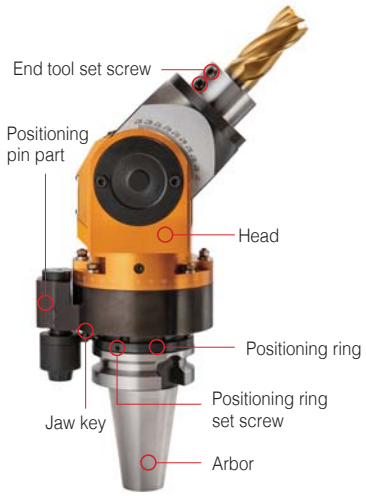
- Doubled effect by one equipment/Available for various angles
- Lighter aluminum body

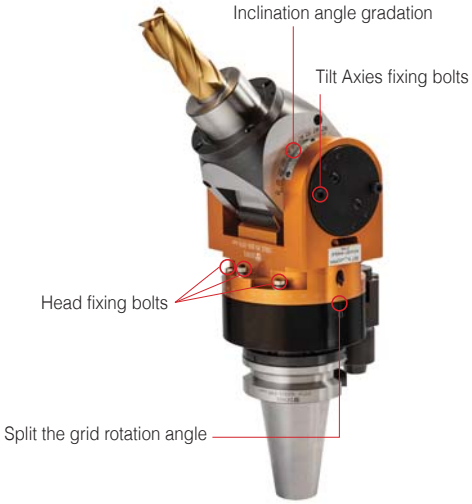
Code system

BT50 - KHU 10 - 195

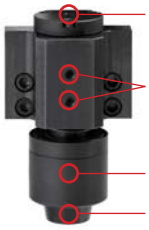
Spindle	Tapping holder	Max. chucking dia.	Length

Name of angular head parts

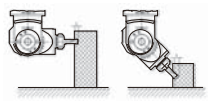
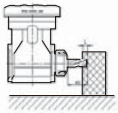
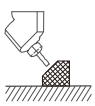
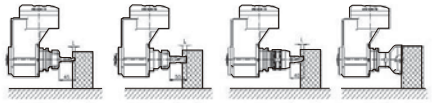




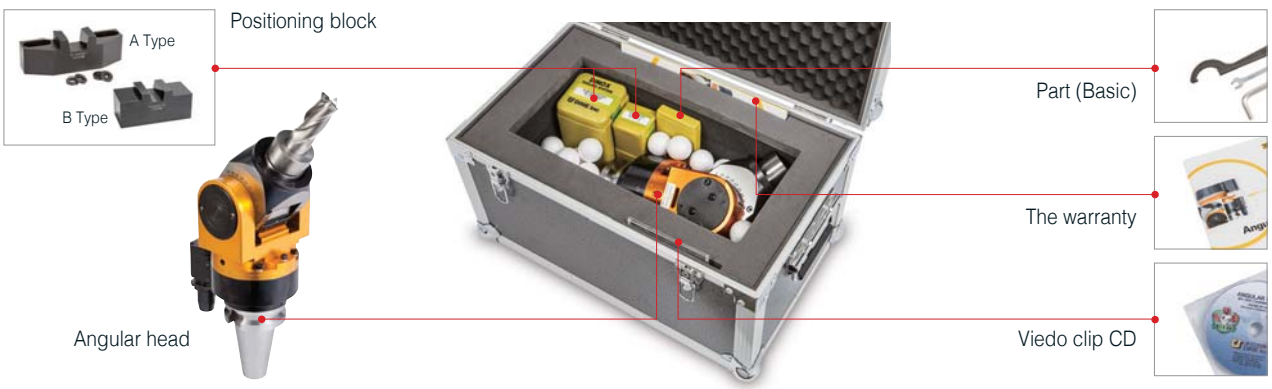
Positioning pin details



Various applications

			
0~90-degree rotating (MAH, KHU)	Fixed 90-degree type (KAH)	Fixed 45-degree type (KAC)	Attachment type (HRAG, KAG)

Components



MAH

Universal type MAH (Reinforced series)

- Reinforced type Better performance by improving existing universal Angular head
  - Stability on large mold machining
  - Use 32mm Ball Endmill
  - Reinforced from KHU type



HRAG

Attachment type HRAG (Reinforced type)

- HRAG: The reinforced bracket enhanced durability upto 200%
  - Stablility on face milling machining
  - Reinforced stiffness from KAG type

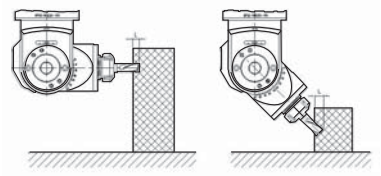


KHU

Universal type KHU

- Free angle adjusting up to 90°
  - HSK and SK type are order made





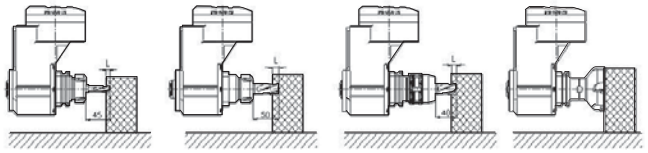
BT50-KHU20-195

KAG

Attachment type KAG

- Free 360° angle adjusting from side to side
  - Possible to use various tools of BT40 and BT30
  - HSK and SK type are order made





BT40-SDC20-60 (Ø12 E/M)

NT40-SDC20-60 (Ø20 E/M)

BT40-NPM20-85 (Ø20 E/M)

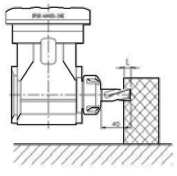
BT40-FMA25.4-45 (Ø80 Shoulder Mill)

KAH

Modular type KHU (90° type)

- Fixed 90° type angular head
  - In case of using a tap collet, please contact us in advance
  - HSK and SK type are order made





BT50-KAH20-200

KAC

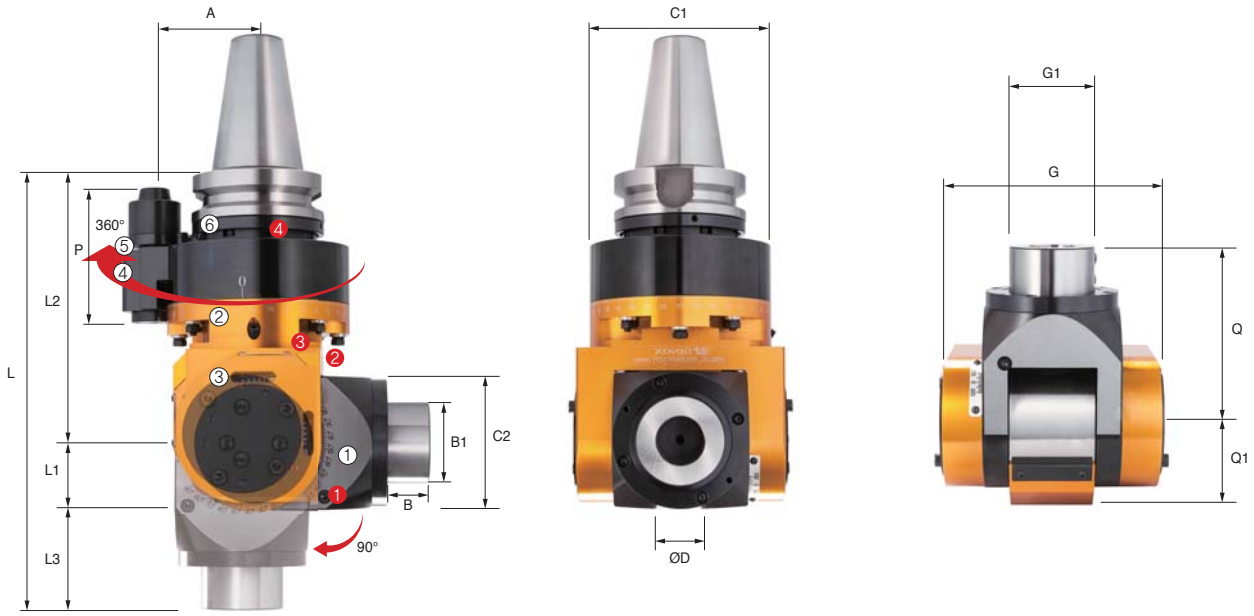
Modular type KAC (45° type)

- Fixed 45° type angular head
  - HSK and SK type are order made

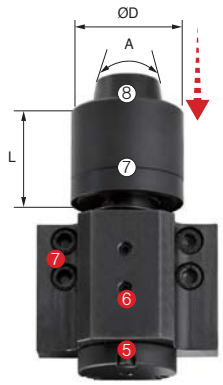


MHA for mold (0°~90°)_Reinforced type

BT-MAH



Positioning pin



Shank size	L	A	ØD
BT50	56.5	30°	Ø40

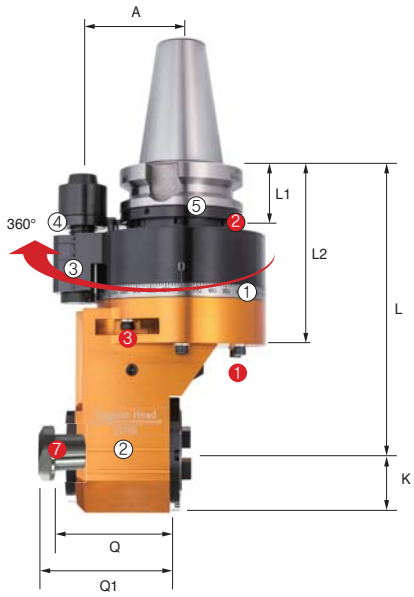
NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Positioning ring
⑦	Positioning pin cover
⑧	Positioning pin

NO	Part name	Designation
1	Inclination angle gradation screw	BT1216
2	Head fixed bolts	BT0645
3	Rotating angle graduation screw	BT0640
4	Positioning ring set screw	MSST5-12
5	Positioning pin height control bolt	BT0516
6	Positioning pin set screw	BT0512
7	Body position block set screw	BX0516

Designation	ØD	L	L1	L2	L3	C	C1	G	C2	Q	Q1	B	B1	P	A	MAX RPM	Install tool	kg
BT50-MAH32-200	32	200	47	78	325	136	95	154	95	125	63	31	60	95	80	3,000	SIDE LOCK	19

HRAG (90° fixed)_Reinforced type

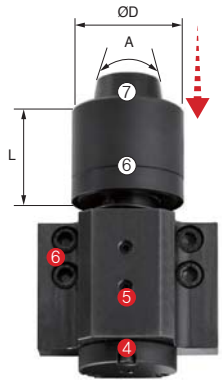
BT-HRAG







Positioning pin



Shank size	L	A	ØD
BT50	56.5	30°	Ø40

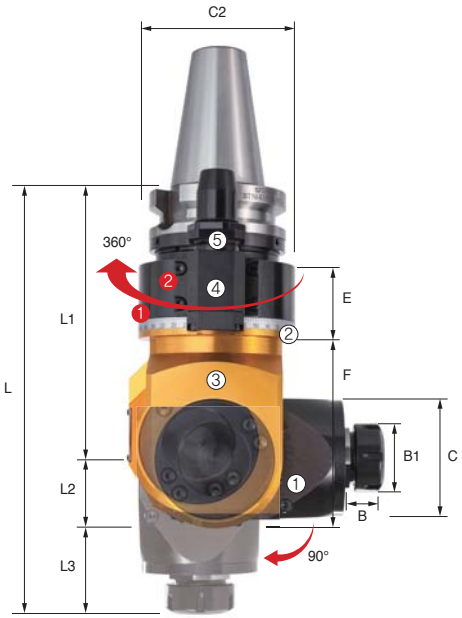
NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Positioning ring
⑥	Positioning pin cover
⑦	Positioning pin

NO	Part name	Designation
1	Head fixed bolts	BX0660
2	Positioning ring set screw	MSST5-12
3	Rotating angle graduation screw	BT0648
4	Positioning pin height control bolt	BT0516
5	Positioning pin set screw	BT0512
6	Body position block set screw	BX0516
7	BT/NT Bolt	

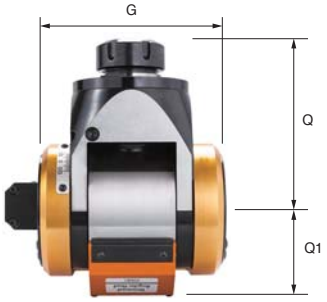
Designation	L	L1	L2	L3	L4	Q	Q1	A	G	G1	MAX RPM	Tool shank	kg
BT50-HRAG40-230	230	56.5	145	46.5	276.5	89	101	80	93	136	3000	BT/NT40	15.75

KHU (0°~90°)_Collet type

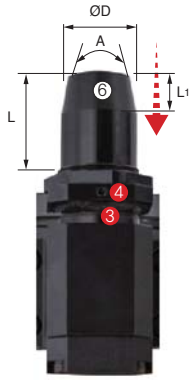
BT-KHU







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

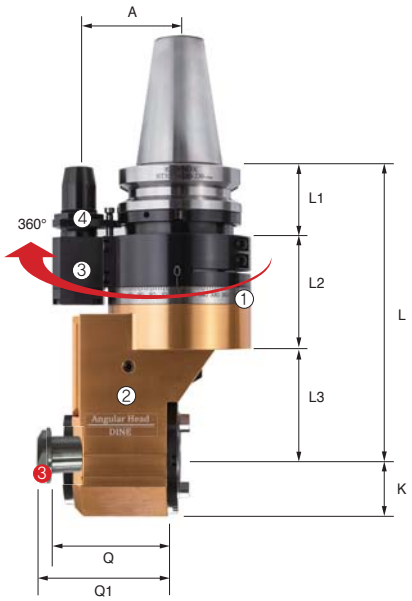
NO	Name
①	Inclination angle gradation (Axial positioning in 0°~90°)
②	Rotating angle graduation (Free radius position in 360°)
③	Head
④	Positioning pin part
⑤	Jaw key
⑥	Height control wrench hole

NO	Part name	Designation
1	Bracket angle fixing bolt	BX0630
2	Position block fixing bolt	BX0512
3	Set screw	BT0404
4	Fixing bolts	BXS0630

Designation	ØD	ØD1	L	L1	L2	L3	B	B1	E	F	C	A	G	Q	Q1	Torque rate (IN: OUT)	Direction of rotation (IN: OUT)	MAX RPM	Collet	kg
BT40-KHU10-160	1.0~10.0	58	160	33	54	247	22	28	51	98	96	65	90	87	40	1: 2	CW: CW	6,000	GER16	6.4
BT50-KHU10-180	1.0~10.0	58	180	33	54	267	22	28	53	103	114	80	90	87	40	1: 2	CW: CW	6,000	GER16	10.5
BT50-KHU20-195	2.0~20.0	84	195	47	73	315	29	50	53	132	114	80	124	120	63	1: 1	CW: CW	3,000	GER32	15.8

KAG (90° fixed type)

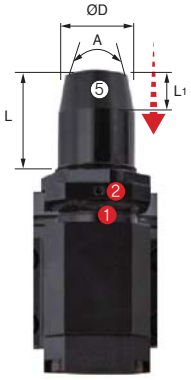
BT-KAG







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

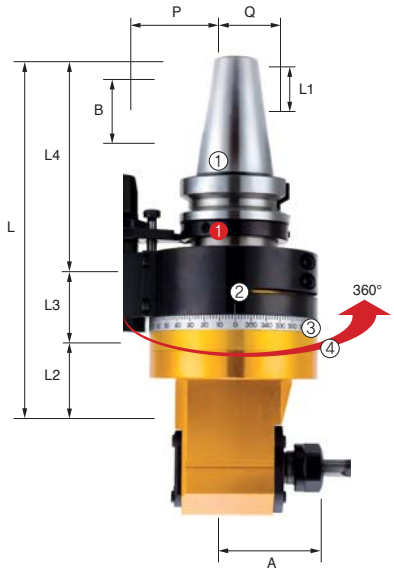
NO	Name
①	Rotating angle graduation (Free radius position in 360°)
②	Head
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
1	Set screw	BT0404
2	Fixing bolts	BXS0630
3	BT / NT Bolt	

Designation	L1	L2	L3	L4	L5	L6	Q	Q1	A	C	G	Torque rate (IN: OUT)	Direction of rotation (IN: OUT)	MAX RPM	Holder shank	kg
BT40-KAG30-195	44	86	65	37.5	195	232.5	66	70	65	96	75	1: 1	CW: CW	4,000	BT30/NT30	6.4
BT50-KAG40-230	57	88	85	46.5	230	276.5	89	94	80	114	93	1: 1	CW: CW	3,000	BT40/NT40	15.8

HRAG (90° fixed)_Collet type

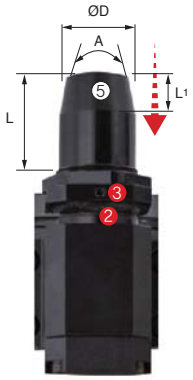
BT-KAH







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

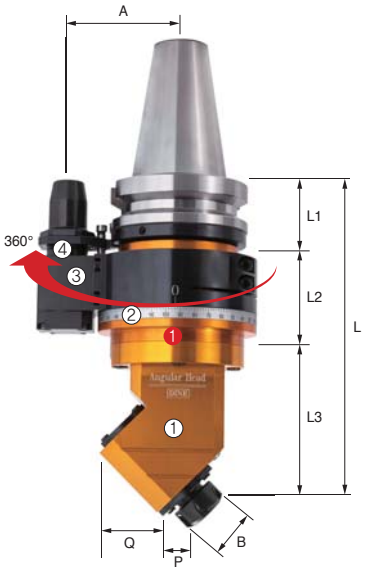
NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
1	Head fixing bolts	BX0618
2	Set screw	BT0404
3	Fixing bolts	BXS0630

Designation	ØD	L	L1	L2	L3	L4	B	A	P	Q	G	G1	Torque rate (IN: OUT)	MAX RPM	Collet	kg
BT40-KAH7-170	1.0~7.0	170	20	44	71	55	19	65	37	24.5	40	96	1: 1	5,000	GER11	4.6
BT40-KAH10-195	1.0~10.0	195	25	44	71	80	28	65	46	32	58	96	1: 1	5,000	GER16	5.8
BT40-KAH13-165	1.0~13.0	165	28	44	71	50	35	65	53	35	60	96	1: 1	5,000	GER20	5.7
BT40-KAH20-180	2.0~20.0	180	38	44	71	65	50	65	71	49	76	96	1: 1	3,500	GER32	6.7
BT50-KAH07-220	1.0~7.0	220	20	57	54	109	19	80	37	24.5	40	96	1: 1	5,000	GER11	9.8
BT50-KAH10-215	1.0~10.0	215	25	57	54	104	28	80	46	32	58	96	1: 1	5,000	GER16	10.7
BT50-KAH10-260	1.0~10.0	260	25	57	54	149	28	80	46	32	58	96	1: 1	5,000	GER16	11.0
BT50-KAH13-260	1.0~13.0	260	28	57	54	149	35	80	53	35	60	96	1: 1	5,000	GER20	11.2
BT50-KAH20-200	2.0~20.0	200	38	57	54	89	50	80	71	49	76	96	1: 1	3,500	GER32	11.6
BT50-KAH20-240	2.0~20.0	240	38	57	54	129	50	80	71	49	76	96	1: 1	3,500	GER32	12.4

KAC (45° fixed)_Collet type

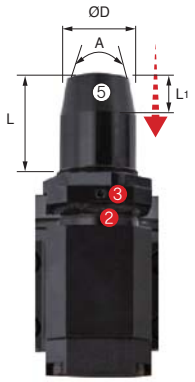
BT-KAC







Positioning pin



Shank size	L	L1	A	ØD
BT40	Max: 32 Min: 26	10	20°	Ø19.6
BT50	Max: 35 Min: 29	15		Ø28

NO	Name
①	Head
②	Rotating angle graduation (Free radius position in 360°)
③	Positioning pin part
④	Jaw key
⑤	Height control wrench hole

NO	Part name	Designation
1	Head fixing bolts	BX0618
2	Set screw	BT0404
3	Fixing bolts	BXS0630

Designation	ØD	L	L1	L2	L3	B	G	G1	P	Q	A	MAX RPM	Collet	kg
BT40-KAC10-220	1.0~10.0	220	44	71	105	28	60	96	25	54	65	5,000	GER16	5.3
BT40-KAC13-220	1.0~13.0	220	44	71	105	28	60	96	25	54	65	5,000	GER20	5.5
BT40-KAC20-230	2.0~20.0	230	44	71	115	50	72	96	30	60	65	3,500	GER32	6.8
BT50-KAC10-240	1.0~10.0	240	57	54	129	28	60	96	25	54	80	5,000	GER16	10.2
BT50-KAC13-240	1.0~13.0	240	57	54	129	28	60	96	25	54	80	5,000	GER20	10.4
BT50-KAC20-250	2.0~20.0	250	57	54	139	50	72	96	30	60	80	3,500	GER32	11.7

FBH back boring & balanced type

FBH/B

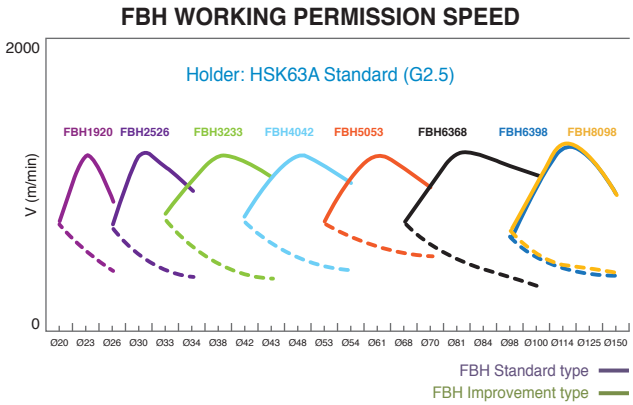
- High speed boring and back boring capability
- High precision balancing: G2.5, Head: G6.3
- Min. adjustment range: 2 ㎛



Code system

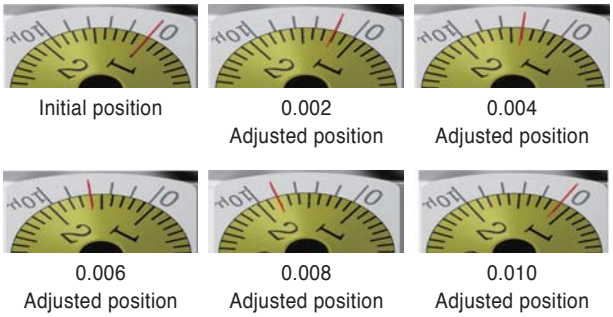
FBH	32	-	33	B
Fine boring head	MD		Min. Boring dia.	Balance type

Working permission speed



Boring range adjustment method

2㎛ Boring range



Initial position

0.002 Adjusted position

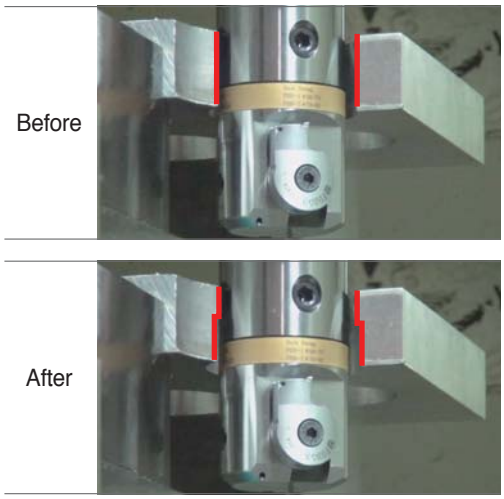
0.004 Adjusted position

0.006 Adjusted position

0.008 Adjusted position

0.010 Adjusted position

Back boring



Adjusting machining direction available



By forward machining

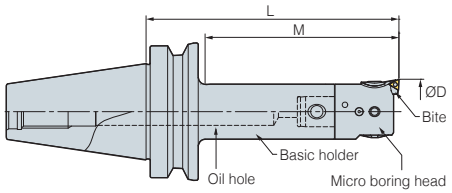
By reverse machining

Easy change of machining direction
only by adjusting the bite

BT-FBH/B

Micro Boring Balance type





(mm)

Designation					Boring range ØD		L	Max. Boring depth	kg
Head	Bite	Body (Basic holder)			Min	Max			
FBH1920B	FBB20N-□-□□	BT30 -	MD19F -	70R	20 (24)	26 (30)	103	60	0.5
FBH2526B	FBB26N-□-□□		MD25F -	90R	26 (32)	34 (40)	127	80	0.7
FBH3233B	FBB33N-□-□□		MD32F -	80R	33 (40)	43 (50)	121	80	0.8
FBH4042B	FBB42N-□-□□		MD40F -	80R	42 (50)	54 (62)	127	96	1.1
FBH5053B	FBB53N-□-□□		MD50F -	70	53 (65)	70 (82)	127	97	1.7
FBH1920B	FBB20N-□-□□	BT40 -	MD19F -	70R	20 (24)	26 (30)	103	45	1.9
FBH2526B	FBB26N-□-□□		MD25F -	95R	26 (32)	34 (40)	133	59	2
FBH3233B	FBB33N-□-□□		MD32F -	100R	33 (40)	43 (50)	141	77	2.5
FBH4042B	FBB42N-□-□□		MD40F -	115R	42 (50)	54 (62)	162	107	3.1
FBH5053B	FBB53N-□-□□		MD50F -	105	53 (65)	70 (82)	162	135	3.5
FBH6368B	FBB68N-□-□□		MD63F -	110	68 (90)	100 (122)	181	154	6.3
FBH6398B	FBB68N-□-□□		MD63F -	135	98 (120)	150 (172)	206	179	7.1
FBH8098B	FBB68N-□-□□		MD80F -	100	98 (120)	150 (172)	171	144	8.3
FBH1920B	FBB20N-□-□□	BT50 -	MD19F -	85	20 (24)	26 (30)	118	80	5.2
FBH2526B	FBB26N-□-□□		MD25F -	105R	26 (32)	34 (40)	142	59	5.8
FBH3233B	FBB33N-□-□□		MD32F -	110R	33 (40)	43 (50)	151	77	6
FBH4042B	FBB42N-□-□□		MD40F -	195R	42 (50)	54 (62)	242	130	6.3
FBH5053B	FBB53N-□-□□		MD50F -	225R	53 (65)	70 (82)	282	182	6.6
FBH6368B	FBB68N-□-□□		MD63F -	230R	68 (90)	100 (122)	301	220	7.2
FBH6398B	FBB68N-□-□□		MD63F -	195R	98 (120)	150 (172)	266	191	8.5
FBH8098B	FBB68N-□-□□		MD80F -	175	98 (120)	150 (172)	246	208	12.8

Spare Part I60

• Through coolant system available

• FBB bites are divided into two sorts Normal type: FBB□□N, Scalable type: FBB□□N-1
There are also the other options for your insert type: FBB□□N-□-C09 or T11
FBB□□N, FBB□□N-1: TPGT, TPGW0802□□L
FBB□□N-□-C: CCMT,CCGT0602□□L
FBB□□N-□-C09: CCMT,CCGT09T3□□L
FBB□□N-□-T11: TPGT1103□□L

FBH

FBH1920B

New Type

Micro Boring Head

(mm)

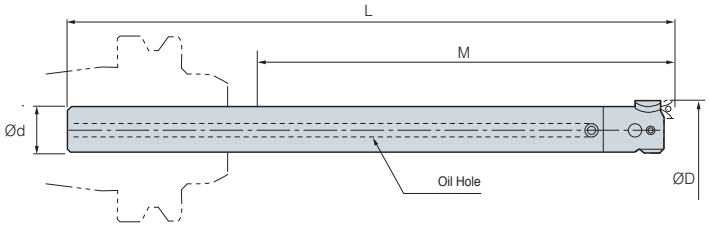
Designation		Boring range ØD		L	Scale ring 1rev. adjustable range	MD No.	kg
		Min	Max				
FBH -	1920B	20	26 (30)	33	Ø0.4 mm	MD1911	0.06
	2526B	26	34 (40)	37	Ø0.4 mm	MD2514	0.12
	3233B	33	43 (50)	41	Ø0.5 mm	MD3218	0.24
	4042B	42	54 (62)	47	Ø0.5 mm	MD4022	0.41
	5053B	53	70 (82)	57	Ø0.6 mm	MD5028	0.8
	6368B	68	100 (122)	71	Ø0.8 mm	MD6336	1.7
	6398B	98	150 (172)	71	Ø0.8 mm	MD6336	2.35

• Stock of basic holders, heads and bites are separately managed
• ( ): Max. boring diameter of extension type

S-FBH/B

Small Micro Boring





(mm)

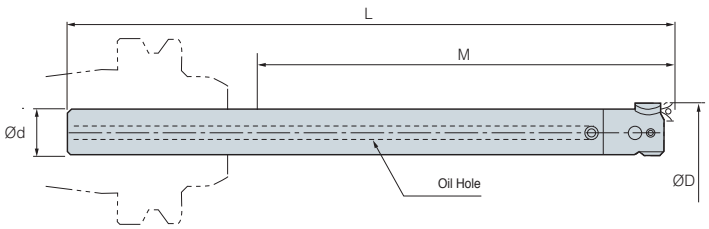
Designation			Shank dia ød	Boring range ØD		L	M	Designation			kg
				Min	Max			Basic shank	Boring head	Bite	
S19W -	FBH20B -	120	19	20	26	190	120	S19W-MD19F-157	FBH1920B	FBB20N	0.6
		140	19	20	26	210	140	S19W-MD19F-177	FBH1920B	FBB20N	0.7
		160	19	20	26	230	160	S19W-MD19F-197	FBH1920B	FBB20N	0.8
S25W -	FBH26B -	150	25	26	34	235	150	S25W-MD25F-197.5	FBH2526B	FBB26N	1.4
		175	25	26	34	260	175	S25W-MD25F-222.5	FBH2526B	FBB26N	1.6
		200	25	26	34	285	200	S25W-MD25F-247.5	FBH2526B	FBB26N	2
S32W -	FBH33B -	180	32	33	43	280	180	S32W-MD32F-239	FBH3233B	FBB33N	2.8
		240	32	33	43	340	240	S32W-MD32F-299	FBH3233B	FBB33N	3.5
S19 -	FBH20B -	40	19	20	26	110	40	S19-MD19F-77	FBH1920B	FBB20N	0.1
		80	19	20	26	150	80	S19-MD19F-117	FBH1920B	FBB20N	0.2
S25 -	FBH26B -	50	25	26	34	135	50	S25-MD25F-97.5	FBH2526B	FBB26N	0.4
		100	25	26	34	185	100	S25-MD25F-147.5	FBH2526B	FBB26N	0.6
S32 -	FBH33B -	90	32	33	43	190	90	S32-MD32F-149	FBH3233B	FBB33N	1.1
		120	32	33	43	220	120	S32-MD32F-179	FBH3233B	FBB33N	1.2

• Through coolant system available

S-FBH

Mini Small Micro Boring





(mm)

Designation			Shank dia ød	Boring range ØD		L	M	Designation			kg
				Min	Max			Basic shank	Boring head	Bite	
S14W	FBH15	85	14	15	18	155	85	S14W-M6-123	FBH15	FBB15-C	0.2
	FBH15	110	14	15	18	180	110	S14W-M6-148	FBH15	FBB15-C	0.3
S16W	FBH18	95	16	18	22	165	95	S16W-M8-128	FBH18	FBB15-C	0.3
	FBH18	125	16	18	22	195	120	S16W-M8-158	FBH18	FBB15-C	0.4
S14	FBH15	40	14	15	18	110	40	S14-M6-78	FBH15	FBB15-C	0.1
S16	FBH18	45	16	18	22	115	45	S16-M8-78	FBH18	FBB15-C	0.1

• Through coolant system available

Parts

Spare parts		
Type (FBH)	Lock screw	Clamp screw
FBH1920B	BTF0404	BXC0304
FBH2526B	BTF0505	BXC0405
FBH3233B	BTF0606	BXC0506
FBH4042B	BTF0808	BXC0610
FBH5053B	BTF0812	BXC0610
FBH6368B	BTF1016	BXC0810
FBH6398B	BTF1012	BXC0810
FBH8098B	BTF1014	BXC0810

FBB Bite (New type)

Designation	Boring range	Insert	Insert screw	Clamp bolt
FBB15C	Ø15~Ø18 mm Ø18~Ø22 mm	CCET0301-□□L	FTNA01633	BFTX02506N
FBB20N	Ø20~Ø26 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0304
FBB20N-C		CCET0401□□L	BFTX0204N	
FBB20N-1	Ø24~Ø30 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB20N-1-C		CCET0401□□L	BFTX0204N	
FBB26N	Ø26~Ø34 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0405
FBB26N-C		CCET0401□□L	BFTX0204N	
FBB26N-1	Ø32~Ø40 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB26N-1-C		CCET0401□□L	BFTX0204N	
FBB33N	Ø33~Ø43 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0506
FBB33N-C		CCMT0602□□/CCGT0602□□	BFTX02506N	
FBB33N-1	Ø41~Ø50 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB33N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N	Ø42~Ø54 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0610
FBB42N-		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N-11		TPGT1103□□L	BFTX0307A	
FBB42N-1	Ø50~Ø62 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB42N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N-1-T11		TPGT1103□□L	BFTX0307A	
FBB53N	Ø53~Ø70 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB53N-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB53N-11		TPGT1103□□L	BFTX0307A	
FBB53N-1	Ø65~Ø82 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB53N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB53N-1-C09		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB53N-1-T11		TPGT1103□□L	BFTX0307A	
FBB68N	Ø68~Ø100 mm Ø98~Ø150 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0810
FBB68N-C		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB68N-11		TPGT1103□□L	BFTX0307A	
FBB68N-1	Ø90~Ø122 mm Ø120~Ø172 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB68N-1-C09		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB68N-1-T11		TPGT1103□□L	BFTX0307A	

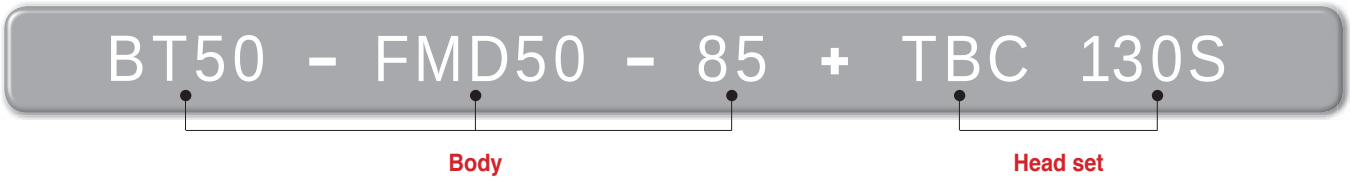
Balance cut tool for Rough boring

TBC

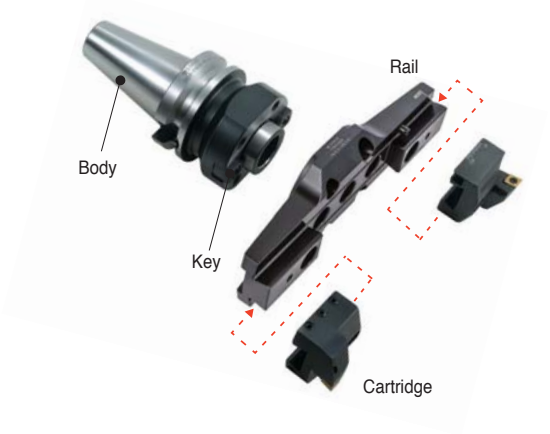
- Wide boring range for big diameters: Ø130~Ø540 mm
- Stable structure against for cutting load - Assembly by dove-tail structure
- Interconvert with FBC
  - Common boring head and rail adopted, different cartridge
- Light-weight (5%~20% reduced)
- Various cartridge approach angle: 15°, 45°



Code system

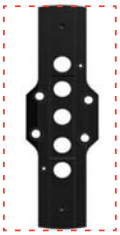


TBC boring tool structure & features





Cartridge: BCC1348
Incert: CCMT1204□□
CNMG1204□□



Less weight and more margin for chip evacuation



Enhanced strength and weight

TBC boring tool cutting condition

Workpiece	Grade (HRC)	Cutting condition		
		Tip (Grade)	Cutting speed (m/min)	Feed per revolution f (mm/rev)
ALL	ADC12	"N"Material	"N"Material	0.1
Mild steel	SS41 (HB160)	P Material	P Material	0.1
Steel	S45C (H250)	P Material	P Material	0.1
Stainless steel	SUS304	M Material	M Material	0.1
Cast-iron	FC25 (HB250)	K Material	K Material	0.1

Boring range

Grade	Dia (Ø)		Body	Head set	Insert
	min	max			
TBC130	130	180	FMD50	TBC130S	CCMT1204□□
TBC175	175	225	FMD50	TBC175S	CCMT1204□□
TBC220	220	270	FMD50	TBC220S	CCMT1204□□
TBC265	265	315	FMD50	TBC265S	CCMT1204□□
TBC310	310	390	FMD50	TBC310S	CCMT1204□□
TBC385	385	465	FMD50	TBC385S	CCMT1204□□
TBC460	460	540	FMD50	TBC460S	CCMT1204□□

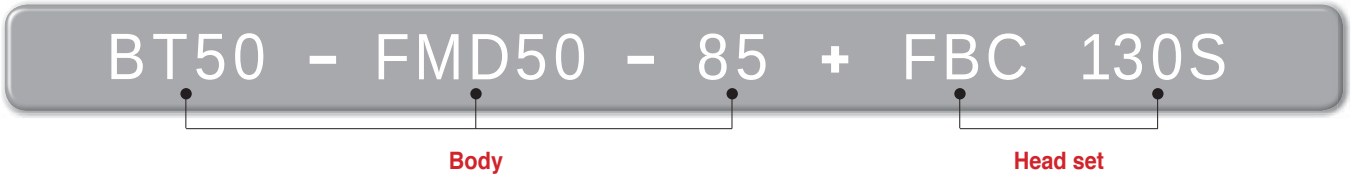
Balance cut tool for Fine boring

FBC

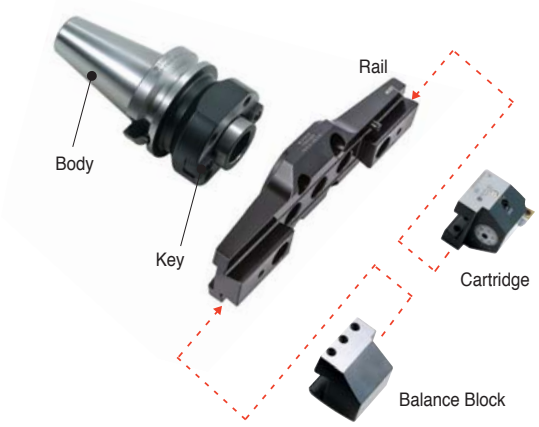


- Wide boring range for big diameters: Ø130 ~ Ø540 mm
- Interconvert with TBC
  - Common boring head and rail adopted, different cartridge [micro cartridge+balancing block]
- Various Insert according to bite
  - Applicable insert: CCMT09T3/1204, TPMT1103 (Cermet, cBN, PCD)

Code system



FBC boring tool structure & features





Cartridge
FCC130



Balance Block
FCB130



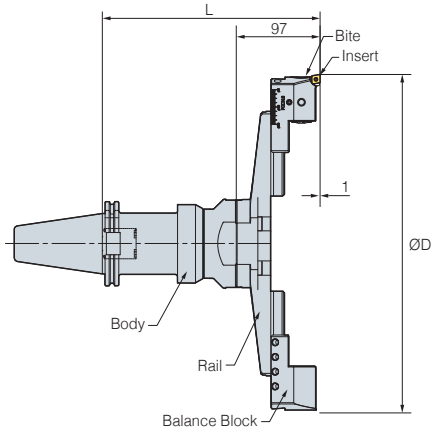
Incert
CCGT09T3□□
CCMT1204□□
TPGT1103□□

FBC boring tool cutting condition

Grade	Dia (Ø)		Head set	Insert
	min	max		
FBC130	130	180	FBC130S (TBR130+FCC130+FCB130)	FBB130-C09 (CCMT09T3□□, CCGT09T3□□ FBB130-C12 (CCMT1204□□) FBB130-T11 (TPMT1103□□,TPGT1103□□L)
FBC175	175	225	FBC175S (TBR175+FCC130+FCB130)	
FBC220	220	270	FBC220S (TBR220+FCC130+FCB130)	
FBC265	265	315	FBC265S (TBR265+FCC130+FCB130)	
FBC310	310	390	FBC310S (TBR310+FCC310+FCB310)	
FBC385	385	465	FBC385S (TBR385+FCC310+FCB310)	
FBC460	460	540	FBC460S (TBR460+FCC310+FCB310)	

TBC, FBC





(mm)

Designation											Boring range	
Body			kg	Rough boring (TBC)			Finish boring (FBC)					
				TBC HEAD SET (Rail+Cartridge)	L	kg	FBC HEAD SET (Rail+Cartridge+Balance block)	L	kg		Min	Max
BT50 -	FMD50 -	85	5.9	TBC130S (TBR130+BCC1348)	175	3.5	FBC130S (TBR130+FCC130+FCB130)	182	3.8		130	180
		155	7.9	TBC130S (TBR130+BCC1348)	245	3.5	FBC130S (TBR130+FCC130+FCB130)	252	3.8		130	180
		205	9.7	TBC130S (TBR130+BCC1348)	295	3.5	FBC130S (TBR130+FCC130+FCB130)	302	3.8		130	180
		255	10.4	TBC130S (TBR130+BCC1348)	345	3.5	FBC130S (TBR130+FCC130+FCB130)	352	3.8		130	180
		85	5.9	TBC175S (TBR175+BCC1348)	175	3.9	FBC175S (TBR175+FCC130+FCB130)	182	4.1		175	225
		155	7.9	TBC175S (TBR175+BCC1348)	245	3.9	FBC175S (TBR175+FCC130+FCB130)	252	4.1		175	225
		205	9.7	TBC175S (TBR175+BCC1348)	295	3.9	FBC175S (TBR175+FCC130+FCB130)	302	4.1		175	225
		255	10.4	TBC175S (TBR175+BCC1348)	345	3.9	FBC175S (TBR175+FCC130+FCB130)	352	4.1		175	225
		85	5.9	TBC220S (TBR220+BCC1348)	175	4.3	FBC220S (TBR220+FCC130+FCB130)	182	4.5		220	270
		155	7.9	TBC220S (TBR220+BCC1348)	245	4.3	FBC220S (TBR220+FCC130+FCB130)	252	4.5		220	270
		205	9.7	TBC220S (TBR220+BCC1348)	295	4.3	FBC220S (TBR220+FCC130+FCB130)	302	4.5		220	270
		255	10.4	TBC220S (TBR220+BCC1348)	345	4.3	FBC220S (TBR220+FCC130+FCB130)	352	4.5		220	270
		85	5.9	TBC265S (TBR265+BCC1348)	175	4.5	FBC265S (TBR265+FCC130+FCB130)	182	4.6		265	315
		155	7.9	TBC265S (TBR265+BCC1348)	245	4.5	FBC265S (TBR265+FCC130+FCB130)	252	4.6		265	315
		205	9.7	TBC265S (TBR265+BCC1348)	295	4.5	FBC265S (TBR265+FCC130+FCB130)	302	4.6		265	315
		255	10.4	TBC265S (TBR265+BCC1348)	345	4.5	FBC265S (TBR265+FCC310+FCB310)	352	4.6		265	315
		85	5.9	TBC310S (TBR310+BCC1354)	175	5.5	FBC310S (TBR310+FCC310+FCB310)	182	5.5		310	390
		155	7.9	TBC310S (TBR310+BCC1354)	245	5.5	FBC310S (TBR310+FCC310+FCB310)	252	5.5		310	390
		205	9.7	TBC310S (TBR310+BCC1354)	295	5.5	FBC310S (TBR310+FCC310+FCB310)	302	5.5		310	390
		255	10.4	TBC310S (TBR310+BCC1354)	345	5.5	FBC310S (TBR310+FCC310+FCB310)	352	5.5		310	390
		85	5.9	TBC385S (TBR385+BCC1354)	175	5.8	FBC385S (TBR385+FCC310+FCB310)	182	5.8		385	465
		155	7.9	TBC385S (TBR385+BCC1354)	245	5.8	FBC385S (TBR385+FCC310+FCB310)	252	5.8		385	465
		205	9.7	TBC385S (TBR385+BCC1354)	295	5.8	FBC385S (TBR385+FCC310+FCB310)	302	5.8		385	465
		255	10.4	TBC385S (TBR385+BCC1354)	345	5.8	FBC385S (TBR385+FCC310+FCB310)	352	5.8		385	465
		85	5.9	TBC460S (TBR460+BCC1354)	175	12.8	FBC460S (TBR460+FCC310+FCB310)	182	12.8		460	540
		155	7.9	TBC460S (TBR460+BCC1354)	245	12.8	FBC460S (TBR460+FCC310+FCB310)	252	12.8		460	540
		205	9.7	TBC460S (TBR460+BCC1354)	295	12.8	FBC460S (TBR460+FCC310+FCB310)	302	12.8		460	540
		255	10.4	TBC460S (TBR460+BCC1354)	345	12.8	FBC460S (TBR460+FCC310+FCB310)	352	12.8		460	540

•Bites for FBC are sold separately

FBB Bite (For FBC)



(mm)

Designation		Insert
FBB130 -	C09	CCMT09T3□□, CCGT09T3□□
	C12	CCMT1204□□
	T11	TPMT1103□□, TPGT1103□□

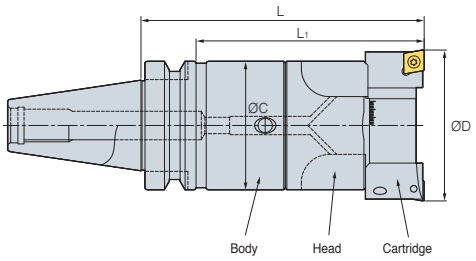
• TBC and DBC cartridges with tip angle of 15°/45° can be purchased by order (45° basis)

Parts

Division	Spare parts								
	Basic								
	Rail	Cartridge	Cartridge	Clamp bolt	Clamp bolt	Balance block	Wrench	Clamp screw	Torx wrench
Type									
TBC130S	TBR130	BCC1348	-	BX0820	BT0645	-	LW-3	BFTX0511N	TW20
TBC175S	TBR175								
TBC220S	TBR220								
TBC265S	TBR265								
TBC310S	TBR310	BCC1354 (BCN1354)			BT0660				
TBC385S	TBR385								
TBC460S	TBR460								
FBC130S	TBR130	-	FCC130		BT0645	FCB130	LW-3	-	-
FBC175S	TBR175								
FBC220S	TBR220								
FBC265S	TBR265								
FBC310S	TBR310		FCC310		BT0660	FCB310			
FBC385S	TBR385								
FBC460S	TBR460								

BT-DBC





(mm)

Designation				Boring range ØD		L	Max. Boring depth
Micro boring head	kg	Body (Basic holder)	kg	Min	Max		
DBC2528S	0.3	BT30-MD25F-90R	0.4	28	35	140	93
DBC3235S	0.4	BT30-MD32F-80R	0.4	35	46	145	114
DBC4046S	0.6	BT30-MD40F-80R	0.5	46	58	150	119
DBC5058S	1.1	BT30-MD50F-70	0.8	58	74	150	128
DBC2528S	0.3	BT40-MD25F-105R	1.9	28	35	165	100
DBC3235S	0.4	BT40-MD32F-115R	2.4	35	46	180	110
DBC4046S	0.6	BT40-MD40F-110R	2.7	46	58	180	130
DBC5058S	1.1	BT40-MD50F-100R	2.7	58	74	180	130
DBC6374S	2.0	BT40-MD63F-90	3.6	74	94	180	150
DBC8094S	3.5	BT40-MD80F-100	4.8	94	120	200	173
DBC2528S	0.3	BT50-MD25F-120R	4.7	28	35	180	100
DBC3235S	0.4	BT50-MD32F-235R	5.3	35	46	300	180
DBC4046S	0.6	BT50-MD40F-230R	5.6	46	58	300	250
DBC5058S	1.1	BT50-MD50F-250R	6.5	58	74	330	280
DBC6374S	2.0	BT50-MD63F-240R	8.4	74	94	330	280
DBC8094S	3.5	BT50-MD80F-175	9.5	94	120	275	225
DBC120S	5.3	BT50-MD80F-175	9.5	120	175	275	235

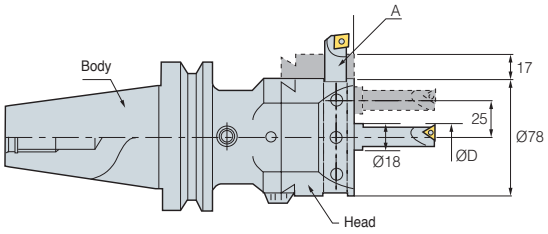
Parts

Division	Spare parts								
	Basic								
	Head	Spring pin	Wrench bolt	Wrench	Cartridge	Set screw	Wrench	Clamp screw	Torx wrench
Type									
DBC2528S	DBC2528	SP0308	BX0415	LW-3	BCC28	BT0306	LW-1.5	FTKA02565	TRX7
DBC3235S	DBC3235	SP0410	BX0515	LW-4	BCC35	BT0308			
DBC4046S	DBC4046	SP0516	BX0620	LW-5	BCC46	BT0410	LW-2	FTNA0408	TRX15
DBC5058S	DBC5058	SP0616			BCC58	BT0412			
DBC6374S	DBC6374	SP1018	BX0830	LW-6	BCC74	BT0516	LW-2.5	BFTX0511N	TRX20
DBC8094S	DBC8094	SP1020	BX1035	LW-8	BCC94	BT0620	LW-3		
DBC120S	DBC120N	SP1020	BX0830	LW-6.0	BCC120	BT0830	LW-4.0	BFTX0511N	TRX20

BT-KMB

Micro Boring





1DIV = Ø0.02mm

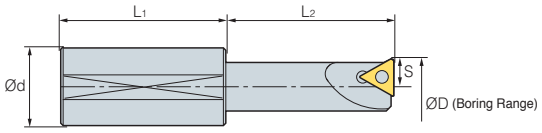
(mm)

Designation			Head (Modular)	Boring bite	L	L_1	kg
BT40 -	MD63F -	64	KMB6336	BB18-□(S)	141	64	5.5
BT50 -	MD63F -	75	KMB6336	BB18-□(S)	152	75	7.0

Boring head	Bite	MD NO.	L	kg
KMB6336	BB18-□(S)	BT□□-MD63F	77	2.2

• Through coolant system is optional

Boring bite: BBtype (For KMB)



(mm)

Designation		Boring range (Center)		Boring range (Side)		S	L_1	L_2	Insert	Insert Screw
		Min	Max	Min	Max					
BB	18-7(S)	7	40	43	91	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	42	45	93	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	44	47	95	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	46	49	97	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	48	51	99	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	50	53	101	8.5	40	50	TPGT1103□□L	BFTX0307A

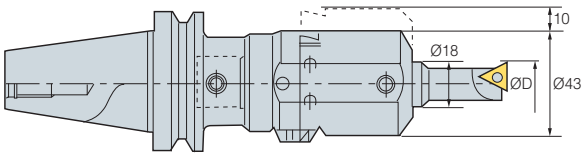
Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
KMB	KMB6336	BTT1620F	LW-8	BB18	MD63F

BT-SMB

Small Micro Boring Bar





1DIV = Ø0.02mm

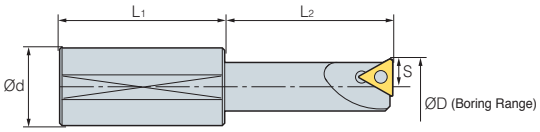
(mm)

Designation			Head (Modular)	Boring bite	L	L_1	kg
BT40 -	MD40F -	60	SMB4022	BB18-O(S)	122.5	60	2.8
BT50 -	MD40F -	60	SMB4022	BB18-O(S)	122.5	60	5.4

Boring head	Bite	MD NO.	L	kg
SMB4022	BB18-O(S)	BTOO-MD40T	62.5	0.6

• Through coolant system not available

Boring bite: BBtype (For SMB)



(mm)

Designation		Boring range		S	L_1	L_2	Insert	Insert screw
		Min	Max					
BB	18-7(S)	7	27	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	29	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	31	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	33	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	35	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	37	8.5	40	50	TPGT1103□□L	BFTX0307A

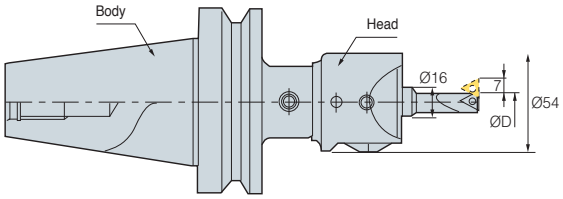
Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
SMB	SMB4022	BTT1013F	LW-5	BB18	MD40F

BT-SMH

Small Micro Boring Bar (For High Precision)





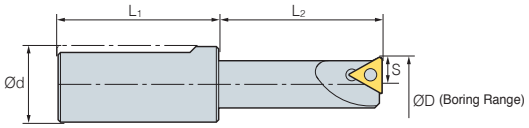
(mm)

Designation			Head (Modular)	Boring bite	L	L_1	kg
BT40 -	MD40F -	60	SMH4022	BB16-O(S)	109	60	3.0
BT50 -	MD40F -	60	SMH4022	BB16-O(S)	109	60	6.0

Boring head	Bite	MD NO.	L	kg
SMH4022	BB18-O(S)	BTOO-MD40F	49	2.7

• Through coolant system not available

Boring bite: BBtype (For SMH)



(mm)

Designation		Boring range ØD Min	Boring range ØD Max	S	L_1	L_2	Insert	Insert screw	Wrench
BB	16-5(S)	5.5	19	2.75	34	20	WBGT0601□□L	BFTX0203A	TRX06
	16-7(S)	7	21	3.5	34	30	TBGT0601□□L	BFTX0204A	TRX06
	16-9(S)	9	23	4.5	34	40	TPGT0802□□L	BFTX0204A	TRX06
	16-11(S)	11	25	5.5	34	45	TPGT1103□□L	BFTX0307A	TRX10
	16-15(S)	15	29	7.5	34	50	TPGT1604□□L	BFTX0307A	TRX10
	16-19(S)	19	33	9.5	34	60	TPGT1103□□L	BFTX0410A	TRX15

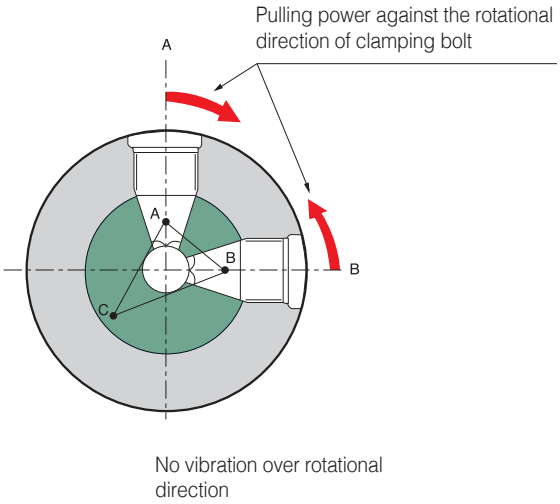
Parts

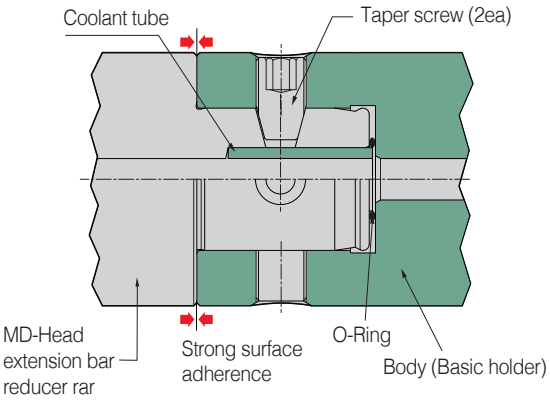
Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
SMH	SMH4022	BTT1013F	LW-5	BB16	MD40F

Versatile tooling system that can flexibly react to FMS

Modular System Series

- Versatile tooling system conforming to FMS specification
- Flexible combination of tool units according to conditions of subject
- Joining with a specially designed screw provides high accuracy (error less than 5μm) and ease of detach for one step setting
- Cutting edge of boring system aligned with the groove of drive key
- Corresponding accuracy and stiffness compared to uni-body type







BT-MD



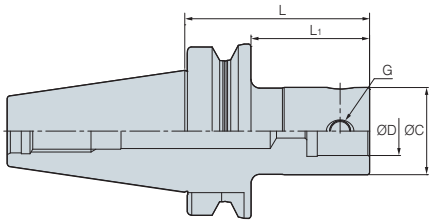


Fig. 1

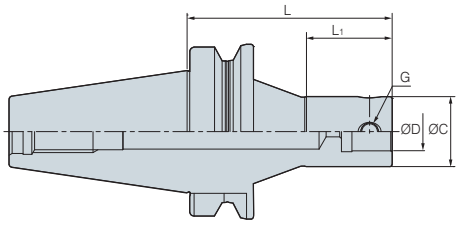


Fig. 2

(mm)

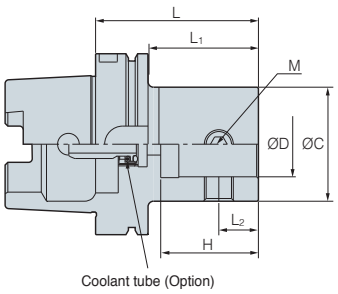
Designation			ØC	ØD	L	L_1	G	kg	Fig.
BT30 -	MD19F -	70	19	11	70	45	M5	0.4	1
	MD25F -	90	25	14	90	63	M6	0.3	1
	MD32F -	80	32	18	80	55	M8	0.4	1
	MD40F -	45	40	22	45	22	M8	0.4	1
	MD40F -	60	40	22	60	36	M10	0.5	1
	MD40F -	80	40	22	80	56	M10	0.5	1
	MD50F-	70	50	28	70	48	M12	0.8	3
BT40 -	MD19F-	70	19	11	70	40	M5	1.8	1
	MD25F-	95	25	14	95	63	M6	1.9	1
	MD25F-	105R	25	14	105	40	M6	1.9	2
	MD32F-	100	32	18	100	70	M8	2.3	1
	MD32F-	115R	32	18	115	45	M8	2.4	2
	MD40F-	60	40	22	60	31	M10	2.7	1
	MD40F-	110R	40	22	110	60	M10	2.7	2
	MD40F-	115	40	22	115	83	M10	2.7	1
	MD50F-	105	50	28	105	73	M12	2.7	1
	MD63F-	64	63	36	64	37	M16	3.3	1
	MD63F-	110	63	36	110	83	M16	3.6	1
	MD63F-	135	63	36	135	108	M16	4.6	1
	MD80F-	100	80	45	100	73	M16	4.8	3
BT50 -	MD19F-	85	19	11	85	44	M5	4.3	1
	MD25F-	105	25	14	105	62	M6	4.5	1
	MD25F-	120R	25	14	120	40	M6	4.7	2
	MD32F-	110	32	18	110	67	M8	5.1	1
	MD32F-	115R	32	18	115	45	M8	5.1	2
	MD32F-	235R	32	18	235	115	M8	5.3	2
	MD40F-	60	40	22	60	22	M10	5.0	1
	MD40F-	195	40	22	195	152	M10	5.4	1
	MD40F-	230R	40	22	230	180	M10	5.6	2
	MD50F-	125	50	28	125	82	M12	6.0	1
	MD50F-	225	50	28	225	182	M12	6.4	1
	MD50F-	250R	50	28	250	81	M12	6.5	2
	MD63F-	75	63	36	75	35	M16	6.0	1
	MD63F-	130	63	36	130	87	M16	6.8	1
	MD63F-	195	63	36	195	152	M16	8.0	1
	MD63F-	230	63	36	230	187	M16	8.4	1
	MD80F-	75	80	45	75	36	M16	9.1	1
	MD80F-	110	80	45	110	69	M16	9.4	1
	MD80F-	175	80	45	175	134	M16	9.5	1
	MD90F-	75	90	45	75	34	M16	9.3	1
	MD90F-	145	90	45	145	104	M16	9.9	1
	MD90F-	195	90	45	195	154	M16	10.2	1

Spare Part I71

• Through coolant system available • Order made body available

HSK-MD





(mm)

Designation		ØC	ØD	L	L1	L2	H	M
HSK 63A -	MD19F - 60	19	11	60	34	6.5	15.5	M5
	MD25F - 60	25	14	60	31	8	18.5	M6
	MD32F - 65	32	18	65	31	11	23.5	M8
	MD40F - 70	40	22	70	41	13	29	M10
	MD50F - 85	50	28	85	58	17	36	M12
	MD63F - 95	63	36	95	69	22	54	M16

• Through coolant system available

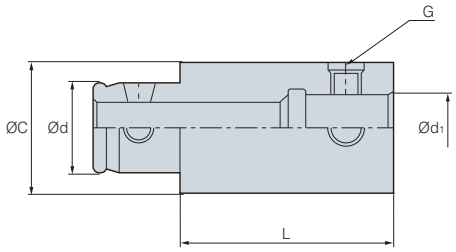
Parts

Division	Spare parts	
	Basic	Option
	Taper screw	Wrench
Type		
MD19F	BTT0506F	LW-2.5
MD25F	BTT0608F	LW-3
MD32F	BTT0810F	LW-4
MD40F	BTT1013F	LW-5
MD50F	BTT1215F	LW-6
MD63F	BTT1620F	LW-8
MD80F	BTT1626F	LW-8
MD90F	BTT1631F	LW-8

EXT

Extension Bar





(mm)

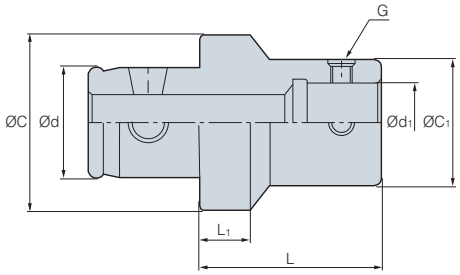
Designation		ØC	Ød	L	Ød1	G
EXT -	1930F	19	11	30	11	M5
	1950F	19	11	50	11	M5
	2530F	25	14	30	14	M6
	2550F	25	14	50	14	M6
	3235F	32	18	35	18	M8
	3260F	32	18	60	18	M8
	4040F	40	22	40	22	M10
	4090F	40	22	90	22	M12
	5050F	50	28	50	28	M12
	50100F	50	28	100	28	M12
	6360F	63	36	60	36	M16
	63120F	63	36	120	36	M16
	8070F	80	45	70	45	M16
	80120F	80	45	120	45	M16
	9080F	90	45	80	45	M16
	90130F	90	45	130	45	M16

• Through coolant system available

RDC

Reducer Bar





(mm)

Designation		Ød	ØC1	Ød1	ØC	L	L1	G
RDC -	3225F	18	25	14	32	30	9	M6
	4025F	22	25	14	40	30	9	M6
	4032F	22	32	18	40	30	9	M8
	5025F	28	25	14	50	30	9	M6
	5032F	28	32	18	50	30	9	M8
	5040F	28	40	22	50	40	10	M10
	6325F	36	25	14	63	30	9	M6
	6332F	36	32	18	63	30	9	M8
	6340F	36	40	22	63	40	10	M10
	6350F	36	50	28	63	45	10	M12
	8032F	45	32	18	80	30	9	M6
	8040F	45	40	22	80	40	10	M10
	8050F	45	50	28	80	45	10	M12
	8063F	45	63	36	80	50	13	M16

• Through coolant system available

Parts

Division	Spare parts		
	Basic		Option
	Taper screw	Spring pin	Wrench
Type			
MD19F	BTT0506F	-	LW-2.5
MD25F	BTT0608F	SP0308	LW-3
MD32F	BTT0810F	SP0410	LW-4
MD40F	BTT1013F	SP0516	LW-5
MD50F	BTT1215F	SP0616	LW-6
MD63F	BTT1620F	SP0818	LW-8
MD80F	BTT1626F	SP1020	LW-8
MD90F	BTT1631F	SP1020	LW-8

DAMPING PRO
Anti-Vibration Tool

KORLOY Anti-Vibration tool

KORLOY DAMPING PRO

- The application of a special design provides an excellent Anti-Vibration effect and is optimized for Overhang work
- Capable to elevate Feed comparing to standard arbor with stable machining
- Longer tool life and noise decrease
- Provides a solution for Mold, Deep Cavity machining, and Heavy-duty work

Code system

KDP - BT50 - FMA25.4 - 260

KORLOY DAMPING PRO

Arbor taper
BT type
HSK type
SK type

FMA: JIS B4113 Face milling
FMB: T-MAX Face milling/Shoulder Cutter
FMC: T-MAX Face milling/Shoulder Cutter

Length of gauge line

Features



- Anti-Vibration: Exclusively designed Anti-Vibration structure
- Material: Special alloy steel
- Anti-Vibration body: Application of high density damper
- Overhang: Capable for 2D~5D
- Coolant: Inner coolant is capable

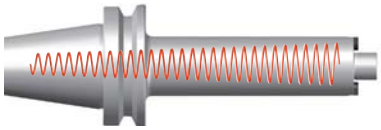


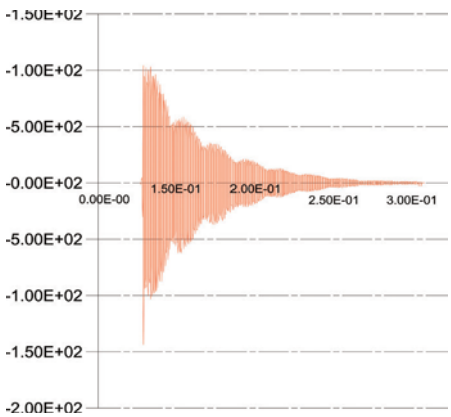
BT type **HSK type** **SK type**

Various types and sizes are applicable

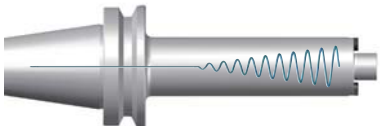
Comparison of vibration damping time

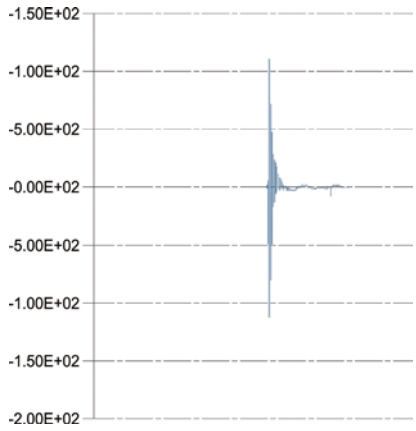
Standard arbor	KORLOY DAMPIG PRO





Longer Vibration damping time/
Chattering is caused while Overhang work

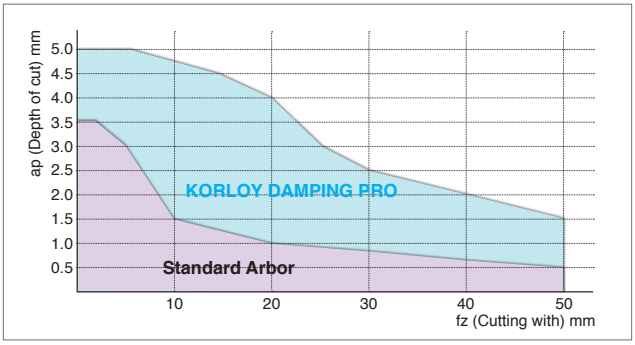




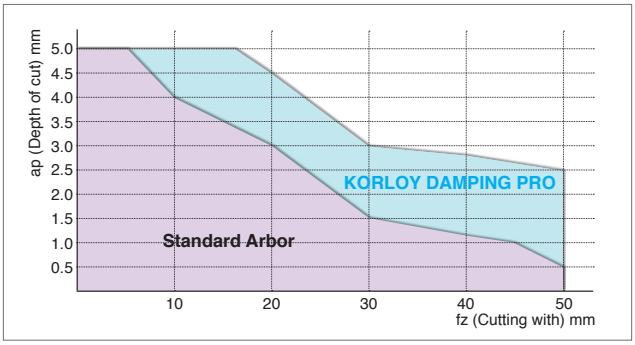
Short Vibration damping time/
Performance is 2~3 times better than standard arbor

Performance evaluation

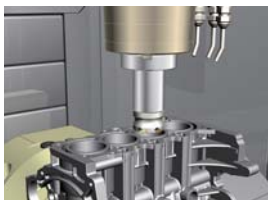
- **Cutting condition:** fz (mm/t) = 0.1
  vc (m/min) = 100
- **Cutter:** AMC4063HS 6flute
- **Arbor:** BT50-FMC22-210 General arbor
  KDP-BT50-FMC22-210 Damping pro



- **Cutting condition:** fz (mm/t) = 0.1
  vc (m/min) = 100
- **Cutter:** FMRC3063HRD-H 6flute
- **Arbor:** BT50-FMC22-210 General arbor
  KDP-BT50-FMC22-210 Damping pro



Application examples

Mold machining	Side milling cutter machining	Facing for long depth	Deep-hole Boring machining
			
Better productivity than general arbor	Excellent performance in the deep grooving	Better productivity and surface roughness than general arbor	Better surface roughness and machinability than general arbor

Side milling cutter machining example

- Faulty occurrence on size and surface roughness by the vibration, when use the general arbor
- **Using DAMPING PRO, good size and surface roughness**



■ General arbor
Cutting condition:
vc (m/min) = 50
fz (mm/t) = 0.1
ae (mm) = 20

■ DAMPING PRO
Cutting condition:
vc (m/min) = 100
fz (mm/t) = 0.1
ae (mm) = 20

Big size Crankshaft machining example

- General arbor: ap = 2 mm
- KORLOY DAMPING PRO: ap = 4mm available
- **2 times better productivity**



■ General arbor
Cutting condition:
vc (m/min) = 100
fz (mm/t) = 0.15
ap (mm) = 2

■ DAMPING PRO
Cutting condition:
vc (m/min) = 100
fz (mm/t) = 0.15
ap (mm) = 4

BT-FMA



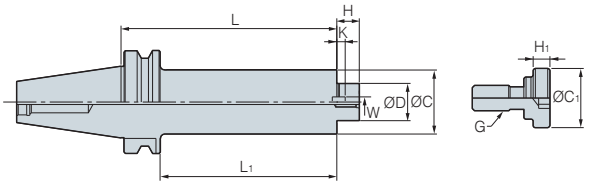


Fig. 1

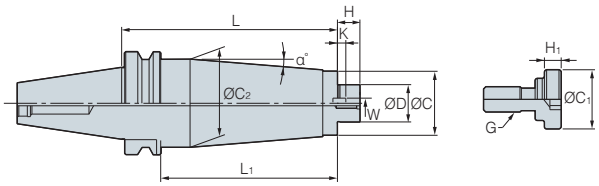


Fig. 2

(mm)

Designation		Cutter dia.	ØD	L	L_1	ØC	$ØC_2$	H	W	K	G	$ØC_1$	H_1	kg	Fig.	α°
KDP-BT40 -	FMA25.4 - 210	80	25.4	210	183	50	60	22	9.5	5	M12	33	10	5.42	2	1
	FMA25.4 - 260	80	25.4	260	233	50	60	22	9.5	5	M12	33	10	6.5	2	1.1
	FMA31.75 -210	100	31.75	210	183	60	-	30	12.7	7	M16	40	10	5.94	1	-
	FMA31.75 -260	100	31.75	260	233	60	-	30	12.7	7	M16	40	10	7.25	1	-
KDP-BT50 -	FMA25.4 - 210	80	25.4	210	172	50	78	22	9.5	5	M12	33	10	9.63	2	4
	FMA25.4 - 260	80	25.4	260	222	50	78	22	9.5	5	M12	33	10	11.8	2	3
	FMA31.75 -210	100	31.75	210	172	60	85	30	12.7	7	M16	40	10	11.8	2	3
	FMA31.75 -260	100	31.75	260	222	60	85	30	12.7	7	M16	40	10	13.6	2	2.5

- The A type is for JIS B4113 Face milling
- The B type and C type are arbors for T-MAX Face Milling and shoulder cutter
- The weight (kg) shown in the chart does not include the weight of face cutter
- Key and screw are clamped
- Wrench is separately sold

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					
FMA25.4	K9.5(B)	MBA-M12	BX0412	BX1225	LW-10
FMA31.75	K12.7(D)	MBA-M16	BX0515	-	LW-14

BT-FMC



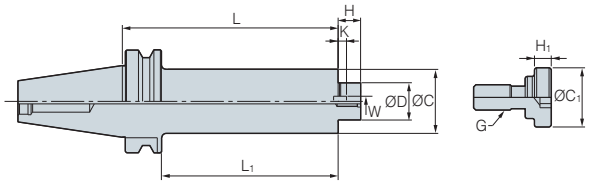


Fig. 1

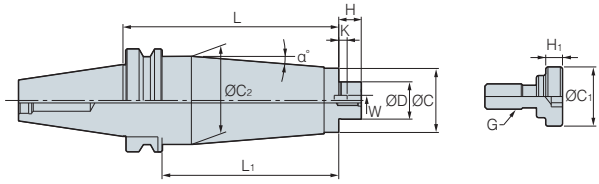


Fig. 2

(mm)

Designation			Cutter dia.	ØD	L	L_1	ØC	$ØC_2$	H	W	K	G	kg	Fig.	α°
KDP-BT40 -	FMC16 -	160	40	16	160	133	38	-	17	8	5	M8	2.45	1	-
	FMC22 -	210	50/63	22	210	183	48	4.95	19	10	5.6	M10	4.37	2	0.1
	FMC22 -	260	50/63	22	260	233	48	60	19	10	5.6	M10	6.3	2	1.5
	FMC27 -	210	80	27	210	183	60	-	21	12	6.3	M12	6	1	-
	FMC27 -	260	80	27	260	233	60	-	21	12	6.3	M12	7.25	1	-
KDP-BT50 -	FMC16 -	171	40	16	171	133	38	-	17	8	5	M8	5.1	1	-
	FMC22 -	210	50/63	22	210	172	48	49.5	19	10	5.6	M10	7.3	2	0.1
	FMC22 -	260	50/63	22	260	222	48	62	19	10	5.6	M10	10	2	1
	FMC27 -	210	80	27	210	172	60	78	21	12	6.3	M12	10.6	2	2.5
	FMC27 -	260	80	27	260	222	60	78	21	12	6.3	M12	12.6	2	2
	FMC27 -	320	80	27	320	282	60	78	21	12	6.3	M12	14.8	2	1
	FMC32 -	210	100	32	210	172	78	-	24	14	7	M16	11.7	1	-
	FMC32 -	260	100	32	260	222	78	-	24	14	7	M16	14.2	1	-
	FMC32 -	330	100	32	330	292	78	-	24	14	7	M16	16.6	1	-

- The A type is for JIS B4113 Face milling
- The B type and C type are arbors for T-MAX Face Milling and shoulder cutter
- The weight (kg) shown in the chart does not include the weight of face cutter
- Key and screw are clamped
- Wrench is separately sold

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					
FMC16	K8.0(A)	-	BX0310	BX0820	LW-6
FMC22	K10.0(C)	-	BX0412	BX1030	LW-8
FMC27	K12.0	MBA-M12	BX0616	-	LW-10
FMC32	K14.0	MBA-M16	BX0820	-	LW-14

HSK-FMA



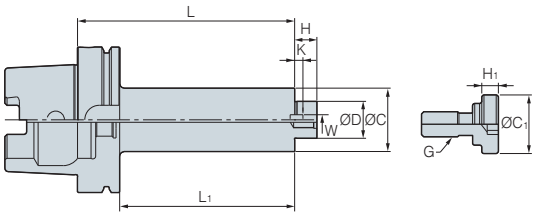


Fig. 1

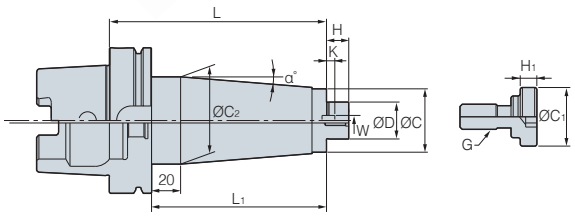


Fig. 2

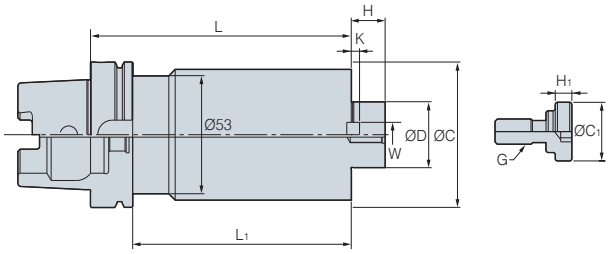


Fig. 3

(mm)

Designation		Cutter dia.	ØD	L	L_1	ØC	$ØC_2$	H	W	K	G	$ØC_1$	H_1	kg	Fig.	α°
KDP-HSK63 -	FMA25.4 - 210	80	25.4	210	184	50	53	22	9.5	5	M12	33	10	4.55	3	0.1
	FMA25.4 - 260	80	25.4	260	234	50	53	22	9.5	5	M12	33	10	5.6	3	0.1
	FMA31.75 -210	100	31.75	210	184	60	-	30	12.7	7	M16	40	10	5.52	2	-
	FMA31.75 -260	100	31.75	260	234	60	-	30	12.7	7	M16	40	10	6.9	2	-
KDP-HSK100 -	FMA25.4 - 210	80	25.4	210	181	50	78	22	9.5	5	M12	33	10	8.32	3	4
	FMA25.4 - 260	80	25.4	260	231	50	78	22	9.5	5	M12	33	10	10.5	3	3
	FMA31.75 -210	100	31.75	210	181	60	85	30	12.7	7	M16	40	10	10.9	3	3
	FMA31.75 -260	100	31.75	260	231	60	85	30	12.7	7	M16	40	10	12.8	3	2.5

- The A type is for JIS B4113 Face milling
- The B type and C type are arbors for T-MAX Face Milling and shoulder cutter
- The weight (kg) shown in the chart does not include the weight of face cutter
- Key and screw are clamped
- Wrench is separately sold

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					
FMA25.4	K9.5(B)	MBA-M12	BX0412	BX1230	LW-10
FMA31.75	K12.7(D)	MBA-M16	BX0515	-	LW-14

HSK-FMC



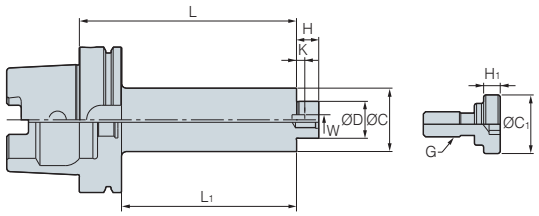


Fig. 1

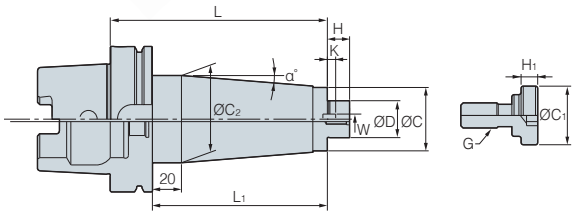


Fig. 2

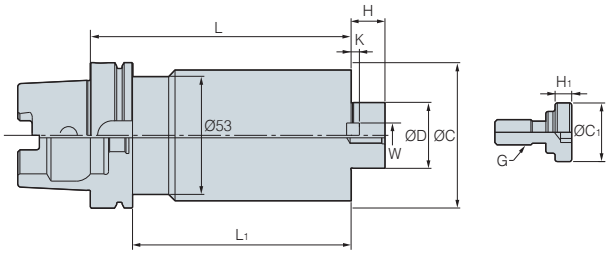


Fig. 3

(mm)

Designation			Cutter dia.	ØD	L	L_1	ØC	$ØC_2$	H	W	K	G	kg	Fig.	α°
KDP-HSK63 -	FMC16 -	160	40	16	160	134	38	-	17	8	5	M8	2.10	1	-
	FMC22 -	210	50/63	22	210	184	48	4.95	19	10	5.6	M10	3.82	1	0.1
	FMC22 -	260	50/63	22	260	234	48	62	19	10	5.6	M10	6.14	3	1.6
	FMC27 -	210	80	27	210	184	60	-	21	12	6.3	M12	5.53	2	-
	FMC27 -	260	80	27	260	234	60	-	21	12	6.3	M12	6.83	2	-
KDP-HSK100 -	FMC16 -	160	40	16	160	131	38	-	17	8	5	M8	3.45	1	-
	FMC22 -	210	50/63	22	210	181	48	49.5	19	10	5.6	M10	4.60	3	0.1
	FMC22 -	260	50/63	22	260	231	48	62	19	10	5.6	M10	8.10	3	1
	FMC27 -	210	80	27	210	181	60	78	21	12	6.3	M12	8.44	3	2.5
	FMC27 -	260	80	27	260	231	60	78	21	12	6.3	M12	10.40	3	2
	FMC27 -	320	80	27	320	291	60	78	21	12	6.3	M12	13.60	3	1
	FMC32 -	210	100	32	210	181	78	-	24	14	7	M16	10.20	1	-
	FMC32 -	260	100	32	260	231	78	-	24	14	7	M16	13.00	1	-
	FMC32 -	330	100	32	330	301	78	-	24	14	7	M16	15.43	1	-

• The A type is for JIS B4113 Face milling
• The B type and C type are arbors for T-MAX Face Milling and shoulder cutter
• The weight (kg) shown in the chart does not include the weight of face cutter
• Key and screw are clamped
• Wrench is separately sold

Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					
FMC16	K8.0(A)	-	BX0310	BX0820	LW-6
FMC22	K10.0(C)	-	BX0412	BX1030	LW-8
FMC27	K12.0	MBA-M12	BX0616	-	LW-10
FMC32	K14.0	MBA-M16	BX0820	-	LW-14

SK-FMC



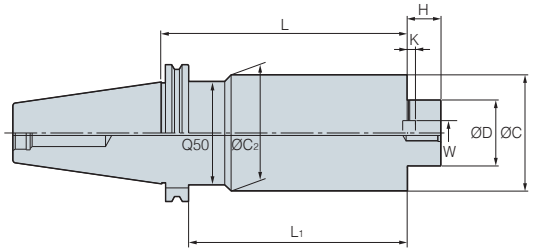


Fig. 1

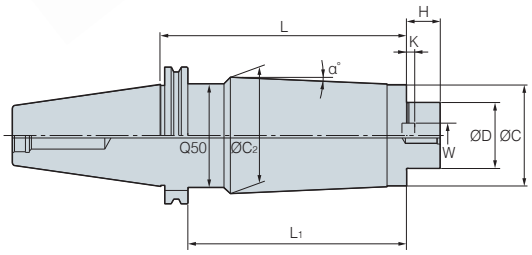


Fig. 2

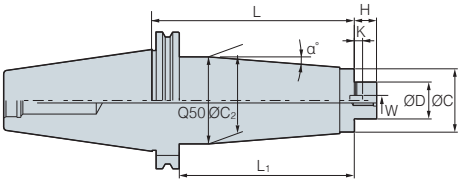


Fig. 3

(mm)

Designation			Cutter dia.	ØD	L	L_1	ØC	$ØC_2$	H	W	K	G	kg	Fig.	α°
KDP-SK40 -	FMC22 -	210	50/63	22	210	183.0	48	49.5	19	10	4.4	M10	4.4	3	0.1
	FMC22 -	260	50/63	22	260	233.0	48	60	19	10	5.6	M10	6.2	2	1.4
	FMC27 -	210	80	27	210	183.0	60	60	21	12	6.3	M12	5.9	1	-
	FMC27 -	260	80	27	260	233.0	60	60	21	12	6.3	M12	7.2	1	-
KDP-SK50 -	FMC22 -	210	50/63	22	210	190.9	48	49.5	19	10	5.6	M10	6.4	3	0.1
	FMC22 -	260	50/63	22	260	240.9	48	62	19	10	5.6	M10	9.1	3	1
	FMC27 -	210	80	27	210	190.9	60	78	21	12	6.3	M12	9.8	3	2.5
	FMC27 -	260	80	27	260	240.9	60	78	21	12	6.3	M12	12.4	3	1.8
	FMC27 -	320	80	27	320	300.9	60	78	21	12	6.3	M12	14.5	3	1.2
	FMC32 -	210	100	32	210	190.9	78	-	24	14	7	M16	11.5	1	-
	FMC32 -	260	100	32	260	240.9	78	-	24	14	7	M16	14	1	-
	FMC32 -	330	100	32	330	310.9	78	-	24	14	7	M16	16.4	1	-

- The A type is for JIS B4113 Face milling
- The B type and C type are arbors for T-MAX Face Milling and shoulder cutter
- The weight (kg) shown in the chart does not include the weight of face cutter
- Key and screw are clamped
- Wrench is separately sold

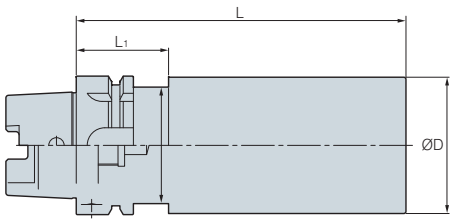
Parts

Division	Spare parts				
	Basic				Option
	Key	Clamp bolt	Wrench bolt	Wrench bolt	Wrench
Type					
FMC16	K8.0(A)	-	BX0310	BX0820	LW-6
FMC22	K10.0(C)	-	BX0412	BX1030	LW-8
FMC27	K12.0	MBA-M12	BX0616	-	LW-10
FMC32	K14.0	MBA-M16	BX0820	-	LW-14

BLK

Blank Tool



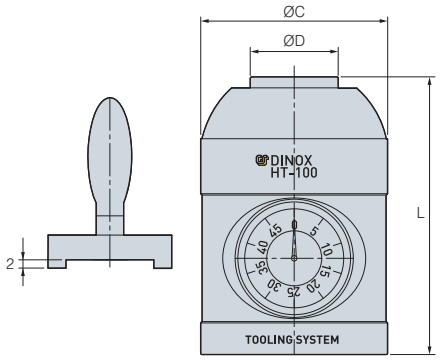


(mm)

Designation	Ød	ØC	L	L1
HSK40A - BLK42 - 180	42	34	180	35
HSK50A - BLK52 - 200	52	42	200	42
HSK63A - BLK63 - 150	63	52	150	42
BLK63 - 250	63	52	250	42
BLK82 - 200	82	52	200	42
HSK100A - BLK102 - 150	102	85	150	45
BLK102 - 250	102	85	250	45
BLK126 - 200	126	85	200	45
BT30 - BLK48 - 180	48	44	180	30
BT40 - BLK63 - 150	63	61	150	35
BLK63 - 250	63	61	250	35
BLK82 - 200	82	61	200	35
BT50 - BLK102 - 150	102	98	150	48
BLK102 - 250	102	98	250	48
BLK126 - 200	126	98	200	48

HT





(mm)

Designation	ØD	ØC	L
HT-100	32	68	100

- Good for setting the Tool length at CNC machine
- No inturferance between height Touch setter and Tool makes safe work
- Location Accuracy: ±0.003 mm

SC Spindle Cleaner



(mm)

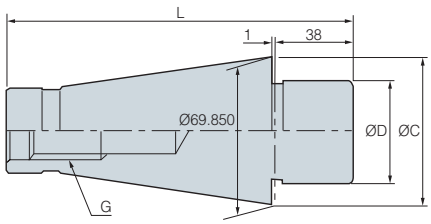
Designation		Taper	N.W.	G.W.
SC -	**BT30**	BT30	0.06kg	0.08kg
	BT40	BT40	0.07kg	0.1kg
	BT50	BT50	0.16kg	0.2kg
	HSK50	HSK50	0.08kg	0.12kg
	HSK63	HSK63	0.1kg	0.13kg
	HSK100	HSK100	0.5kg	0.7kg

Features

• Cleaning ships of taper wipe is made of lambskin
It can clean inside slide of spindles to prevention of static electricity and to extend spindles and tapers durable life

KCP



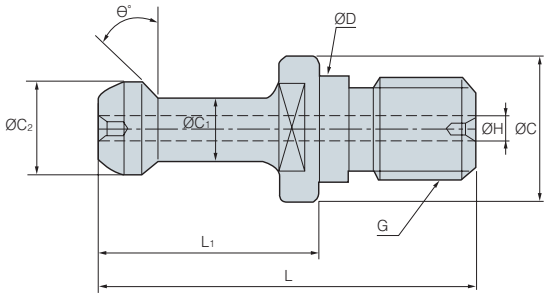


(mm)

Designation		Taper	Cutter dia.	ØD	ØC	L	G
NTN 50 -	**KCP47.625**	NT50	200(8″)	47.625	69.55	164.00	U1”-8(M24)
	KCP60	NT50	200(8″)	60	69.55	164.00	M24

Pull Stud Bolt



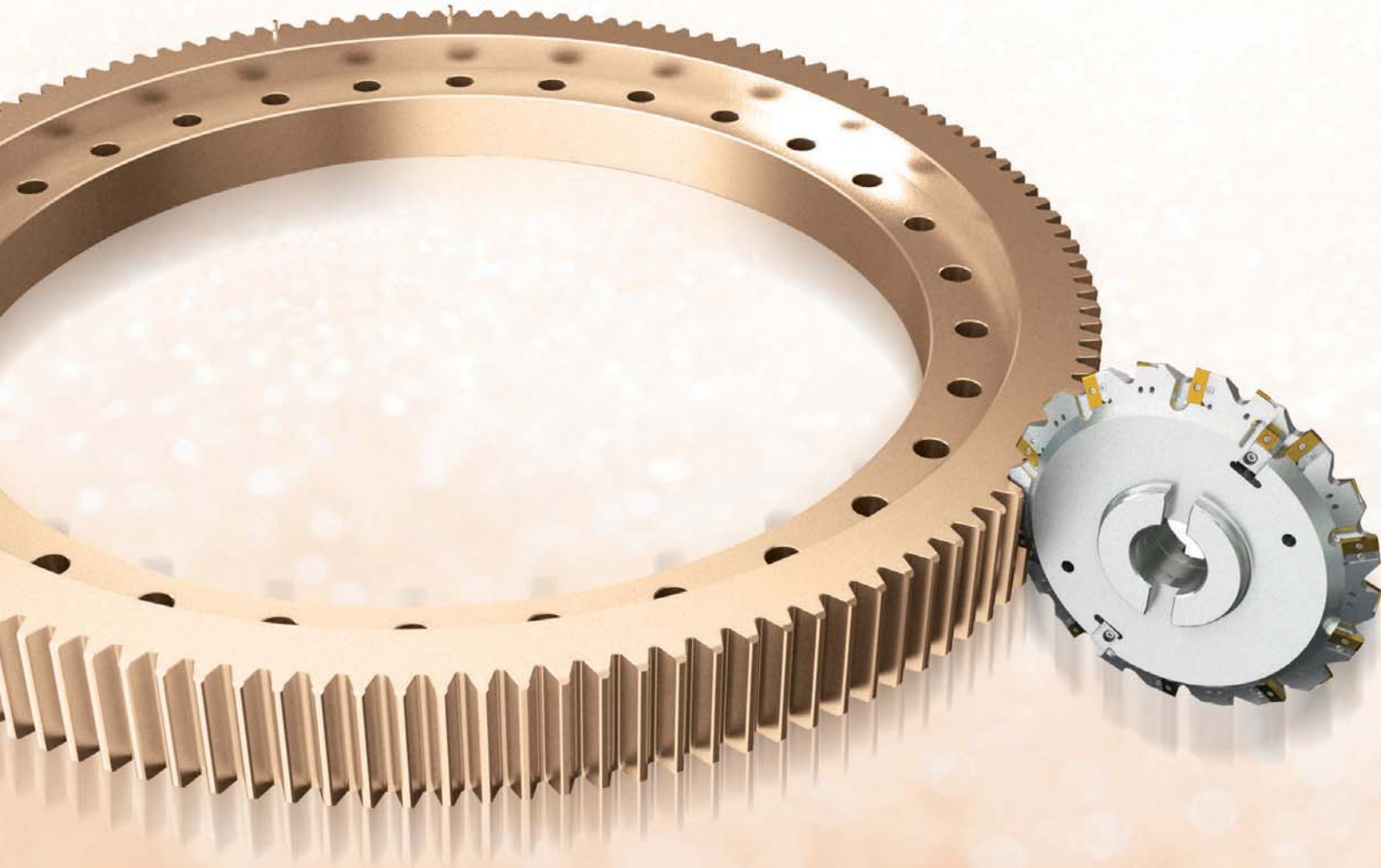


(mm)

Designation	ØD	ØC	ØC1	ØC2	L1	L	θ	G	ØH
P20T-1	8.5	12	6	8.5	17.5	31.5	15°	M8	
P30T-1	12.5	16.5	7	11	23	43	45°	M12	
P30T-1(Ø2.5)	12.5	16.5	7	11	23	43	45°	M12	Ø2.5
P30T-2	12.5	16.5	7	11	23	43	30°	M12	
P30T-2(Ø2.5)	12.5	16.5	7	11	23	43	30°	M12	Ø2.5
P40T-1	17	23	10	15	35	60	45°	M16	
P40T-1(3)	17	23	10	15	35	60	45°	M16	Ø3
P40T-2	17	23	10	15	35	60	30°	M16	
PS40-3F	17	23	10	15	35	60	0°	M16	
PS-G51	17	22	12.45	18.8	19.11	44.11	45°	M16	Ø7
DIN69872-A40	17	23	14	19	26	54	15°	M16	Ø7
DIN69872-B40	17	23	14	19	26	54	15°	M16	
JISB6339-A40(PS-806)	17	23	14	19	29	54	15°	M16	Ø7
JISB6339-B40(PS-805)	17	23	14	19	29	54	15°	M16	
P50T-1	25	38	17	23	45	85	45°	M24	
P50T-1(7)	25	38	17	23	45	85	45°	M24	Ø7
P50T-2	25	38	17	23	45	85	30°	M24	
PS50-1F	25	38	17	23	45	85	0°	M24	
PS50-1FH	25	38	17	23	45	85	0°	M24	Ø8
PS-G41	25	37	20.83	28.96	25.2	65.2	45°	M24	Ø10
DIN69872-A50	25	36	21	28	34	74	15°	M24	Ø11.5
P50T-1HS	25	38	17	23	45	85	45°	M24	Ø5.7

J

TOOLING EXAMPLES

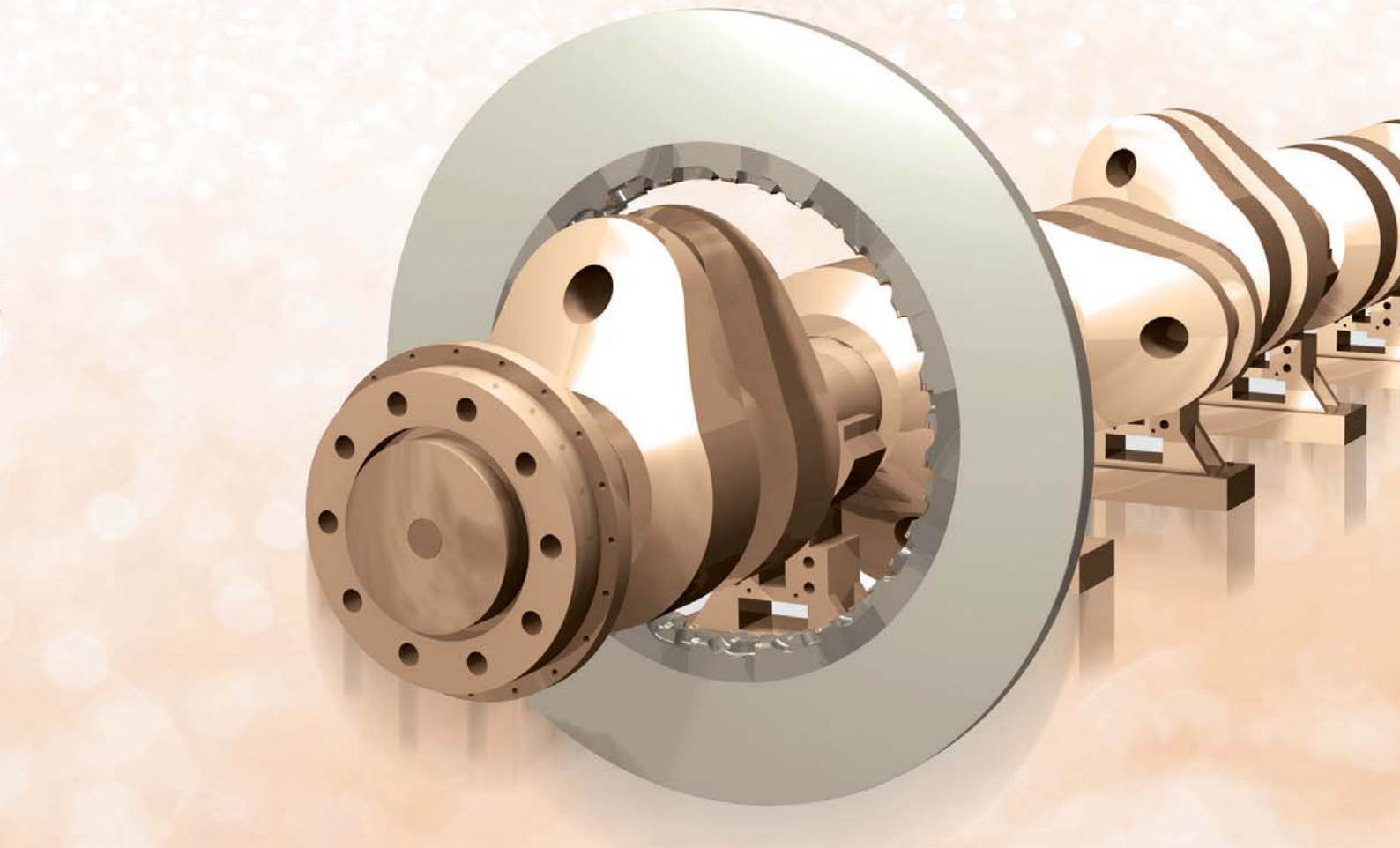


Industrial Tooling Example

J02 Gear Machining Solution
J04 Ship Building Industrial Solution
J07 Role Machining Solution
J08 Railway Industrial Solution
J10 Pipe Industrial Solution
J12 Bearing working Solution
J13 Development Industrial Solution
J14 Aviation Industrial Solution
J18 Slitter Knife

Automobile Tooling Examples

J19 Crankshaft
J20 Knuckle
J22 Brake
J24 Connecting Rod
J26 Block
J28 Head



Gear machining (External Gear)

Cutter for roughing



- Cutter diameter: Ø300
- The Number of Edges: 60
- Available for high speed working through ontrolled V-style edges to reduce cutting force

Cutter for medium

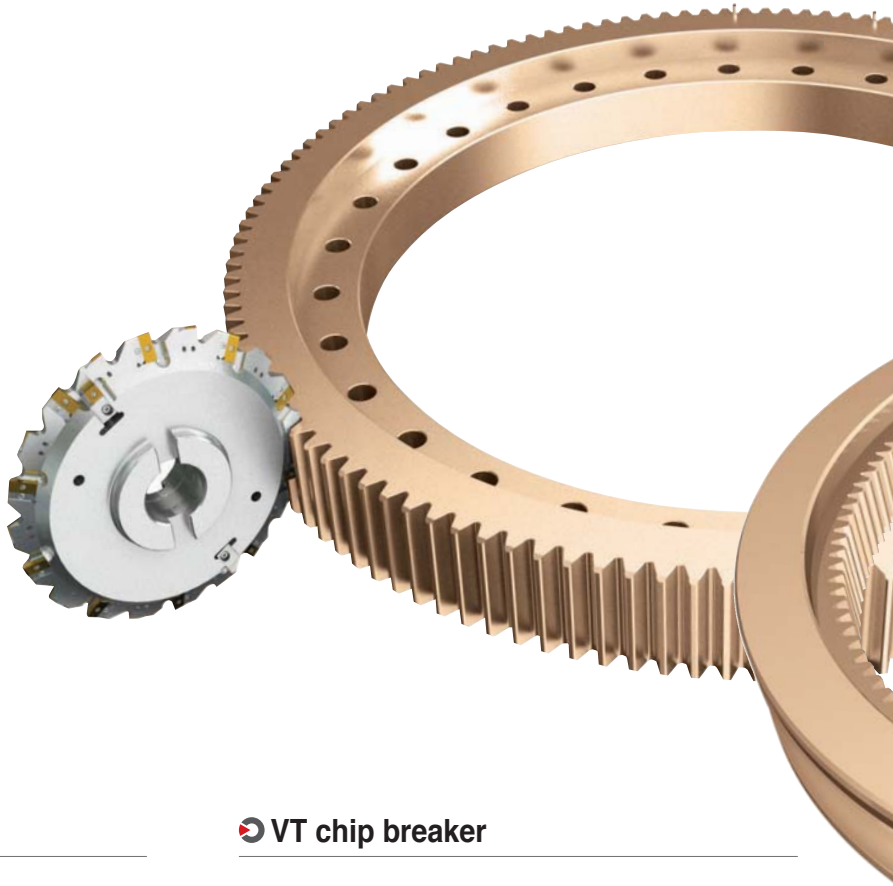


- Cutter diameter: Ø280
- The Number of Edges: 48
- Available for high efficiency and long life and high productivity through Korloy's own insert shape
- Made R part of gear by proper designed 'R'-shape of insert

Cutter for finishing: M20



- Cutter diameter: Ø400
- The Number of Edges: 20
- Gear cutter for medium is realized on the 4 grade of precision. (KS, JS)
- Chamfering system available for machining efficiency



Hob cutter



- Cutter diameter: Ø350
- The Number of Edges: 100
- Indexable hob for roughing worked by generating cutting action
- Available for customized producing by user

King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life.
- Grade: PC3500, PC5300

VT chip breaker



- Excellent rigidity on the high feed and depth
- Excellent impact resistance and long life based on stable structure and outstanding rigidity
- Type of SNMM/CNMM

TPDB



High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

VH chip breaker



- Innovative improved chip breaking on the medium working
- Provided good performance on the flange and continuous working
- Type of SNMM/CNMM

Gear machining (Internal Gear)

Cutter for roughing



- Cutter diameter: Ø560
- The Number of Edges: 140
- Available for all module gear working is caused by edges designed stair shape

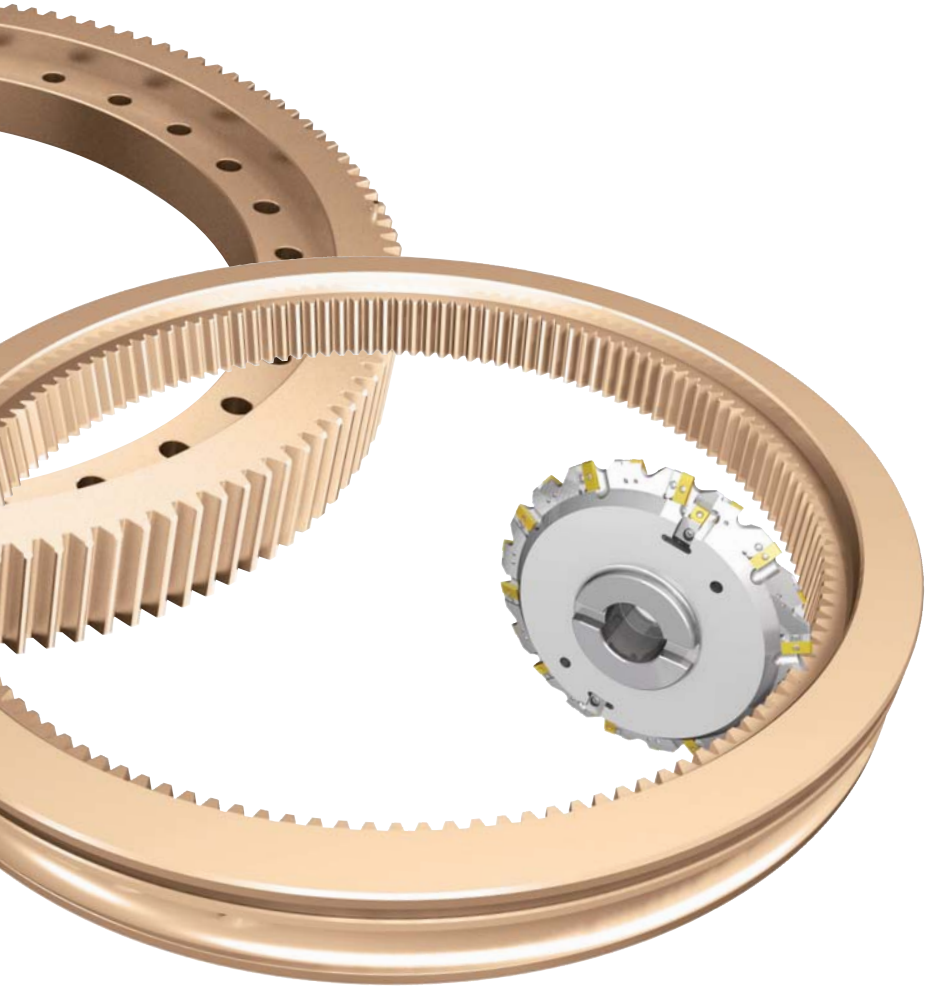


Cutter for medium



- Cutter diameter: Ø400
- The Number of Edges: 48
- Available for making involute curve shape of internal gear



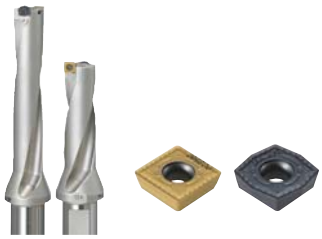


Cutter for finishing



- Cutter diameter: Ø400
- The Number of Edges: 20
- Cutter for finishing available for 4 grades accuracy of internal gear
- Available for chamfering on the same time and unnecessariness of extra working

King Drill

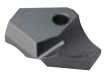


Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300

TPDB





High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

Ship building (Engine block)

Roughing cutter for cylinder block



- Cutter diameter: Ø200
- Applicable insert: SNCF1507ANN-MF
- Economical concepts: 8 edge available insert, high feed available tool
- KORLOY exclusive latch clamping system provides quick change of insert

TPDB



High precision and high efficiency indexable drill

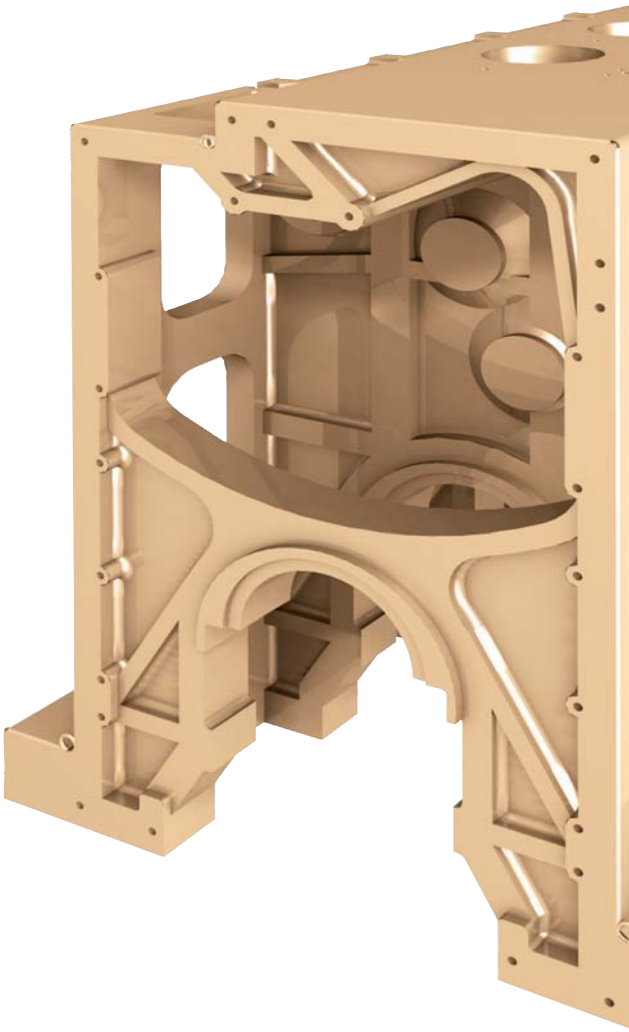
- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness

King Drill

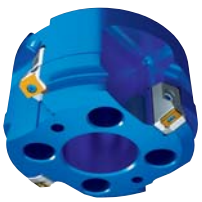


Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300



Cylinder block cam shaft boring cutter (Aluminum body cutter)

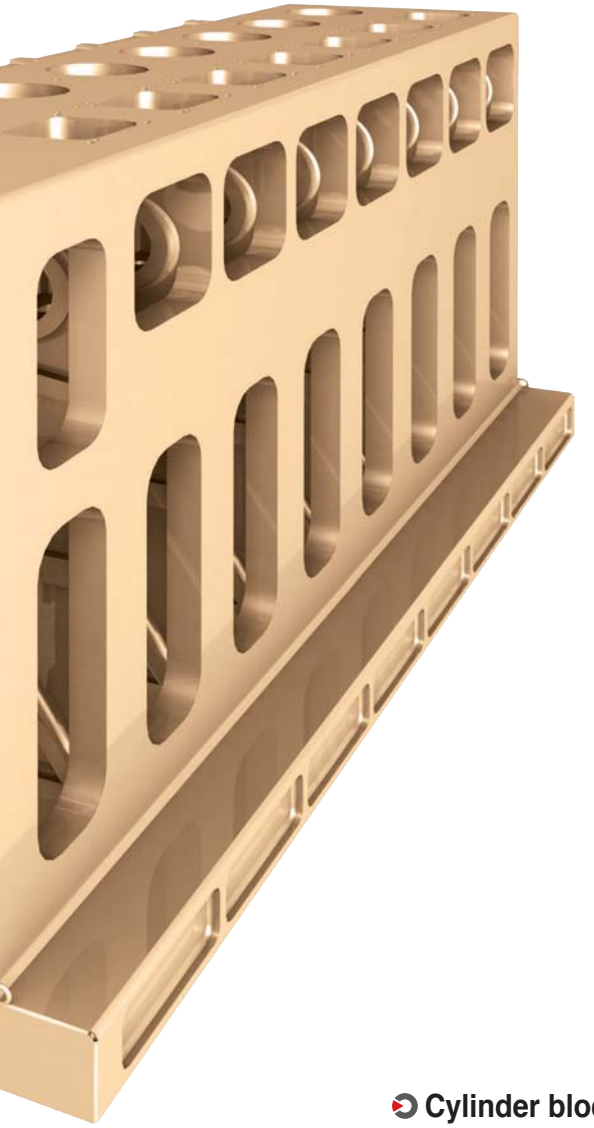


- Cutter diameter: Ø270
- Applicable insert: LNE434/SDKX1506
- Right-hand rotational aluminum cutter body, easy to handle, makes high precision boring

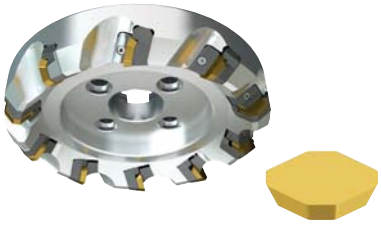
Cylinder block roughing and medium (Both)



- Cutter diameter: Ø200
- Applicable insert: LNE434 / LNCS1907-R3.0-WC
- Designs available for roughing and medium applications
- Available high efficiency working to chose LNE 434 insert for roughing and high reliability grade
- Good surface working through LNCS1907-R3.0-WC Wiper shape for medium

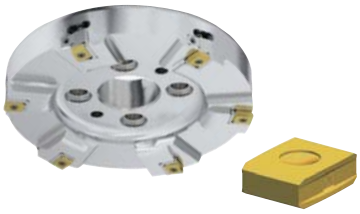


High rake-angle applied cylinder block roughing cutter



- Cutter diameter: Ø250
- Applicable insert: SECN2606AFN
- High rake angle cutter suitable for the machining applications that have the tendency to create chatter

Adjustable medium machining cutter



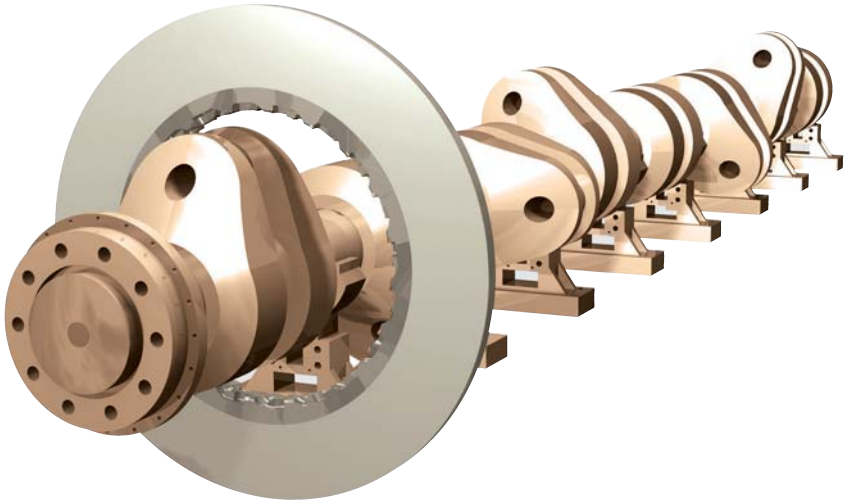
- Cutter diameter: Ø250
- Applicable insert: LNCS1907-C1.5-WC
- Cutting edge height adjustable device provides excellent surface finish

Cylinder block bearing cap seat machining cutter



- Cutter diameter: Ø250
- Applicable insert: RDKT2006M0
- Several sizes of inserts are prepared to meet the radius requirement of work-piece
- Rigid inserts for high efficiency machining

Ship building (Crank shaft/Propeller)

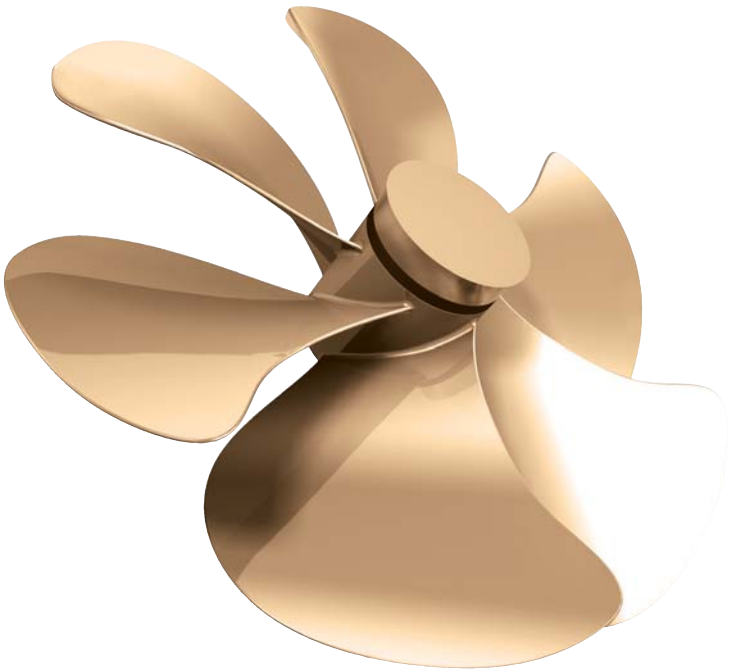




KORLOY exclusive screw-on type internal pin miller



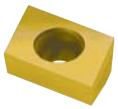
- Cutter diameter: Over Ø2000
- Weight: 1.5 tons
- Pin miller for crank shaft of medium size ship engine
- Special segment assembly system developed by KORLOY makes it easy to handle and provides excellent cutting performance with good chip forming



Periphery side of propeller machining tool

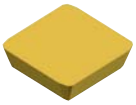


- Cutter diameter: Ø150
- Applicable insert: CDEW170708R
- Positive relief angle applied to get smooth cutting without chatter



Top face of propeller machining tool







- Cutter diameter: Ø250
- Applicable insert: SECN1904EER
- Double layer insert array provides big depth of cut

Role machining (Body/Shape/Parting-off)

Role machining (Body/shape/parting-off)



Competitor



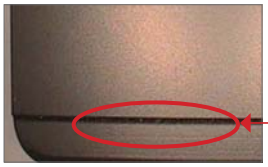
NC6315

- Good chip evacuation even in deep grooving
- High hardness coating grade that has excellent wear resistance prevents damage from cutting load (Photo shows edge damage after machining same time under same conditions)

Application case



Competitor

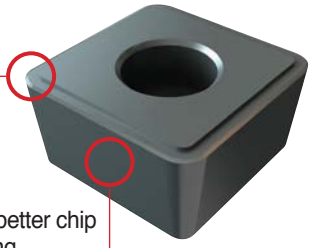


NC6315

- Equipped with wide chip breaker enough to prevent crater wear
- Better chip control from the beginning of the machining, together with high hardness coating grade provides 3 times longer tool life than conventional tool (especially at finishing)

The combination of high hardness coating grade (NC6315) and chip breaker shows better performance

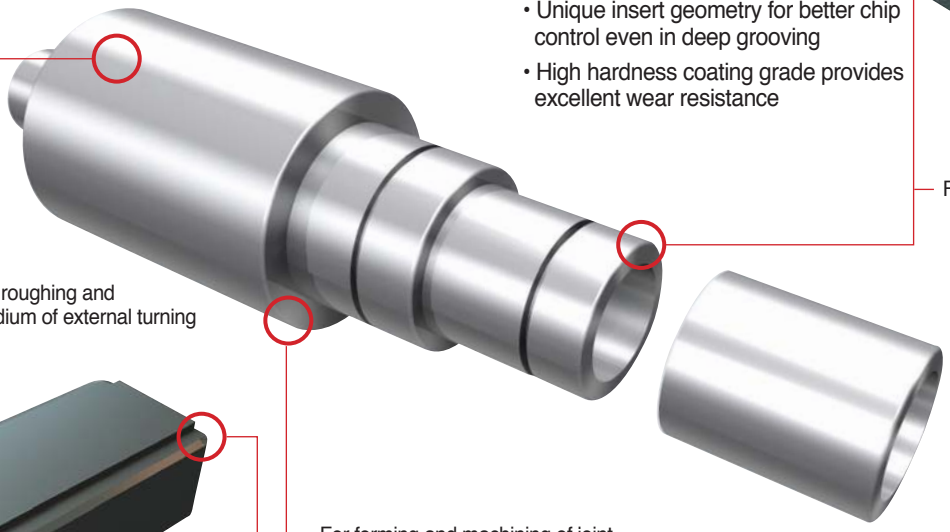
Closer chip breaker to the cutting edge provides better chip control even in deep grooving



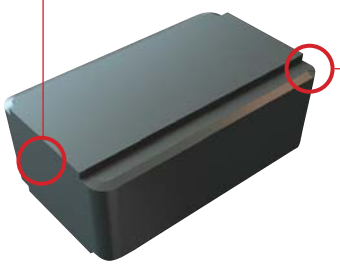
Parting-off roll

- Unique insert geometry for better chip control even in deep grooving
- High hardness coating grade provides excellent wear resistance

For parting-off



For roughing and medium of external turning



For forming and machining of joint



External turning of roll

- Match of high hardness coating grade (NC6315) with chip breaker provides longer tool life with smooth chip control
- Various cutting edge designs are applicable according to workpiece materials and cutting conditions

Forming and grooving of roll

- Special chip breaker focus on suitable chip forming (engineered chip breaker width and depth)
- Strong cutting edge treatment prevents un-expected fracture of insert

Railway Industry (Rail)

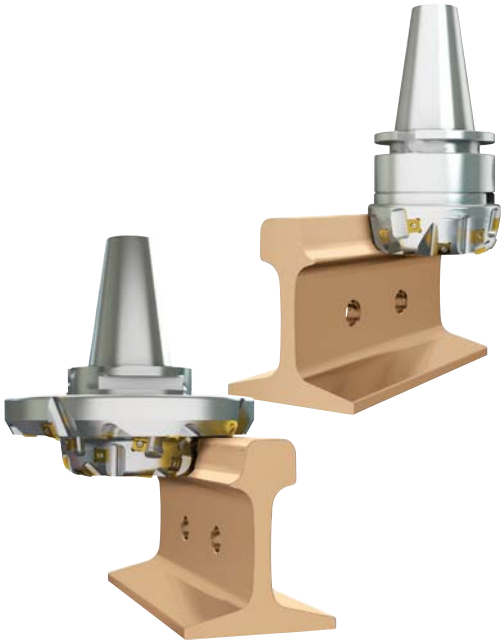
Cutter for turnout's joint plates





- Cutter diameter: Ø160
- The Number of Edges: 54
- Special customizing is available upon customer's requests



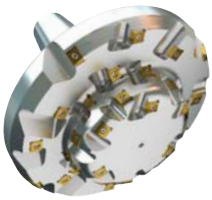


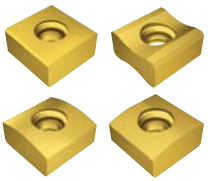
Cutter for upper parts of rails





- Cutter diameter: Ø160
- The Number of Edges: 16
- Precise forming of rail way is possible





- Cutter diameter: Ø300
- The Number of Edges: 33
- One body design of cutter and arbor provides high rigidity



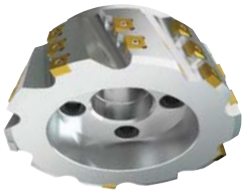
Cutter for upper tapers of rails

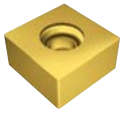


- Cutter diameter: Ø200
- The Number of Edges: 24
- Economical 8 edge available insert
- Special customizing is available insert
- Special customer's requests upon customer's requests



Cutter for upper flanks of rails





- Cutter diameter: Ø240
- The Number of Edges: 25

Cutter for rail repair





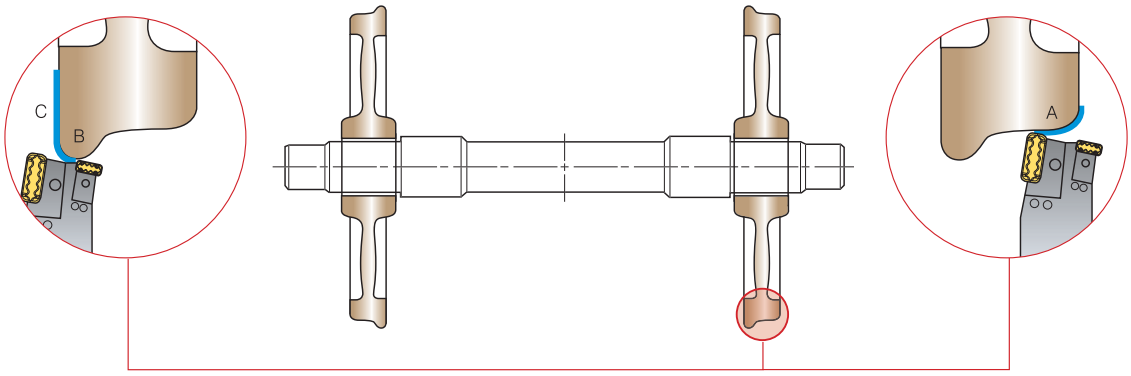
- Cutter diameter: Ø600
- The Number of Edges: 198
- Milling applicable on the rail of part requested repairing

Rail Industry (Wheel)

The type of LNUX for the working of wheel (Repair)



- Material: SSW2. Ø920~1000
- Cutting conditions: vc = 78 m/min (13~18min-1), fn = 1.0 mm/rev, ap = 3~4 mm
- Insert: LNUX301940-TM Grade: NC3215
- Result: good chip evacuation, stable structure and long life tool life

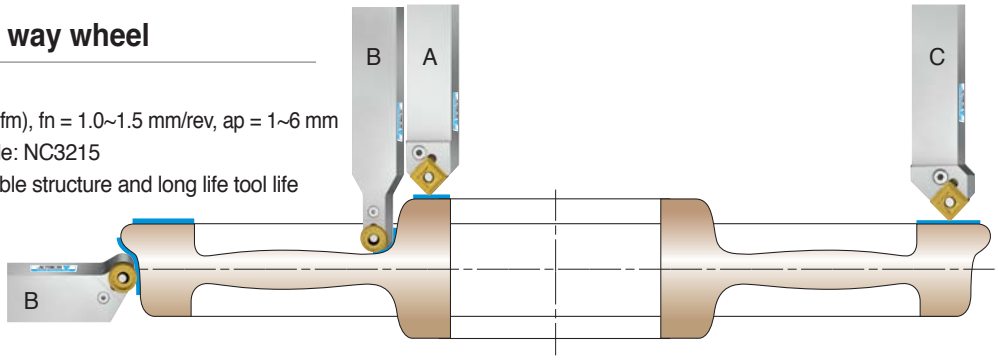


LNUX301940-TF	LNUX301940-TM
 • For light cutting, it generates a low load with good chips	 • Comprehensive design for general use, strong cutting edge with good chip forming (First recommendation)

Working procedure	A	B	C
Insert	LNUX301940-TF/TM	LNUX191940-25/22	
Grade	NC3215	NC3215	
Cutting condition	Decrease the speed on deep part of A	Increase the speed to get good chip evacuation	

RCMX insert for rail way wheel

- Material: SSW2. Ø840
- Cutting conditions: vc = 55~100 (sfm), fn = 1.0~1.5 mm/rev, ap = 1~6 mm
- Insert: RCMX3209M0-SL Grade: NC3215
- Result: good chip evacuation, stable structure and long life tool life



VT chip breaker



- Strong cutting edge for high feed and deep cutting depth
- Tough design of chip breaker provides excellent impact resistance
- SNMM type

SL chip breaker



- Comprehensive chip breaker covers wide application range
- Proper chip control with long tool life

B chip breaker



- Comprehensive roughing design having strong edge strength with long tool life

SB chip breaker

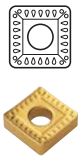


- Better chip control at low depth of cut machining

TM chip breaker



- Medium-finishing chip breaker, proper surface finish, superior wear resistance

Working procedure	A	B	C
Applicable insert			
Holder	PSDNN5050-U25	PRDCN5050-U32 PRGCN5050-U32	PSSNR5050-S25
Insert	SNMM250724-GH	RCMX3209MO-SL	SNMM250724-VT
Grade	NC3215	NC3215	NC3215

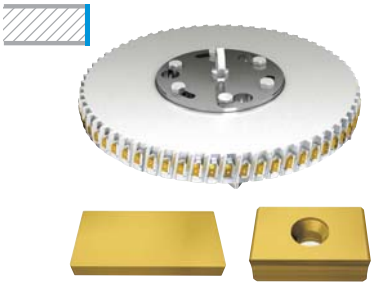
Pipe Industry (Edge milling)

" X " shape machining

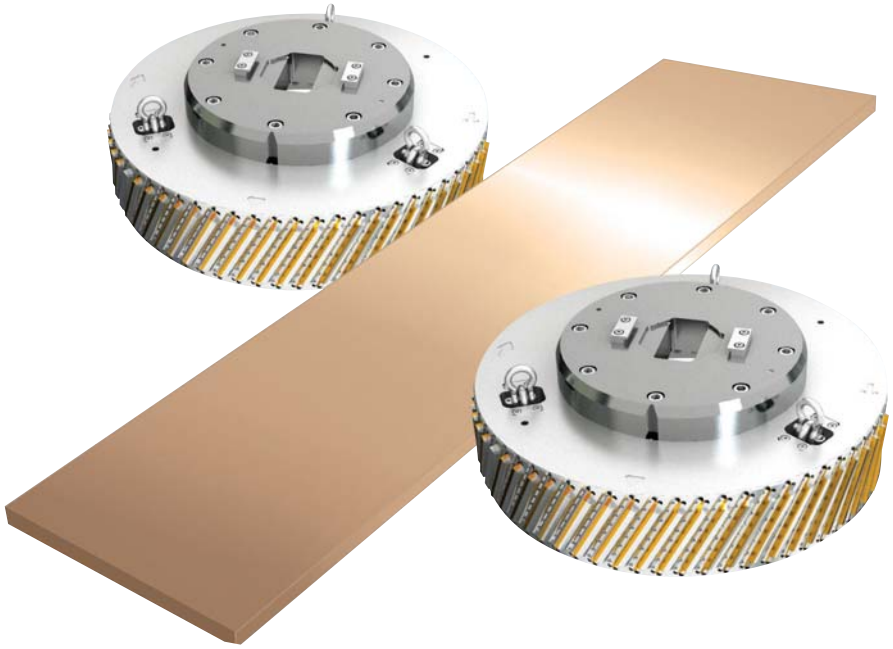


- A cutter to make the "X" shape on the both side-end of steel plate, to do bevel-end welding
- Locator wedge type clamping system applied for the cutter provides long durability of cutter as well as strong clamping power
- Grade: NC5340

" I " shape machining



- A machining to make "I" shape on the both side-end of steel plate, to do bevel-end or plane-end welding
- Variety of inserts (with chip breaker or without chip breaker) are available according to your cutting conditions
- Grade: NC5340



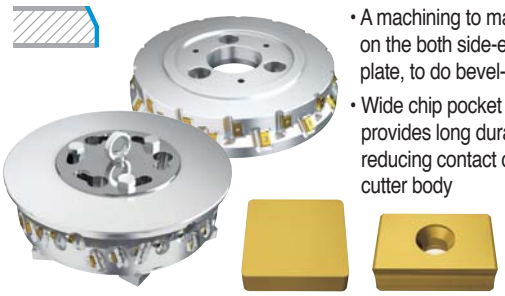


A-1 ····▶ A-2 ····▶ A-3



B-1 ····▶ B-2 ····▶ B-3

" Y " shape machining



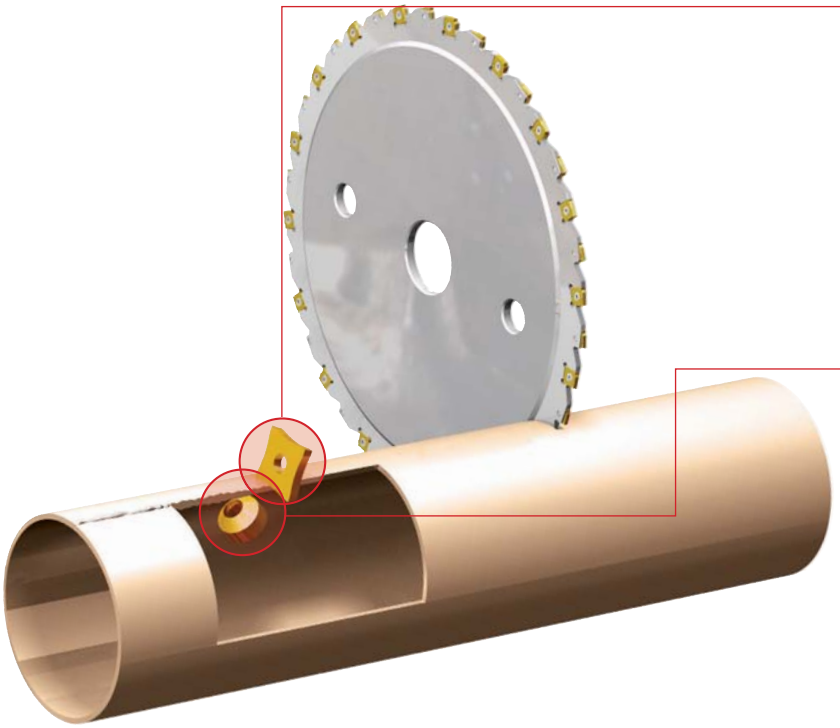
- A machining to make "Y" shape on the both side-end of steel plate, to do bevel-end welding
- Wide chip pocket on cutter provides long durability of it by reducing contact of chip with cutter body

Special machining

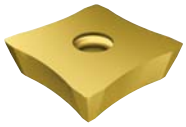


- Special design of cutter as per side-end shape of steel plant upon customer's request is available

Pipe Industry (Bead removal/Parting-off/Chamfering)



Bead removal insert: external

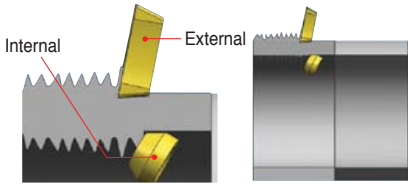


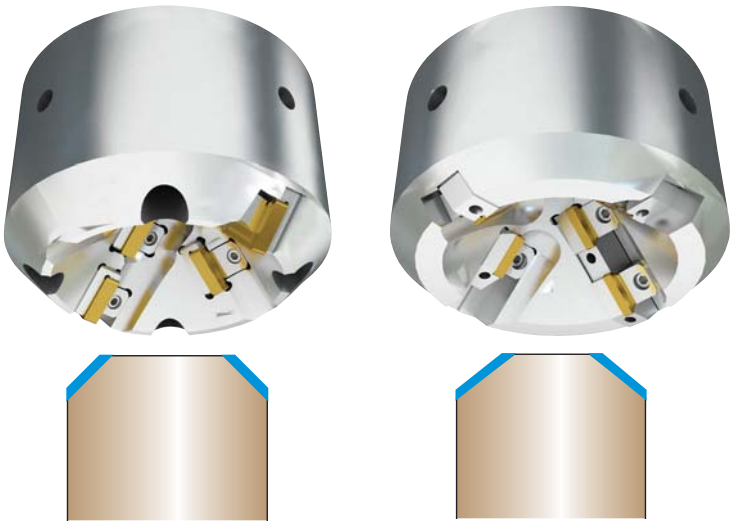
- Tool removing protruded part of melted welding material at outside of pipe
- Economical tool by using square insert, utilizing 4 cutting edges
- Grade: NC3030

Bead removal insert: internal



- Tool removing protruded part of melted welding material at inside of pipe
- Grade: NC5330

Working method	Application range	Applicable inserts	Cutter
	For external bead removal	SDMX80-R□□/SEGW54-R□□ SNMG150708-R□□/SNMN1207(SNU452)-□□R SNMN1507(SNU552)-□□R/SOET1906-254 SEGX2509-R□□	Customizing
	For internal bead removal	AR□□(AC)/SF□□R-□□	



Chamfer tool



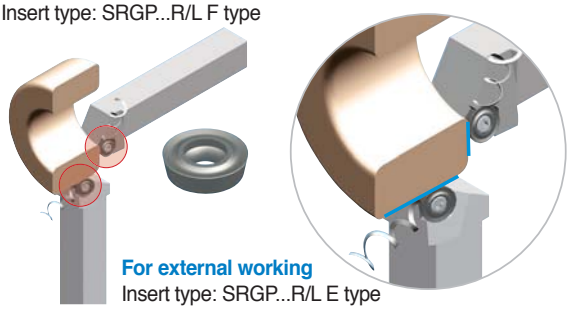


- Chamfering tool machining cut-off face of pipe
- Special chamfering angle design is possible upon customer's request
- Cost effective concept: Triangle and Square double sided insert provides 6~8 effective cutting edges
- Grade: NCM325, PC3500

Bearing

For external and facingworking

For facing
Insert type: SRGP...R/L F type

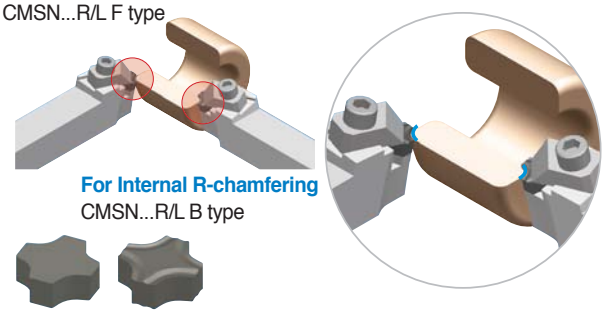


For external working
Insert type: SRGP...R/L E type

- Applicable on the internal, external and facing working

For internal and external r-chamfering

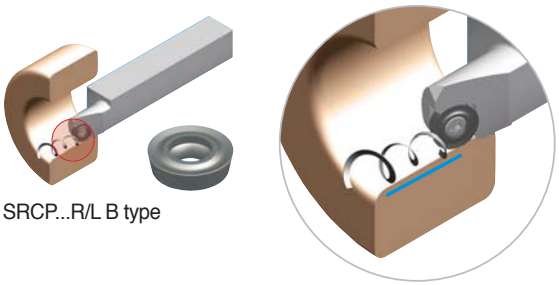
For R-chamfering
CMSN...R/L F type



For Internal R-chamfering
CMSN...R/L B type

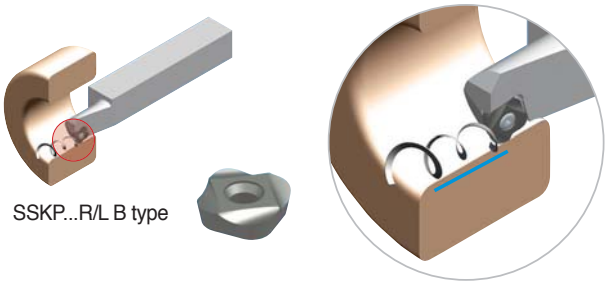
- Applicable 8 corner of insert
- R-shape is realized to internal and external part of corner

For internal working



SRCP...R/L B type

- Applicable over Ø12



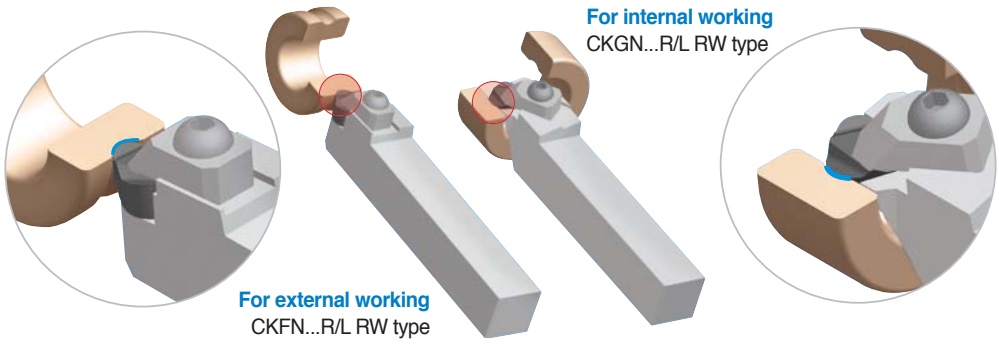
SSKP...R/L B type

- Applicable over Ø11.5 with 4-corner insert for internal and low working

For ray-way

- For Ray-way on internal and external bearing
- Applicable 3 corner insert
- Able to customize



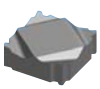


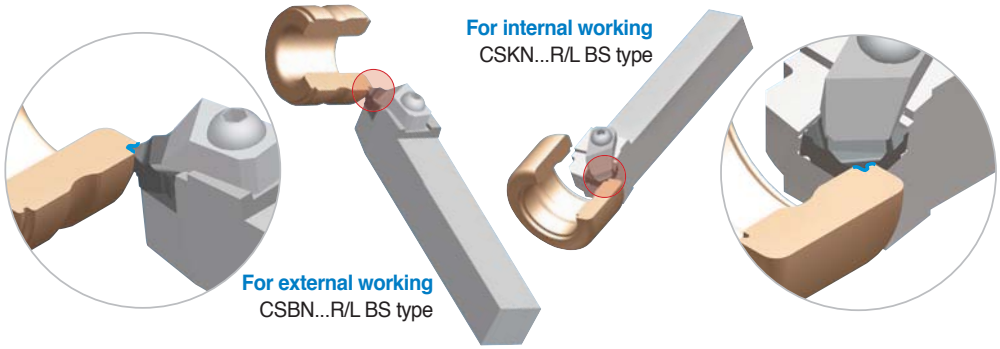
For internal working
CKGN...R/L RW type

For external working
CKFN...R/L RW type

For shield way

- For shield working on internal and external bearing
- Applicable 4 corner insert
- Able to customize





For internal working
CSKN...R/L BS type

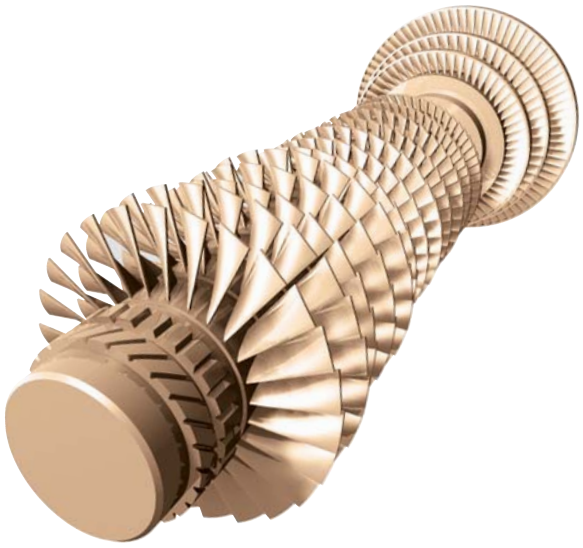
For external working
CSBN...R/L BS type

Power Generation (Wind Power Generation Shaft/Tower Flange)

VH chip breaker



- Good chip control in heavy machining
- Excellent performance for flange machining
- Suitable for continuous cutting conditions
- SNMM/CNMM type



VT chip breaker



- Strong cutting edge for high feed and deep cutting depth
- Though design of chip breaker provides excellent impact resistance
- SNMM/CNMM type



TM (Thread milling)





- Thread milling indexable tools
- Various type of holder (standard, long, taper) and inserts
- Screw diameter: Ø9~Ø46 mm

H Endmill



Endmill for high hardened steel machining at high speeds

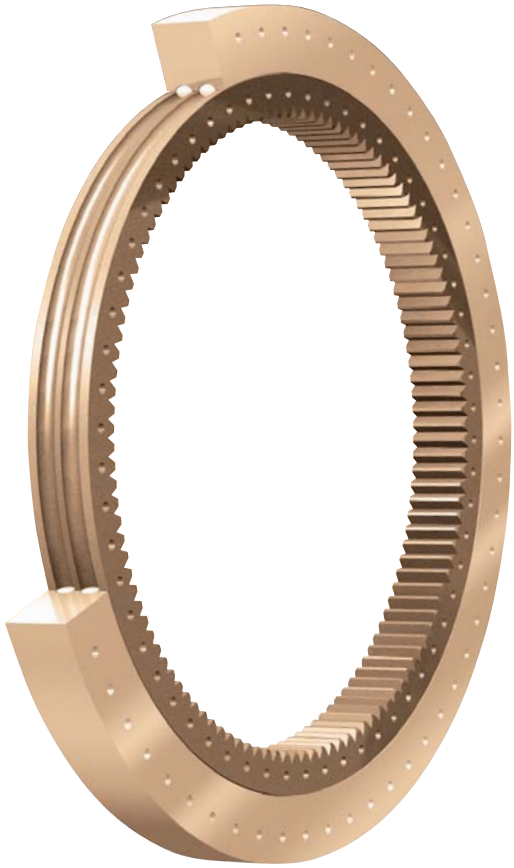
- New grade (PC303S, PC310U) - Ultra fine substrate and AlTiSiN coating guarantee excellent wear resistance
- Special edge treatment - Special cutting edge design was applied for less chipping and longer tool life

RCMX type



- High quality machining
- Rigid insert ensures good surface finish and long tool life
- RCMX type





Vulcan Drills (VZD)



- Rigid body for high feed and precision machining
- Better chip evacuation from improved chip breaker
- Applicable for the drilling under poor cutting conditions

King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300

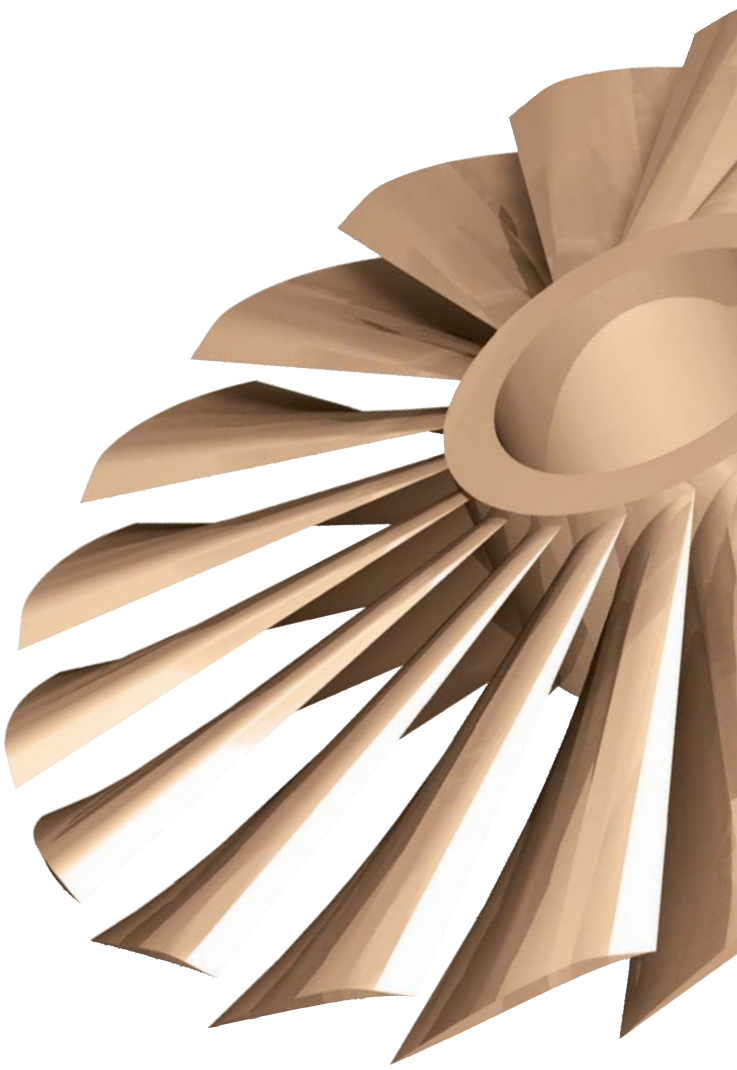
Aviation Industry (Engine/Turbine)

TPDB

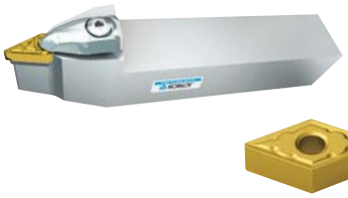


High precision and high efficiency indexable drill

- Highly efficient drilling in high speed and high feed machining
- Excellent surface roughness



ISO turning



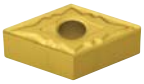
- Available to customize whole and special items for complicated and various shape

Boring Bar



Internal turning

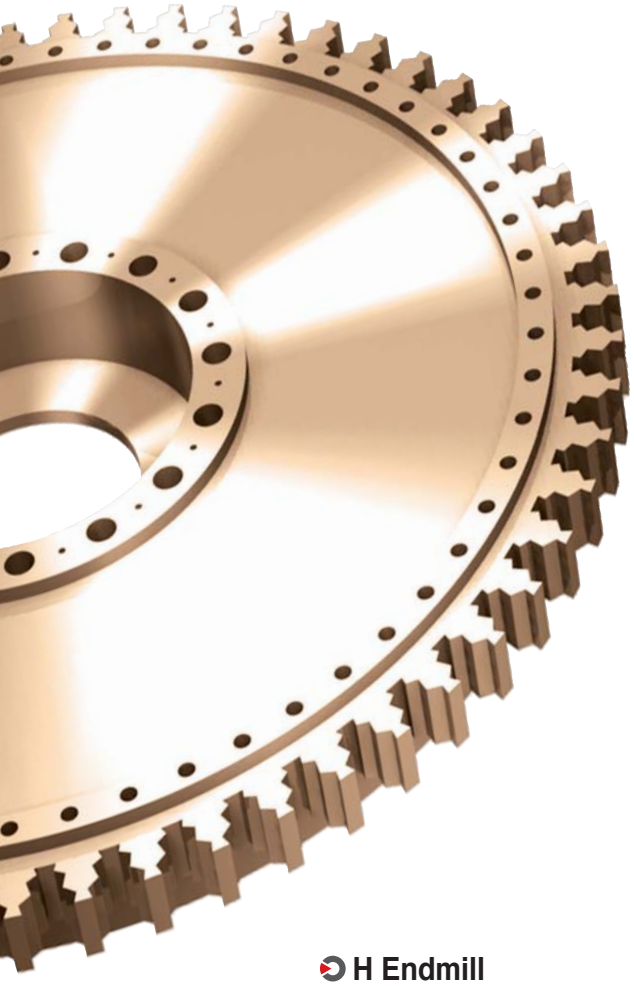
- ISO standard boring bar for internal machining



Rich Mill



- Increased number of edges and excellent tool life due to 8 corner edges
- Smooth cutting with low cutting load due to the unique geometry & high rake angle of cutting edge, this combination provides excellent tool life



MSD



Long tool life with protecting material

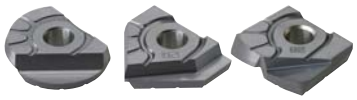
- Good chip control with proper chip-pocket
- Decrease the chipping and increase the cutting ability due to applicable streamlined shape insert
- Increase impact resistance and lubrication due to apply PVD K Black coating on the sub-micron material

Laser Mill



Multi-functional indexable end-mill

- Extremely hard grade provides long tool life
- Easy and simple clamping of insert by using single screw
- Excellent quality for fine finishing due to its precise tolerance



H Endmill



Endmill for high hardened steel machining at high speeds

- New grade (PC303S, PC310U) - Ultra fine substrate and AlTiSiN coating guarantee excellent wear resistance
- Special edge treatment - Special cutting edge design was applied for less chipping and longer tool life

Aviation Industry (Landing Gear/Accessory)

HRMDouble



High efficient and cost effective tool utilizing a double sided insert

- Cost effective tool by using double sided insert with a total of 6 cutting edges
- Smooth cutting utilizing a high rake angle sharp cutting edge insert



MGT



For grooving, turning, profiling, cut-off

- Multi functional grooving tool can over variety of machining with multifunctional grooving tool and the chip breaker with excellent cutting perfomance and the ability to expand grooves



Pro-X Mill



High-speed aluminum milling tool

- Unique mounting system of insert provides tight clamping of insert
- Mirror surface and high rake angle of insert provides excellent machined surface by reduced cutting load and edge build-up
- Grade: H01

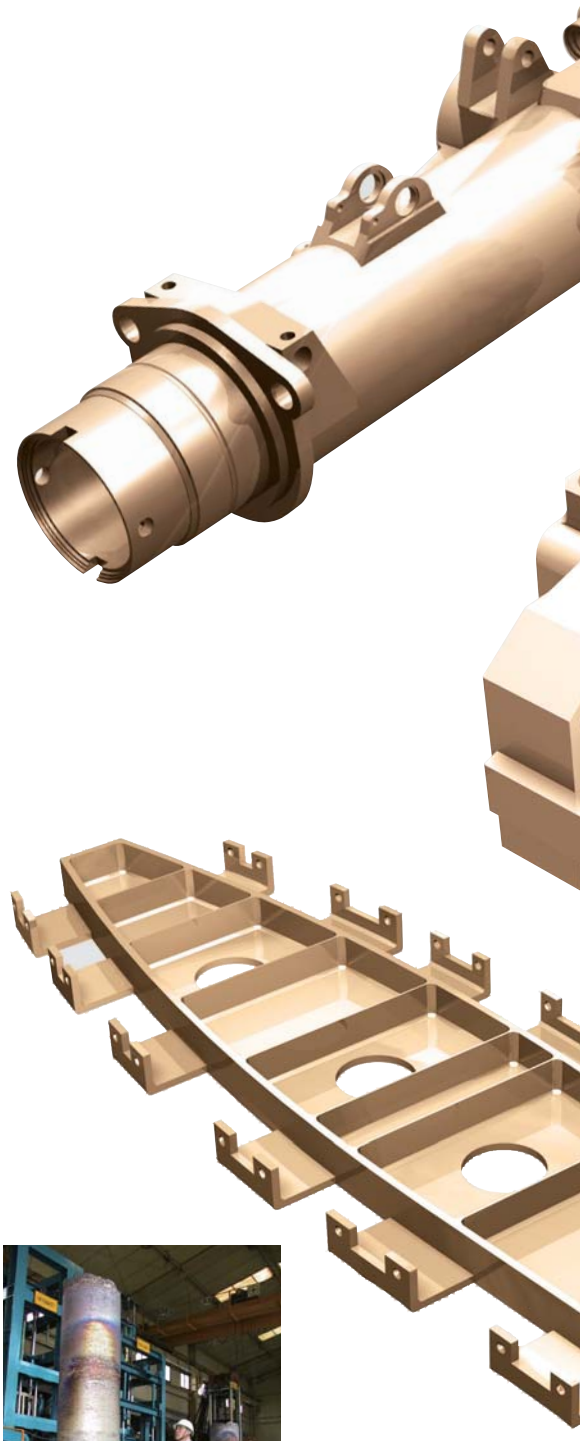


SSEA



Solid carbide end-mill for aluminum machining

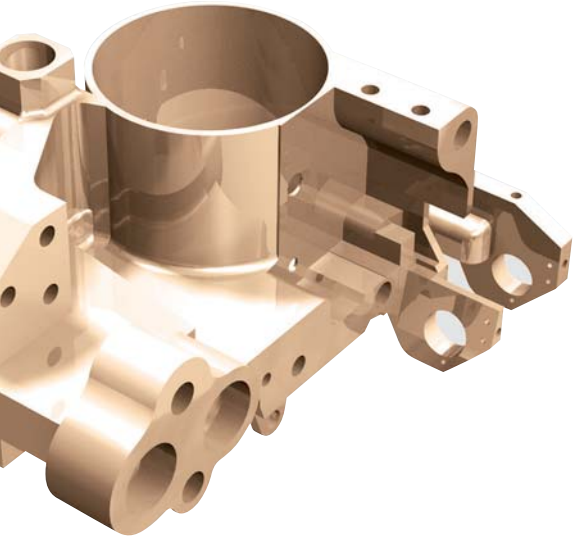
- Advanced geometry of end-mill refrains build-up-edge
- Superior surface machined
- DLC coated end-mills available

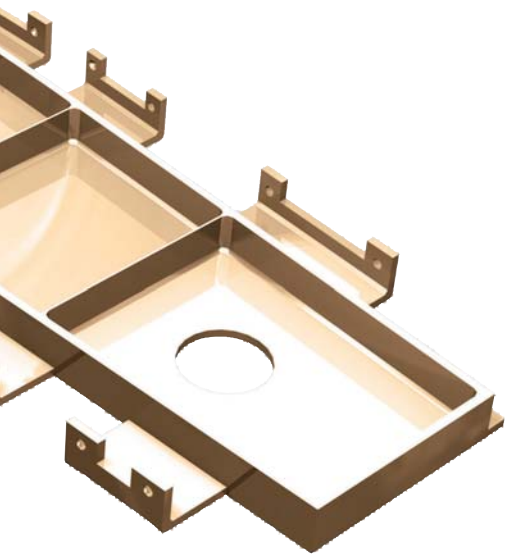




Titanium
Picture provided: KPC Inc







King Drill



Optimal indexable drill design

- Drill shape and chip breaker are optimized at the central and peripheral insert locations for better chip control and surface finish
- Grades, optimized for the central and peripheral insert locations in order to maximize cutting tool life
- Grade: PC3500, PC5300





MLD (Mach Long Drill)

- Direct drilling without separate operation (step drilling) over 20xD
- Wider flute space along with drill provides effective chip control
- Special design for rigid body provides smooth drilling without bending of drill

Alpha Mill



Multi functional milling tool

- Vast coverage of milling operation due to its variety of cutters and inserts
- 3 dimensional chip breaker design provides smooth cutting



Brazed Endmill



- Apply High Spiral Angle (over 40 degrees) able to get good sharpness
- Available high speed milling due to reduce the working temperature
- Expected long tool life by applying hardened carbide material.
- Economical welded tool due to available 2 or 3 times re-grinding

Slitter Knife

Application

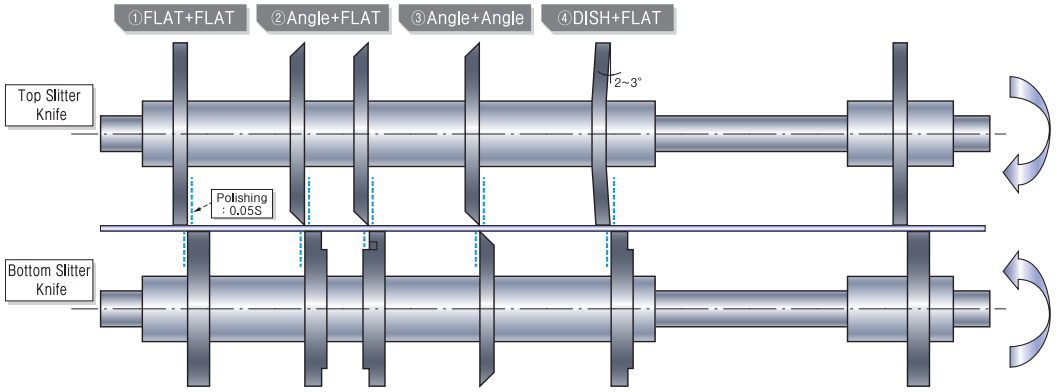
- For video tape/For audio tape
- For mangetic tape/For brass plate, mobile battery



Tool selection

- Top slitter knife: Thickness: ±0.01~0.02 mm
- Bottom slitter knife: Thickness: ±0.001 mm / Flatness: under 0.0005 mm
  Polishing surface roughness: under 0.05 S

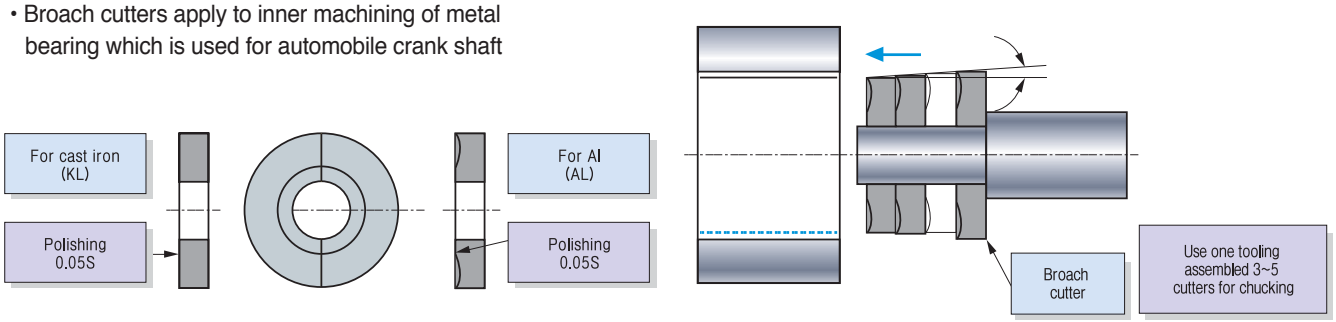
Machining example



Broach cutter

Application

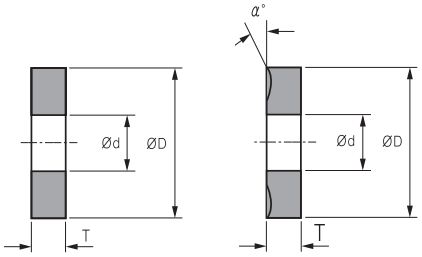
- Broach cutters apply to inner machining of metal bearing which is used for automobile crank shaft



Order

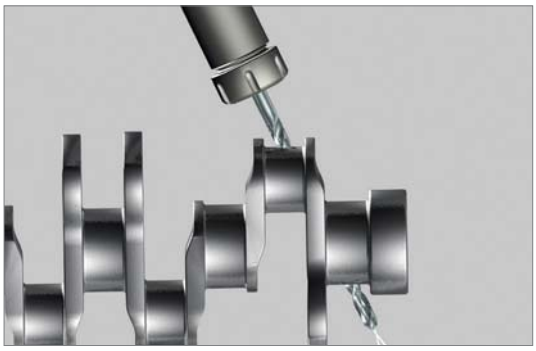
- Designation for cast iron: KL Ød×Ød×T
- Designation for Aluminium: AL Ød×Ød×T
  : AL Ød×Ød×T×α°

(If there is no mentioned any angle, α = 30°)



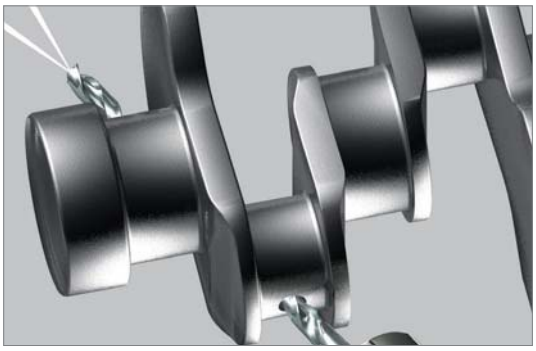
Automobile engine tooling example (Crank Shaft)

Oil Bore - Mach Long Drill (MLD)



Taper Spline Structure
(Rigidity has been enhanced due to increased contact area)

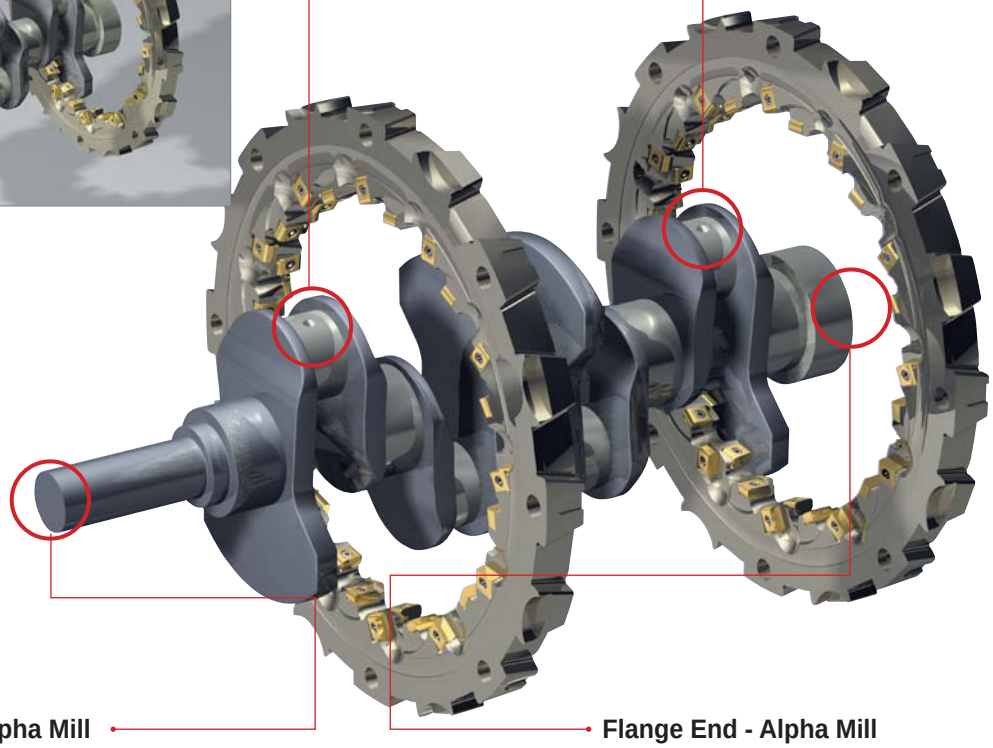
Oil Bore - Mach Long Drill (MLD)



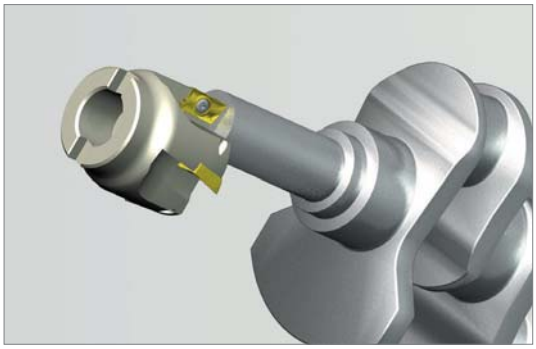
- Machining wihout step feed operation for deep hole drilling like 20D
- Optimal performance with MQL System

Pin & Journal - Crankshaft Cutter (Internal/External)

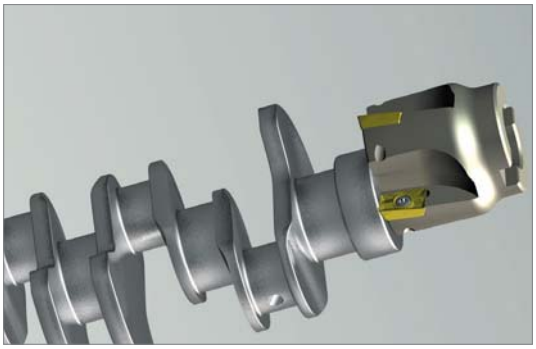




Post End - Alpha Mill



Flange End - Alpha Mill



Automobile tooling example (Knuckle)

Micro Boring bar



Mach Drill



Micro Boring bar





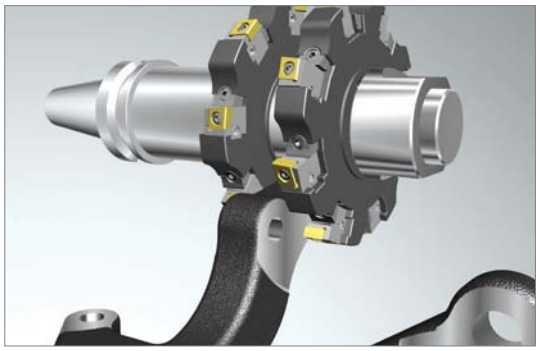
Indexable Side Cutter (SPB)



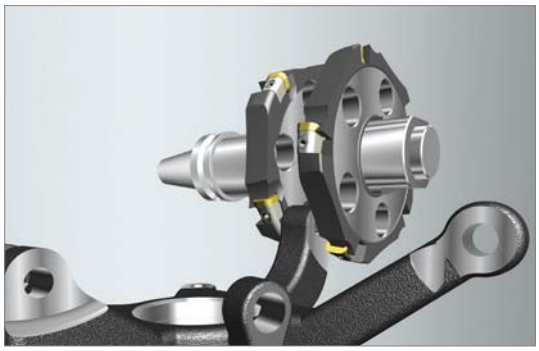
Future Mill (FMP)

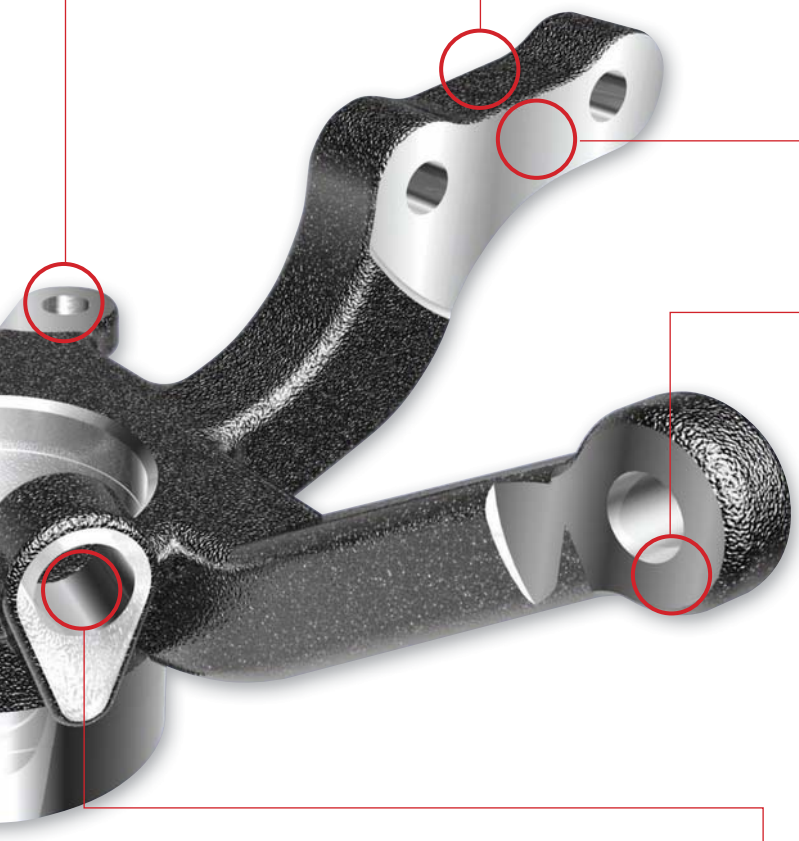


Indexable Side Cutter (Tangential type)



Indexable Side Cutter (Radial type)





Future Mill (FMP)



Step Drill



Drill (King Drill)



Automobile break tooling example (Carrier)

Drill



Drill



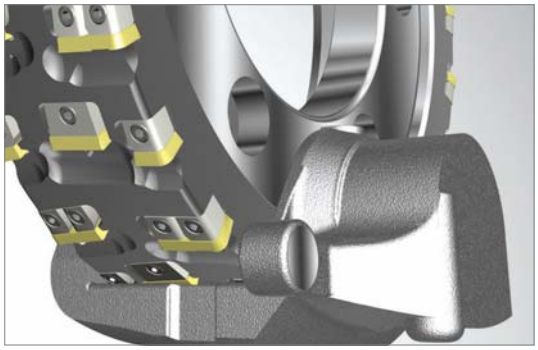


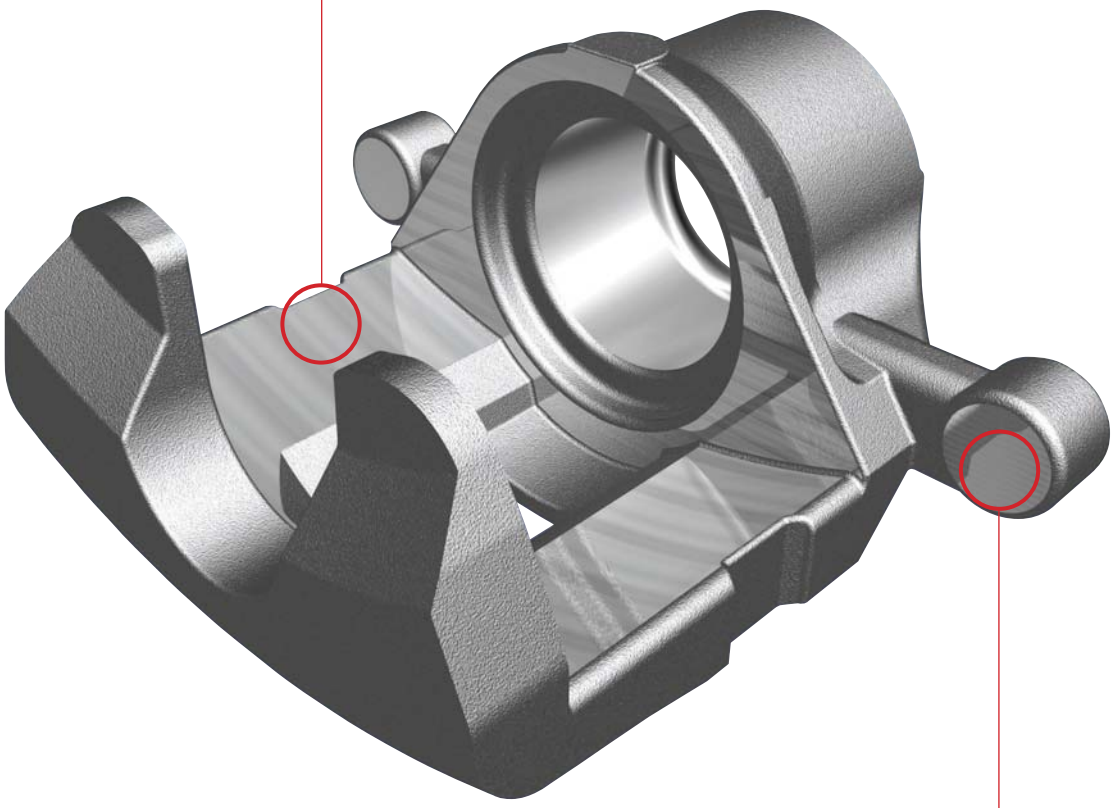
Side Cutter



Automobile break tooling example (Housing)

Side Cutter





Side Cutter



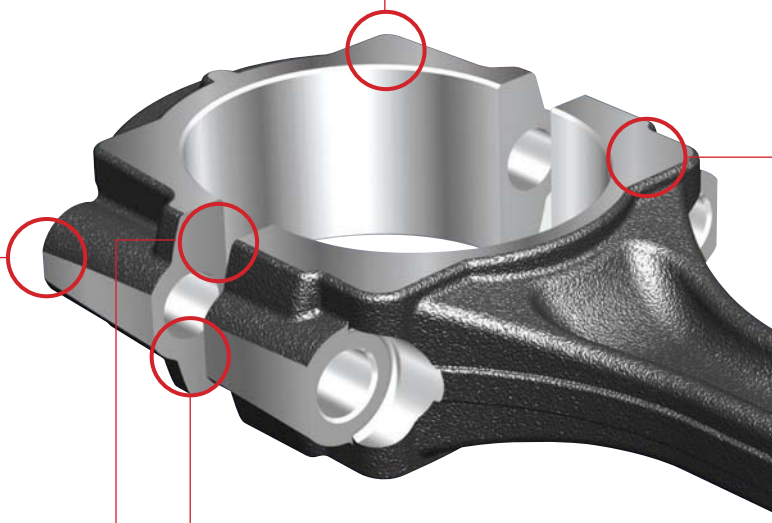
Automobile tooling example (Connecting Rod)

Drill



Rich Mill (RM4)





Side Cutter



Side Cutter



Rich Mill (RM4)



Rich Mill (RM8)

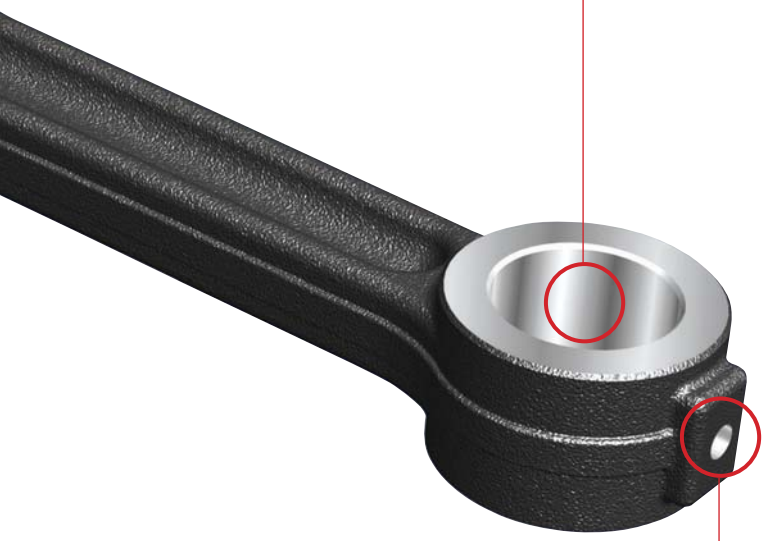


Drill (King Drill)

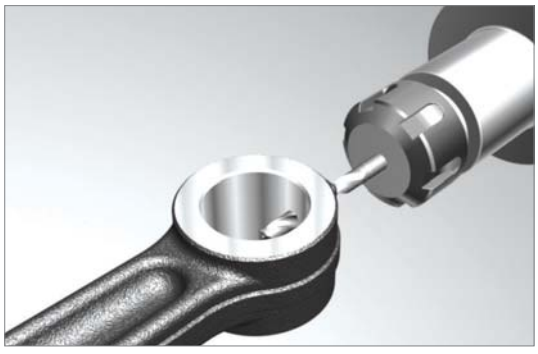


Step Drill



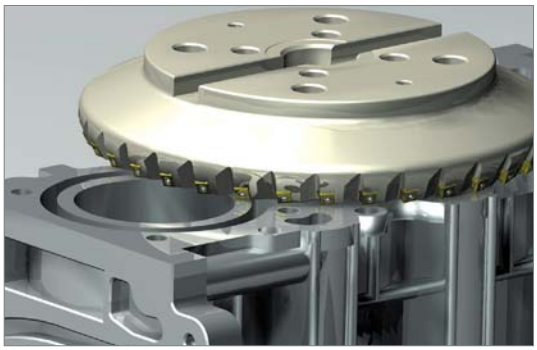


Drill



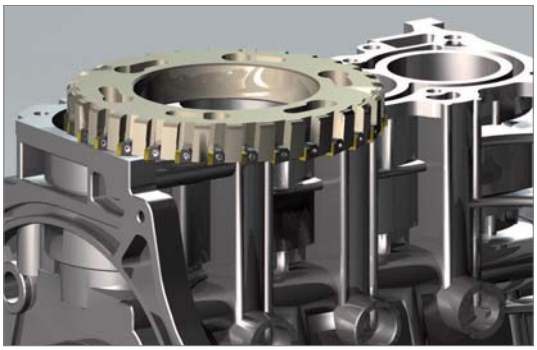
Automobile engine tooling example (Block)

Top Face (Roughing)



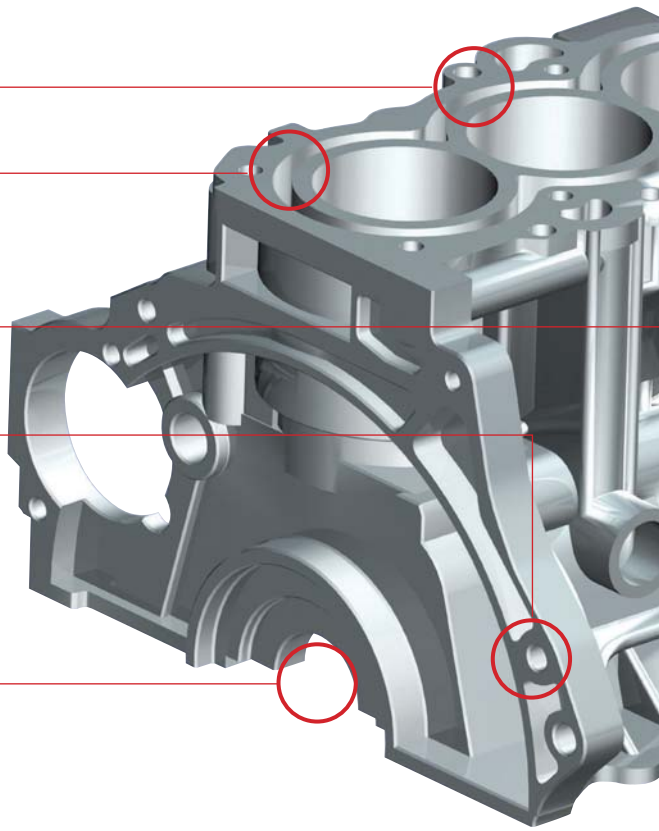
• Applied 8 corner edges of insert

Top Face (Finishing) - High feed Cutter



Bosses - Alpha Mill

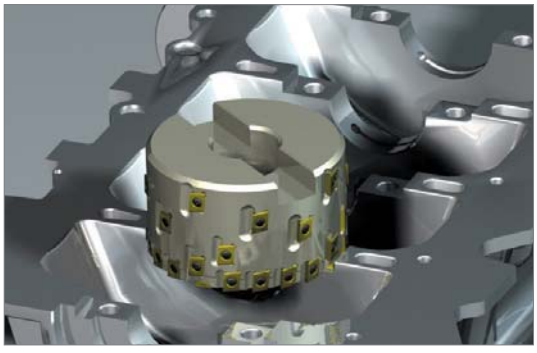




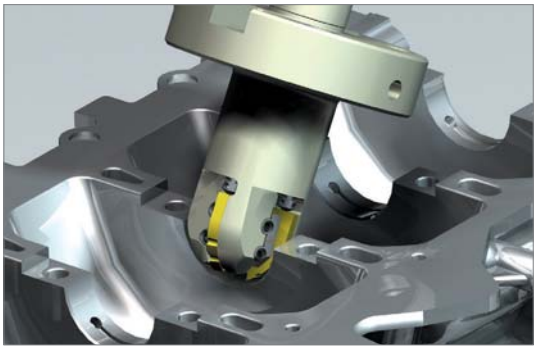
Line Boring Bar Reamer



Bearing Cap Seat - Form Cutter

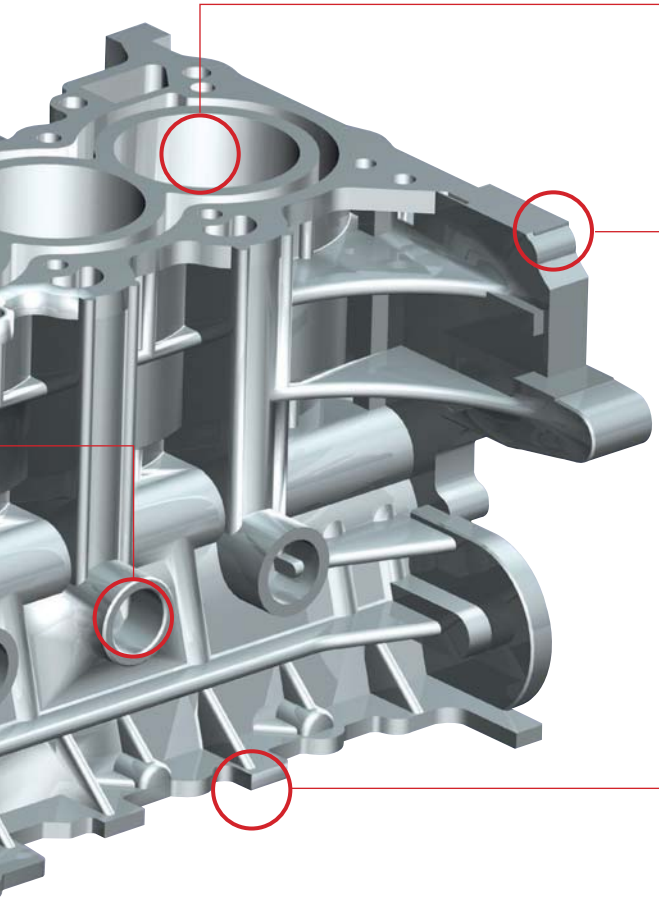


Crank Bore (Crankshaft Bearing Bore) - Form Cutter

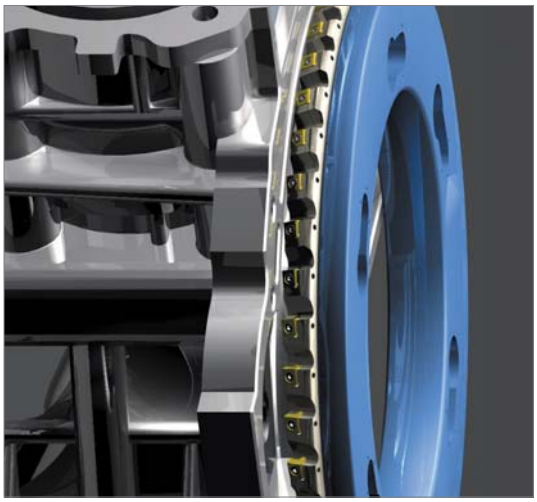


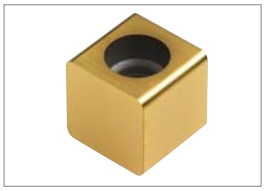
Cylinder Bore (Roughing) - Boring Cutter

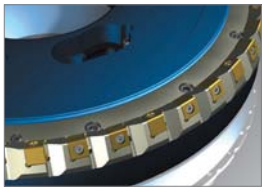




Front & Rear Face - Cube Couple Mill

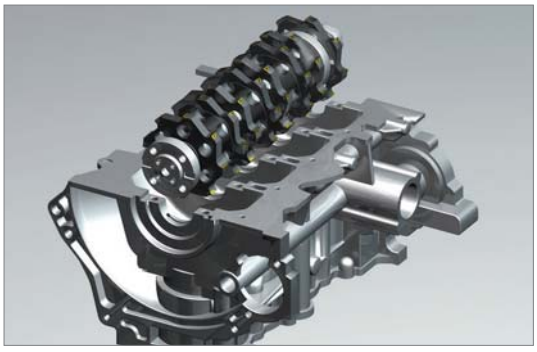




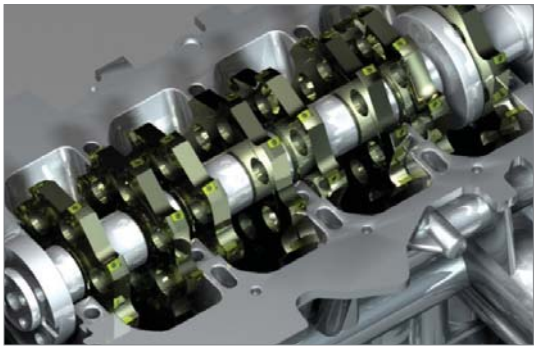


- High feed cutter made of aluminum
- Due to light weight, it s easy to handle & effective to prevent accident

Cheek Faces - Gang Cutter

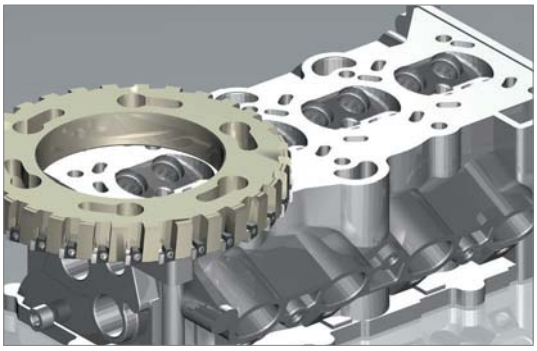


Cheek Faces - Gang Cutter



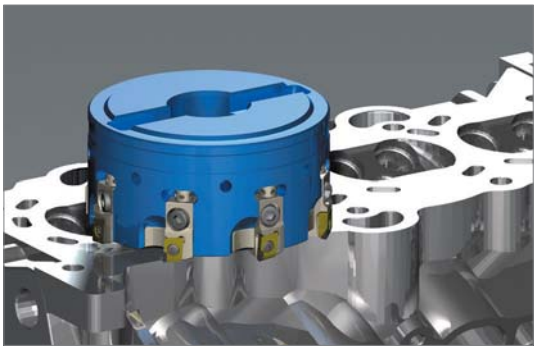
Automobile engine tooling example (Head)

Top Face (Roughing & Finishing) - High Feed Cutter



• Carbide insert, PCD insert

Top Face (Roughing & Finishing) - Aero Mill



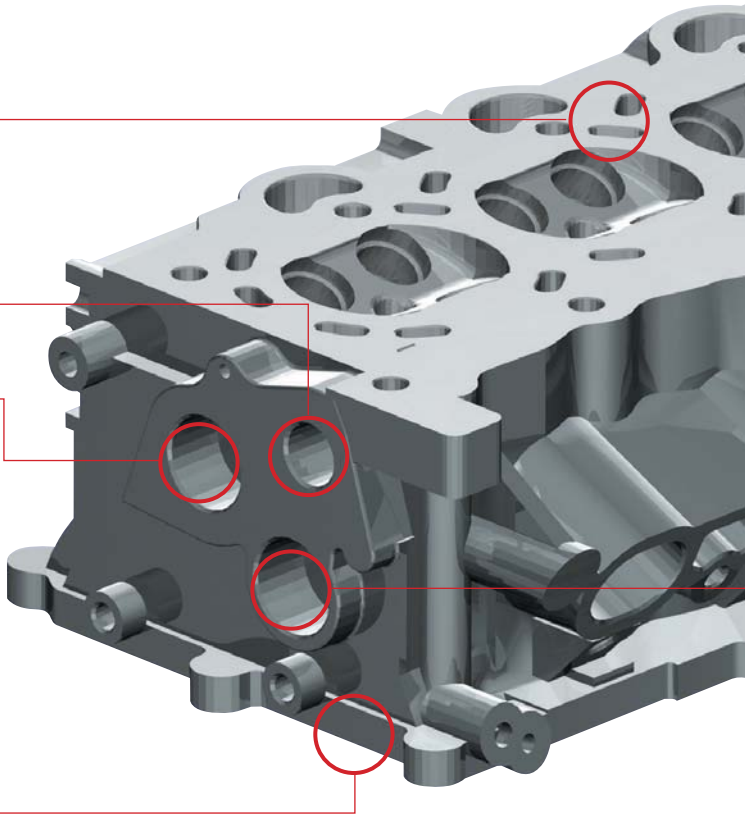
• Due to the light weight of aluminum body that about 50% of steel body, excellent cutting performance with high speed machining can be achieved

Step Burnishing Reamer

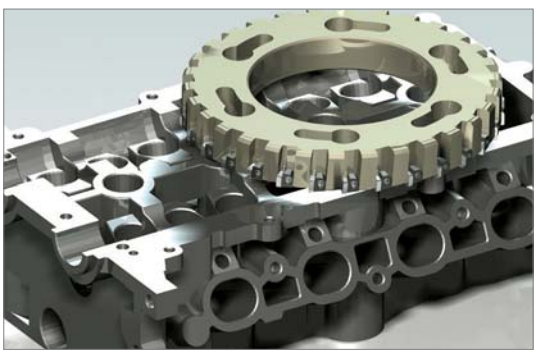


Straight Reamer



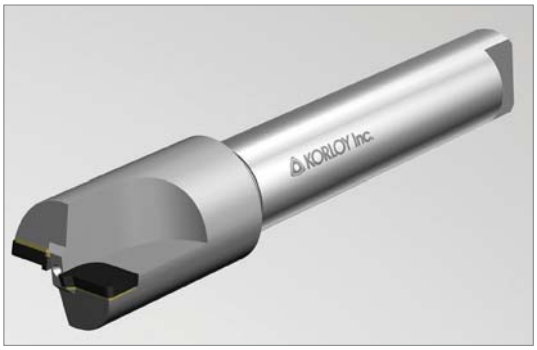


Bottom Face (Roughing & Finishing) - High feed Cutter

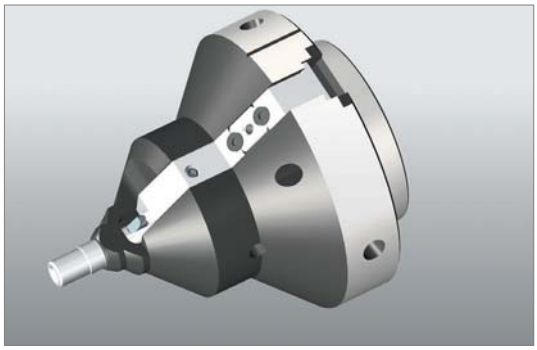


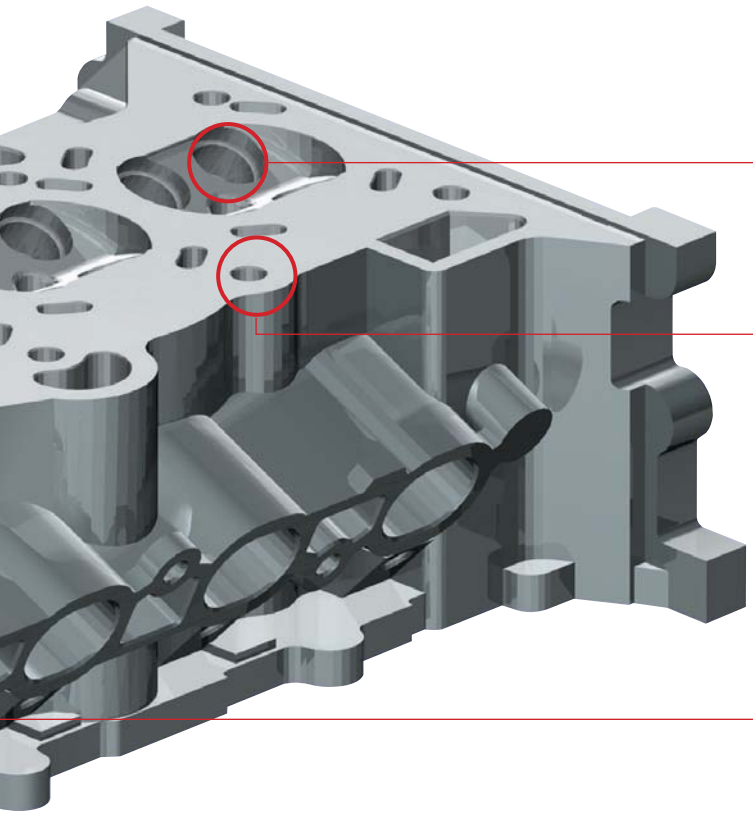
• Carbide insert, PCD insert

Counter Bore Tool

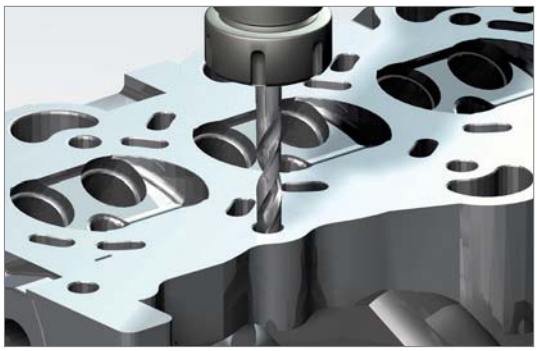


Valve Seat - Apolo Cutter (Special Boring Holder)

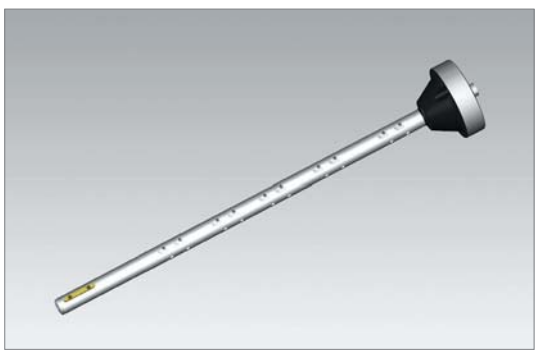




Top Face (Drilling) - Mach Drill



Cam Shaft Bearing Seat - Line Boring Bar



• Stable machining at high speed without chattering

Cam Journal Bore - High Speed Reamer



• Available for high speed machining
• Excellent surface finish & roundness



Parts

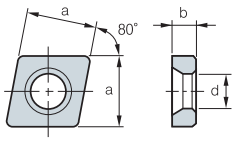
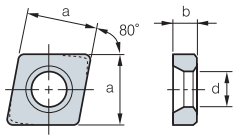
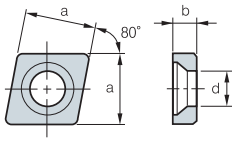
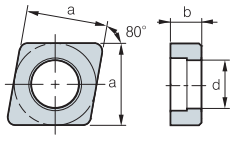
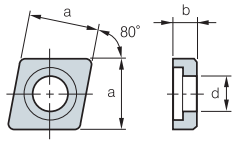
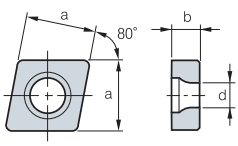
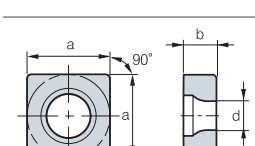
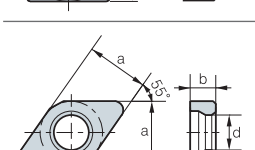
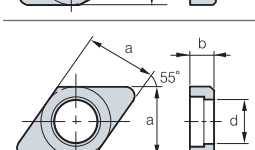
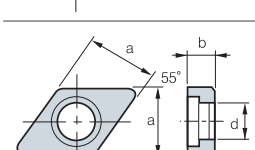
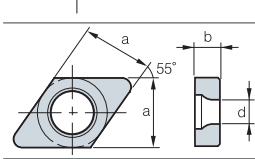
K02 Shim
K03 Cartridge
K03 Chip Breaker
K03 Chip Cover
K03 Clamp
K04 Coolant Bolt
K04 Wrench Bolt
K04 Lever

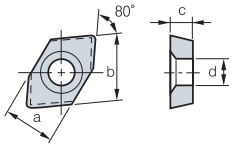
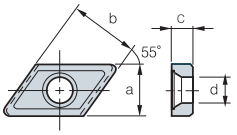
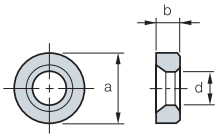
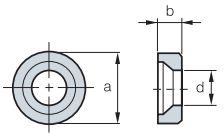
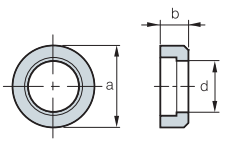
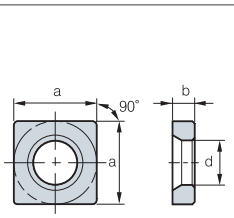
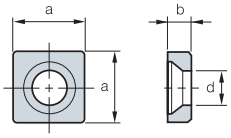
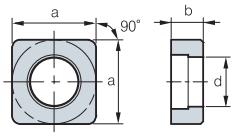
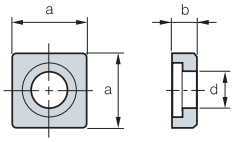
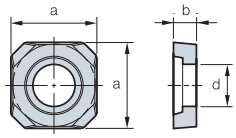
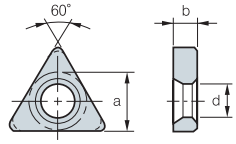
Parts

K05 Locator
K05 Nut
K05 Pin
K05 Screw
K06 Shim Pin
K07 Spring
K07 Wrench
K07 Stop Ring
K07 Washer
K07 Stopper
K07 Nozzle

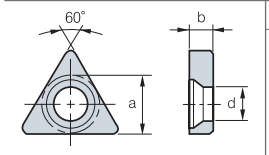
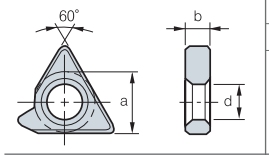
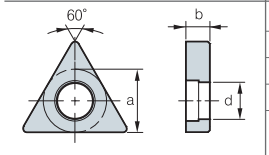
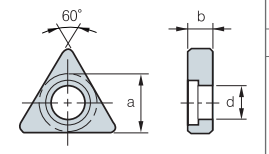
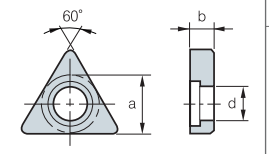
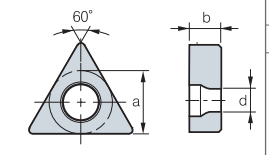
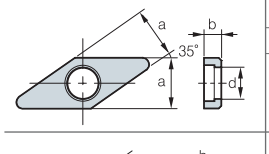
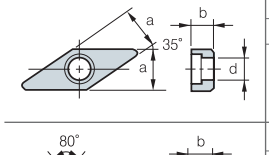
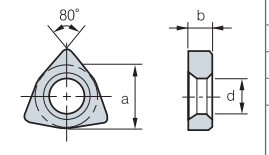
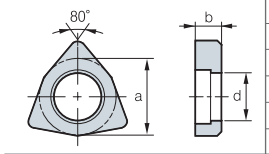
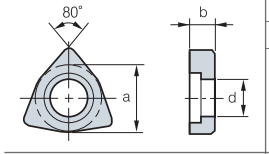
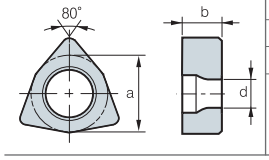
PARTS K

Shim

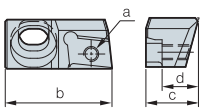
Geometry	Designation	Dimensions				
		a	b	c	d	angle
	SC32	8.5	3.18		4.9	
	SC32N	8.5	3.18		4.88	
	SC42	12.5	3.18		6.9	
	SC42N	11.6	3.18		6.5	
	SC53	15.7	4.76		7.9	
	SC53N	14.6	4.76		8.11	
	SC63	18.85	4.76		10	
	SC63N	17.8	4.76		9.6	
	SC83	24.4	4.76		12.8	
	SC84N	24.2	6.35		13	
	SC42B	12.5	3.18		6.9	
	SC42CC	12.5	3.18		3.5	
	SC32D	9.27	3.18		6.48	
	SC43D	12.45	4.76		7.34	
	SC53D	15.62	4.76		9.65	
	SC63D	18.8	4.76		11.25	
	SC84D	25.08	6.35		14.85	
	SC42S	11.5	3.18		6.4	
	SC32S	8.3	3.18		5.4	
	SC63V	18.35	4.76		5.5	
	SC83V	25.3	4.76		6.55	
	SC84V	25.3	6.35		6.35	
	SC32V	9.12	3.18		3.4	
	SC42V	12.6	3.18		4.5	
	SC44V	12.6	6.35		4.5	
	SC54V	15.75	6.35		5.5	
	SS32V	9.12	3.18		3.4	
	SS42V	12.6	3.18		4.5	
	SS54V	15.75	6.35		5.5	
	SS64V	18.9	6.35		5.5	
	SD317	9.35	2.7		5.2	
	SD32N	8.5	3.18		4.88	
	SD42	12.5	3.18		6.9	
	SD42N	11.6	3.18		6.5	
	SD43N	11.6	4.75		6.5	
	SD32D	9.2	3.18		5.8	
	SD43D	12.45	4.76		7.34	
	SD32S	8.5	3.18		5.4	
	SD42S	11.5	3.18		6.4	
	SD32V	9.12	3.18		3.4	
	SD43V	12.6	4.76		4.5	
	SD44V	12.6	6.35		4.5	

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	SES33C	9.1	12	4.76	3.5	
	SK33C	9.33	14.7	4.8	3.5	
	SK33CL	9.33	14.7	4.8	3.5	
	SR10	8.4	3.18		4.7	
	SR12	10	3.18		4.7	
	SR16	13.55	4.76		6.9	
	SR20	17.1	4.85		7.9	
	SR25	22	6.35		9.6	
	SR32	27.8	6.35		13	
	SR42CC	12.575	3.18		3.5	
	SR10S	8.8	3.18		5.4	
	SR12S	10.55	3.18		5.4	
	SS32	8.5	3.18		4.9	
	SS32N	8.5	3.18		4.88	
	SS42	12.5	3.18		6.9	
	SS42B	12.5	3.18		6.9	
	SS42N	11.6	3.18		6.5	
	SS53	15.7	4.76		7.9	
	SS53N	14.6	4.76		8.11	
	SS63	18.85	4.76		10	
	SS63N	17.8	4.76		9.6	
	SS84	24.4	6.35		12.8	
	SS84N	24.2	6.35		13	
	SS42CC	12.5	3.18		3.5	
	SS32CC	9.3	3.18		3.5	
	SS32D	9.27	3.18		5.77	
	SS43D	12.45	4.76		7.34	
	SS53D	15.62	4.76		9.65	
	SS63D	18.8	4.76		11.25	
	SS84D	25.15	6.35		14.43	
	SS32S	8.3	3.18		5.4	
	SS42S	11.5	3.18		6.4	
	SS42SAF	11.2	3		5.5	
	ST317	9.35	2.7		5	
	ST317B	9.35	2.7		5	
	ST317N	8.5	2.7		4.88	
	ST42	12.5	3.18		6.9	
	ST42N	11.6	3.18		6.5	
	ST53	15.7	4.76		7.9	

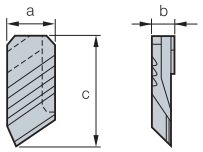
Shim

Geometry	Designation	Dimensions a	b	c	d	angle
	ST32CC	9.35	3.18		3.5	
	ST32C1	9.13	3.18		4.95	
	ST42C1	12.3	3.18		4.95	
	ST32D	9.35	3.18		5.77	
	ST43D	12.52	4.76		7.34	
	ST53D	15.7	4.76		9.65	
	ST63D	18.87	4.76		11.25	
	ST32M	8.7	3.18		4.7	
	ST43M	12.5	4.76		6.3	
	ST32S	8.5	3.18		5.4	
	ST32V	9.12	6.18		3.4	
	ST44V	12.6	6.35		4.5	
	SV32D	9.2	3.18		5.8	
	SV43D	12.29	4.76		7.34	
	SV32D2	9.2	3.18		5.8	
	SV32S	8.4	3.18		5.4	
	SW317	9.35	2.7		5	
	SW317N	8.5	2.7		4.88	
	SW42	12.5	3.18		6.9	
	SW42N	11.6	3.18		6.5	
	SW32D	9.25	3.18		5.8	
	SW43D	12.45	4.76		7.34	
	SW53D	15.62	4.76		9.65	
	SW63D	18.8	4.76		11.25	
	SW84D	24.89	6.35		14.43	
	SW43M	12.5	4.76		6.2	
	SW32M	8.52	3.18		5.2	
	SW32V	9.12	3.18		3.4	
	SW44V	12.6	6.35		4.5	
	SW54V	15.75	4.76		5.5	

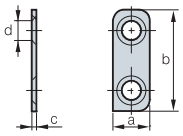
Cartridge

Geometry	Designation	Dimensions a	b	c	d	angle
	LAPDR-AJ	M4x0.7	30	15	10	

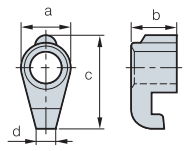
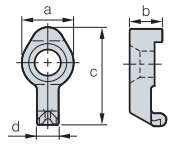
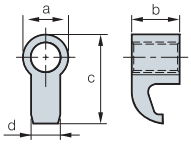
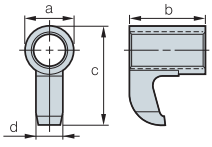
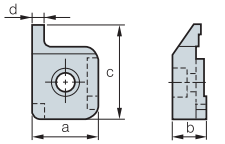
Chip breaker

Geometry	Designation	Dimensions a	b	c	d	angle
	CB20	8.5	3.4	20		

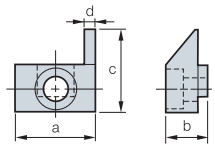
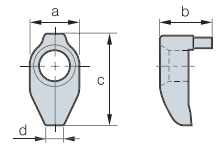
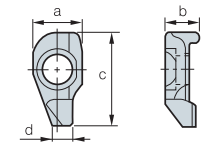
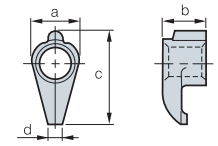
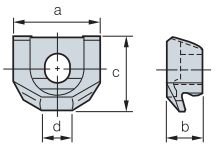
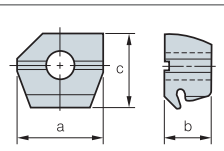
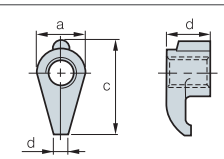
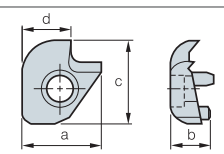
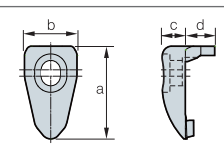
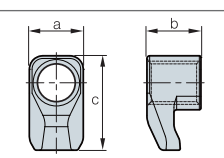
Chip cover

Geometry	Designation	Dimensions a	b	c	d	angle
	CFMP3R14R1-A	10.5	20	1	(Ø4.3)	
	CFMP3R-A	8	18	1	(Ø4.3)	
	CFMP4R-A	8	22	1	(Ø4.3)	

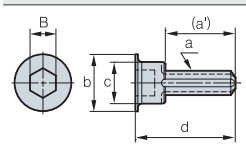
Clamp

Geometry	Designation	Dimensions a	b	c	d	angle
	CA05R	8.9	5.5	17.6	3.3	
	CA06R	12	7.2	20.6	5.3	
	CH5R3	7.85	7.2	14.8	3.1	
	CH6R4	12.02	9	23.97	3.75	
	CBH4.5R1	8	5.74	17.7	4	
	CBH4.5R2	9.5	6.4	18	4	
	CBH5R1	10	7.8	21.3	5	
	CBH6R1	12	9.3	26	6	
	CDH6N	9.5	10	18.6	6.1	
	CDH7N	7.9	11.4	14.7	4.7	
	CDH8N	10.9	16.9	22.4	6.1	
	CDH8N1	10.9	16.9	19.1	6.1	
	CDH8N2	10.9	16.9	25.4	6.1	
	CDH8N3	12.5	19.8	25.4	9.2	
	CDS8N	10.8	17	22.2	5	
	CGH5R1	19.5	9.5	28.8	2.5	
	CGH5R2	20.5	9.5	28.8	3.5	
	CGH5R3	22.5	9.5	28.8	5.5	

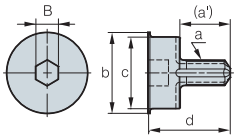
Clamp

Geometry	Designation	Dimensions				
		a	b	c	d	angle
	CGH6R1	22.3	11.9	23.2	2.5	
	CGH6R2	23.2	11.9	23.2	3.4	
	CGH6R3	24.0	11.9	23.2	4.2	
	CHH3.5R1	7.5	6.7	13	2.45	
	CHH4.5R1	7.9	7.85	14.1	2.54	
	CHH5.5R1	9.8	10	16.4	4	
	CH4R1	7.4	5	14.1	3.1	
	CH5R1	10.0	6.6	20.2	4.5	
	CH5R2	6.85	7	13.8	2	
	CH6R2	8.85	8.7	16.5	2	
	CH6R3	11.8	10	23	4.2	
	CMH5R1	18.5	7.9	16	6.26	
	CMH6R2	20.0	11	17.5	13.8	
	CMH6R6	18.5	7.9	16	6.26	
	CMH6R1	24	8.5	16.5	8.28	
	CMH6R3	20.0	11	17.51		
	CMH6L3	20.0	11	17.51		
	CS5R1	6.8	7	14.5	2	
	CS6R1	8.8	8.5	18.1	2.7	
	CS8R1	11.8	10	23	4.2	
	CTH6L1	23.5	12	25.4	14.35	
	CTH6R1	23.5	12	25.4	14.35	
	CTH6R2	21.78	12.9	31.22	17.33	
	CVH3	21	11	5.8	7.7	
	CVH3V	29	14	7	8	
	CVH4	25.5	14.5	6	7	
	CVH5	30	17	7.5	9.5	
	CVH6	33.5	18.5	8	10	
	CXH8N	10.1	10.0	17.5	-	

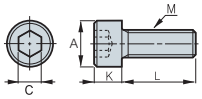
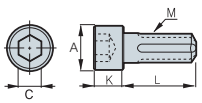
Coolant bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CBA063-3IN/MM	M10	Ø25	Ø16	37	8	(27)
	CBA063-4IN/MM	M10	Ø25	Ø16	42.5	8	(27)
	CBA080-IN/MM	M12	Ø28	Ø18	45.5	10	(32)
	CBP063-IN/MM	M10	Ø22	Ø16	38.6	8	(27)
	CBP080-IN/MM	M12	Ø25	Ø18	48.6	10	(32)

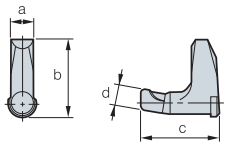
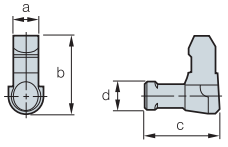
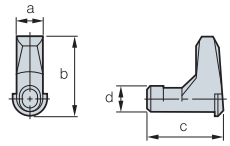
Coolant bolt

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CBA100-IN/MM	M16	Ø54	Ø43	47	14	(32)
	CBA100-IN-25.4	M12	Ø44	Ø36	41.5	10	(25)
	CBA125-IN	M20	Ø65	Ø54	56	17	(38)
	CBA125-IN-25.4	M12	Ø44	Ø36	43.5	10	(25)
	CBA125-MM	M20	Ø65	Ø54	57	17	(35)
	CBA160-IN	M24	Ø83	Ø73	56	19	(38)
	CBA160-MM	M20	Ø83	Ø73	53	17	(34)
	CBP100-IN	M16	Ø50	Ø43	48.6	14	(32)
	CBP100-IN-25.4	M12	Ø44	Ø36	46.5	10	(25)
	CBP100-MM-1	M16	Ø50	Ø43	48.6	14	(36)
	CBP125-IN	M20	Ø65	Ø54	56	17	(38)
	CBP125-IN-25.4	M12	Ø44	Ø36	55	10	(25)
	CBP125-MM	M20	Ø65	Ø54	57	17	(35)
	CBP125-MM-1	M20	Ø61	Ø54	65.6	14	(33)
	CBP160-IN	M24	Ø83	Ø73	56	19	(38)
	CBP160-MM	M20	Ø83	Ø73	53	17	(34)

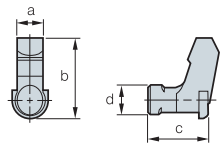
Wrench bolt

Geometry	Designation	Dimensions				
		A	C	K	L	M
	SB0825	13	6	8	25	M08 x 1.25
	SB1025	16	8	10	25	M10 x 1.50
	SB1035	16	8	10	35	M10 x 1.50
	SB1230	18	10	12	30	M12 x 1.75
	SB1630	24	14	16	30	M16 x 2.0
	SB1645	24	14	16	45	M6 x 2.0
	SB2040	30	17	20	40	M20 x 2.5
	CB1025	13	6	8	25	M08x1.25
	CB1025	16	8	10	25	M10x1.50
	CB1035	16	8	10	35	M10x1.50
	CB1230	18	10	12	30	M12x1.75
	CB1245	18	10	12	45	M12x1.75
	CB1630	24	14	16	30	M16x2.0
	CB1645	24	14	16	45	M16x2.0
	CB2040	30	17	20	40	M20x2.5

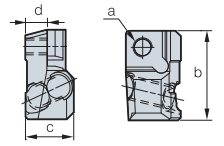
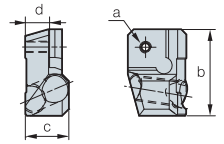
Lever

Geometry	Designation	Dimensions			
		a	b	c	d
	LR10	3.4	10.8	11.7	3
	LR12	3.7	13.5	13.4	3.5
	LR16	4.75	18.7	18.3	4.3
	LR20	5.9	20.5	18.7	5.55
	LR25	7.35	24.25	23.7	6.2
	LR32	8.45	29.7	26.95	7.9
	LV2	2.6	7.75	6	2.1
	LV3B	3.1	10	9.5	3.7
	LV4B	4.7	14.55	15.6	4.7
	LV4BN	4.7	16	14.9	4.68
	LV3	3.7	10	12	3.6
	LV3N	3.75	10	12	3.55
	LV3AN	3.75	12.1	11.4	4.64
	LV3C	3.1	10	7.85	3.6
	LV3CN	3.2	10	7.8	3.6
	LV3D	3.1	11.7	9.5	3.6
	LV3DN	3.2	11.65	9.5	3.55
	LV4	4.7	14.55	14	4.7
	LV4N	4.7	13.45	13.2	4.68
	LV5	6	17.1	17	6
	LV5N	6	16.4	17.08	5.95
	LV5AN	6	18.82	17.3	5.95
	LV6N	7.5	20.5	21	7.6
	LV8N	8.6	25.5	25.4	8.6

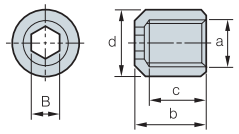
Lever

Geometry	Designation	Dimensions			
		a	b	c	d
	LV4A	4.6	13.24	9.95	4.7
	LV4AN	4.7	13.3	10	4.68

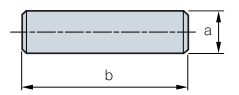
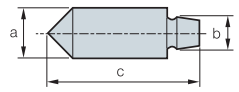
Locator

Geometry	Designation	Dimensions			
		a	b	c	d
	LFMP3R-A	M3.5	18.7	10.1	4.6
	LFMP4R1-A	M4.5	24.3	13.8	6.2
	LFMP4R-A	M4.5	26.3	13.8	6.2
	LFMA3R-A	M3	18.5	9.5	4.8
	LFMA4R-A	M3.5	26	13.1	7.3

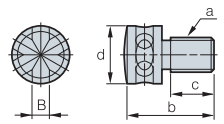
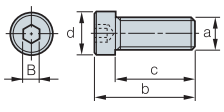
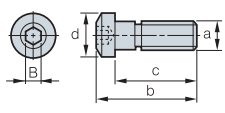
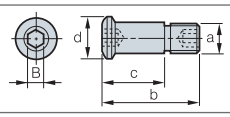
Nut

Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	N0407	M4 X 0.7	7.5	6	7	3	
	N0508	M5 X 0.8	8.3	6.6	7	3	

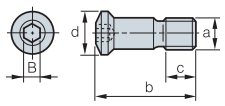
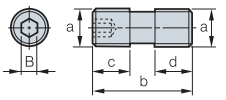
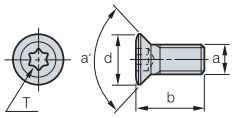
Pin

Geometry	Designation	Dimensions		
		a	b	c
	PN0308	3.0	8	
	PN0310	3.0	10	
	PN0312	3.0	12	
	PN0314	3.0	14	
	PN0515	4.8	3.3	14.5

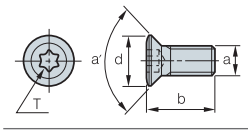
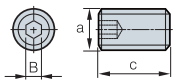
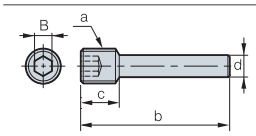
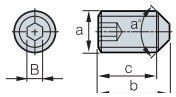
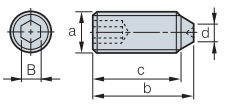
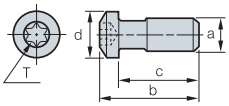
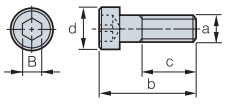
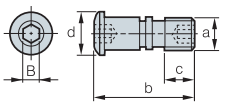
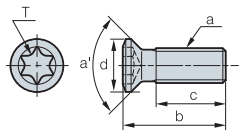
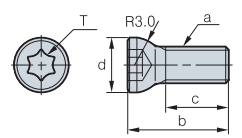
Screw

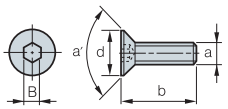
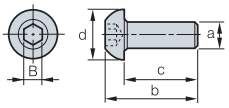
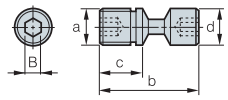
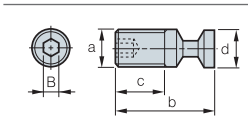
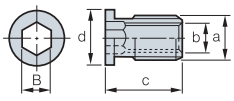
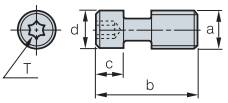
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	AZ0508F	M5 X 0.5	13	8	9	Ø2	
	AZ0514	M5 X 0.8	14	7	9	Ø2.5	
	BHA0510	M5 X 0.8	15	10	8.5	4.0	
	BHA0512	M5 X 0.8	17	12	8.5	4.0	
	BHA0612	M6 X 1.0	18	12	10	5.0	
	BHA0614	M6 X 1.0	20	14	10	5.0	
	BHA0616	M6 X 1.0	22	16	10	5	
	BHA0619-NYLOK	M6 X 1.0	25	19	10	5	
	CHX0407	M4 X 0.7	9.5	7.36	5.7	2.5	
	CHX0415	M4 X 0.7	17.5	15	5.4	2.5	
	CHX0510	M5 X 0.8	13.1	10.1	7.7	3	
	CHX0518	M5 X 0.8	21.5	18	8	3	
	CHX0622	M6 X 1.0	26.5	22	10	4	
	CHX0513	M5 X 0.8	13	8	6.4	2.5	
	CHX0616	M6 x 1.0	16.2	10.1	8.5	3	
	CHX0617L	M6 x 1.0 (Left)	17.2	10.1	8.5	3	
	CHX0621	M6 X 1.0	21	10.1	8.5	3	

Screw

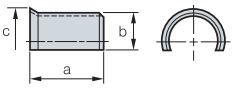
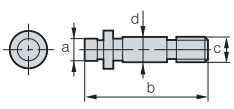
Geometry	Designation	Dimensions					
		a	b	c	d	B(T)	á
	CHX0625	1/4-20UNC	24.8	11	10	4	
	CTX03510	M3.5 X 0.6	10	4.7	5.3	15	
	CTX04513	M4.5 X 0.75	13.1	6.9	6.8	20	
	CTX04513H	M4.5 X 0.75	13.1	7.2	6.8	20	
	CTX0515	M5 X 0.8	15	8	7	20	
	CTX0517	M5 X 0.8	17.5	10	7	20	
	CTX0621	M6 X 1.0	21.2	12.4	9	25	
	DHA0514	M5 X 0.8	14.0	5.0	7.0	2.5	
	DHA0617	M6 x 1.0	17.0	7.0	7.5	3.0	
	DHA0620	M6 x 1.0	20.0	8.0	8.0	3.0	
	DHA0624	M6 x 1.0	24.0	12.0	8.5	3.0	
	DHA0815	M8 X 1.25	15.5	6.25	6.25	4.0	
	DHA0818F	M8 X 1.0	18	8.5	5.5	4.0	
	DHA0820	M8 X 1.25	20.0	8.0	9.0	4.0	
	DHA0821F	M8 X 1.0	21.0	8.5	8.5	4.0	
	DHA0825	M8 X 1.25	25.0	10.0	9.0	4.0	
	DHA0830	M8 X 1.25	30.0	11.5	11.5	4.0	
	ETGA0520CBM	M5 X 0.8	20		6.5	20	43°
	ETGD0825	M8 X 1.25	25.2		11.1	40	40°
	ETKA0523	M5 X 0.8	23		7.6	20	43°
	ETKA0625	M6 X 1.0	25.5		8.8	20	43°
	ETKD0516	M5 X 0.8	16.4		6.8	20	40°
	ETKD0620	M6 X 1.0	20		8.3	30	40°
	ETNA02506	M2.5 X 0.45	5.7		3.4	7	43°
	ETNA0408	M4 X 0.7	8.0		5.1	15	43°
	ETNA0412	M4 X 0.7	12		5.1	15	43°
	ETNA0511	M5 X 0.8	11.0		6.4	20	43°
	ETND02506F	M2.5 X 0.35	6.25		3.1	7	40°
	ETND0307F	M3 X 0.35	7.8		3.7	8	40°
	ETND03509	M3.5 X 0.6	9.6		4.7	10	40°
	FTGA03507	M3.5 X 0.6	7.0		5.3	15	60°
	FTGA03508	M3.5 X 0.6	8.0		5.3	15	60°
	FTGA03510	M3.5 X 0.6	10.0		5.3	15	60°
	FTGA03512	M3.5 X 0.6	12.0		5.0	15	60°
	FTGA0411F	M4 X 0.5	11.0		7.0	15	60°
	FTGA0417CBM	M4 X 0.7	17.0		5.5	15	62°
	FTGA0510-P	M5 X 0.8	10.0		7.0	20	63°
	FTGA0512-P	M5 X 0.8	12.0		7.0	20	63°
	FTGA0513	M5 X 0.8	13.2		7.0	20	61°
	FTGA0513-P	M5 X 0.8	13.0		7.0	20	63°
	FTGA0517	M5 X 0.8	17.0		7.5	20	61°
	FTGA0621	M6 X 1.0	21.5		9.0	20	61°
	FTGA0826	M8 X 1.25	26.0		11.6	25	61°
	FTKA02206	M2.2 X 0.45	5.5		3.0	6	60°
	FTKA02206S	M2.2 X 0.45	5.6		3.05	7	60°
	FTKA02555	M2.5 X 0.45	5.5		3.5	7	60°
	FTKA02565	M2.5 X 0.45	6.5		3.5	7	60°
	FTKA02565S	M2.5 X 0.45	6.5		3.8	8	60°
	FTKA0307	M3 X 0.5	7.2		4.2	9	60°
	FTKA03508	M3.5 X 0.6	8.4		5.5	15	60°
	FTKA03510	M3.5 X 0.6	10.4		5.5	15	60°
	FTKA03511A	M3.5 X 0.6	11.0		5.2	15	60°
	FTKA0408	M4 X 0.7	8.4		5.5	15	60°
	FTKA0410	M4 X 0.7	10.0		5.5	15	60°
	FTKA0411K	M4 X 0.7	11.0		6.8	15	60°
	FTKA0412B	M4 X 0.7	12.5		5.5	15	60°
	FTKA0413	M4 X 0.7	13.0		5.5	15	60°
	FTNA01633	M1.6 X 0.35	3.3		2.6	6	60°
	FTNA0203	M2 X 0.4	3.0		2.7	6	60°
	FTNA02033	M2 X 0.4	3.3		2.7	6	60°
	FTNA0204	M2 X 0.4	4.3		2.7	6	60°
	FTNA02205	M2.2 X 0.45	4.5		3.0	6	60°
	FTNA0238	M2 X 0.4	3.8		3.0	6	60°
	FTNA0305	M3 X 0.5	5.2		4.2	9	60°
	FTNA0306	M3 X 0.5	6.2		4.2	9	60°
	FTNA0307	M3 X 0.5	7.2		4.2	9	60°
	FTNA0408	M4 X 0.7	8.5		5.5	15	60°
	FTNA0411	M4 X 0.7	11.0		5.5	15	60°
	FTNA0511	M5 X 0.8	11		7.0	20	63°
	FTNA0513	M5 X 0.8	13.0		7.0	20	60°
	FTNA0516	M5 X 0.8	16.0		7.0	20	60°

Screw

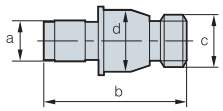
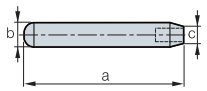
Geometry	Designation	Dimensions a	b	c	d	B(T)	á
	FTNB0411	M4 X 0.7	10.8		5.7	15	60°
	FTNC04509	M4.5 X 0.75	9.5		6.8	20	55°
	FTNC04511	M4.5 X 0.75	11.5		6.8	20	55°
	KHA0508	M5 X 0.8	8			2.5	
	KHA0510	M5 X 0.8	10			2.5	
	KHA0610	M6 X 1.0	10			3	
	KHA0612	M6 X 1.0	12			3.0	
	KHA0812	M8 X 1.25	12			4.0	
	KHA0815	M8 X 1.25	15			4.0	
	KHA1015	M10 X 1.5	15			5.0	
	KHA1020	M10 X 1.5	20			5.0	
	KHB0417	M4 X 0.7	17.2	4.5	2.5	2	
	KHB0406	M4 X 0.7	6	4.2	3	2	
	KHC0510	M5 X 0.8	10	8.1		2.5	90°
	KHC0610	M6 X 1.0	10	7.8		3.0	90°
	KHC0812	M8 X 1.25	12	9		4.0	90°
	KHC1016	M10 X 1.5	16	12.3		5.0	90°
	KHC1020	M10 X 1.5	20	16.3		5.0	90°
	KHD0510	M5 X 0.8	10	9	3	2.5	
	KHD0610	M6 X 1.0	10	10	4	3	
	KHD0810	M8 X 1.25	10	10	7.5	4	
	LTX0512	M5 X 0.8	15.1	12	7.3	20	
	LTX0514	M5 X 0.8	17.1	14	7.3	20	
	MHA0512	M5 X 0.8	17.0	10.8	8.0	4.0	
	MHB0310	M3 X 0.5	13.4	8.0	5.5	2.5	
	MHB0410	M4 X 0.7	14.0	8.0	7.0	3.0	
	MHB1055	M10 X 1.5	65	50	16	8	
	MHB1260	M12 X 1.75	72	55	18	10	
	MHB1680	M16 X 2.0	96	75	24	14	
	MHX0523	M5 X 0.8	23.5	9.7	10	2.5	
	MHX0626	M6 X 1.0	25.8	10	11	3	
	MHX0630	M6 X 1.0	30	12.5	10.5	4	
	PTKA02508	M2.5 X 0.45	8	5	3.8	8	92°
	PTKA03510	M3.5 X 0.6	10	5	5	15	92°
	PTKA0407	M4 X 0.7	7	4.6	5.5	15	86°
	PTKA0407F	M4 X 0.5	7.3	3.8	6.5	15	91°
	PTKA0408	M4 X 0.7	8	5.6	5.5	15	86°
	PTKA0408F	M4 X 0.5	8.3	5.7	6.5	15	91°
	PTKA0409F	M4 X 0.5	9.3	6.7	6.5	15	91°
	PTKA0410F	M4 X 0.5	10.3	7.7	6.5	15	91°
	PTKA0411F	M4 X 0.5	11.3	8.7	6.5	15	91°
	PTKA0412	M4 X 0.7	12	7.5	5.9	15	92°
	PTKA0412F	M4 X 0.5	12.3	9.7	6.5	15	91°
	PTKA0413F	M4 X 0.5	13.3	10.7	6.5	15	91°
	PTKA0512	M5 X 0.8	12	7	6.9	20	92°
	PTMA03508	M3.5 X 0.6	8	5.3	6	9	90°
	PTMA0403F	M4 X 0.5	3.3	1.7	6.5	15	91°
	PTMA0404F	M4 X 0.5	4.3	2.7	6.5	15	91°
	PTMA0405F	M4 X 0.5	5.3	3.7	6.5	15	91°
	PTMA0406F	M4 X 0.5	6.3	4.7	6.5	15	91°
	PTMA0411	M4 X 0.7	11	8.5	6.6	15	90°
	PTKA0411-R3	M4 X 0.7	11	6.9	6	15	

Geometry	Designation	Dimensions a	b	c	d	B(T)	á
	FHGA0618	M6 X 1.0	18		8.5	4.0	61°
	PXMA0306	M3 X 0.5	5.9		5.7	2	90°
	SHX0310	M3 X 0.5	10		5.9	2	91°
	RHA0510	M5 X 0.8		10		4.0	
	RHA0613	M6 X 1.0	16.3	13	10.5	4.0	
	RHA0620	M6 X 1.0	24	20	10.5	4.0	
	VHX0509B	M5 X 0.8	9	4.15	5	2	
	VHX0512B	M5 X 0.8	12	6.5	5	2	
	VHX0512BN	M5 X 0.8	12	6.56	5	2	
	VHX0514	M5 X 0.8	14.5	8.25	5	2	
	VHX0613N	M6 X 1.0	13.4	7.5	5.93	2.5	
	VHX0617	M6 X 1.0	17	10	6	2.5	
	VHX0617N	M6 X 1.0	16.75	8.34	5.9	2.5	
	VHX0621	M6 X 1.0	21	14	6	2.5	
	VHX0817N	M8 X 1.0	17.05	7.98	7.9	3	
	VHX0820N	M8 X 1.0	20.7	7.98	7.9	3	
	VHX0820AN	M8 X 1.0	20.5	10.36	7.9	3	
	VHX0821	M8 X 1.0	21	10	8	3	
	VHX0821N	M8 X 1.0	21.2	9.68	7.9	3	
	VHX0823N	M8 X 1.0	23.5	10.36	7.9	3	
	VHX0825	M8 X 1.0	25	12	8	3	
	VHX1027N	M10 X 1.0	27.2	14.4	9.8	5	
	VHX1236N	M12 X 1.0	36	18.3	11.8	5	
	VHX0613A	M6 X 1.0	13.4	9.1	6.0	2.5	
	SHXN0509F	M5 X 0.5	M3.5 X 0.6	8.65	6.3	3.5	
	SHXN0610F	M6 X0.75	M4 X 0.5	10	7.8	4	
	SHXN0712F	M7 X0.75	M5 X 0.8	12	8.5	5	
	WTX0813	M8 X 1.25	17.2	4.9	8.5	25	
	WTX0817	M8 X 1.25	22	4.9	8.5	25	

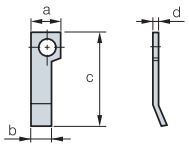
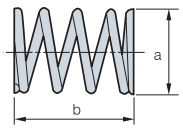
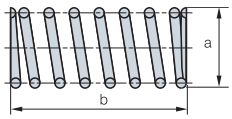
Shim pin

Geometry	Designation	Dimensions a	b	c	d
	SP3	5.5	3.5	5.9	
	SP3N	6.85	3.3	5.55	
	SP3N-1	5.3	3.3	5.55	
	SP4	7.0	4.0	7.6	
	SP4N	5.8	4.35	7.4	
	SP5	8.5	4.5	8.8	
	SP5N	8.5	5.68	9	
	SP6N	11.1	6.0	11.0	
	SP8N	12.0	10.0	15.35	
	SP2M	5	14	M5 X 0.8	6
	SP3M	3.5	19.5	M4 X 0.7	4
	SP3M-1	3.5	16.5	M4 X 0.7	4
	SP4M	5	19	M5 X 0.8	6

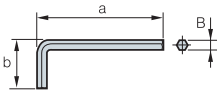
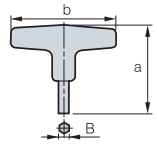
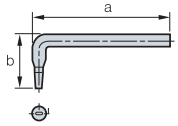
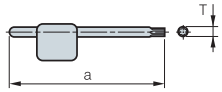
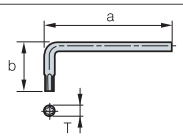
Shim pin

Geometry	Designation	Dimensions			
		a	b	c	d
	SP3D	3.7	13.1	UNF10-32	5.6
	SP3D2	3.6	12	UNF10-32	5.5
	SP3DS	3.7	11.54	UNF10-32	5.6
	SP4D	4.97	17.19	UNF1/4 28	7.12
	SP4DL	5	17.1	UNF1/4 28	7
	SP4DS	4.97	13.26	UNF1/4 28	
	SP5D	6.21	21.9	UNF5/16-24	9.44
	SP6D	7.75	21.9	UNF3/8-24	11.02
	SP8D	9.02	29.63	UNF7/16-20	14.21
	LSPS3	60	8.2	5.55	
	LSPS4	65	10	7	
	LSPS5	69	11.4	8.85	
	LSPS6	69	13	11	
	LSPS8	73	16.5	15.2	

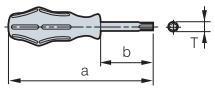
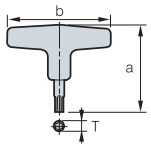
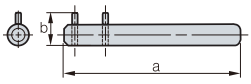
Spring

Geometry	Designation	Dimensions			
		a	b	c	d
	SR2	4.0	2.8	12.6	0.4
	SPR0315	3.0	15		
	SPR0415	4.0	15		
	SR3	9.2	12.5		
	SR4	4.0	11.0		
	SPR0714	7	14		
	SPR0510	5	10		
	SPR0714	7	14		
	SPR0811	8	11		

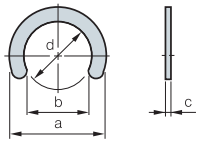
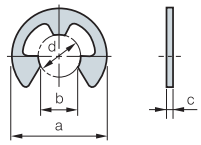
Wrench

Geometry	Designation	Dimensions		
		a	b	B(T)
	HW20L	52	18	2
	HW25L	58.5	20.5	2.5
	HW30L	66	23	3
	HW35L	72	25	3.5
	HW40L	74	29	4
	HW50L	85	33	5
	HW40	82	80	4
	HW50	96	90	5
	SW50L	70	27.5	
	TW06P	63		6
	TW07P	63		7
	TW08P	71		8
	TW09P	75		9
	TW10P	78		10
	TW15P	82		15
	TW20P	86		20
	TW15L	60	21	15
	TW20L	60	21	20

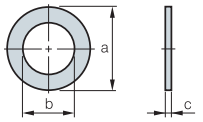
Wrench

Geometry	Designation	Dimensions		
		a	b	B(T)
	TW07S	140	60	7
	TW08S	150	76	8
	TW09S	165	70	9
	TW15S	190	90	15
	TW20S	195	91	20
	TW20	75	80	20
	TW25	74	80	25
	SW15S	150	13	

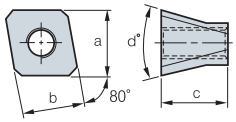
Stop ring

Geometry	Designation	Dimensions			
		a	b	c	d
	CR03	4.8	2.6	0.4	3.0
	CR04	6.6	3.6	0.4	4.0
	CR05	7.6	4.6	0.4	5.0
	ER03	7.0	2.6	0.6	3.0
	ER04	9.0	3.5	0.6	4.0
	ER05	11	4.3	0.6	5.0

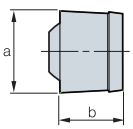
Washer

Geometry	Designation	Dimensions		
		a	b	c
	WA3	11.0	6.8	0.5~1.0
	WA4	10.0	5.3	0.5~1.0

Stopper

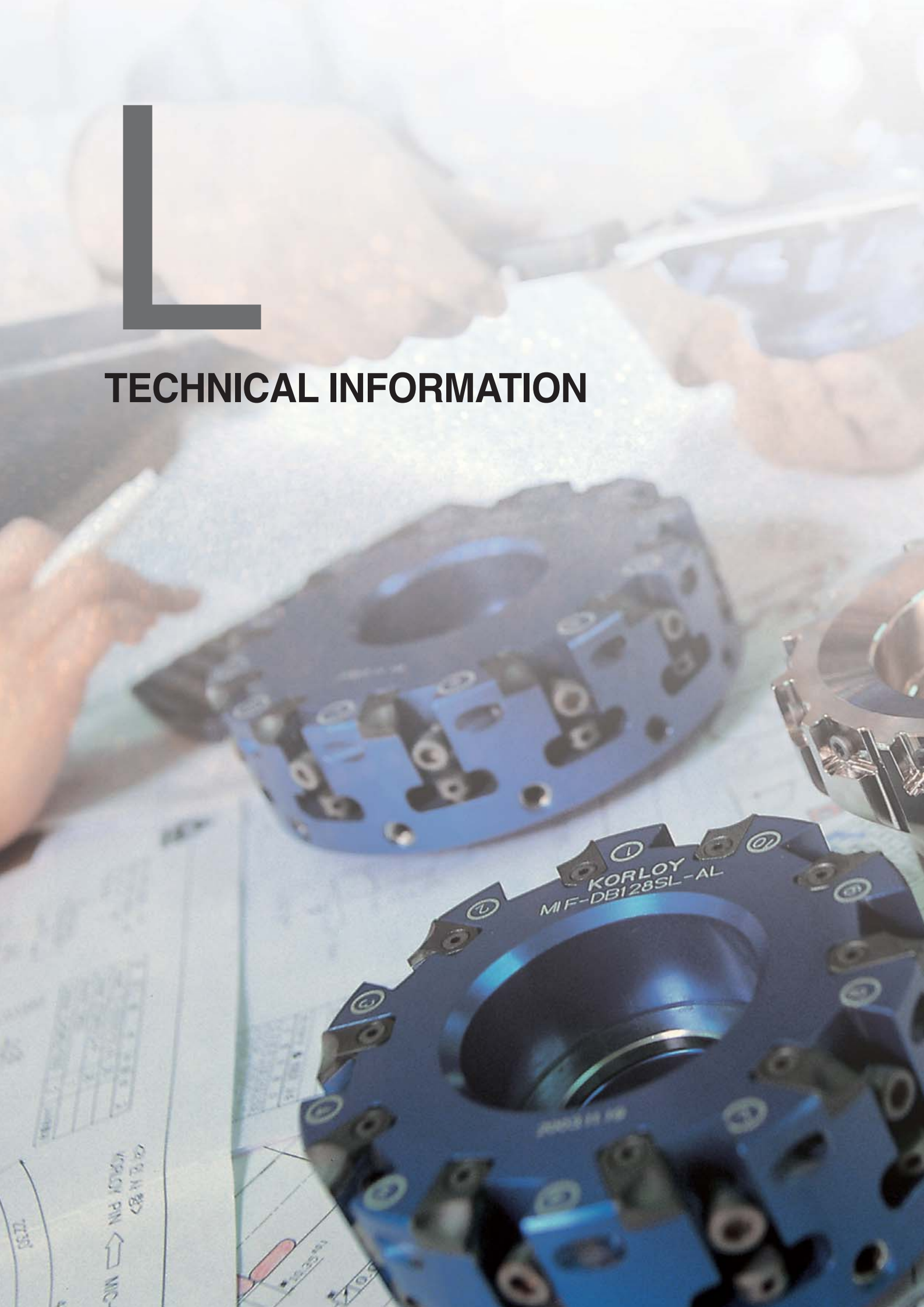
Geometry	Designation	Dimensions			
		a	b	c	d°
	STP5	11	10.2	11	30°

Nozzle

Geometry	Designation	Dimensions	
		a	b
	CN0605	6	4.6

L

TECHNICAL INFORMATION



General Information I

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L09 Properties of Korloy grades

Technical Information

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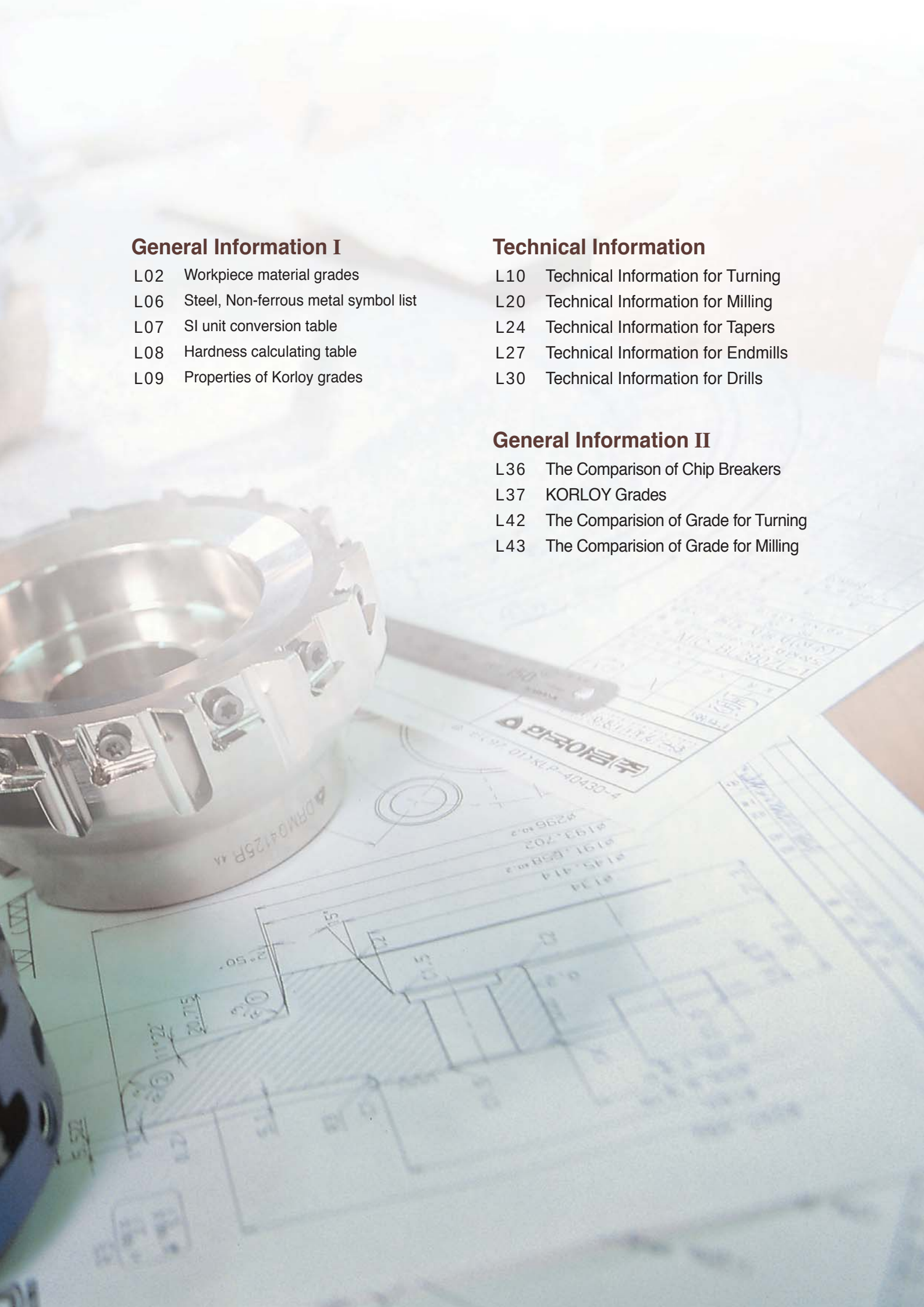
L30 Technical Information for Drills

General Information II

L36 The Comparison of Chip Breakers
L37 KORLOY Grades
L42 The Comparision of Grade for Turning
L43 The Comparision of Grade for Milling



Carbon steel and alloy steel for structural use

Type		Korea	ISO	Japan	U.S.A	Great britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Carbon steel		SM10C	C10	S10C	1010	040A10 045A10 045M10	C10E C10R	XC10	-
		SM15C	C15E4 C15M2	S15C	1015	055M15	C15E C15R	-	-
		SM20C	-	S20C	1020	070M20 C22, C22E C22R	C22 C22E C22R	C22 C22E C22R	-
		SM25C	C25 C25E4 C25M2	S25C	1025	C25 C25E C25R	C25 C25E C25R	C25 C25E C25R	-
		SM30C	C30 C30E4 C30M2	S30C	1030	080A30 080M30 CC30 C30E C30R	C30 C30E C30R	C30 C30E C30R	30Г
		SM35C	C35 C35E4 C35M2	S35C	1035	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	35Г
		SM40C	C40 C40E4 C40M2	S40C	1039 1040	080M40 C40 C40E C40R	C40 C40E C40R	C40 C40E C40R	40Г
		SM43C	-	S43C	1042 1043	080A42	-	-	40Г
		SM45C	C45 C45E4 C45M2	S45C	1045 1046	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	45Г
		SM48C	-	S48C	-	080A47	-	-	45Г
		SM50C	C50 C50E4 C50M2	S50C	1049	080M50 C50 C50E C50R	C50 C50E C50R	C50 C50E C50R	50Г
		SM53C	-	S53C	1050 1053	-	-	-	50Г
		SM55C	C55 C55E4 C55M2	S55C	1055	070M55 C55 C55E C55R	C55 C55E C55R	C55 C55E C55R	-
		SM58C	C60 C60E4 C60M2	S58C	1059 1060	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	60Г
Alloy steel	Nickel chromium steel	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - 15NiCr13 -	SNC236 SNC415(H) SNC631(H) SNC815(H) SNC836	- - - - -	- - - 655M13(655H13) -	- - - 15NiCr13 -	- - - - -	40XH - 30XH3A - -
	Nickel chromium molybdenum steel	SNCM220	20NiCrMo2 20NiCrMoS2	SNCM220	8615 8617(H) 8620(H) 8622(H)	805A20 805M20 805A22 805M22	20NiCrMo2 20NiCrMoS2	20NCD2	-
		SNCM240	41CrNiMo2 41CrNiMoS2	SNCM240	8637 8640	-	-	-	-
		SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- - - - - - - - -	SNCM415 SNCM420(H) SNCM431 SNCM439 SNCM447 SNCM616 SNCM625 SNCM630 SNCM815	- 4320(H) - 4340 - - - - -	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	- 20XH2M(20XHM) - - - - - - -
	Chromium steel	SCr415(H)	-	SCr415(H)	-	-	17Cr3 17CrS3	-	15X 15XA
		SCr420(H)	20Cr4(H) 20CrS4	SCr420(H)	5120(H)	-	-	-	20X
		SCr430(H)	34Cr4 34CrS4	SCr430(H)	5130(H) 5132(H)	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	30X
		SCr435(H)	34Cr4 34CrS4 37Cr4 37CrS4	SCr435(H)	5135(H)	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	35X
		SCr440(H)	37Cr4 37CrS4 41Cr4 41CrS4	SCr440(H)	5140(H)	530M40 41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	40X
		SCr445(H)		SCr445(H)					45X

• The above Alloy steel can supplied by domestic manufacturing

Type		Korea	ISO	Japan	U.S.A	Great britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Alloy steel	Chromium molybdenum steel	SCM415(H)	-	SCM415(H)	-	-	-	-	-
		SCM418(H)	18CrMo4 18CrMoS4	SCM418(H)	-	-	18CrMo4 18CrMoS4	-	20XM
		SCM420(H)	-	SCM420(H)	-	708M20(708H20)	-	-	20XM
		SCM430	-	SCM430	4130	-	-	-	30XM 30XMA
		SCM432	-	SCM432	-	-	-	-	-
		SCM435(H)	34CrMo4 34CrMoS4	SCM435(H)	(4135H) 4137(H)	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	35XM
		SCM440(H)	42CrMo4 42CrMoS4	SCM440(H)	4140(H) 4142(H)	708M70 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	-
		SCM445(H)	-	SCM445(H)	4145(H) 4147(H)	-	-	-	-
	Manganese steel and Manganese chromium steel	SMn420(H)	22Mn6(H)	SMn420(H)	1522(H)	150M19	-	-	-
		SMn433(H)	-	SMn433(H)	1534	150M36	-	-	30 Γ 2 35 Γ 2
		SMn438(H)	36Mn6(H)	SMn438(H)	1541(H)	150M36			35 Γ 2 40 Γ 2
		SMn443(H)	42Mn6(H)	SMn443(H)	1541(H)	-	-	-	40 Γ 2 45 Γ 2
		SMnC420(H)	-	SMnC420(H)	-	-	-	-	-
		SMnC443(H)	-	SMnC443(H)	-	-	-	-	-
	Aluminum chromium molybdenum steel	SACM645	41CrAlMo74	SACM645	-	-	-	-	-

• The above Alloy steel can supplied by domestic manufacturing

Tool steel

Type	Korea	ISO	Japan	U.S.A	Great britain	Germany	France	Russia
	KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
High speed steel	SKH2	HS18-0-1	SKH2	T1				
	SKH3	-	SKH3	T4				
	SKH4	-	SKH4	T5				
	SKH10	-	SKH10	T15	BM 2	S6/5/2	Z 85 WDCV	
	SKH51	HS6-5-2	SKH51	M2				
	SKH52	HS6-6-2	SKH52	M3-1				
	SKH53	HS6-5-3	SKH53	M3-2				
	SKH54	HS6-5-4	SKH54	M4	BM 35	S6/5/2/5	6-5-2-5	
	SKH55	HS6-5-2-5	SKH55	M 35				
	SKH56	-	SKH56	M36				
	SKH57	HS10-4-3-10	SKH57	-		S2/9/2		
	SKH58	HS2-9-2	SKH58	M7				
	SKH59	HS2-9-1-8	SKH59	M42				
Alloy tool steel	STS11	-	SKS11	F2				
	STS2	-	SKS2	-				
	STS21	-	SKS21	-				
	STS5	-	SKS5	-				
	STS51	-	SKS51	L6				
	STS7	-	SKS7	-				
	STS8	-	SKS8	-				
	STS4	-	SKS4	-				
	STS41	-	SKS41	-				
	STS43	105V	SKS43	W2-9 1/				
	STS44	-	SKS44	W2-8 1-2				
	STS3	-	SKS3	-		105WCr6	105WC13	
	STS31	105WCr1	SKS31	-				
	STS93	-	SKS93	-				
	STS94	-	SKS94	-				
	STS95	-	SKS95	-	BD3	X210Cr12	Z200C12	
	STD1	210Cr12	SKD1	D3				
	STD11	-	SKD11	D2	BA2	X100CrMoV5 1	Z100CDV5	
	STD12	100CrMoV5	SKD12	A2				
	STD4	-	SKD4	-	BH21	X30WCrV9 3	Z30WCV9	
	STD5	X30WCrV9-3	SKD5	H21				
	STD6	X37CrMoV5-1	SKD6	H11	BH13	X40CrMoV5 1	Z40CDV5	
	STD61	X40CrMoV5-1	SKD61	H13				
	STD62	X35CrWMoV5	SKD62	H12				
	STD7	32CrMoV12-28	SKD7	H10				
	STD8	-	SKD8	H19				
	STF3	-	SKT3	-		55NiCrMoV6	55NCDV7	
	STF4	55NiCrMoV7	SKT4	L6				

• The above Alloy steel can supplied by domestic manufacturing

Type	Korea	ISO	Japan	U.S.A	Great britain	Germany	France	Russia
	KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Free cutting carbon steel	SUM11	-	SUM11	1110				
	SUM12	-	SUM12	1109				
	SUM21	9S20	SUM21	1212				
	SUM22	11SMn28	SUM22	1213	230M07	9SMn28	S250	
	SUM22L	11SMnPb28	SUM22L	12L13		9SMnPb28	S250Pb	
	SUM23	-	SUM23	1215	240M07	9SMn36	S 300	
	SUM23L	-	SUM23L	-				
	SUM24L	11SMnPb28	SUM24L	12L14		9SMnPb36	S300Pb	
	SUM25	12SMn35	SUM25	-				
	SUM31	-	SUM31	1117				
	SUM31L	-	SUM31L	-				
	SUM32	-	SUM32	-				
	SUM41	-	SUM41	1137				
	SUM42	-	SUM42	1141				
	SUM43	44SMn28	SUM43	1144				
High carbon chromiom	STB1	-	SUJ1	-				
	STB2	B1	SUJ2	52100	534A99	100Cr6	100Cr6	
	STB3	B2	SUJ3	ASTM A 485 Grade 1				
	STB4	-	SUJ4	-				
	STB5	-	SUJ5	-				

• The above Alloy steel can supplied by domestic manufacturing

Stainless steel

Type		Korea	ISO	Japan	U.S.A		Great britain	Germany	France	Russia
		KS	ISO	JIS	UNS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Stainless steel	Austenitic	STS201	X12CrMnNiN17-7-5	SUS201	S20100	201	284S16	X12CrNi17-7	Z12CMN17-07Az	12X17·9AH4
		STS202	X12CrMnNiN18-9-5	SUS202	S20200	202	301S21	X2CrNiN18-7		07X16H6
		STS301	X10CrNi18-8	SUS301	S30100	301		X12CrNi17-7	Z11CN17-08	
		STS301L	X2CrNiN18-7	SUS301L						
		STS301J1		SUS301J1			302S25			12X18H9
		STS302		SUS302	S30200	302		X10CrNiS18-9	Z12CN18-09	
		STS302B	X12CrNiSi18-9-3	SUS302B	S30215	302B	303S21			
		STS303	X10CrNiS18-9	SUS303	S30300	303	303S41		Z8CNF18-09	12X18H10E
		STS303Se		SUS303Se	S30323	303Se		X5CrNi18-10		
		STS303Cu		SUS303Cu			304S31			08X18H10
		STS304	X5CrNi18-9	SUS304	S30400	304		X2CrNi19-11	Z7CN18-09	
			X2CrNi18-9				304S11			03X18H11
		STS304L	X2CrNi19-11	SUS304L	S30403	304L		X2CrNiN18-10	Z3CN19-11	
		STS304N1	X5CrNiN18-8	SUS304N1	S30451	304N			Z6CN19-09Az	
		STS304LN	X2CrNiN18-8	SUS304LN	S30453	304LN		X5CrNi18-12	Z3CN18-10Az	
		STS304J1		SUS304J1			305S19			06X18H11
		STS305	X6CrNi18-12	SUS305	S30500	305			Z8CN18-12	
		STS309S		SUS309S	S30908	309S	310S31	X5CrNiMo27-12-2	Z10CN24-13	10X23H18
		STS310S	X6CrNi25-20	SUS310S	S31008	310S	316S31	X5CrNiMo27-13-3	Z8CN25-20	
		STS316	X5CrNiMo17-12-2	SUS316	S31600	316		X2CrNiMo17-13-2	Z7CND17-12-02	
			X3CrNiMo17-12-3				316S11	X2CrNiMo17-14-3	Z6CND18-12-03	03X17H14M3
		STS316L	X2CrNiMo17-12-2	SUS316L	S31603	316L			Z3CND17-12-02	
			X2CrNiMo17-12-3						Z3CND17-12-03	
			X2CrNiMo18-14-3							
		STS316N		SUS316N	S31651	316N	317S16	X6CrNiTi18-10		
		STS317		SUS317	S31700	317	321S31	X6CrNiNb18-10		08X18H10T
		STS321	X6CrNiTi18-10	SUS321	S32100	321	347S31		Z6CNT18-10	08X18H12
		STS347	X6CrNiNb18-10	SUS347	S34700	347		X6CrAl13	Z6CNNb18-10	
		STS384	X3NiCr18-16	SUS384	S38400	384	405S17		Z6CN18-16	
	Ferritic	STS405	X6CrAl13	SUS405	S40500	405			Z8CA12	
		STS410L		SUS410L				X6Cr17	Z3C14	
		STS429		SUS429	S42900	429	430S17	X7CrS18		12X17
		STS430	X6Cr17	SUS430	S43000	430		X6CrMo17-1	Z8C17	
		STS430F	X7CrS17	SUS430F	S43020	430F	434S17		Z8CF17	
		STS434	X6CrMo17-1	SUS434	S43400	434			Z8CD17-01	
		STS444	X2CrMoTi18-2	SUS444	S44400	444			Z3CDT18-02	
		STSXM27		SUSXM27	S44627			X10Cr13	Z1CD26-01	
	Martensitic	STS403		SUS403	S40300	403	410S21			
		STS410	X12Cr13	SUS410	S41000	410	416S21	X20Cr13	Z13C13	
		STS416	X12CrS13	SUS416	S41600	416	420S29	X20CrNi17-2	Z11CF13	20X13
		STS420J1	X20Cr13	SUS420J1	S42000	420	431S29		Z20C13	20X17H2
		STS431	X19CrNi16-2	SUS431	S43100	431			Z15CN16-02	
		STS440A	X70CrMo15	SUS440A	S44002	440A		X7CrNiAl17-7	Z70C15	
	Precipitation hardening type	STS630	X5CrNiCuNb16-4	SUS630	S17400	S17400			Z6CNU17-04	09X17H7IO
		STS631	X7CrNiAl17-7	SUS631	S17700	S17700			Z9CNA17-07	
		STS631J1		SUS631J1						

• The above Alloy steel can supplied by domestic manufacturing

Casting or forging steel

Type		Korea	ISO	Japan	U.S.A	Great britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Casting Iron	Grey iron casting	GC100 GC150 GC200 GC250 GC300 GC350	100,150, 200, 250, 300, 350	FC100 FC150 FC200 FC250 FC300 FC350	No 20 B No 25 B No 30 B No 35 B No 45 B No 50 B No 55 B	 Grade 150 Grade 220 Grade 260 Grade 300 Grade 350 Grade 400	GG 10 GG 15 GG 20 GG 25 GG 30 GG 35 GG 40	Ft 10 D Ft 15 D Ft 20 D Ft 25 D Ft 30 D Ft 35 D Ft 40 D	-
	Spheroidal graphite iron casting	GCD400 GCD500 GCD600 GCD700	700-2, 600-3, 500-7, 450-10, 400-15, 400-18, 350-22	FCD400 FCD500 FCD600 FCD700	60-40-18 80-55-06 100-70-03	SNG 420/12 SNG 370/17 SNG 500/7 SNG 600/3 SNG 700/2	GGG 40 GGG 40.3 GGG 50 GGG 60 GGG 70	FCS 400-12 FGS 370-17 FGS 500-7 FGS 600-3 FGS 700-2	B
	Austempered Spheroidal graphite iron casting	FCAD	-	FCAD	-	EN-GJS-	EN-GJS-	EN-GJS-	-
	Austenitic iron casting	FCA- FCDA-	L-, S-	FCA- FCDA-	Type 1, 2, Type D-2, D-3A Class 1, 2	F1, F2, S2W, S5S	GGL-, GGG-	L-, S-	-

Non-ferrous alloy

Type		Korea	ISO	Japan	U.S.A	Great britain	Germany	France	Russia
		KS	ISO	JIS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Aluminum alloy	Aluminum alloy ingots for casting	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	Al-Cu4MgTi - - - - - Al-Si7Mg(Fe) Al-Si7Mg Al-Si5Cu1Mg Al-Cu4Ni2Mg2 - - - - - -	AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC8A AC8B AC8C AC9A AC9B	204.0 - 319.0 - - - 356.0 A356.0 355.0 242.0 514.0 - - - - -	- - - LM-6 - - LM-25 - LM-16 - LM-5 LM-13 LM-26 - LM-29 -	- - - - G(GK)-AlSi9Cu3 - G(GK)-AlSi7MG - - G(GK)-AlMg5 - - - - - GD-AlSi12 (Cu)	A-U5GT - - - - - A-S7G - - A-U4NT - A-S12UNG A-S10UG A-S10UG - A-S18UNG	
	Aluminum alloy die casting	ALDC1 ALDC2 ALDC3 ALDC4 ALDC7 ALDC7Z ALDC8 ALDC8Z ALDC9	Al-Si12CuFe - - - Al-Si8Cu3Fe Al-Si8Cu3Fe - - -	ADC1 ADC3 ADC5 ADC6 ADC10 ADC10Z ADC12 ADC12Z ADC14	A413.0 A360.0 518.0 - A380.0 A380.0 383.0 383.0 B390.0	LM20 - - - - LM24 LM2 LM2 LM30	GD-AlSi10Mg GD-AlMg9 - GD-AlSi9Cu3 GD-AlSi9Cu3 - - - EN AW-5052	A-S13 A-S9G A-G6 A-G3T - - - - -	
	Aluminum alloy extruded shapes	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	- - AlMg4.5Mn0.7 - AlMg1SiCu AlMg0.7Si - - AlZn5.5MgCu	A5052S A5454S A5083S A5086S A6061S A6063S A7003S A7N01S A7075S	5052 5454 5083 5086 6061 6063 - - 7075	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075 -	EN AW-5052 EN AW-5454 EN AW-5083 EN AW-5086 EN AW-6061 EN AW-6063 EN AW-7003 - EN AW-7075	

Heat resistant steel

Type		Korea	ISO	Japan	U.S.A		Great britain	Germany	France	Russia
		KS	ISO	JIS	UNS	AISI SAE	BS BS/EN	DIN DIN/EN	NF NF/EN	GOCT
Heat resistant steel	Austenitic	STR31 STR35 STR36 STR37 STR38 STR309 STR310 STR330 STR660 STR661		SUH31 SUH35 SUH36 SUH37 SUH38 SUH309 SUH310 SUH330 SUH660 SUH661	 S63008 S63017 S30900 S31000 N08330 S66286	 309 310 N08330	331S42 349S52 349S54 381S34 309S24 310S24 	 X53CrMnNi21-9 CrNi2520 CrAl1205	Z35CNWS14-14 Z52CMN21-09-Az Z55CMN21-09-Az Z15CN24-13 Z15CN25-20 Z12NCS35-16 Z6NCTV25-20	
	Ferritic	STR21 STR409 STR409L STR446	 X6CrTi12 X2CrTi12	SUH21 SUH409 SUH409L SUH446	R30155 S40900 	 409	 409S19 	X6CrTi12 X45CrSi9-3	 Z6CT12 Z3CT12 Z12C25	
	Martensitic	STR1 STR3 STR4 STR11 STR600 STR616		SUH1 SUH3 SUH4 SUH11 SUH600 SUH616	S44600 S65007 S42200	 446 	401S45 443S65 	 	Z45CS9 Z40CSD10 Z80CSN20-02 	

• The above Heat resistant steel can supplied by domestic manufacturing

Steel, Non-ferrous metal symbol list

Comparison of workpiece material standards

Group		Standard term	Code
Structural Steel		Rolled Steel for Welded Suructure	SWS
		Rerolled Steel	SBR
		Rolled Steel for General Structure	SB
		Light Gauge Steel for General Structure	SBC
		Hot- rolled Steel Plate, Sheet/ Strip for Automobile Structural Use	SAPH
Steel Plate		Cold-rolled Steel Sheet/Strip	SBC
		Hot-rolled Soft Steel Sheet/Strip	SHP
Steel Pipe		Carbon Steel Pipe for Ordinary Piping	SPP
		Carbon Steel Pipe for Boiler and Heat Exchanger	STH
		Seamless Steel Pipe for High Pressure Gas Cylinder	STHG
		Carbon Steel Pipe for General Structural Use	SPS
		Carbon Steel Pipe for Machine Structural Use	STST
		Alloy Steel Pipe for Structural Use	STA
		Stainless Steel Pipe for Machine and Structural Use	STS-TK
		Carbon Steel Square Pipe for General Structural Use	SPSR
		Alloy Steel Pipe	SPA
		Carbon Steel Pipe for Pressure Service	SPPS
		Carbon Steel Pipe for High Temperature Service	SPSR
		Carbon Steel Pipe for High Pressure Service	SPPH
		Stainless Steel Pipe	STSxT
Iron and Steel		Carbon Steel for Machine Structural Use	SMxxC, SMxxCK
		Aluminum Chromium Molybdenum Steel	SACM
		Chromium Molybdenum Steel	SCM
		Chromium Steel	SCr
		Nickel Chromium Steel	SNC
		Nickel Chromium Molybdenum Steel	SNCM
		Manganese Steel and manganese Chromium Steel for Machine Structural Use	SMn, SMnC
Special steel	Tool steel	Carbon Tool Steel	STC
		Hollow Drill Steel	SKC
		Alloy Tool Steel	STS, STD, STF
		High Speed Tool Steel	SKH
	Stainless steel	Stainless Steel Bar	STS
	Heat resisting steel	Heat Resisting Steel	STR
		Heat Resisting Steel Bar	STR
		Heat Resisting Steel Sheet	STR
	Free cutting carbon steel		SUM
	Special steel		STB
	Spring steel		SPS

Group	Standard term	Code
Forged steel	Carbon Steel Forging	SF
	Chromium Molybdenum Steel Forging	SFCM
	Nickel Chromium Molybdenum Steel Forging	SFNCM
Cast iron	Gray Cast iron	GC
	Spheroidal Graphite Cast iron	GCD
	Blackheart Malleable Cast iron	BMC
	Whiteheat Malleable Cast iron	WMC
	Pearlitic Malleable Cast iron	PMC
Cast steel	Carbon Cast Steel	SC
	High Tensile Strength Carbon Cast Steel & Low Alloy Cast Steel	HSC
	Stainless Cast Steel	SSC
	Heat Resisting Cast Steel	HRSC
	High Manganese Cast Steel	HMnSC
	Cast Steel for High Temperature and High Pressure Service	SCPH
Casting	Brass Casting	BsC
	High Strength Brass Casting	HBsC
	Bronze Casting	BrC
	Phosphoric Bronze Casting	PCB
	Aluminum Bronze Casting	AlBC
	Aluminum Alloy Casting	ACxA
	Magnesium Alloy Casting	MgC
	Zinc Alloy Die Casting	ZnDC
	Aluminum Alloy Die Casting	Aℓ DC
	Magnesium Alloy Die Casting	MgDC
	White Metal	WM
	Aluminum Alloy Casting for Bearing	AM
	Brass Alloy Casting for Bearing	KM

SI unit conversion table

Major SI unit conversion table

Force

N	kgf	dyn
1	1.01972×10^{-1}	1×10^{-5}
9.80665	1	9.80665×10^{5}
1×10^{-5}	1.01972×10^{-6}	1

Stress

Pa or N/m²	MPa or N/mm²	kgf/mm²	kgf/cm²	kgf/m²
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}	1.01972×10^{-1}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10	1.01972×10^{5}
9.80665×10^{6}	9.80665	1	1×10^{2}	1×10^{6}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1	1×10^{4}
9.80665	9.80665×10^{-6}	1×10^{-6}	1×10^{-4}	1

Pressure

Pa	kPa	MPa	bar	kgf/cm²
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}
1×10^{3}	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}
1×10^{6}	1×10^{3}	1	1×10	1.01972×10
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.01972
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-1}	1

Work, Energy, Calorie

J	kW·h	kgf·m	kcal
1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
3.60000×10^{6}	1	3.67098×10^{5}	8.60000×10^{2}
9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.26858×10^{2}	1

Power

W	kW	kgf·m/s	PS	kcal/h
1	1×10^{-3}	1.01972×10^{-1}	1.35962×10^{-3}	0.860
1×10^{3}	1	1.01972×10^{2}	1.359 62	8.60000×10^{2}
9.81 65	9.80665×10^{-3}	1	1.33333×10^{-2}	8.433 71
7.355×10^{2}	7.355×10^{-1}	7.5×10	1	6.32529×10^{2}
1.16279	1.16279×10^{-3}	1.18572×10^{-1}	1.58095×10^{-3}	1

Specific heat

J/(kg·K)	kcal/(kg·°C) cal/(g·°C)
1	2.38889×10^{-4}
4.18605×10^{3}	1

Thermal conductivity

W/(m·k)	kcal/(h·m·°C)
1	8.6000×10^{-1}
1.16279	1

Revolution per minute

min⁻¹	s⁻¹	r.p.m.
1	0.0167	1
60	1	60

Hardness calculating table

Work piece hardness calculating table

Vickers 50kgf HV	Brinell 3000kgf HB		Rockwell				Shore HS	Tensile strength (approximate value) MPa (1)
	Standard ball 10㎜	Cemented carbide ball 10㎜	A scale 60kgf Diamond particle HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf Diamond particle HRC	D scale 100kgf Diamond particle HRD		
940	-	-	85.6	-	68.0	76.9	97	
920	-	-	85.3	-	67.5	76.5	96	
900	-	-	85.0	-	67.0	76.1	95	
880	-	(767)	84.7	-	66.4	75.7	93	
860	-	(757)	84.4	-	65.9	75.3	92	
840	-	(745)	84.1	-	65.3	74.8	91	
820	-	(733)	83.8	-	64.7	74.3	90	
800	-	(722)	83.4	-	64.0	74.8	88	
780	-	(710)	83.0	-	63.3	73.3	87	
760	-	(698)	82.6	-	62.5	72.6	86	
740	-	(684)	82.2	-	61.8	72.1	84	
720	-	(670)	81.8	-	61.0	71.5	83	
700	-	(656)	81.3	-	60.1	70.8	81	
690	-	(647)	81.1	-	59.7	70.5	-	
680	-	(638)	80.8	-	59.2	70.1	80	
670	-	630	80.6	-	58.8	69.8	-	
660	-	620	80.3	-	58.3	69.4	79	
650	-	611	80.0	-	57.8	69.0	-	
640	-	601	79.8	-	57.3	68.7	77	
630	-	591	79.5	-	56.8	68.3	-	
620	-	582	79.2	-	56.3	67.9	75	
610	-	573	78.9	-	55.7	67.5	-	
600	-	564	78.6	-	55.2	67.0	74	
590	-	554	78.4	-	54.7	66.7	-	2055
580	-	545	78.0	-	54.1	66.2	72	2020
570	-	535	77.8	-	53.6	65.8	-	1985
560	-	525	77.4	-	53.0	65.4	71	1950
550	(505)	517	77.0	-	52.3	64.8	-	1905
540	(496)	507	76.7	-	51.7	64.4	69	1860
530	(488)	497	76.4	-	51.1	63.9	-	1825
520	(480)	488	76.1	-	50.5	63.5	67	1795
510	(473)	479	75.7	-	49.8	62.9	-	1750
500	(465)	471	75.3	-	49.1	62.2	66	1705
490	(456)	460	74.9	-	48.4	61.6	-	1660
480	488	452	74.5	-	47.7	61.3	64	1620
470	441	442	74.1	-	46.9	60.7	-	1570
460	433	433	73.6	-	46.1	60.1	62	1530
450	425	425	73.3	-	45.3	59.4	-	1495
440	415	415	72.8	-	44.5	58.8	59	1460
430	405	405	72.3	-	43.6	58.2	-	1410
420	397	397	71.8	-	42.7	57.5	57	1370
410	388	388	71.4	-	41.8	56.8	-	1330
100	379	379	70.8	-	40.8	56.0	55	1290
390	369	369	70.3	-	39.8	55.2	-	1240
380	360	360	69.8	(100.0)	38.8	54.4	52	1205
370	350	350	69.2	-	39.9	53.6	-	1170
360	341	341	68.7	(109.0)	36.6	52.8	50	1130
350	331	331	68.1	-	35.5	51.9	-	1095
340	322	322	67.6	(108.0)	34.4	51.1	47	1070
330	313	313	67.0	-	33.3	50.2	-	1035

Vickers 50kgf HV	Brinell 3000kgf HB		Rockwell				Shore HS	Tensile strength (approximate value) MPa (1)
	Standard ball 10㎜	Cemented carbide ball 10㎜	A scale 60kgf Diamond particle HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf Diamond particle HRC	D scale 100kgf Diamond particle HRD		
320	303	303	66.4	(107.0)	32.2	49.4	45	1005
310	294	294	65.8	-	31.0	48.4	-	980
300	284	284	65.2	(105.5)	29.8	47.5	42	950
295	280	280	64.8	-	29.2	47.1	-	935
290	275	275	64.5	(104.5)	28.5	46.5	41	915
285	270	270	64.2	-	27.8	46.0	-	905
280	265	265	63.8	(103.5)	27.1	45.3	40	890
275	261	261	63.5	-	26.4	44.9	-	875
270	256	256	63.1	(102.0)	25.6	44.3	38	855
265	252	252	62.7	-	24.8	43.7	-	840
260	247	247	62.4	(101.0)	24.0	43.1	37	825
255	243	243	62.0	-	23.1	42.2	-	805
250	238	238	61.6	99.5	22.2	41.7	36	795
245	233	233	61.2	-	21.3	41.1	-	780
240	228	228	60.7	98.1	20.3	40.3	34	765
230	219	219	-	96.7	(18.0)	-	33	730
220	209	209	-	95.0	(15.7)	-	32	695
210	200	200	-	93.4	(13.4)	-	30	670
200	190	190	-	91.5	(11.0)	-	29	635
190	181	181	-	89.5	(8.5)	-	28	605
180	171	171	-	87.1	(6.0)	-	26	580
170	162	162	-	85.0	(3.0)	-	25	545
160	152	152	-	81.7	(0.0)	-	24	515
150	143	143	-	78.7	-	-	22	490
140	133	133	-	75.0	-	-	21	455
130	124	124	-	71.2	-	-	20	425
120	114	114	-	66.7	-	-	-	390
110	105	105	-	62.3	-	-	-	-
100	95	95	-	56.2	-	-	-	-
95	90	90	-	52.0	-	-	-	-
90	86	86	-	48.0	-	-	-	-
85	81	81	-	41.0	-	-	-	-

Note) 1. 1MPa = 1N/㎟
2. The number In the blank is not generally used ranges

Properties of KORLOY grades

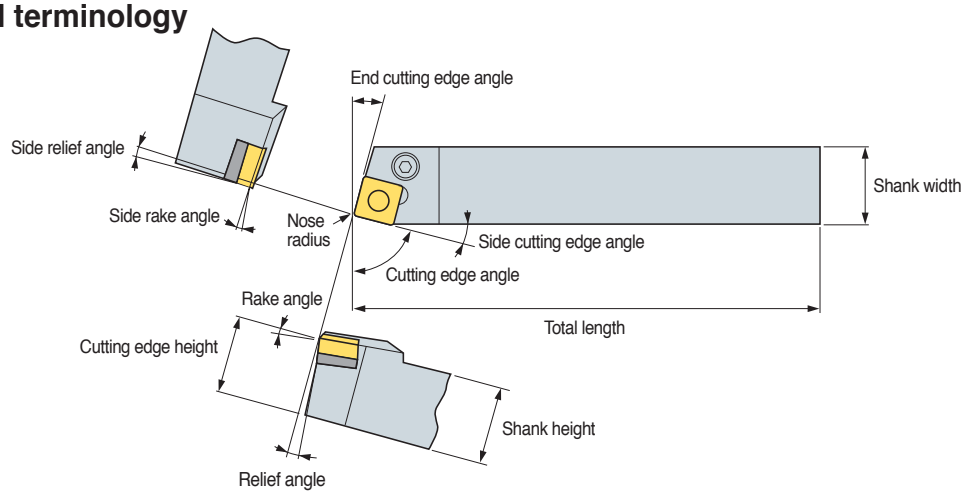
Physical properties of KORLOY grades

Application	ISO Classification symbol		KORLOY grades	Specific gravity (g/㎤)	Hardness (HRA)	TRS (kgf/㎟)	Compressive strength (kg/㎟)	Young's modulus (10^3kgf/㎟)	Thermal expansion coefficient (10^{-6}/°C)	Thermal conductivity (cal/㎝sec°C)
Grades for cutting tools	P	P01	ST05	10.6	92.7	140	440	-	-	-
		P10	ST10	10.0	92.1	175	460	48	6.2	25
		P20	ST20	11.8	91.9	200	480	56	5.2	42
		P30	ST30A	12.2	91.3	230	500	53	5.2	-
	M	M10	U10	12.9	92.4	170	500	47	-	-
		M20	U20	13.1	91.1	210	500	-	-	88
		M30	ST30A	12.2	91.3	230	500	53	5.2	-
		M40	A40	13.3	89.2	270	440	-	-	-
	K	K01	H02	14.8	93.2	185	-	61	4.4	105
		K10	H01	13.0	92.9	210	570	66	4.7	109
		K20	G10	14.7	90.9	250	500	63	-	105
Ultra fine grain alloy	Z	Z10	FA1	14.1	91.4	290	-	58	5.7	-
		Z20	FCC	12.5	91.3	235	-	-	-	-
Grade for tungsten carbide wear parts	V	V1	D1	15.0	92.3	205	520	-	-	-
		V2	D2	14.8	90.9	250	150	-	-	-
		V3	D3	14.6	89.7	310	410	-	-	-
		V4	G5	14.3	89.0	320	380	-	-	-
		V5	G6	14.0	87.7	350	330	-	-	-
Grade for mining and civil engineering tools	E	E1	GR10	14.8	90.9	220	-	-	-	-
		E2	GR20	14.8	90.3	240	-	-	-	-
		E3	GR30	14.8	89.0	270	-	-	-	-
		E4	GR35	14.8	88.2	270	-	-	-	-
		E5	GR50	14.5	87.0	300	-	-	-	-

The physical properties of element

Element	Specific gravity (g/㎤)	Hardness (HB)	Young's modulus (×10^3kgf/㎟)	Thermal conductivity (cal/㎝sec°C)	Thermal expansion coefficient (×10^{-6}/°C)	Melting point (°C)
WC	15.6	2,150	70	0.3	5.1	2,900
TiC	4.94	3,200	45	0.04	7.6	3,200
TaC	14.5	1,800	29	0.05	6.6	3,800
NbC	8.2	2,050	35	0.04	6.8	3,500
TiN	5.43	2,000	26	0.07	9.2	2,950
Al_2O_3	3.98	3,000	42	0.07	8.5	2,050
cBN	3.48	4,500	71	3.1	4.7	-
Diamond	3.52	9,000	99	5.0	3.1	-
Co	8.9	-	10~18	0.165	12.3	1,495
Ni	8.9	-	20	0.22	13.3	1,455

Insert shape and terminology

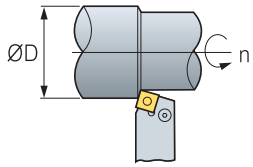


Relating angles between tool and workpiece

Cutting edge inclination	Terminology	Function	Effect
Rake angle	Side rake angle Rake angle	• Cutting force, Cutting heat, The effects of chip control on tool life	• (+): Excellent machine-ability(reducing cutting force, weakening cutting edge strength) • (+): When machining excellent machine-ability or thin workpiece • (-): When strong cutting edge is needed at interrupted condition or mill scale
Relief angle	Relief angle Side relief angle	• Only cutting edge contact with cutting face	• (-): Cutting edge is strong but has short tool life to make bad influence on flank wear
Cutting edge angle	Cutting edge angle	• Affects chip control and cutting force direction	• (+): Improved chip control because chip thickness is big
	Side cutting edge angle	• Affects chip control and cutting force direction	• (+): Strong cutting edge due to distributed cutting force but chip control is bad by thin chip thickness • (-): Improved chip performance
	End cutting edge angle	• Prevent friction between cutting edge and cutting face	• (-): Cutting edge is strong but has short tool life to make bad influence on flank wear

Calculation formulas for machining

Cutting speed



$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}$$

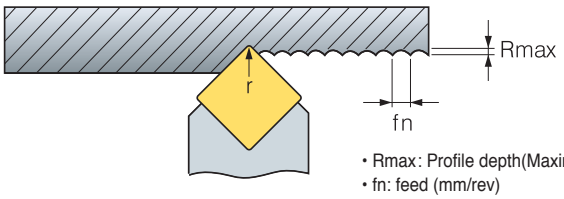
- vc: Cutting speed (m/min)
- D: Diameter (mm)
- n: Revolution per minute (min^{-1})
- π: Circular constant (3.14)

Feed

$$fn = \frac{vf}{n} \text{ (mm/rev)}$$

- fn: Feed per revolution (mm/rev)
- vf: Table feed (mm/min)
- n: Revolution per minute (min^{-1})

Surface finish



- Rmax: Profile depth(Maximum height roughness) (μ)
- fn: feed (mm/rev)
- r : nose radius

- Theoretical surface roughness

$$Rmax = \frac{fn^2}{8r} 1000(\mu m)$$

- Practical surface roughness

Steel: Rmax × (1.5~3)
Cast iron: Rmax × (3~5)

Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \qquad P_{HP} = \frac{P_{kw}}{0.75} \qquad Q = \frac{vc \times fn \times ap}{1000}$$

- P_{KW}: Power requirement [kW]
- P_{HP}: Power requirement (horse power) [HP]
- vc: Cutting speed [m/min]
- ap: Depth of cut [mm]
- fn: Feed per revolution [mm/rev]
- kc: Specific cutting resistance [kg/mm²]
- η: Machine efficiency rate (0.7~0.8)

Rough Kc	
Mild steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, Brass	70

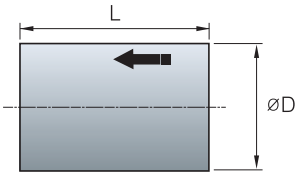
Material removal rate

$$Q\ (cm^3/min) = vc \times ap \times fn$$

- Q: Material removal rate [cm^3/min]
- ap: Depth of cut [mm]
- vc: Cutting speed [m/min]
- fn: Feed per revolution [mm/rev]

● Machining time

External face machining 1



Constant revolution per minute

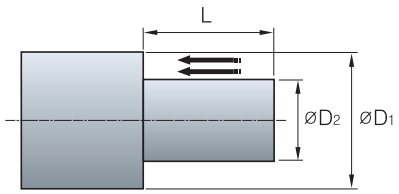
$$T = \frac{60 \times L}{fn \times n}$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times fn \times vc}$$

T: Machining time [sec]
L: Cutting length [mm]
fn: Feed per revolution [mm/rev]
n: Revolution per minute [min^{-1}]
D: Diameter of workpiece [mm]
vc: Cutting speed [m/min]

External face machining 2



Constant revolution per minute

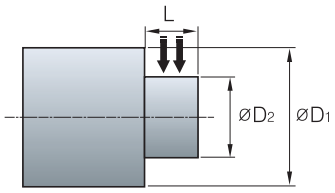
$$T = \frac{60 \times L}{fn \times n} \times N$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1000 \times fn \times vc} \times N$$

T: Machining time [sec]
L: Cutting length [mm]
fn: Feed per revolution [mm/rev]
n: Revolution per minute [min^{-1}]
D1: Maximum diameter of workpiece [mm]
D2: Minimum diameter of workpiece [mm]
vc: Cutting speed [m/min]
N: The number of pass = (D1-D2)/d/2

Facing



Constant revolution per minute

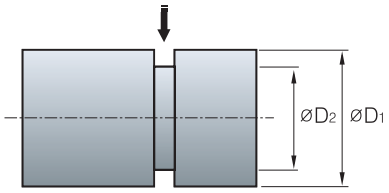
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n} \times N$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times fn \times vc} \times N$$

T: Machining time [sec]
T1: Machining time before the maximum rpm[sec]
L: Width of machining [mm]
fn: Feed per revolution [mm/rev]
n: Revolution per minute [min^{-1}]
D1: Maximum diameter of workpiece [mm]
D2: Minimum diameter of workpiece [mm]
vc: Cutting speed [m/min]
N: The number of pass = (D1-D2)/d/2

Grooving



Constant revolution per minute

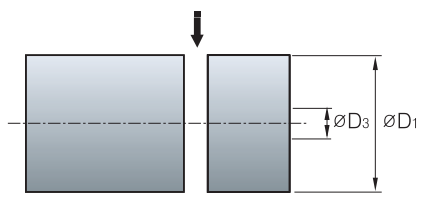
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times fn \times vc}$$

T: Machining time [sec]
T1: Machining time before the maximum rpm[sec]
L: Width of machining [mm]
fn: Feed per revolution [mm/rev]
n: Revolution per minute [min^{-1}]
D1: Maximum diameter of workpiece [mm]
D2: Minimum diameter of workpiece [mm]
vc: Cutting speed [m/min]

Parting



Constant revolution per minute

$$T = \frac{60 \times D_1}{2 \times fn \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3)\ (D_1 - D_3)}{4000 \times fn \times vc}$$

$$T_3 = T_1 + \frac{60 \times D_3}{2 \times fn \times n_{max}}$$

T: Machining time [sec]
T1: Machining time before the maximum rpm[sec]
T3: Machining time till maximum RPM[sec]
fn: Feed per revolution [mm/rev]
n: Revolution per minute [min^{-1}]
nmax: Maximum revolution per minute [min^{-1}]
D1: Maximum diameter of workpiece [mm]
D3: Maximum diameter at maximum RPM [mm]
vc: Cutting speed [m/min]

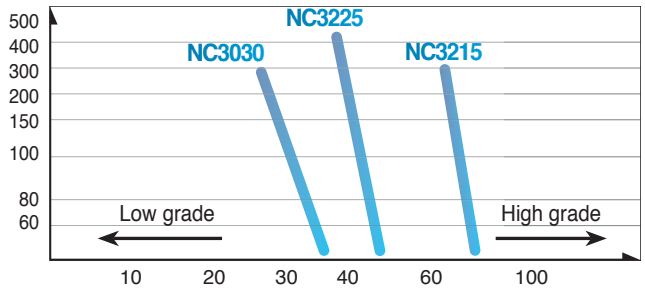
The affects of cutting condition

• The most desirable machining means short machining time, long tool life and good precision
This is the reason that proper cutting condition for each tools should be selected according to material's properties, hardness, shapes, the efficiency of machine

Cutting speed

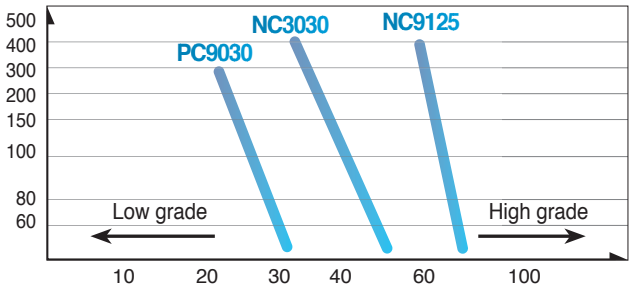
• **Workpiece:** S45C (180HB)
• **Tool life criterion:** VB = 0.2 mm
• **Depth of cut:** 1.5 mm
• **Feed:** 0.3 mm/rev
• **Holder:** PCLNR2525-M12
• **Insert:** CNMG120408, Dry cutting

(The tool life feature of P grade)



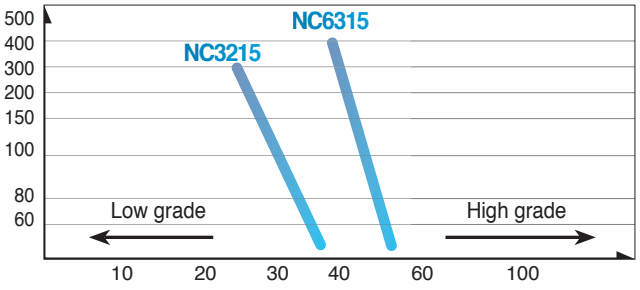
• **Workpiece:** STS304 (200HB)
• **Tool life criterion:** VB = 0.2 mm
• **Depth of cut:** 1.5 mm
• **Feed:** 0.3 mm/rev
• **Holder:** PCLNR2525-M12
• **Insert:** CNMG120408, Dry cutting

(The tool life feature of M grade)



• **Workpiece:** GC300 (180HB)
• **Tool life criterion:** VB = 0.2 mm
• **Depth of cut:** 1.5 mm
• **Feed:** 0.3 mm/rev
• **Holder:** PCLNR2525-M12
• **Insert:** CNMG120408, Dry cutting

(The tool life feature of K grade)



Cutting Speed's effects

• When the cutting speed increases up to 20% in an application, the tool life respectively decreases down 50%
Although inversely, if the cutting speed increases up to 50% the tool life decreases 20%. On the other hand if cutting speed is too low (20-40m/min) Tool life shortens due to vibration

Feed

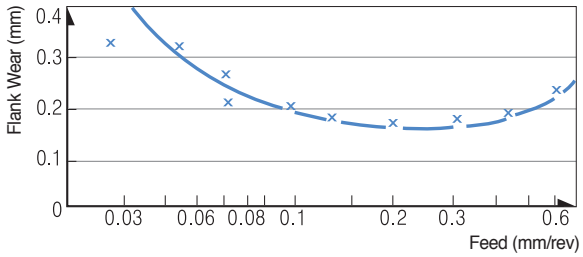
- The feed rate in turning means the progressed interval of a distance in a work piece within 1 revolution
  The feed rate in a milling application means the table feed divided by number of teeth of cutter (feed rate per tooth)

The effects of feed

- When the feed rate decreases the flank wear is increased. When the feed rate is too low, the tool life shortens radically
- When the feed rate increases, the flank wear increases due to high temperatures, however the feed rates effects tool life less than the cutting speed. And higher feed rates improve machining efficiency

(Relationship between feed and flank wear in steel turning)

- **Workpiece:** SNCN431
- **Grade:** ST20
- **Cutting speed:** 200 m/min
- **Depth of cut:** 1.0 mm
- **Cutting time:** 10 mm

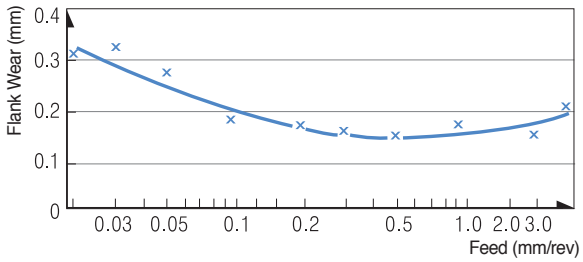


Depth of cut

- Determined by the required allowances in machining a material and the capacity the machine can tolerate
  There are cutting limits according to the different shapes and sizes of the insert

(Relationship between depth of cut and flank wear in steel turning)

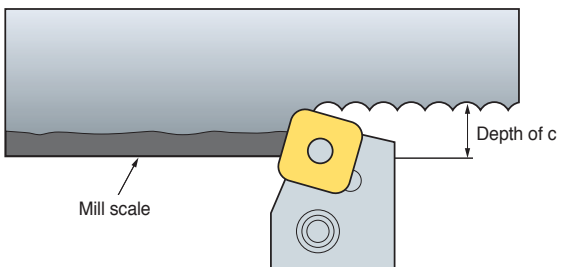
- **Workpiece:** SNCN431
- **Grade:** ST20
- **Cutting speed:** 200 m/min
- **Feed:** 0.2 mm/rev
- **Cutting time:** 10 mm



The effect of a depth of cut

- The depth of cut does not have a big influence on tool life
- When the depth of cut is small the work piece is not cut but rather rubbed. In these cases, machine off the work hardened parts that decrease tool life
- When machining a cast skin or milling scale smaller depth of cuts usually cause chipping and abnormal wear because of hard impurities in the surface of the work piece

(Surface parts including mill scale Roughing)



Relief angle

• Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily

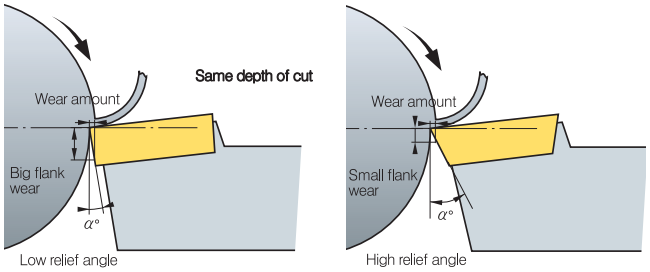
● Relationship between various relief angle and flank wear

Affects

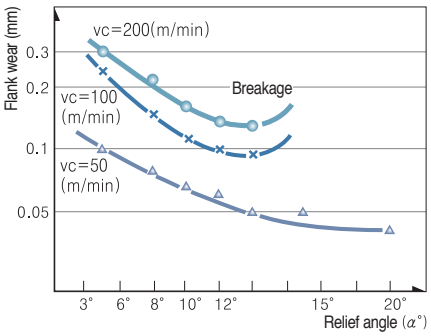
1. If relief angle is big Flank wear decreases
2. If relief angle is big Cutting edge strength weakens
3. If relief angle is small Chattering occurs

Selection system

1. Hard workpiece/When strong cutting edge is needed
   - Low relief angle
2. Soft workpiece/Workpiece turning to work hardening easily
   - High relief angle



- **Workpiece:** SNCM431 (HB)
- **Grade:** P20
- **Depth of cut:** 1 mm
- **Feed:** 0.32 mm/rev
- **Cutting time:** 20 mm



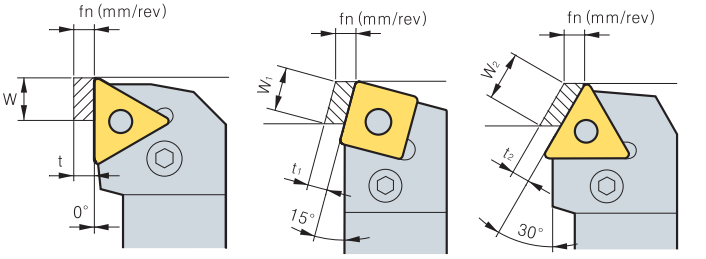
Side cutting edge angle

• Side cutting edge angle has big influence on chip flow and cutting force therefore proper Side cutting edge angle is very important

● Side cutting edge angle and chip thickness

- As side cutting edge angle is getting bigger chips are getting thinner and wider (refer to left picture)
- At the same feed and depth of cut with approach angle 0˚ Chip thickness is the same as feed (t = fn) and chip width is equal to depth of cut (W=ap)

$t_1 = 0.97t$, $W_1 = 1.04W$
$t_2 = 0.87t$, $W_2 = 1.15W$



① Approach angle 0˚ ② Approach angle 15˚ ③ Approach angle 30˚

● Side cutting edge angle and 3 cutting forces

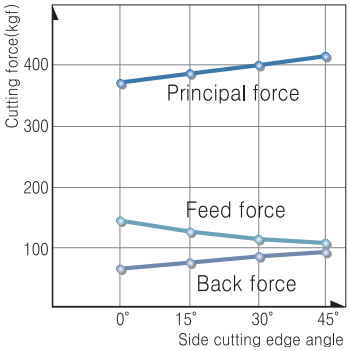
Affects

1. Big side cutting edge angle with the same feed makes chip attaching length longer and chip thickness thinner. So that cutting forces scatter to long cutting edge therefore tool life gets longer
2. Big side cutting edge angle for machining long bars can cause bending

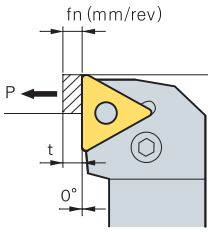
Selection system

1. Deep depth of cut finishing/Long thin workpiece/Low machine rigidity
   - Side cutting edge angle
2. Hard and high calorific power workpiece/Roughing big workpiece/ High machine rigidity - Side cutting edge angle

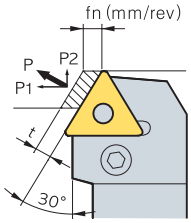
- **Workpiece :** SCM440 (HB250)
- **Grade:** TNGA220412
- **vc:** 100 mm/min
- **ap:** 4 mm
- **fn:** 0.45 mm/rev



● Side cutting edge angle and cutting load



① "Force P is loaded."

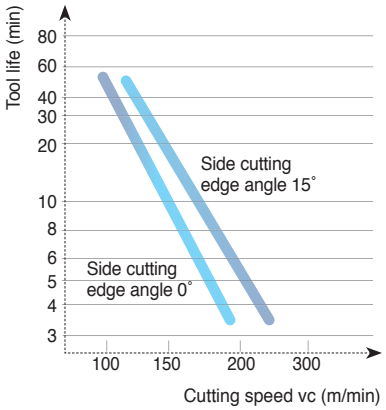


② "Force P is scattered to P1, P2."

As approach angle gets bigger Back force gets bigger and feed force gets smaller

● Side cutting edge angle and tool life

- **Workpiece:** SCM440
- **Grade:** P20
- **Depth of cut:** 3 mm
- **Feed:** 0.2 mm/rev



● Side cutting edge angle and cutting performance

Specification	Low ← Approach angle → High
Wear rate	High ⋯⋯ Low
Workpiece	Easy to cut material ⋯⋯ Difficult to cut material
Machining power	Small ⋯⋯ Big
Chatter	Hard to occur ⋯⋯ Easy to occur
How to machine	Finishing ⋯⋯ Roughing
Workpiece rigidity	Long thin workpiece ⋯⋯ Thick workpiece
Machine rigidity	In case of low rigidity ⋯⋯ In case of high rigidity

End cutting edge angle

- It affects machined surface to prevent interference between surface of workpiece and insert

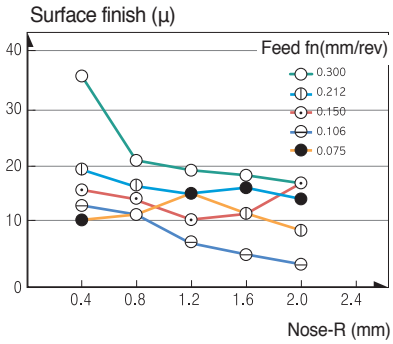
Affects

1. If end cutting edge angle reduces cutting edge get stronger but cutting heat generated by machining increases
2. Small end cutting edge angle can cause chattering due to the increases cutting force

Nose-R

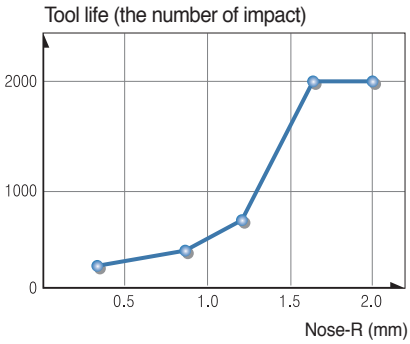
- Nose-R affects not only surface roughness but strength of cutting edge
- In general, It's desirable that Nose-R is 2~3 times bigger than feed

● Nose R and surface finish



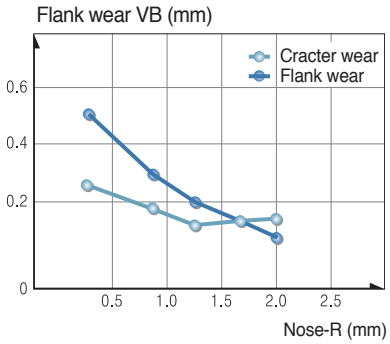
- **Workpiece:** SNCM439, HB200
- **Grade:** P20
- **vc:** 120 mm/min
- **ap:** 0.5 mm

● Nose R and tool life



- **Workpiece:** SCM440, HB280
- **Grade:** P10
- **vc:** 100 mm/min, **ap:** 0.5 mm
- **fn:** 0.3 mm/rev

● Nose R and wear of tool

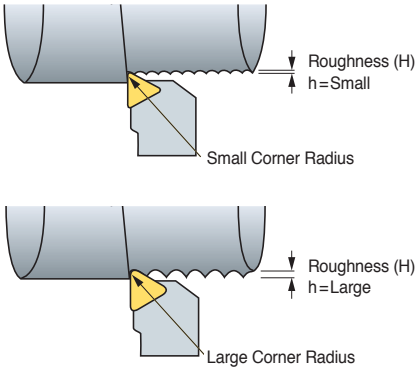


- **Workpiece:** SNCM439, HB200
- **Grade:** P10
- **vc:** 140 mm/min, **ap:** 2 mm
- **fn:** 0.2 mm/rev, **T:** 10 min

Nose-R

Affects

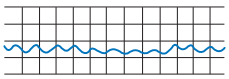
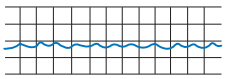
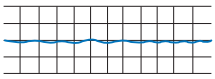
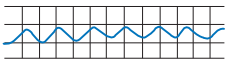
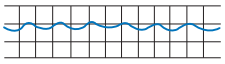
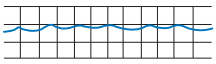
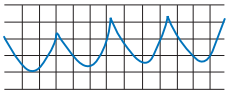
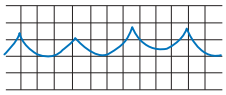
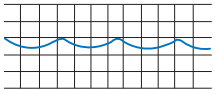
1. Big Nose-R improves surface finish
2. Big Nose-R improves cutting edge strength
3. Big Nose-R reduces flank wear and crater wear
4. Too big Nose-R causes chattering due to increased cutting force



Selection system

1. For finishing with small depth of cut/long and thin workpiece/ When machine power is low - Small Nose-R
2. For applications that need strong cutting edge such as intermittent and machining mill scale/For roughing of big workpiece/When the machine power is strong eough - Big Nose-R

● Relationship between nose radius, feed and various surface roughness

Feed (mm/rev) \ Nose R	0.4	0.8	1.2
0.15			
0.26			
0.46			

Cutting edge shape and the affects

● Rake angle (α)

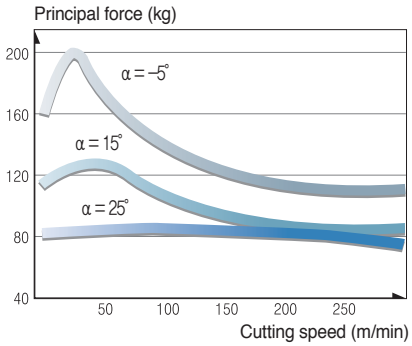
Rake angle has big influence on cutting force, chip flow and tool life

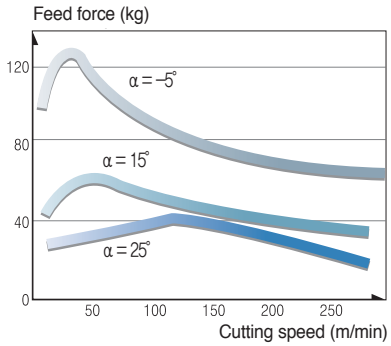
Affects

1. High rake angle results in good suface finish
2. As the rake angle increases by 1° Machining power decreases by 1%.
3. High rake angle weakens cutting edge

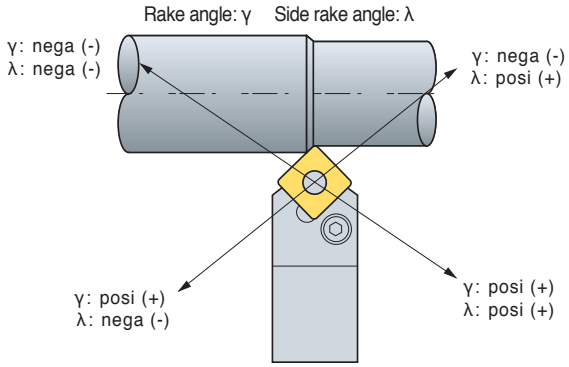
Selection system

1. For hard workpiece/For applications that need strong cutting edge such as interrupted and machining mill scale - Low rake angle
2. For soft workpiece/Easy to cut material/When the rigidity of machine power and workpiece is low - High rake angle

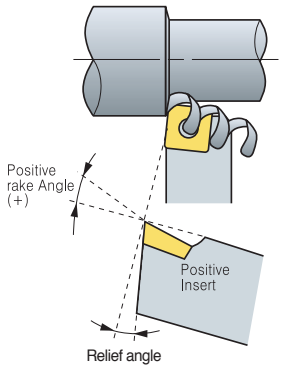


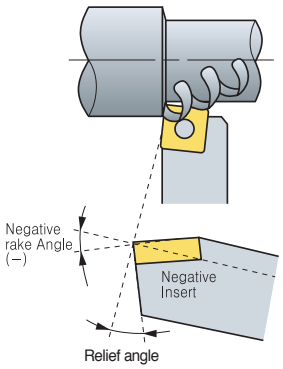


● Rake angle and the direction of chip flow



In order to prevent machined surface from damages Avoid nega, posi combination. γ: nega (-) λ: posi (+)





Selecting proper tools

• Nowadays, It's very difficult to select the best tools in complicating tooling system and various cutting conditions However, It can be simplified by classifying basic factors below

● Selection of inserts and tool holder

Listed below is the basic factors and choose B according to A

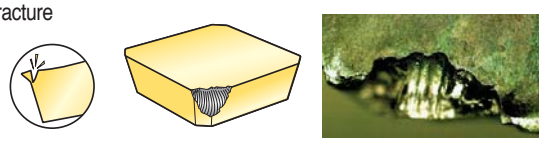
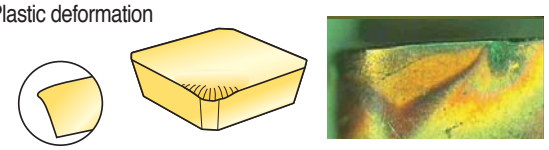
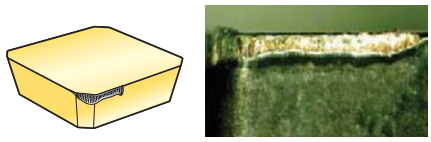
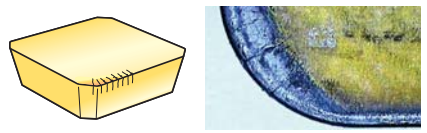
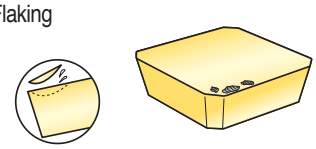
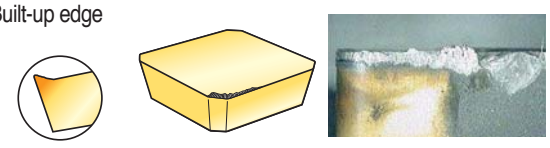
A : Basic factors

· Workpiece material
· Workpiece shape
· Workpiece size
· Hardness of workpiece
· Surface roughness of workpiece (before machining)
· Surface finish required
· Type of lathe machine
· Condition of lathe machine (rigidity, power etc)
· Horse power of machine
· Clamping method of workpiece

B : Selection system

① Select as big approach angle as possible
② Select as big shank as possible
③ Select as strong cutting edge of insert as possible
④ Select as big nose radius as possible
⑤ In finishing, Select the insert using many corners
⑥ Select as small insert as possible
⑦ Cutting speed should be determined carefully according to cutting conditions
⑧ Select as deep depth of cut as possible
⑨ Select as fast feed as possible
⑩ Cutting condition should be determined within chip breaker application ranges

Trouble shooting

Tool failure	Cause	Solution
Crater wear 	• Improper grade • Excessive cutting condition	• Choose harder grade • Decrease cutting condition
Fracture 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honed or chamfered edge • Choose bigger size holder
Plastic deformation 	• Improper grade • Excessive cutting condition • High cutting temperature	• Choose harder grade • Decrease cutting condition • Choose grade wich heat conductivity are big
Wear on nose radius (Flank wear) 	• When the hardness of workpiece is too high compare with tool • When machinig surface hardened workpiece • Improper grade • Excessive cutting speed • Too small relief angle • Too low feed	• Choose harder grade • Decrease cutting speed • Choose lager relief angle • Increase feed
Thermal crack 	• Expansion and shrinking by cutting temperature • Improper grade (*Specially milling operation)	• Apply to dry cutting (In case of wet cutting, use enough coolant) • Choose tougher grade
Chipping 	• Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder	• Choose tougher grade • Decrease feed • Apply to large honing or chamfer edge • Choose bigger size holder
Notch wear 	• Surface hardened workpiece • Friction due to bad chip geometry (Generate vibration)	• Choose harder grade • Improve chip control form large rake angle
Flaking 	• Deposition on cutting edge • Bad chip control	• Improve cutting performance fromd large rake angle • Apply to chip pocket with big size
Complete breakage 	• Unusable condition due to wear off the most parts of cutting edge by progress of wear	• Reduce the feed rate. • Reduce the depth of cut. • Select a tougher grade. • Select a stronger chipbreaker. • Select a thicker insert.
Built-up edge 	• Slow cutting speed • Sticky materials	• Increase cutting speed. • Use more positive rake geometry. • Use tougher grade

Types of tool failure and trouble shooting

Troubles	Causes	Solution																		
		Cutting conditions				Selecting insert grade				Tool shape								Machine clamping		
		Cutting speed	Feed	Depth of cut	Coolant	Select harder grade	Select tougher grade	Select better heat-impact resistance grade	Select better adhesion resistance grade	Chip breaker valuation	Rake angle	Nose radius	Side cutting edge angle	Cutting edge strength Honing	Improving insert precision M class → G class	Improving holder rigidity	Clamping workpiece	Holder overhang	Machine vibration
Poor precision Unstable machining size	Insert precision is variable														●				
	Workpiece, Separation of tool									●	⬆	⬇				●	●	●	●
Cutting edge back thrust is big It's necessary to adjust because machining precision changes during operation.	Flank wear increase					●						⬆							
	Cutting condition is improper	⬇	⬆			●													
Poor surface roughness for finishing Criterion of tool life.	Weakened cutting force by increasing wear of tool	⬇			Wet cutting				●	●	⬆	⬆		⬇	●				
	Cutting edge chipping		⬇	⬇			●			●		⬆		⬆			●	●	●
	Adhesion, built-up edge	⬆	⬆		Wet cutting				●	●	⬆			⬇	●				
	Improper cutting conditions	⬆	⬇	⬇	Wet cutting														
	Improper tool and shape of cutting edge									●		⬆		⬇	●				
	Vibration, chattering	⬇	⬇	⬇	Wet cutting		●			●	⬆	⬇		⬇		●	●	●	●
Cutting heat generation Poor machining precision and short tool life by cutting heat	Improper cutting conditions	⬇	⬇	⬇		●													
	Improper tool and shape of cutting edge									●	⬆			⬇					
Burr, chipping, nap steel, aluminum (burr)	Improper cutting conditions	⬇	⬆		Wet cutting	●													
	Wear on the tool, improper shape of cutting edge								◉	●	⬆	⬇		⬇					
Cast iron (Weak chipping)	Improper cutting conditions		⬇	⬇		●													
	Wear on the tool, improper shape of cutting edge									●	⬆	⬆		⬇		●	●	●	●
Soft steel (nap)	Improper cutting conditions	⬆	⬍		Wet cutting	●													
	Wear on the tool, improper shape of cutting edge								◉	●	⬆			⬇					

⬆: Increase ⬇: Decrease ●: use ◉: Correct use

Tool life criterion

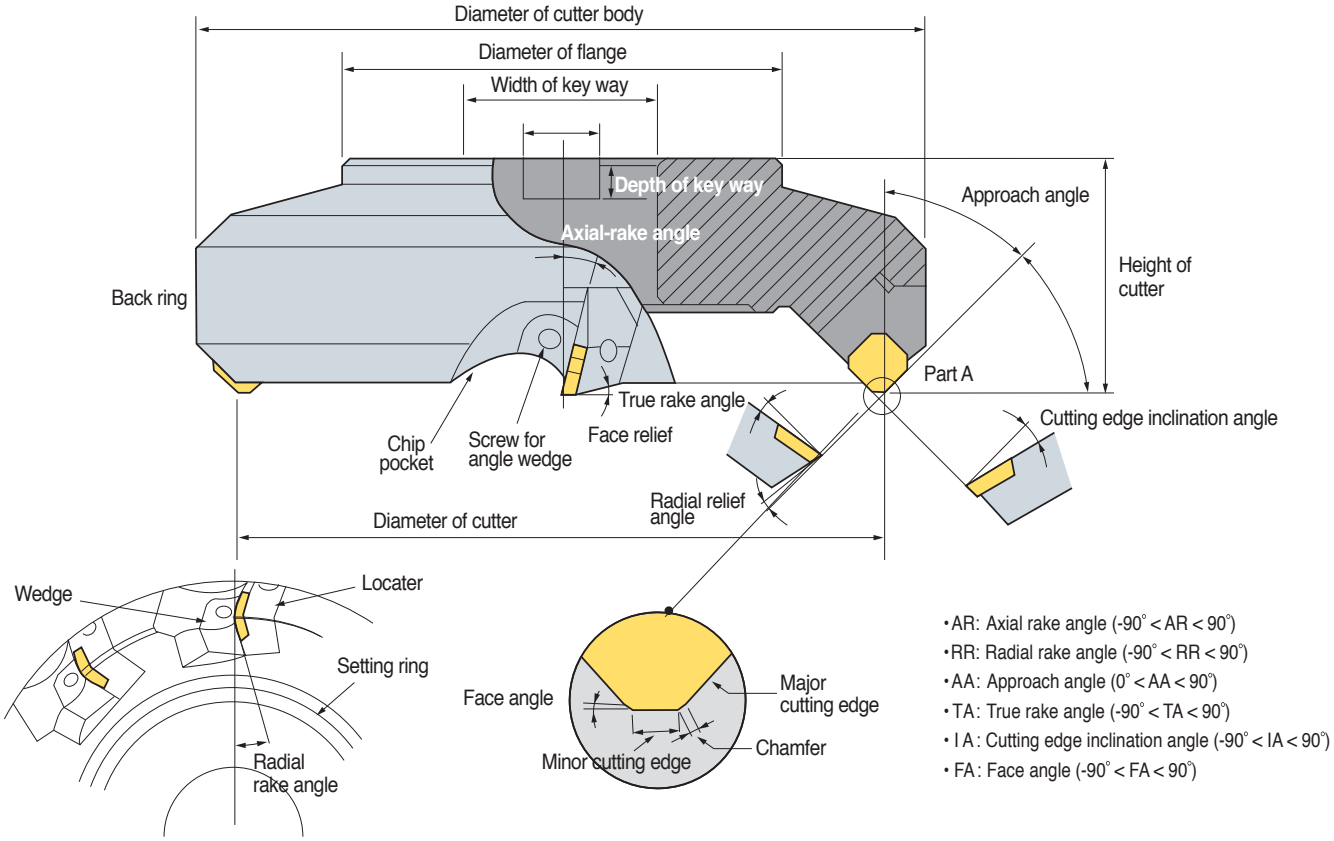
● KS B0813

Flank wear width	0.2 mm	Precision light cutting , Finishing in nonferrous alloy
	0.4 mm	Machining special steel
	0.7 mm	General cutting in cast iron, steel etc
	1~1.25 mm	General cutting in cast iron, steel etc
Depth of crater wear	In general 0.05~0.1 mm	

● ISO (B8688)

Tool life criterion	Application
Complete breakage	Machining special steel
Flank wear width VB = 0.3 mm	Even flank wear of cemented carbides, Ceramic tool
VBmax = 0.5 mm	Uneven flank wear
Crater wear width KT = 0.06+0.3fmm (f:mm/rev)	Cemented carbides tool
Criterion by surface roughness 1, 1.6, 2.5, 4, 6.3, 10㎛Ra	When surface roughness is important

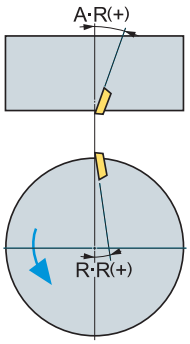
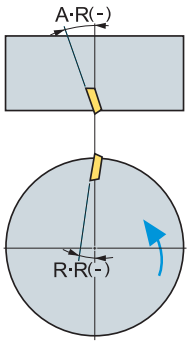
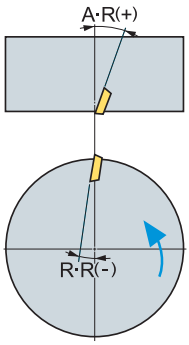
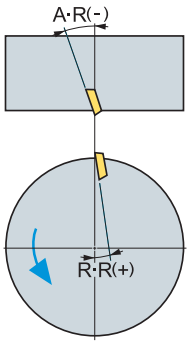
Milling cutter shape and designation



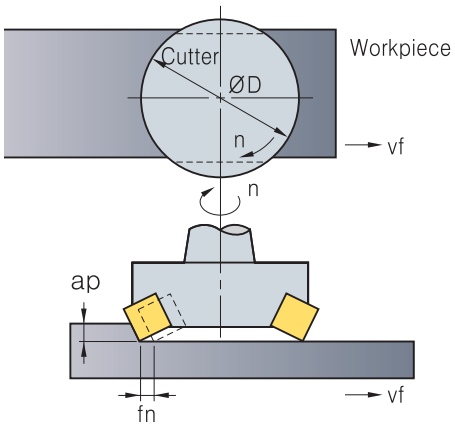
● The terminology and functions of cutting edge angle

No.	Tool failure	Symbol	Function	Effects
1	Axial rake angle	A.R	Chip flow direction, Adhesion	Positive: Excellent cutting, built-up edge prevented
2	Radial rake angle	R.R	Affecting on thrust	Negative: Excellent chip control
3	Approach angle	A.A	Chip thickness, Determines flow direction	(+): Chip thickness become thinner, cutting force could be reduced
4	True rake angle	T.A	Effective rake angle	(+): Better cutting. Preventing adhesion, Weakening cutting edge strength (−): Cutting edge strength increases, easy to adhere
5	Cutting edge inclination angle	I.A	Determines chip flow direction	(+): Good chip flow, cutting force could decreases, Comer edge strength weakens
6	Relief angle	F.A	Controlling cutting edge strenght, tool life and chattering	Surface roughness increases as F.A gets close to 0 degree

Features by combination of rake angle

Division	Double positive angle	Double negative angle	Posi - Negative angle	Nega - Positive angle
				
Use	• General machining of steel, cast iron, stainless steel • Machining soft steel that brings about built-up edge easily • Machining material having tendency to poor surface roughness	• Under interrupted cutting condition • Roughing of cast iron and steel	• Machining difficult to cut material • Roughing with deep depth of cut and wide width of cut in steel and cast iron	• Chip flows to center of cutter body
Advantages	• As for tough workpiece material It prevents built-up edge to improve surface roughness • Low cutting load and better machinability	• Strong cutting edge • Roughing of workpiece that has bad surface condition containing sand, mill scale • Double sided inserts can be applied(Economical) • Good chip control	• Good chip flow and machinability. • Suitable for machining of difficult-to-cut material • Un-even partition clamping prevents chattering	-
Disadvantages	• Weak cutting edge strength • Only single sided inserts are available (No economical) • Machine and cutter need enough power and rigidity	• Machine and cutter need enough power and rigidity	• Only single sided inserts are available (No economical)	• Since the chips flows toward the center of cutter. Chips scratch on machined surface • Bad chip flow • No economical

Major cutting formulas



● Cutting speed

$$vc = \frac{\pi \cdot D \cdot n}{1000} \text{ (m/min)}$$

- vc: Cutting speed (m/min)
- D: Diameter of tool (mm)
- n: Revolution per minute (min^{-1})
- π: Circular constant (3.14)

● Feed

$$fz = \frac{vf}{z \cdot n} \text{ (mm/t)}$$

- fz: Feed per tooth (mm/t)
- vf: Feed per minute (mm/min)
- n: Revolution per minute (min^{-1})
- z: Number of tooth

● Chip removal amount

$$Q = \frac{Lxvfxap}{1000} \text{ (cm^3/min)}$$

- Q: Chip removal amount (cm^3/min)
- L: Width of cut (mm)
- vf: Table feed (mm/min)
- ap: Depth of cut (mm)

● Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta} \qquad P_{hp} = \frac{P_{kw}}{0.75}$$

- Pc: Power requirement (kW)
- H: Horse power requirement (hp) (mm/min)
- Q: Chip removal amount (cm^3/min)
- kc: Specific cutting resistance (kgf/mm^3)
- η: Machine efficiency rate (0.7~0.8)

● Machining time

$$T = \frac{60 \times Lt}{vf} \text{ (sec)}$$

- T: Machining time (sec)
- Lt: Total length of table feed (mm) (= Lw+D+2R)
- Lw: The length of workpiece (mm)
- D: The diameter of cutter body (mm)
- vf: Table feed (mm/min)
- R: Relief length (mm)

● True rake angle/Cutting edge inclination angle

True rake angle: tan (T) = tan (R) x cos (AA) + tan (A) x sin (C)

Cutting edge inclination angle: tan (I) = tan (A) x cos (AA) - tan (R) x sin (C)

Values of specific cutting resistance

Workpiece	Tensile strength (kg/mm²) and hardness	Specific cutting resistance according to various feed kc(MPa)				
		0.1 (mm/t)	0.2 (mm/t)	0.3 (mm/t)	0.4 (mm/t)	0.6 (mm/t)
Soft steel	52	220	195	182	170	158
Medium carbon steel	62	198	180	173	160	157
High carbon steel	72	252	220	204	185	174
Tool steel	67	198	180	173	170	160
Tool steel	77	203	180	175	170	158
Chrome manganese steel	77	230	200	188	175	166
Chrome manganese steel	63	275	230	206	180	178
Chrome molybdenum steel	73	254	225	214	200	180
Chrome molybdenum steel	60	218	200	186	180	167
Nickel Chrome molybdenum steel	94	200	180	168	160	150
Nickel Chrome molybdenum steel	HB352	210	190	176	170	153
Cast steel	52	280	250	232	220	204
Hardened cast iron	HRC46	300	270	250	240	220
Meehanite cast iron	36	218	200	175	160	147
Gray cast iron	HB200	175	140	124	105	97
Brass	50	115	95	80	70	63
Light alloy (Al - Mg)	16	58	48	40	35	32
Light alloy (Al - Si)	20	70	60	52	45	39

Chip removal amount (cm³/min) per rated horse power

Workpiece \ Rated horse power		5Hp	10Hp	20Hp	30Hp	40Hp	50Hp
Steel	Soft	32	75	163	295	425	570
	Medium	26	55	127	212	310	425
	hard	18	41	93	163	228	310
Cast iron	Soft	52	116	260	455	670	880
	Medium	32	75	163	295	425	570
	hard	26	55	127	212	310	425
Bronze Brass	Soft	77	163	390	670	980	1,280
	Medium	54	118	275	490	700	910
	hard	26	55	127	245	325	425
Aluminum		90	195	440	780	1,110	1,500

Selection of MILL-MAX diameter (D)

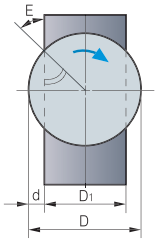
● Selection by machine rigidity

Machine horse power (PS)	10~15	15~20	Over 20
Proper cutter body specification (mm)	Ø80~Ø100	Ø125~Ø160	Ø160~Ø200

● Selection by machine rigidity

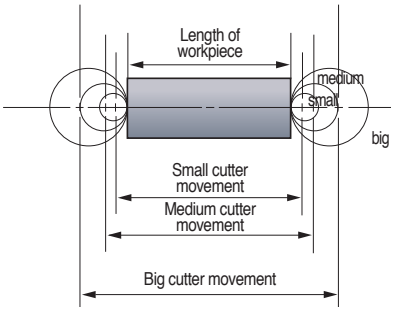
Workpiece	E	δ
Steel	+20°~-10°	3 : 2
Cast iron	Under +50°	5 : 4
Light alloy	Under +40°	5 : 3

D: External diameter of cutter body
D1: Width of workpiece
d: Projected part of cutter body
E: Engage angle
δ: Ratio of cutter body and width of workpiece (D: D1)



● Selection by machining time

The bigger size cutter the longer machining time

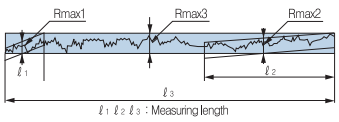
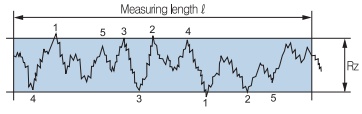
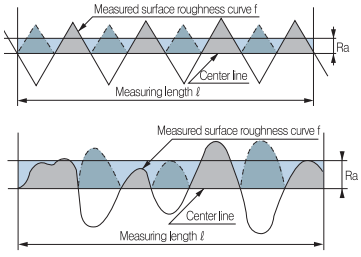


● Selection by number of tooth

Workpiece	Steel	Cast iron	Light alloy
Number of tooth	Dx (1~1.5)	Dx (1~4)	Dx1+α

ex) D = ø100 ⇒ 4" x(1~1.5) = 4~6 D is the size of cutter body converted into inch size

Classification of surface roughness

Type	Symbol	How to calculate	Measured value
Maximum height	Rmax	• The distance between the top of profile peak line and the bottom of profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve (Expressed by unit: μ) • Exclude extraordinary values (too small or big) that look like grooves or mountains	
+10 point mean roughness	Rz	• Sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute value of the highest profile peaks and the depths of five deepest profile valleys measured in the vertical magnification is expressed by micro meter (μ)	
Arithmetic mean roughness	Ra	• Sampling only the reference length from the roughness curve in the direction of mean line , taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and is expressed by micro meter (μ) • Generally, Read measured value by Ra measurer	

Finish mark		▽▽▽▽	▽▽▽	▽▽	▽	~
Surface roughness	Rmax	0.8s	6.3s	25s	100s	Unspecified
	Rz	0.8z	6.3z	25z	100z	
	Ra	0.2a	1.6a	6.3a	25a	

Trouble shooting for milling

Trouble	Causes	Solutions										
		Cutting conditions				Tool shape					Insert grade	
		Cutting speed	Depth of cut	Feed	Coolant	Rake angle	Relief angle	Approach angle	Chattering at cutting edge	Nose radius	Toughness	Hardness
Flank wear	• Improper insert grade • Improper cutting conditions • Chattering	⬇		⬆			⬆	⬇		⬆		⬆
Crater wear	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇	●	⬆	⬆			⬇		⬆
Chipping	• Lack of insert toughness • Excessive feed • Excessive cutting load			⬇		⬇	⬇	⬇		⬆	⬆	
Built-up edge	• Improper cutting conditions • Improper cutting edge shape • Improper insert grade	⬆	⬇			⬆				⬇		
Chattering	• Improper cutting conditions • Lack of number of cutting teeth • Improper cutting edge shape • Bad chip flow • Unstable workpiece clamping		⬇	⬇	●	⬆		⬆	⬇	⬇		
Poor surface finish	• Built-up edge • Improper cutting conditions • Chattering • Bad chip flow	⬆	⬇	⬇	●	⬆			⬇	⬆		
Thermal crack	• Improper cutting conditions • Improper insert grade	⬇	⬇	⬇	◉	⬆				⬆	⬆	
Fracture	• Improper insert grade • Excessive cutting load • Bad chip flow • Chattering • Excessive overhang		⬇	⬇	●						⬆	

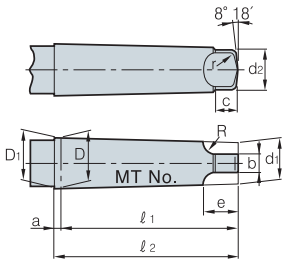
⬆: Increase ⬇: Decrease ●: use ◉: Correct use

General formulas for milling

● Machine efficiency rate (η)

Power transmission mode	Efficiency rate (E)	Reference
Principal axis direct connection driving	0.90	
Belt driving	0.85	Double connection: 0.85 × 0.85 ≒ 0.70
Starting driving	0.75	
Oil pressure driving	0.60~0.90	

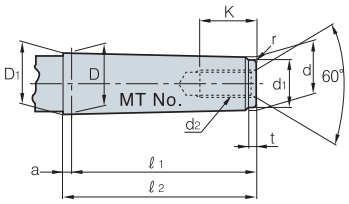
Morse taper (Tang type)



(mm)

MT No.	Taper	Taper angle (α)	D	a	D1	d1	ℓ1	ℓ2	d2	b	c	e	R	r
0	1/19.212	1°29′27″	9.045	3	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1
1	1/20.047	1°25′43″	12.065	3.5	12.240	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5	1.2
2	1/20.020	1°25′50″	17.780	5	18.030	14.034	75.0	80.0	13.5	6.3	10	16	6	1.6
3	1/19.922	1°26′16″	23.825	5	24.076	19.107	94.0	99.0	18.5	7.9	13	20	7	2
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.164	117.5	124.0	24.5	11.9	16	24	8	2.5
5	1/19.002	1°30′26″	44.399	6.5	4.741	36.531	149.5	156.0	35.7	15.9	19	29	10	3
6	1/19.180	1°29′36″	63.348	8	63.765	52.399	210.0	218.0	51.0	19.0	27	40	13	4
7	1/19.231	1°29′22″	83.058	10	83.578	68.186	286.0	296.0	66.8	28.6	35	54	19	5

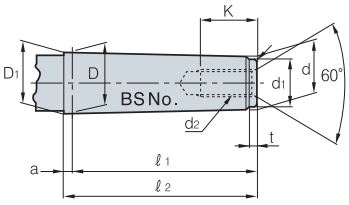
Morse taper (Screw type)



(mm)

MT No.	Taper	Taper angle (α)	D	a	D1	d	ℓ1	ℓ2	d1	d2	k	t	r
0	1/19.212	1°29′27″	9.045	3	9.201	6.442	50	53	6	-		4	0.2
1	1/20.047	1°25′43″	12.065	3.5	12.230	9.396	53.5	57	9	M6	16	5	0.2
2	1/20.020	1°25′50″	17.780	5	18.030	14.583	64	69	14	M10	24	5	0.2
3	1/19.922	1°26′16″	23.825	5	24.076	19.759	81	86	19	M12	28	7	0.6
4	1/19.254	1°29′15″	31.267	6.5	31.605	25.943	102.5	109	25	M16	32	9	1
5	1/19.002	1°30′26″	44.399	6.5	4.741	37.584	129.5	136	35.7	M20	40	9	2.5
6	1/19.180	1°29′36″	63.348	8	63.765	53.859	182	190	51	M24	50	12	4
7	1/19.231	1°29′22″	83.058	10	83.578	70.058	250	260	65	M33	80	18.5	5

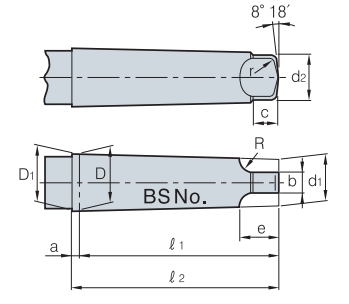
Brown sharp taper (Screw type)



(mm)

B&S No.	D	a	D1	d	d1	ℓ1	ℓ2	t	r	d2	K
4	10.221	2.4	10.321	8.890	8.0	31.0	34.2	2	0.2	-	-
5	13.286	2.4	13.386	11.430	10.0	44.4	46.8	3	0.2	-	-
6	15.229	2.4	15.330	12.700	11.0	60.0	62.7	3	0.2	M 8(1/4)	20
7	18.424	2.4	18.524	15.240	14.0	76.2	78.6	4	0.2	M10(3/8)	24
8	22.828	3.2	22.962	19.090	17.0	90.5	93.7	4	0.6	M12(1/2)	28
9	27.104	3.2	27.238	22.863	21.0	101.6	104.8	4	0.6	M12(1/2)	28
10	32.749	3.2	32.887	26.534	24.0	144.5	147.7	5	1.0	M16(5/8)	32
11	38.905	3.2	39.039	31.749	29.0	171.4	174.6	5	1.0	M16(5/8)	32
12	45.641	3.2	45.774	38.103	35.0	181.0	184.2	6	2.5	M20(3/4)	40
13	52.654	3.2	52.787	44.451	41.0	196.8	200.0	6	3.0	M20(3/4)	40
14	59.533	3.2	59.666	50.800	47.0	209.6	212.8	7	4.0	M24(1)	40
15	66.408	3.2	66.541	57.150	53.0	222.2	225.4	7	4.0	M24(1)	50
16	73.292	3.2	73.425	63.500	59.0	35.0	238.2	8	5.0	M30(11/8)	60

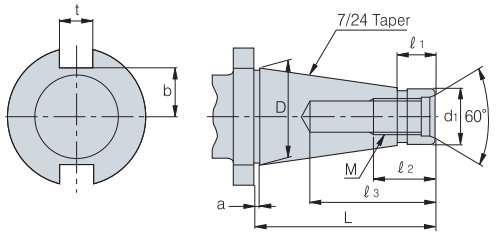
Brown sharp taper (Tang type)



(mm)

B&S No.	D	a	D1	d1	d2	ℓ1	ℓ2	b	c	e	R	r
4	10.221	2.4	10.321	8.458	8.1	42.1	44.5	5.5	8.7	14.4	7.9	1.3
5	13.286	2.4	13.386	10.962	10.7	55.6	58.0	6.3	9.5	16.2	7.9	1.5
6	15.229	2.4	15.330	12.167	11.7	73.0	75.4	7.1	11.1	18.0	7.9	1.5
7	18.424	2.4	18.524	14.675	14.2	89.7	92.1	7.9	11.9	20.3	9.5	1.8
8	22.828	3.2	22.962	18.453.	18.0	104.8	108.0	8.7	12.7	22.0	9.5	2.0
9	28.104	3.2	27.238	22.200	21.8	117.5	120.7	9.5	14.3	25.4	11.1	2.5
10	32.749	3.2	32.887	25.751	25.7	162.7	165.9	11.1	16.7	28.1	11.1	2.8
11	38.905	3.2	39.039	30.985	30.7	189.7	192.9	11.1	16.7	30.0	12.7	3.3
12	45.641	3.2	45.774	37.246	37.1	201.6	204.8	12.7	190	32.5	12.7	3.8
13	52.654	3.2	52.787	43.589	43.4	217.5	220.7	12.7	19.0	35.7	15.9	4.3
14	59.533	3.2	59.666	49.841	49.8	232.6	235.8	14.2	21.4	41.2	19.0	4.8
15	66.408	3.2	66.541	56.186	56.1	245.3	248.5	14.2	21.4	44.4	22.2	5.3
16	73.292	3.2	73.425	62.441	62.2	260.4	263.6	15.8	23.8	50.0	25.4	5.8

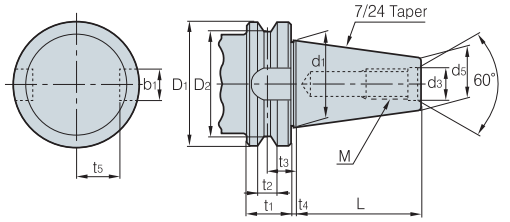
Standard taper of american milling machine



(mm)

NT No.	Dimensions	D	D1	L	ℓ1	M	ℓ2	ℓ3	a	t	b
30	$1\frac{1}{4}$	31.750	$17.40^{-0.29}_{-0.36}$	70	20	UNC $\frac{1''}{2}$	24	50	1.6	15.9	6
40	$1\frac{3}{4}$	44.450	$25.32^{-0.30}_{-0.384}$	95	25	UNC $\frac{5''}{8}$	30	60	1.6	15.9	22.5
50	$2\frac{3}{4}$	69.850	$39.60^{-0.31}_{-0.41}$	130	25	UNC $1''$	45	90	3.2	25.4	35
60	$4\frac{1}{4}$	107.950	$60.20^{-0.34}_{-0.46}$	210	45	UNC $1\frac{1''}{4}$	56	110	3.2	25.4	60

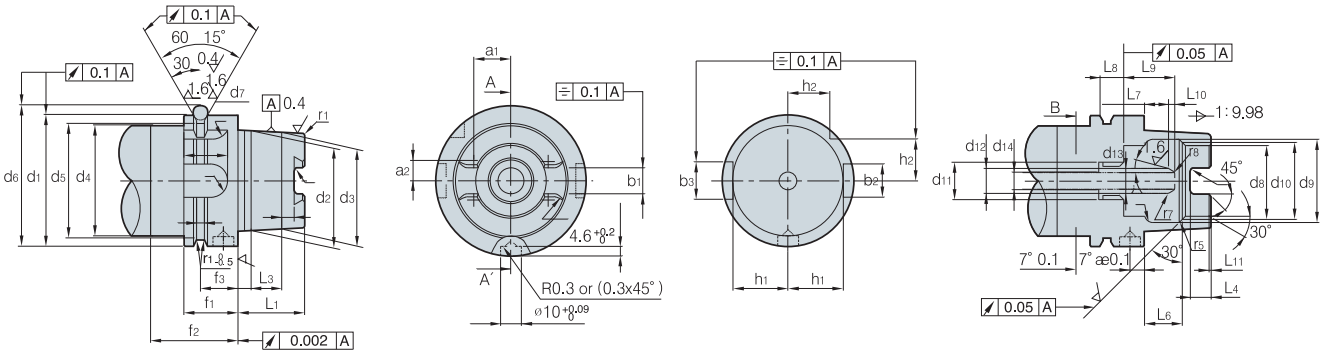
Bottle grip taper



(mm)

BT No.	D1	D2	t1	t2	t3	t4	d1	d3	L	M	b1	t5	d5
35	53	43	22	10	14.6	2	38.1	13	56.5	M12×1.75	16.1	19.6	21.62
40	63	52	25	10	16.6	2	44.45	17	65.4	M16×2	16.1	22.6	25.3
45	85	73	30	12	21.2	3	57.15	21	82.8	M20×25	19.3	29.1	33.1
50	100	85	35	15	23.2	3	69.85	25	101.8	M24×3	25.7	35.4	40.1
60	155	135	45	20	28.2	3	107.95	31	161.8	M30×3.5	25.7	60.1	60.7

HSK shank (DIN 69893)



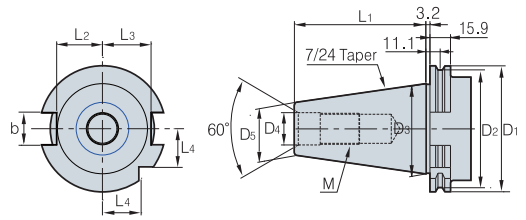
(mm)

HSK No.	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
50	10.54	12	14	50	38	36.90	42	43	59.3	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.5	16	14	63	48	46.53	53	55	72.3	7	34	40	37	M18X1	12	8	8.4	17.862	9.25
100	20	20	14	100	75	72,80	85	92	109.75	7	53	63	58	M24X1.5	16	12	12	27.329	15.00

(mm)

HSK No.	f1	f2	f3	f4	b1	b2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	r1	r2	r3	r4	r5	r6	r7	r8
50	26	42	18	3.75	2	15.5	25	5	11	7.5	4.5	14.13	10	10	23	3	1	19	1	1.5	2.38	6	0.5	1	2	6
63	26	42	18	3.75	28.5	20	32	6.3	14.7	10	6	18.13	10	12	24.5	3	1	21	1.2	1.5	3	8	0.6	1.5	3	8
100	29	45	20	3.75	44	31.5	50	10	24	15	10	28.56	12.5	16	28	3	1.5	24	2	2	3	12	1	1.5	3	10

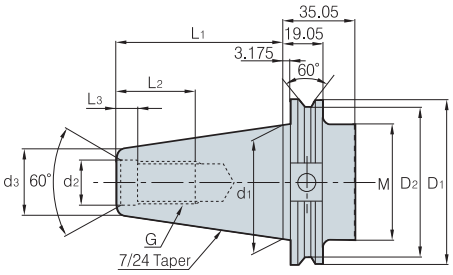
DIN 69871



(mm)

Shank No	D1	D2	D3	D4	D5	L1	L2	L3	L	b	M
30	50.0	44.3	31.75	13	17.8	47.8	16.4	19.0	33.5	16.0	M12×1.75
40	63.5	56.2	44.45	17	24.5	68.4	22.8	25.0	42.5	16.1	M16×2
45	82.5	57.2	57.15	21	33.0	82.7	29.1	31.3	52.5	19.3	M20×2.5
50	97.5	91.2	68.85	25	40.1	101.7	35.5	37.7	61.5	25.7	M24×3

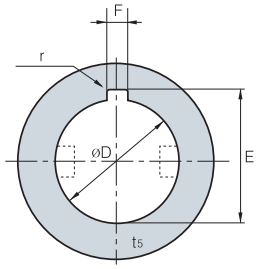
CAT shank



(mm)

Shank No	D1	D2	M	d1	d2	d3	L1	L2	L3	G
CAT40	63.5	56.36	M16×2	44.45	16.28	21.84	68.25	28.45	4.78	5/8-11
CAT45	82.55	75.41	M20×25	57.15	19.46	27.69	82.55	38.1	4.78	3/4-10
CAT50	98.43	91.29	M24×3	69.85	26.19	35.05	101.6	44.45	6.35	1-8

Standard of milling cutter hole (KSB3203)



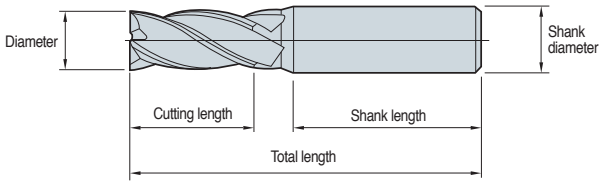
● Type A

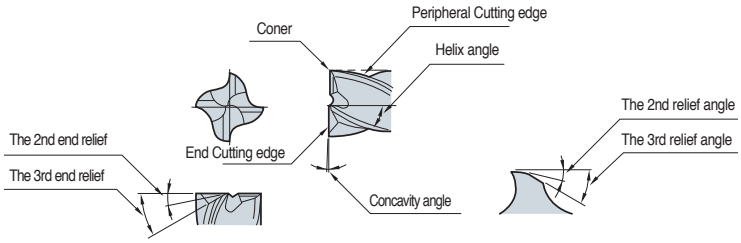
Diameter	øDH7	E	F	r
8	$8^{+0.015}_{0}$	$8.9^{+0.25}_{0}$	$2^{+0.16}_{+0.06}$	0.4
10	$10^{+0.015}_{0}$	$11.5^{+0.25}_{0}$	$3^{+0.16}_{+0.06}$	0.4
13	$13^{+0.018}_{0}$	$14.6^{+0.25}_{0}$	$3^{+0.16}_{+0.06}$	0.6
16	$16^{+0.018}_{0}$	$17.7^{+0.25}_{0}$	$4^{+0.19}_{+0.07}$	0.6
19	$19^{+0.021}_{0}$	$21.1^{+0.25}_{0}$	$5^{+0.19}_{+0.07}$	1
22	$22^{+0.021}_{0}$	$24.1^{+0.25}_{0}$	$6^{+0.19}_{+0.07}$	1
27	$27^{+0.021}_{0}$	$29.8^{+0.25}_{0}$	$7^{+0.23}_{+0.08}$	1.2
32	$32^{+0.025}_{0}$	$34.8^{+0.25}_{0}$	$8^{+0.23}_{+0.08}$	1.2
40	$40^{+0.025}_{0}$	$43.5^{+0.3}_{0}$	$10^{+0.23}_{+0.08}$	1.2
50	$50^{+0.025}_{0}$	$53.5^{+0.3}_{0}$	$12^{+0.23}_{+0.095}$	1.6
60	$60^{+0.030}_{0}$	$64.2^{+0.3}_{0}$	$14^{+0.275}_{+0.095}$	1.6
70	$70^{+0.030}_{0}$	$75.0^{+0.3}_{0}$	$16^{+0.275}_{+0.095}$	2
80	$80^{+0.030}_{0}$	$85.5^{+0.3}_{0}$	$18^{+0.275}_{+0.095}$	2
100	$100^{+0.035}_{0}$	$107.0^{+0.3}_{0}$	$24^{+0.32}_{+0.11}$	2.5

● Type B

Diameter	øDH7	E	F	r
$\frac{1}{2}$	$12.70^{+0.018}_{0}$	$14.17^{+0.25}_{0}$	$2.38^{+0.31}_{+0.13}$	0.5
$\frac{5}{8}$	$15.875^{+0.018}_{0}$	$17.74^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{3}{4}$	$19.050^{+0.021}_{0}$	$20.89^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{7}{8}$	$22.225^{+0.021}_{0}$	$24.07^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
1	$25.40^{+0.021}_{0}$	$28.04^{+0.25}_{0}$	$6.35^{+0.31}_{+0.13}$	1.2
$1\frac{1}{4}$	$31.750^{+0.025}_{0}$	$35.18^{+0.25}_{0}$	$7.94^{+0.32}_{+0.14}$	1.6
$1\frac{1}{2}$	$38.10^{+0.025}_{0}$	$42.32^{+0.25}_{0}$	$9.53^{+0.89}_{+0.25}$	1.6
$1\frac{3}{4}$	$44.450^{+0.025}_{0}$	$49.48^{+0.25}_{0}$	$11.11^{+0.89}_{+0.25}$	1.6
2	$50.80^{+0.03}_{0}$	$55.83^{+0.25}_{0}$	$12.7^{+0.89}_{+0.25}$	1.6
$2\frac{1}{2}$	$63.50^{+0.03}_{0}$	$69.42^{+0.25}_{0}$	$15.81^{+0.89}_{+0.25}$	1.6
3	$76.20^{+0.03}_{0}$	$82.93^{+0.25}_{0}$	$19.05^{+0.89}_{+0.25}$	2.4
$3\frac{1}{2}$	$88.90^{+0.035}_{0}$	$98.81^{+0.25}_{0}$	$22.23^{+0.89}_{+0.25}$	2.4
4	$101.60^{+0.035}_{0}$	$111.51^{+0.25}_{0}$	$25.4^{+0.89}_{+0.25}$	2.4
$4\frac{1}{2}$	$114.30^{+0.035}_{0}$	$125.81^{+0.25}_{0}$	$25.58^{+0.89}_{+0.25}$	3.2
5	$127.0^{+0.04}_{0}$	$140.08^{+0.25}_{0}$	$31.75^{+0.89}_{+0.25}$	3.2

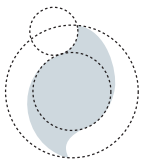
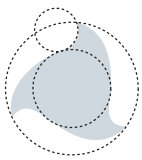
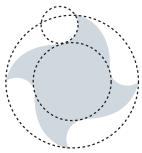
Endmill's shape and names





The comparison according to number of flute

Features of number of flute

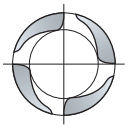
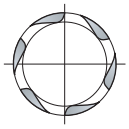
Ø10mm	2 flutes	3 flutes	4 flutes
Shape			
Cross section	44mm²	46mm²	48mm²
Ratio	56%	58%	61%
Advantages	Good chip flow	Good chip flow	High rigidity
Disadvantages	Weak rigidity	Difficult to measure external diameter	Bad chip flow
Usages	Side facing, Grooving	Side facing, Grooving	Side cutting
	Multi-functional	Medium, finishing	Finishing

Affection of number of flute

Specification	Major features	2 flutes	4 flutes
Tool rigidity	Torsional rigidity	○	◎
	Bending rigidity	○	◎
Surface finish	Surface roughness	○	◎
	Machining precision	○	◎
Chip control	Chip clogging	◎	○
	Chip evacuation	◎	○
Grooving	Chip evacuation	◎	○
	Grooving	◎	○
Side facing	Surface finish	○	◎
	Vibration	◎	○

◎: Excellent ○: Good

The differences between general endmills and high speed endmills

General endmills		High speed endmills	
Cross section shape	Features	Cross section shape	Features
	- Applied for Low speed, High depth of cut, Low feed - Low hardness workpiece(general steel, cast iron)		- Applied for high speed, low depth of cut, high feed - Useful for hardened workpiece such as die steel

Calculations of cutting condition

Calculations of Cutting speed

$$vc = \frac{\pi \times D \times n}{1000} \qquad n = \frac{1000 \times vc}{\pi \times D}$$

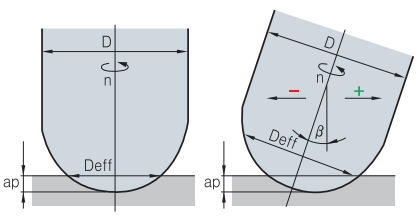
Calculations of feed speed

$vf = n \times fn$ or $n \times fz \times z$

$$fn = \frac{vf}{n} \qquad fz = \frac{fn}{z} \text{ or } \frac{vf}{n \times z}$$

vc: Cutting speed (m/min)
π: Circular constant (3.141592)
D: Endmill diameter (mm)
n: Revolution per minute (min^{-1})
vf: Feed speed (m/min)
fn: Feed per revolution (mm/rev)
fz: Feed per flute (mm/t)
z: Number of flute

Ball endmills cutting speed calculation formulas

Revolution per minute	$n = \frac{vc \times 1000}{D \times \pi}$
Cutting speed	$vc = \frac{D \times \pi \times n}{1000}$
Feed per tooth	$fz = \frac{vf}{z \times n}$
Feed per revolution	$fn = fz \times z$
Feed speed	$vf = fz \times z \times n$
Chip removal rate	$Q = ae \times ap \times vf$
Effective diameter of Ball Endmill 	$D_{eff} = 2 \times \sqrt{D \times ap - ap^2}$ Calculation Table $D_{eff} = D \times \sin\left[\beta \pm \arccos\left(\frac{D-2ap}{D}\right)\right]$

The affection of flute length

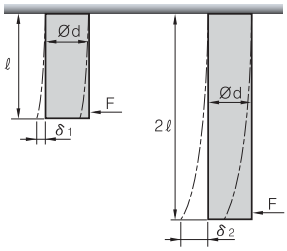
● Expression of aspect ratio

- Aspect ratio
- ℓ/d
- Ex) 3D, 15D, 22D

● Deformation rate according to length

- Deformation rate is reaction force against external force
- Proportional to the cube of length
- Set flute length and overall length as short as possible
- The more flute the better rigidity
- When flute width rate is narrower drill's rigidity is higher

$$\delta = \frac{P\ell^3}{3EI}$$



δ = Deformation volume **ℓ** = Length of cut

P = Cutting force **E** = Elasticity coefficient

I = Inertia moment ($I = \frac{\pi d^4}{64}$)

- ℓ: 2ℓ
- δ1: δ1 = 8δ1 = δ2

Spindle revolution conversion table (RPM) - external diameter

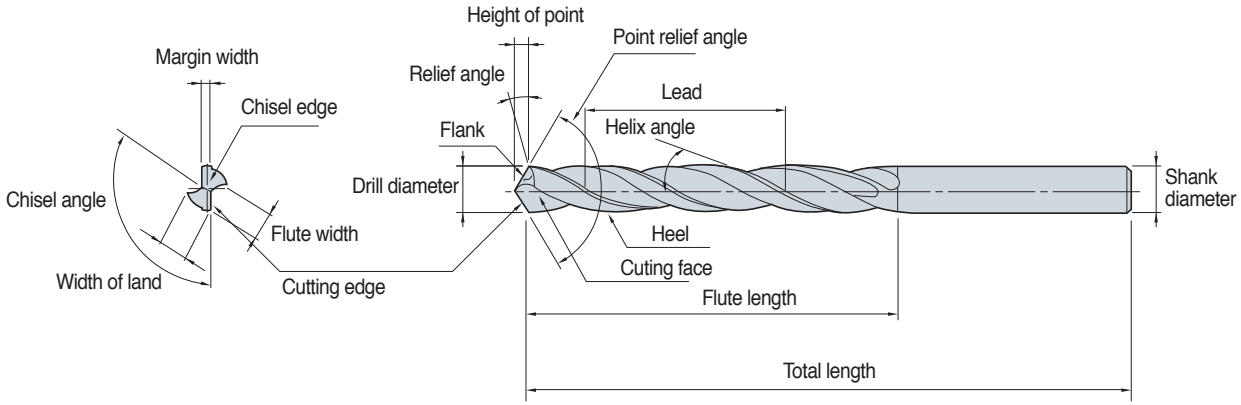
vc / External	Cutting speed (vc, m/min)															
	20	30	40	50	60	70	80	90	100	120	140	150	180	200	250	300
0.2	31,831	47,746	63,662	79,577	95,493	111,408	127,324	143,239	159,155	190,986	222,817	23,872	286,479	318,310	397,887	477,465
0.3	21,221	31,831	42,441	53,052	63,662	74,272	84,883	95,493	106,103	127,324	148,545	159,155	190,986	212,207	265,258	318,310
0.4	15,915	23,873	31,831	39,789	47,746	55,704	63,662	71,620	79,577	95,493	111,408	119,366	143,239	159,155	198,944	238,732
0.5	12,732	19,099	25,465	31,831	38,197	44,563	50,930	57,296	63,662	76,394	89,127	95,493	114,592	127,324	159,155	190,986
0.6	10,610	15,915	21,221	26,526	31,831	37,136	42,441	47,746	53,052	63,662	74,272	79,577	95,493	106,103	132,629	159,155
0.7	9,095	13,642	18,189	22,736	27,284	31,831	36,378	40,926	45,473	54,567	63,662	68,209	81,851	90,946	113,682	136,419
0.8	7,958	11,937	15,915	19,894	23,873	27,852	31,831	35,810	39,789	47,746	55,704	59,683	71,620	79,577	99,472	119,366
0.9	7,074	10,610	14,147	17,684	21,221	24,757	28,294	31,831	35,368	42,441	49,515	53,052	63,662	70,736	88,419	106,103
1	6,366	9,549	12,732	15,915	19,009	22,282	25,465	28,648	31,831	38,197	44,563	47,746	57,296	63,662	79,577	95,793
1.5	4,244	6,366	8,488	10,610	12,732	14,854	16,977	19,099	21,221	25,465	29,709	31,831	38,197	42,441	53,052	63,662
2	3,183	4,775	6,366	7,958	9,549	11,141	12,732	14,324	15,915	19,099	22,282	23,873	28,648	31,831	39,789	47,746
2.5	2,546	3,820	5,093	6,366	7,639	8,913	10,186	11,459	12,732	15,279	17,825	19,099	22,918	25,465	31,831	38,197
3	2,122	3,183	4,244	5,305	6,366	7,427	8,488	9,549	10,610	12,732	14,854	15,915	19,099	21,221	26,526	31,831
3.5	1,819	2,728	3,638	4,547	5,457	6,366	7,276	8,185	9,095	10,913	12,732	13,642	16,370	18,189	22,736	27,284
4	1,592	2,387	3,183	3,979	4,775	5,570	6,366	7,162	7,958	9,549	11,141	11,937	14,324	15,915	19,894	23,873
4.5	1,415	2,122	2,829	3,537	4,244	4,951	5,659	6,366	7,074	8,488	9,903	10,610	12,732	14,147	17,684	21,221
5	1,273	1,910	2,546	3,183	3,820	4,456	5,093	5,730	6,366	7,639	8,913	9,549	11,459	12,732	15,915	19,099
5.5	1,157	1,736	2,315	2,894	3,472	4,051	4,630	5,209	5,787	6,945	8,102	8,681	10,417	11,575	14,469	17,362
6	1,061	1,592	2,122	2,653	3,183	3,714	4,244	4,775	5,305	6,366	7,427	7,958	9,549	10,610	13,263	15,915
6.5	979	1,469	1,959	2,449	2,938	3,428	3,918	4,407	4,897	5,876	6,856	7,346	8,815	9,794	12,243	14,691
7	909	1,364	1,819	2,274	2,728	3,183	3,638	4,093	4,547	5,457	6,366	6,821	8,185	9,095	11,368	13,642
7.5	849	1,273	1,698	2,122	2,546	2,971	3,395	3,820	4,244	5,093	5,942	6,366	7,639	8,488	10,610	12,732
8	796	1,194	1,592	1,989	2,387	2,785	3,183	3,581	3,979	4,775	5,570	5,968	7,162	7,958	9,947	11,937
8.5	749	1,123	1,498	1,872	2,247	2,621	2,996	3,370	3,745	4,494	5,243	5,617	6,741	7,490	9,362	11,234
9	707	1,061	1,415	1,768	2,122	2,476	2,829	3,183	3,537	4,244	4,951	5,305	6,366	7,074	8,842	10,610
9.5	670	1,005	1,340	1,675	2,010	2,345	2,681	3,016	3,351	4,021	4,691	5,026	6,031	6,701	9,377	10,052
10	637	955	1,273	1,592	1,910	2,228	2,546	2,865	3,183	3,820	4,456	4,775	5,730	6,366	7,958	9,549
11	579	868	1,157	1,447	1,736	2,026	2,315	2,604	2,894	3,472	4,051	4,341	5,209	5,787	7,234	8,681
12	531	796	1,061	1,326	1,592	1,857	2,122	2,387	2,653	3,183	3,714	3,979	4,775	5,305	6,631	7,958
13	490	735	979	1,224	1,469	1,714	1,959	2,204	2,449	2,938	3,428	3,673	4,407	4,897	6,121	7,346
14	455	682	909	1,137	1,364	1,592	1,819	2,046	2,274	2,728	3,183	3,410	4,093	4,547	5,684	6,821
15	424	637	849	1,061	1,273	1,485	1,698	1,910	2,122	2,546	2,971	3,183	3,820	4,244	5,305	6,366
16	398	597	796	995	1,194	1,393	1,592	1,790	1,989	2,387	2,785	2,984	3,581	3,979	4,974	5,968
17	374	562	749	969	1,123	1,311	1,498	1,685	1,872	2,247	2,621	2,809	3,370	3,745	4,681	5,617
18	354	531	707	884	1,061	1,238	1,415	1,592	1,768	2,122	2,476	2,653	3,183	3,537	4,421	5,305
19	335	503	670	838	1,005	1,173	1,340	1,508	1,675	2,010	2,345	2,513	3,016	3,351	4,188	5,026
20	318	477	637	796	955	1,114	1,273	1,432	1,592	1,910	2,228	2,387	2,865	3,183	3,979	4,775
21	303	455	606	758	909	1,061	1,213	1,364	1,516	1,819	2,122	2,274	2,728	3,032	9,789	4,547
22	289	434	579	723	868	1,013	1,157	1,302	1,447	1,736	2,026	2,170	2,604	2,894	3,617	4,341
23	277	415	554	692	830	969	1,107	1,246	1,384	1,661	1,938	2,076	2,491	2,768	3,460	4,152
24	265	398	531	663	796	928	1,061	1,194	1,326	1,592	1,857	1,989	2,387	2,653	3,316	3,979
25	255	382	509	637	764	891	1,019	1,146	1,273	1,528	1,783	1,910	2,292	2,546	3,183	3,820

Tool failure and trouble shooting

Trouble		Causes	Solutions																	
			Cutting condition					Tool shape						Grade		etc				
			Cutting speed	Feed	Depth of cut	Coolant	Up cut·down cut	Relief angle	Lead angle	Length of flute	Number of flute	Honing	Chip pocket	Toughness	Hardness	Machine rigidity	Machine vibration	Workpiece fixing	Overhang
Damage at cutting edge	Excessive periphery cutting edge	Improper cutting condition	⬇	⬆		◉											⬆		
	Chipping	Improper cutting condition Generating built up edge Weak tool rigidity Improper grade		⬇			⬇	⬇				◉		⬆			⬇	⬆	⬇
	Fracture during operation	Improper cutting conditions Excessive cutting load Excessive overhang		⬇	⬇					⬇			⬆			⬆		⬆	⬇
Poor surface finish		Generating built-up edge	⬆	⬆		◉			⬆			◉							
		Chattering	⬇				⬇			⬇						⬆	⬇	⬆	⬇
		Poor straightness		⬇	⬇		⬆		⬆	⬇									⬇
Poor machining precision (Machined size, perpendicularity)		Improper cutting conditions Improper tool shape	⬆	⬇			⬇			⬇	⬆					⬆	⬇		⬇
Bad chip evacuation		Excessive cutting volume Improper chip pocket Improper cutting conditions		⬇	⬇						⬇		⬆						

⬆ : Increase ⬇: Decrease ●: use ◉: Correct use

The shape of drills and the names



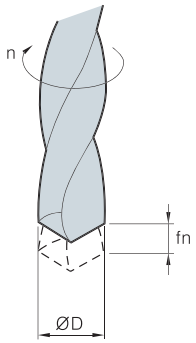
Shape and the feature of cutting

Helix angle	Plays rake angle of cutting edge's role. If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases Poor machinability ◀ low - Helix angle - high ▶ Smooth chip evacuation Hard workpiece (hardened steel) ◀ low - Helix angle - high ▶ Soft material (aluminum etc)
Length of flute	The path of both chip evacuation and cooling lubricant Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage
Point angle	Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118 thrust resistance decrease ◀ low - Point angle - high ▶ thrust resistance increase Torque increase, Burr on exit increase ◀ low - Point angle - high ▶ Torque decrease, Burr on exit decrease Soft material (aluminum etc) ◀ low - Point angle - high ▶ Hard workpiece (hardened steel)
Margin	While machining Margin is the part of contact between workpiece and drill's external. It prevents bending and plays guide's role It depends on drill size Cutting force decrease ◀ small - Margin - big ▶ Cutting force increase Poor guide ◀ small - Margin - big ▶ Good guide
Web thickness	Web is the part of center of drill and drill's rigidity depends on the web. Drill needs cutting edge, chisel edge, at the tip of drill because drill makes a hole at the beginning of drilling . When web thickness is big Thinning is needed to reduce cutting force Cutting force decrease ◀ small - Web thickness - big ▶ Cutting force increase Rigidity decrease ◀ small - Web thickness - big ▶ Rigidity increase Good chip evacuation ◀ small - Web thickness - big ▶ Bad chip evacuation Soft material (aluminum etc) ◀ small - Web thickness - big ▶ Hard workpiece (hardened steel)
Back taper	Drill diameter size is getting smaller from point to shank in order to avoid the friction between drill periphery and workpiece. The decrease of diameter divided by flute length 100mm generally becomes 0.04~0.1mm. As for high performance drills and drills for hole shrinkage workpiece during operation have big back taper
Thinning	In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust

Types of	Edge shape	Feature	Korloy's drills
X type		Good centering High central thickness Crank shaft	Mach solid drill (MSD) Vulcan drill (VZD)
S type		For wide use For general Easy regrinding	Solid drill (SSD)

Major cutting formulas

Cutting speed	Feed	Helix angle	Machining time
$vc = \frac{\pi \cdot D \cdot n}{1000}$ (m/min)	$fn = \frac{vf}{n}$ (mm/rev)	$\delta = \tan^{-1}\left(\frac{\pi D}{L}\right)$	$tc = \frac{ld}{n \cdot fn}$ (min)
• vc: Cutting speed (m/min) • D: Drill diameter (mm) • n: Revolution per minute (min^{-1}) • π: Circular constant (3.14)	• fn: Feed per revolution (mm/rev) • vf: Feed per minute (mm/min) • n: Revolution per minute (min^{-1})	• δ: Helix angle • D: Drill diameter (mm) • L: Lead (mm) • π: Circular constant (3.14)	• tc: Machining time (min) • n: Revolution per minute (min^{-1}) • ld: Drilling time (mm) • fn: Feed (mm/rev)



Cutting torque and thrust (calculation formulas)

$Md = KD^2 \times (0.0631 + 1.686 \times fn)$ (kg·cm)

$T = 57.95KDfn^{0.85}$ (kg)

• Md: Cutting torque (kg·cm)
• T: Cutting thrust (kg)
• D: Drill diameter (mm)
• fn: Feed per revolution (mm/rev)
• K: Material coefficient

Workpiece material (SAE/AISI)		Tensile strength (kgf)	Hardness (HB)	Material coefficient K
Cast iron	Cast iron (Gray)	21	177	1.00
	Cast iron	28	198	1.39
	Cast iron (Ductile)	35	224	1.88
General steel	1020(carbon steel C 0.2%)	55	160	2.22
	1112(C 0.12, S 0.2%)	62	183	1.42
	1335(Mn 1.75%)	63	197	1.45
Nickel Chrome steel	3115 (Ni 1.25, Cr 0.6, Mn 0.5)	53	163	1.56
	3120 (Ni 1.25, Cr 0.6, Mn 0.7)	69	174	2.02
	3140	88	241	2.32
Chrome molybdenum steel	4115 (Cr 0.5, Mo 0.11, Mn 0.8)	63	167	1.62
	4130 (Cr 0.95, Mo 0.2, Mn 0.5)	77	229	2.10
	4140 (Cr 0.95, Mo 0.2, Mn 0.85)	94	269	2.41
Nickel molybdenum steel	4615 (Ni 1.8, Mo 0.25, Mn 0.5)	75	212	2.12
	4820 (Ni 3.5, Mo 0.25, Mn 0.6)	140	390	3.44
Chrome steel	5150 (Cr 0.8, Mn 0.8)	95	277	2.46
Chrome vanadium steel	6115 (Cr 0.6, Mn 0.6, V 0.12)	58	174	2.08
	6120 (Cr 0.8, Mn 0.8, V 0.1)	80	255	2.22

Cutting torque and thrust (empirical formula)

$Md = K_1 d^2 \cdot fn^m$
$T = K_2 d \cdot fn^n$

• Md: Cutting torque (kg·cm)
• T: Thrust (kg)
• fn: Feed (mm/rev)
• d: Drill diameter (mm)
• K_1, K_2, m, n: Experimental Data Characteristic value

Workpiece	K_1	m	K_2	n
Soft steel	5.9	1.00	125.0	0.88
Rolled steel	3.5	1.00	55.0	0.88
7-3 brass	2.5	0.94	44.4	0.87
Aluminum	1.5	0.90	33.3	0.78
Zinc	1.4	0.88	27.0	0.74
Gun metal	2.0	0.94	21.6	0.75
Galvanized iron	0.3	0.57	6.4	0.55

Tool failures and solutions

Trouble		Causes	Solutions																	
			Cutting condition					Tool shape						Grade		etc				
			Cutting speed	Feed	Step feed	Initial feed	Coolant	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Thinning	Toughness	Hardness	Machine rigidity	Machine vibration	Guide bush	Clamping workpiece
Chipping		• Too sharp cutting edge (too big relief angle) (thinning edge is too sharp)						⬇		⬇	⬆			⬆					
		• Excessive cutting speed	⬇				●												
		• Built-up edge					●	⬇		⬇	⬆			⬆					
		• Vibration and chattering	⬇													⬆	⬇		●
Wear		• Excessive cutting speed (Abnormal wear at margin)	⬇				●												
		• Insufficient cutting speed (Abnormal wear at center)	⬆				●												
Chip		• Long chip	⬆	⬆			●				⬇								
		• Over lap	⬆	⬆															
		• Chip burning	⬆				●												
Hole precision burr, poor surface finish		• Tool clamping precision				⬇			⬇		⬇					⬆	⬇		●
		• Excessive feed, sharp point angle		⬇					⬆		⬇								
		• Excessive cutting speed (Considered tool grade)	⬆				●	⬇	◉						⬆				
Fracture	Breakage on contact	• Poor surface finish			●	⬇												●	
		• Insufficient machine rigidity														⬆			●
		• Improper cutting condition	⬆	⬇															
	Breakage at hole bottom	• Crooked hole	⬆						⬆				●				⬇	●	
		• Chip clogging		⬇	●							⬆							

⬆: Increase ⬇: Decrease ●: use ◉: Correct use

Hole size for threading

● Metric coarse screw threads

Specification	Hole diameter
M1 X 0.25	0.75
M1.1 X 0.25	0.85
M1.2 X 0.25	0.95
M1.4 X 0.3	1.1
M1.6 X 0.35	1.25
M1.7 X 0.35	1.35
M1.8 X 0.35	1.45
M2 X 0.4	1.6
M2.2 X 0.45	1.75
M2.3 X 0.4	1.9
M2.5 X 0.45	2.1
M2.6 X 0.45	2.2
M3 X 0.6	2.4
M3 X 0.5	2.5
M3.5 X 0.6	2.9
M4 X 0.75	3.25
M4 X 0.7	3.3
M4.5 X 0.75	3.8
M5 X 0.9	4.1
M5 X 0.8	4.2
M5.5 X 0.9	4.6
M6 X 1	5
M7 X 1	6
M8 X 1.25	6.8
M9 X 1.25	7.8
M10 X 1.5	8.5
M11 X 1.5	9.5
M12 X 1.75	10.3
M14 X 2	12
M16 X 2	14
M18 X 2.5	15.5
M20 X 2.5	17.5
M22 X 2.5	19.5
M24 X 3	21
M27 X 3	24
M30 X 3.5	26.5
M33 X 3.5	29.5
M36 X 4	32
M39 X 4	35
M42 X 4.5	37.5
M45 X 4.5	40.5
M48 X 5	43

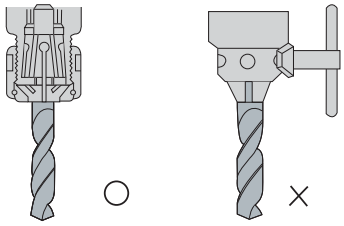
● Metric coarse screw threads

Specification	Hole diameter
M2.5 X 0.35	2.2
M3 X 0.35	2.7
M3.5 X 0.35	3.2
M4 X 0.5	3.5
M4.5 X 0.5	4
M5 X 0.5	4.5
M5.5 X 0.5	5
M6 X 0.75	5.3
M7 X 0.75	6.3
M8 X 1	7
M8 X 0.75	7.3
M9 X 1	8
M9 X 0.75	8.3
M10 X 1.25	8.8
M10 X 1	9
M10 X 0.75	9.3
M11 X 1	10
M11 X 0.75	10.3
M12 X 1.5	10.5
M12 X 1.25	10.8
M12 X 1	11
M14 X 1.5	12.5
M14 X 1	13
M15 X 1.5	13.5
M15 X 1	14
M16 X 1.5	14.5
M16 X 1	15
M17 X 1.5	15.5
M17 X 1	16
M18 X 2	16
M18 X 1.5	16.5
M18 X 1	17
M20 X 2	18
M20 X 1.5	18.5
M20 X 1	19
M22 X 2	20
M22 X 1.5	20.5
M22 X 1	21
M24 X 2	22
M24 X 1.5	22.5
M24 X 1	23
M25 X 2	23
M25 X 1.5	23.5
M25 X 1	24
M26 X 1.5	24.5
M27 X 2	25

Cautions

● Selection of drill chuck

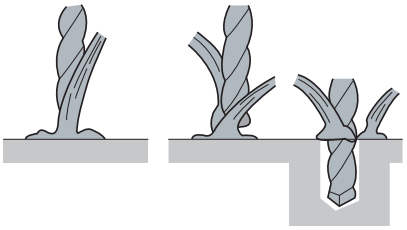
• Collect chuck is favorable Because it has strong grip power
(General drill-chuck and Keyless chuck don't have enough grip power.)



• Collect chuck • General drill-chuck

● Coolant supply

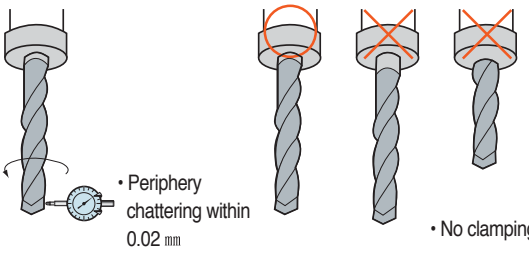
• Supply enough coolant around hole entrance
• Standard cutting oil pressure: 3~5 kg/㎠, Flux: 2~5 l/min



• Supply much coolant at hole entrance

● Mounting drill

• When mounting drill Periphery chattering should be within 0.02 ㎜
• Flute should not be clamped

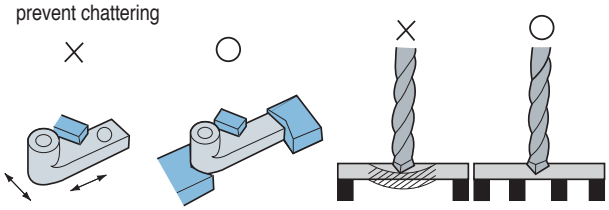


• Periphery chattering within 0.02 ㎜

• No clamping flute

● How to clamp workpiece

• At high performance drilling High thrust, torque and horizontal cutting force work at the same time so that workpiece should be clamped strongly to prevent chattering



• Uniformed and strong clamping is needed (Right and left, up and down)

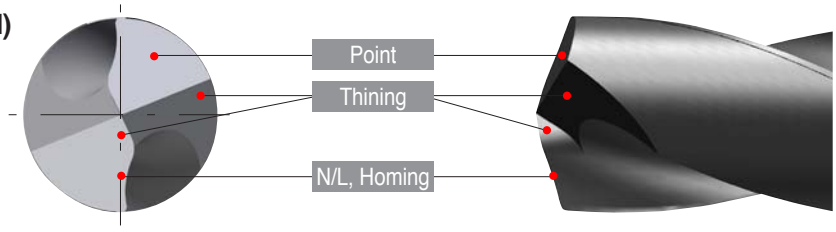
• Strong clamping is needed because bending causes chipping

Notice

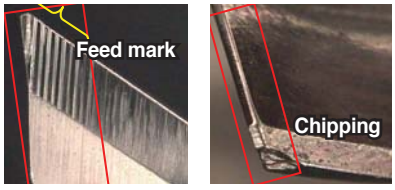
1) For better drill's life, small damage and wear are favorable to be regrinding
2) Damage and wear size should be within 1.5 ㎜ for regrinding
3) If drill has crack, regrinding is impossible
4) Ordering for regrinding is acceptable or purchase regrinding machine

Regrinding procedures

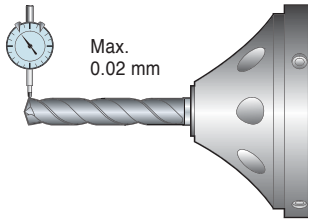
● Regrinding mathod (Mach Drill)



1) Preparation Determination of regrinding areas
- Check the cutting edge for damage and wear If large fracture is found, remove it by rough grinding



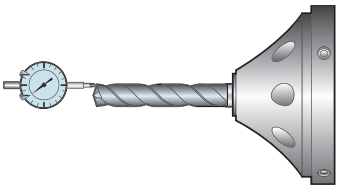
2) Grinding operation Drills setting
- Drill is clamped to collet chuck Chattering is kept within 0.02 mm

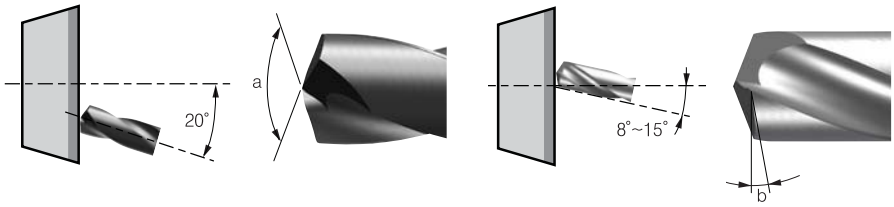


3) Grinding operation-Grinding point

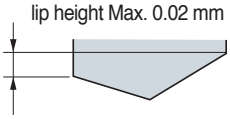
- Check damage and wear at the point and remove it completely
- The difference of the lip height is kept within 0.02 mm

Point angle (a): 140°
Point relief angle (b)t: 8°~15°





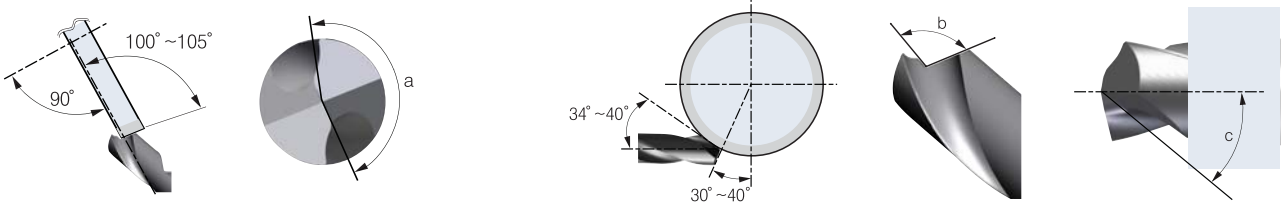
The difference of the lip height Max. 0.02 mm



4) Grinding operation-Thinning grinding

- Considering N/L width Cutting edge length from the center of drill axis should be 0.03~0.08mm for balancing
- Set the wheel to tilt drill axis by 34°~40°.

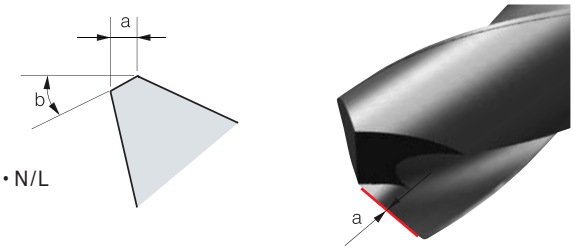
Thinning angle (a)°: 155°~160° Thining open angle (b): 100°~105°
Thinning relief angle (c): 34°~40°



5) Grinding-N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge
- After negaland operation Finishes with brush or handstone

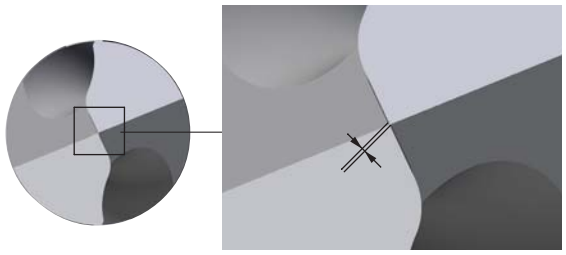
N/L width (a): 0.05mm~0.16mm/N/L angle (b): 24°~26°



● TIP

· Making point
- Without center drill, the point width should be below 0.10 mm

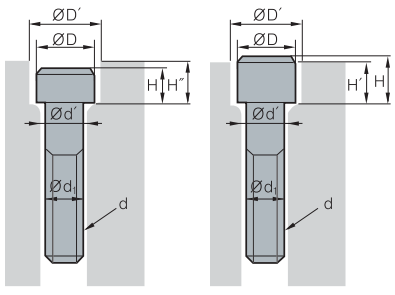
· Recommended grinding condition
- Diamond wheel: 240~400 mesh
- Diamond chisel: 400~600 mesh
- Diamond hand stone: 800~1500 mesh



Hexagonal socket bolt (clamping screw) size

● Counter boring and size of bolt hole for hexagonal socket bolt

ISO (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Ød1	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
Ød′	3.4	4.5	5.5	6.5	8.5	11	14	16	18	20	22	24	26	30	33
ØD	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
ØD′	5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
H	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H′	2.7	3.6	4.6	5.5	7.4	9.2	11.0	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H″	3.3	4.4	5.4	6.5	8.6	10.8	13.0	15.2	17.5	19.5	21.5	23.5	25.5	29	32



The comparison of chip breakers

※2017.11-Ver.01

APPLICATION				KORLOY	KYOCERA	TAEGUTEC	SUMITOMO	SANDVIK	KENNAMETAL	ISCAR	WLATER	MITSUBISHI	SECO	TUNGALLOY
NEGATIVE	P	Application	Ultra-Finishing	-	DP (G-class)	-	FA	PMC	FF (G-class)	SF	-	PK (G-class), FY	FF1	TF
				VL	GP	FA	FL, FB	QF	UF	PF	NF3	FH, FS, SY	FF2	NS, ZF
			Finishing	VF	PP	FG	LU, FE	PF, XF	FN	NF, SM	NF4	FP		NM, NS, SS
				VB	-	SF	SU	61	K	F3P	FP5	LP, SH, SA	MF2	TS, TSF
			Medium to finishing	VQ, VC	HQ, CQ	MC	SE	HM	LF, CT	TF	NS6	C (Cermet)		AS
				LP	PQ, CJ	FC	SX	PMC	-	-	MP3	MV	MF5	ZM, AM
			Medium machining	VM	HK, GS, HS, PS	MP, MT	GU (UG)	QM, SM	MP, MN	PP, TF	NM4, NP5	MA, MH	M3, M5	TQ, TM
				MP	PG	PC	GE, UX	PM, XM	-	M3P	MP5	MP	-	DM, None C/B
			Roughing	B25				-	RP, MR	GN	-	GM, None C/B	M5	TH
				HR, GR	PT, GT, HT, PH	RT	MU, ME, MX	PR, WR	RN, None C/B	R3P	RP5, NM9	GH, RP	MR5, MR6, MR7	THS
			Heavy duty machining	GH	PX	HB, RH, RX	HG, MP	PR, XMR	RH	NR, HT	RP7, NR4, NRF	HZ	R4, R5	CH
				VH	-	HZ, EH	HP	QR	RM	HR	NRR, NR8	HX	R6, R7, R8, PR6	THS, TRS
				VT	-	HT, HY, HD	HU, HW, HF	HR	MM	T3P	-	HV	PR9, R56, R57, R68	65, TUS
		Low carbon steel	Soft steel	VL	XF, XP, XP-T	SF	FL	LC	-	-	-	FY	-	-
				-	XQ, XS	-	-	-	-	-	-	SY	-	-
		High feed	Wiper	VW	WP, WF	WS	LUW, SEW	WF, WL	FW	WF	NF	SW	FF2, MF2	AFW, FW
				LW	WQ, WE	WT	GUW	WM, WMX	MW	WG	NM	MW	MF5, M3	ASW, SW
				-	-	-	-	WR	RW	-	-	-	R4, R7	-
		Application	Shaft (long bar)	SH	CJ, ST	FS, VF, FX	HM	K	-	-	-	ES	UX	P, S
				KNUX-	KNMX-	KNUX-	-	KNUX-71	-	-	-	KNMX-19	-	KNMX
	M	Stainless steel	Finishing	VP2, MP	MQ, GU, SK	EA, SF	SU, EF	MF, XF	FP, FF	SF, VL, F3M	NF4, FM5	SH, LM	FF1, MF1	SS, SF, SA
			Medium cutting	HS, MM	HU, TK, MS	MP, EM	EX, EG, GU	MM,XM,QM,MMC	MP, UP, MS	PP, TF, M3M	NM4, NR4	MS, GM, MM	MF3, MF4	SM
			Roughing	GS, RM	MU	ET	MU, HM, EM	MR, XMR, MRR	RP, P	MR, R3M	RM5, NRS	MA, ES	MF5, M5	S, SH
	K	Cast iron	Finishing	MP	None C/B, C, KQ	MT	UZ	KF, PMC, XF	T-20, FN	TF	NM, MK5	LK, MA	M4	CF
			Medium cutting	B25, MK	ZS, KG	RT, KT	UX, GZ	KM, XM	UN, RP	GN	NM5, RK5	MK, GK, None C/B	M5	CM, None C/B
			Roughing	-MA, RK	-MA, GC, KH	-MA	-MA	KR, XMR, KRR	MR, S-20, -MA	-MA, NR	-MA, RK7	RK, -MA	MR7	CH
	S	HRSA	Ultra-finishing	VP1	MQ, SK	EA	EF	SF, SGF	FS (G-class) LF (G-class)	SF, PF	NF4	FJ(G-class)	M1	SF
			Finishing	VP2	TK	ML	UP, EG	23.SR, XF, SMC	UP	PP	NFT	LS	MF1	HMM
			Medium cutting	VP3	MS	EM	EX	SM, SMR, XM	MS, GP, P, UN	TF	NMS, NMT	MS	MF4, MR3	HRF
			Roughing	VP4	MU	ET	MU	XMR	RP	MR	NRS, NRT	RS, GJ	MR4	HRM
	N	Aluminium alloy		HA	AH	ML	AX	23	GP, MS	NF, PP	FN2, PF2, MN2, PM2	MJ	MF1	P
POSITIVE	P M K	Application	Finishing	VL	XP, PP	FA, FX	FC	PF, XF	11	PF	FP4	SMG (G-class), FV	FF1	01
				VF	GP	-	FB, LU (FP,FK)	UF	UF	F3P	FK6	SV, FP	F1	PSF, PF
			Medium cutting	HMP	XQ	FG	LB, NF	PM, XM	LF, FP	14	MP4,FM2,FM4,MK4	LP	MF2	PSS
				MP	HQ, GK	PC, FM	SU, SC	UM, PMC	MP, T-20	SM	FP6,MM4,FM6,RK4	MV	F2, M3	PS
			Roughing	C25	None C/B	MT	MU	PR, UR, XR	MF, GM, -C	19	RP4, RM4, RK6	None C/B, MP	M5	PM
			Wiper	-	WP	-	LUW	WL, WF	FW	WF	PM	SW	-	-
				-	-	WT	SDW	WM, WMX	MW	WG	-	MW	-	-
	M S	Stainless steel For HRSA	Finishing	VP1	CF, GF, GQ	FG	FC, FM	MF, MM, MMC	11, UF, LF	PF	FM4, NM4	FJ (G-class), FM, LM	F1, MF2	PSF, PSS
			Medium to finish cutting	VL	MQ, MF	SA	LB, SI	MR, XR, SMC	MF	SM, M3M	RM4	MM, None C/B	M3, M5	PS, PM
	K	Cast iron	Medium cutting	MP	HQ	PC	MU	KF, KM	LF	17	FK6	MK	M3	CM
			Roughing	C25	GK	MT	None C/B	KR	MF, UF	19	MK4, RK6	None C/B, -MW	M5	None C/B
	N	Aluminium alloy		AK, AR	AH	FL	AW, AG, AY	AL	HP, LF	AS, AF	PM2	AZ, FS	AL	AL
High precision bar turning (tolerance class G&E)				KF, KM	FSF, USF, J, A3	GF, FF, GW	FY, FX, FZ	K, F, UM	GH	LF, RF, XL	-	F, SR, SS, SM	UX	JS, J10, JRP, JPP

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
CVD	P	NC3215 (new)	P10~P15	For high speed turning of general steel and forged steel	●									TiN / Al_2O_3 / MT-TiCN
		NC3225 (new)	P20~P25	For universal turning of general steel and forged steel	●		●	●		●				TiN / Al_2O_3 / MT-TiCN
		NC3120	P20~P25	For medium turning of steel	●		●	●		●				Al_2O_3 / TiC / MT-TiCN
		NC3030	P25~P35	For medium to rough turning of steel	●			●		●				TiN / Al_2O_3 / TiC / MT-TiCN
		NC5330	P30~P35	For multi-purpose machining of mild steel and forged steel	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NC500H	P25~P35	For heavy turning of steel	●					●				TiN / Al_2O_3 / MT-TiCN
		NC5340 (new)	P30~P35	For high/medium low speed milling of turning		●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NCM325	P30~P40	For high speed turning of steel		●			●		●			TiN / Al_2O_3 / MT-TiCN
		NC5350 (new)	P35~P45	For medium low/ low speed milling of steel		●								TiN / Al_2O_3 / MT-TiCN
		NCM335	P35~P45	For rough and interrupted milling of steel and high speed milling of cast iron		●								TiN / Al_2O_3 / MT-TiCN
	K	NC6315 (new)	K10~K15	For turning applications of gray and ductile cast iron	●		●	●		●				Al_2O_3 / MT-TiCN
		NC5330	K15~K25	For multi-purpose machining of cast iron at high speed	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
	M	NC9115 (new)	M10~M20	For turning applications of ferritic and martensitic stainless steel	●									TiN / Al_2O_3 / MT-TiCN
		NC9125 (new)	M20~M30	For stainless steel turning	●									TiN / Al_2O_3 / MT-TiCN
		NC9135 (new)	M30~M40	For interrupted machining of stainless steel	●									TiN / Al_2O_3 / MT-TiCN
		NC5330	M25~M35	For multi-purpose machining of STS	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NCM325	M25~M35	For high speed milling of STS		●				●	●			TiN / Al_2O_3 / MT-TiCN
		NCM335	M30~M40	For rough and interrupted milling of STS		●								TiN / Al_2O_3 / MT-TiCN
	S	NC9125 (new)	S15~S25	For roughing heat resistant alloy	●	●	●	●		●	●			TiN / Al_2O_3 / MT-TiCN
		NC9135 (new)	S20~S30	For continuous cutting of heat resistant alloy	●									TiN / Al_2O_3 / MT-TiCN
PVD	P	PC230	P15~P30	For finish and medium turning of steel		●			●		●			TiAlN
		PC3500	P25~P35	For medium and rough milling of steel (1st recommended)		●	●	●	●		●			TiN / TiAlN
		PC3600	P20~P30	For universal milling of steel		●								★New TiAlN film (High hardness/ Oxidation resistance)
		PC3545	P35~P45	For medium/rough milling of steel at high interruption		●								TiN / TiAlN

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
PVD		PC5300	P30~P40	For medium/rough milling of steel	●	●	●	●	●	●	●			★New TiAlN film (High hardness/ Oxidation resistance)
		new PC5335	P30~P40	For medium/rough milling of steel	●	●					●			★TiAlCrN film (Lubricative)
		new PC5400	P35~P45	For medium/rough milling of steel	●	●		●			●			★TiAlCrN film (Lubricative)
		new PC2005	P01~P10	For milling of high hardness heat-treated steel		●								TiMeN TiAlN
		new PC2010	P05~P15	For milling of pre hardened steel and press mold steel		●								TiMeN TiAlN
		new PC2015	P10~P20	For milling of carbon steel and mold making		●								AlCrN
		new PC2505	P01~P10	For milling high hardened steel (heat-treated steel)		●								★New TiAlN film (High hardness/ Oxidation resistance)
		new PC2510	P05~P15	For milling pre hardened steel and pressed die steel		●								★New TiAlN film (High hardness/ Oxidation resistance)
		PC210F	P10~P20	For high speed milling of general steel and alloy steel (Laser Mill)		●								★New TiAlN film (High hardness/ Oxidation resistance)
		PC3030T	P20~P30	For steel threading					●					TiAlN
		PC203F	P05~P15	For high speed end milling of steel (H-max)									●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC220	P20~P35	For universal end milling of steel (I-max)									●	★New TiAlN film (High hardness)
		new PC303S	P05~P15	For end milling of high hardness steel and press mold steel									●	TiMeN TiAlN
		new PC310U	P10~P20	For end milling of high hardness steel and press mold steel									●	TiMeN TiAlN
		new PC315E	P20~P35	For end milling of carbon steel and pre hardened steel									●	AlCrN
		new PC320	P20~P35	For medium/ rough end milling									●	TiAlN
		PC205F	P15~P30	For general drilling Solid drill								●		★New TiAlN film (High hardness/ Oxidation resistance)
		new PC215G	P15~P30	For general drilling Solid drill								●		TiAlN
		new PC230F	P25~P35	For general drilling Solid drill								●		TiAlN
		new PC325U	P20~P35	For general drilling Solid drill								●		TiAlCrN
		new PC315G	P15~P30	For general drilling Solid drill								●		TiAlCrN
	K	PC8110	K05~K15	For finish turning and milling of cast iron	●	●		●						★New TiAlN film (High hardness/ Oxidation resistance)
		PC6510	K05~K15	For high speed milling of cast iron		●			●		●			TiN TiAlN
		PC5300	K20~K30	For medium-rough turning and milling of cast iron	●	●	●	●	●	●	●			★New TiAlN film (High hardness/ Oxidation resistance)
		new PC5335	K20~K30	For medium-rough turning and milling of cast iron	●	●					●			★TiAlCrN film (Lubricative)

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
PVD		PC5400 (new)	K25~K35	For medium-rough turning and milling of cast iron	●	●			●		●			★TiAlCrN film (Lubricative)
		PC215K	K15~K30	For medium-rough milling of cast iron		●	●	●	●					★New TiAlN film (High hardness/ Oxidation resistance)
		PC2005 (new)	K01~K10	For finish milling of cast iron		●								TiMeN / TiAlN
		PC2015 (new)	K10~K20	For universal milling of cast iron		●								AlCrN
		PC203F	K05~K15	For high speed end milling of cast iron (H-max)									●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC220	K20~K35	For high speed end milling of cast iron (H-max)									●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC303S (new)	K05~K15	For finish end milling of cast iron									●	TiMeN / TiAlN
		PC310U (new)	K10~K20	For medium / rough end milling of cast iron									●	TiMeN / TiAlN
		PC315E (new)	K20~K35	For universal end milling of cast iron									●	AlCrN
		PC320 (new)	K20~K35	For universal end milling of cast iron									●	TiAlN
		PC215G (new)	K15~K30	For general drilling Solid drill								●		TiAlN
		PC325U (new)	K20~K35	For general drilling Solid drill								●		TiAlCrN
		PC315G (new)	K15~K30	For general drilling Solid drill								●		TiAlCrN
	M	PC8110	M10~M20	For medium to finish turning of STS	●			●		●				★New TiAlN film (High hardness/ Oxidation resistance)
		PC9030	M25~M35	For medium to rough turning of STS at interruption	●		●	●		●				TiAlN
		PC5300	M20~M30	For medium to rough turning and milling of STS	●	●	●	●	●	●	●			★New TiAlN film (High hardness/ Oxidation resistance)
		PC5335 (new)	M25~M35	For medium to rough turning and milling of STS	●	●					●			★TiAlCrN film (Lubricative)
		PC9530	M25~M35	For medium to rough milling of STS at interruption		●					●			TiAlN
		PC5400 (new)	M30~M40	For medium to rough turning and milling of STS	●	●			●		●			★TiAlCrN film (Lubricative)
		PC3545	M30~M40	For rough and highly interrupted milling of STS		●								TiN / TiAlN
		PC3030T	M20~M30	For STS threading					●					TiAlN
		PC2015 (new)	M10~M20	For universal milling of STS		●								AlCrN
		PC8105 (new)	M05~M15	For finish turning of STS	●			●						TiAlN
		PC8115 (new)	M15~M25	For medium to rough turning of STS	●			●						TiAlN
		PC303S (new)	M05~M15	For universal end milling of cast iron									●	TiMeN / TiAlN

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
PVD	M	PC310U (new)	M10~M20	For universal end milling of cast iron									●	TiMeN / TiAlN
		PC320S	M20~M35	For general endmilling of stainless steel (STS)									●	TiMeN / TiAlN
		PC315E (new)	M20~M30	For universal end milling of cast iron									●	
		PC205F	P20~P35	For general drilling Solid drill								●		★New TiAlN film (High hardness/ Oxidation resistance)
		PC215G (new)	M15~M25	For general drilling Solid drill								●		TiAlN
		PC325U (new)	M20~M30	For general drilling Solid drill								●		TiAlCrN
		PC315G (new)	M15~M25	For general drilling Solid drill								●		TiAlCrN
	S	PC8105 (new)	S01~S10	For finish turning of heat-resistant alloy	●			●						TiAlN
		PC8110	S05~S15	For medium to finish turning of heat-resistant alloy steel	●			●		●				★New TiAlN film (High hardness/ Oxidation resistance)
		PC8115 (new)	S10~S20	For medium to rough turning of heat-resistant alloy	●			●						TiAlN
		PC5300	S15~S25	For medium to rough turning and milling of heat-resistant alloy steel	●	●	●	●	●	●	●		●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC5335 (new)	S20~S30	For medium to rough turning and milling of heat-resistant alloy steel	●	●					●			★ TiAlCrN film (Lubricative)
		PC5400 (new)	S25~S35	For medium to rough turning and milling of heat-resistant alloy steel	●	●			●		●			★ TiAlCrN film (Lubricative)
		PC3545	S25~S35	For rough and highly interrupted milling of heat-resistant alloy steel		●								TiN / TiAlN
		PC2015 (new)	S10~S20	For universal milling of heat-resistant alloy		●								AlCrN
		PC210	S15~S25	General E/M Cutting for Heat resistant Alloy Steel									●	★New TiAlN film (High hardness/ Oxidation resistance)
		PC320S	S15~S25	General E/M Cutting for Heat resistant Alloy Steel									●	TiMeN / TiAlN
		PC325E (new)	S25~S35	For universal end milling of heat-resistant alloy									●	AlCrN
		PC205F	S15~S25	For universal end milling of heat-resistant alloy								●		★New TiAlN film (High hardness/ Oxidation resistance)
Uncoated	P	ST30A	P25~P35	For general steel machining	●		●		●	●				
	K	H01	K10~K15	For finishing cast iron and non ferrous metal (aluminum, etc.)	●	●		●			●		●	
		H05	K10~K15	For finishing cast iron	●	●					●			
		G10	K15~K20	For medium cutting of cast iron	●	●		●						
	N	H01	N10~N20	For finishing cast iron and non ferrous metal (aluminum, etc.)	●	●		●			●		●	
		H05	N15~N25	For medium cutting of cast iron and non ferrous metal (aluminum, etc.)	●	●							●	
Cermet	P	CC1500 (new)	P01~P10	For light cutting of steel at high speed (Optimized for precise boring)	●		●	●	●	●				★ TiAlCrN film (Lubricative)
		CC2500 (new)	P10~P20	For light cutting of steel at medium to high speeds	●		●	●	●	●				★ TiAlCrN film (Lubricative)

KORLOY grades

Cat.	ISO	Grade	Range	Workpiece application	Turning	Milling	Facing	Grooving	Threading	Parting	Index drill	Solid drill	Endmill	Coating layer
Cermet	P	CN1500 (new)	P05~P15	For continuous cutting at high speeds	●		●	●	●	●				
		CN2000	P10~P20	For medium to rough turning and milling of steel	●		●	●		●				
		CN2500 (new)	P15~P25	For highly interrupted machining at high feed	●		●	●						
		CN30	P20~P30	For rough milling of steel		●								
	K	CN1500 (new)	K05~K10	For high speed finishing of cast iron	●		●	●						
		CN2500 (new)	K10~K20	For high speed and interrupted machining of cast iron	●		●	●						
cBN	H	KB410	H01~H10	For high speed and continuous cutting of heat-treated steel	●									
		KB420	H05~H15	For highly efficient machining of heat-treated steel	●									
		KB425	H15~H25	For high speed and interrupted cutting of heat-treated steel	●									
		KB320	H15~H25	For continuous and interrupted cutting of heat-treated steel	●									
		KB335	H25~H35	For highly interrupted cutting of heat-treated steel	●									
		DNC100 (new)	H01~H10	For high speed and continuous cutting of heat-treated steel	●									★New TiAlN film (High hardness)
		DNC250	H05~H15	For high speed and continuous or low interrupted cutting of heat-treated steel	●									TiN TiAlN
		DNC350	H15~H25	For medium to high interrupted cutting of heat-treated steel	●									★New TiAlN film (High hardness)
		DNC400 (new)	H25~H35	For medium interrupted and continuous cutting of heat-treated steel	●									TiN TiAlN
	K	KB350	K01~K10	For finishing of high hardness cast	●									
		KB370	K05~K15	For high speed machining of cast iron	●	●								
PCD	N	DP90	N01~N10	For machining cemented carbide, ceramics, high Si-aluminum alloy, stone and rock	●									
		DP150	N05~N15	For machining high Si-aluminum alloy, copper alloy, rubber, wood and carbon	●									
		DP200	N10~N20	For precise machining of plastic, wood and aluminum	●									
DLC	N	PD1000	N01~N20	For turning of non ferrous metal (aluminum, etc.)	●									DLC
		PD2000	N01~N20	For milling of non ferrous metal (aluminum, etc.)		●								DLC
		PD3000	N01~N20	For end milling of non ferrous metal (aluminum, etc.)									●	DLC
Diamond coated	N	ND1000	N01~N20	For turning of non ferrous metal (graphite, aluminum, copper)	●									Dia Coating
		ND2000	N01~N20	For milling of non ferrous metal (graphite, aluminum, copper)		●								Dia Coating
		ND3000 (new)	N01~N05	For end milling of non ferrous metal (graphite, aluminum, copper)	●	●					●	●	●	Dia Coating
		ND2100 (new)	N05~N10	For hole making and endmilling of composite materials							●	●	●	Dia Coating

The comparison of grade for turning

WC

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	ST10 ST20 MA2 ST30 ST30A	ST10P ST20E A30 ST40E	PW30	IC50M IC54	S1P SM30 S30T S6	TTX TTM TTR	K45 KM K420	TX10S TX20 TX30 TX40	STi10T STi20T UTi20T	SRN5 WS20B EX35 EX40 EX45	S1F VC6 VC5 VC56		P10 P20 P30 P40		
	M	U2	U10E U2 A30 A40			H13A H10F	AT10 AT15 TTR	K2885 K2S	TU10 TU20 TU40	UTi20T	WAM10B EX35	VC27 VC28		M10 M20 M40		
	K	H01 H05 G10E	H1 G10E	KW10H	IC4 IC20 IC28	H1P H10F	THM THR	K68 K8735	TH03 TH10 KS20	HTi10T HTi20T	WH05 W10 WH20	VC3 VC2 VC1		K10 K20 K20M K30		

CVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	NC3215★ NC3225★ NC3120 NC3030 NC5330	AC805P AC810P AC700G AC900G AC820P AC2000 AC8025P AC830P	CA5505 CA510 CA515 VP5115 CA5515 CA525 VP5125 CA5525 CR9025 CA5535 CA530	IC8150 IC8250 IC8350	GC4305 GC4205 GC4315 GC4215 GC4325 GC4225 GC4335 GC4235	TP0500 TP0501 TP1500 TP1501 TGP25 TP2500 TP2501 TGP35 TP3501 TP3500 TGP45	KCP05 KCP05B KCP10 KCP10B KCP25 KCP25B KCP30 KCP30B KCP40 KCP40B	T9105 T9115 T9125 T9135	UE6105 UE6110 MY5015 MC6025 UE6020 MC6035 UE6035 UH6400	HG8010 HG8025 GM8035	VP5515 VP5525 VP5535	WPP10S WKP13S WPP20S WKP23S WPP30S WKP33S	TT8105 TT8110 LC215P TT8115 TT8120 LC225P TT8125 TT5100 TT8135 TT7100	CP5	JC110V JC215V JC325V JC450
	M	NC9115★ NC9125★ NC9025 NC9135★	AC610M AC630M AC6030M	CA6515 CA6525	IC6015 IC6025	S05F GC2015 GC2220 GC2025	TM2000 TM4000	KCM15 KCM15M KCM25 KCM25B KCM35 KCM35B	T6120 T6130	MC7015 MC7025 US7020 US735	GM25 GX30	VP8515 VP8525	WAM10 WMP20S WAM20 WAM30	TT9215 TT9225 TT9235		
	K	NC6205 NC6210 NC6315★	AC405K AC415K AC420K	CA4505 CA4010 CA4515 CA4115 CA4120	IC5005 IC5015	GC3205 GC3210 GC3215 GC3225	TK1001 TK2001 TGK1500	KCK05 KCK05B KCK15 KCK15B KCK20 KCK20B	T5105 T5115 T5125	MC5005 UC5105 MC5015 UC5115	HG3505 HG3515	VP1505 VP1510 VP1515	WKK10S WKK20S WAK30	TT7005 TT7505 TT7310 TT7015 TT6300	CP2 CP5	JC105V JC110V JC215V

PVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	PC8105★ PC8110 PC230 PC5300 PC8115★		PR1005 PR915 PR1115 PR930 PR1025 PR630 PR660	IC507 IC808 IC830 IC908 IC3028 IC330	GC1025 GC4125	CP200 CP250 CP500	KU10T KU25T	AH710 GH730 AH330 AH740 AH120 GH330	VP15TF VP20MF	IP2000 IP3000	VC907 VC927 VC905	WTA43 WTA41	TT5030		JC5003 JC5015
	M	PC8105★ PC8110 PC8115★ PC5300★ PC9030 PC5400★	AC510U EH510Z AC520U EH520Z AC530U	PR915 PR930 PR1125 PR630 PR660	IC808 IC907 IC3028 IC830 IC330	GC1005 GC1105 GC1020 GC1025 GC4125 GC2035	CP200 CP250 CP500	KC5010 KC5510 KC5025 KC5525	AH330 GH330 AH120 GH730 AH140 AH630 AH645	MP9005 VP10RT VP15TF VP20MF MP7035	IP50S IP100S	VC929 VC927 VC902 VC901 VC905	WSM10S WSM20S WSM30S WSM40S	TT5030 TT8020	ZM3 QM3 VM1 TAS	JC5003 JC5015
	K	PC5300	EH510Z EH520Z		IC5100 IC810 IC220 IC908 IC228		CP200 CP250 CP500		AH110 GH110 AH120		CY110H	VC929 VC903 VC927 VC902 VC901 VC907		TT5030		
	S	PC8105 PC8110 PC8115★ PC5300 PC5400★	AC510U AC520U	PR915 PR660 PR1325	IC808 IC907 IC3028 IC328	GC1105 GC1025 GC2035	TS2000 CP500 TS2500	KC5010 KC5025	AH110 AH120	VP05RT VP10RT VP15TF MP7035			WSM10 WSM20 WSM30	TT5030		

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	CC1500★ CN1500★ CC2500★ CN2000 CN2500★	T110A T2000Z★ T1500A T3000Z★	PV30★ TN30 PV7020★ TN60 TN620 TN6020 TN90 PV90★	IC20N IC520N IC30N IC530N	CT5015 CT525 GC1525★	CM C15M TP1020 TP1030★	HT2 KT125 HT5 KT175 KT195M	NS520 GT530★ NS530 NS9530 GT9530★ NS540 NS730	NX2525 NX3035 UP35N★ AP25N★ NX335 MP3025★	CH350 CZ25★ CH530 CH550 CH570	VC83	WTA43★ WTA41★	PV3010★ CT3000	T3N T15 N20 C30 N40	LN10 CX50 CX75 CX90 CX99
	M															
	K	CN1500★ CN2500★	T110A							NX2525				CT3000	T15	LN10 CX75

★ : PVD Coating cermet ★ : New Grade

The comparison of grade for milling

CVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Milling	P	NC5330 NC5340★ NCM325 NC5350★ NCM335	ACP100		IC5100 IC5400	GC4210 GC4220 GC4230	MP1500 MS2500 MP2500 MS2500 T350M MM4500	KCPM20 KCMP30 KC927M	T3130	FH7020 F7030		SM245	WKP25S WKP35S WKP35G	TT8515 TT7800		
	M	NC5330 NC5340★ NCM325 NC5350★ NCM335	ACP400			GC2040	MP2500 MM4500		T3130	F7030						
	K	NC5330 NC5340★ NC5350★	ACK200		IC5100	GC3330 GC3040	MK1500 MK2000 MS2500 T350M MK3000	KC907M KCK15 KC914M KCPK30 KC917M KC924M	T1115 T1015	MC5020			WAK15 WKK25 WKP25S WKP35S WKP35G	TT7515 TT6800		

PVD coated

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Milling	P	PC2005★ PC2010★ PC2015★ PC2505★ PC2510★ PC3600 PC3500 PC210F★ PC5300 PC5400★	ACZ310 ACP200 ACZ330 ACP300 ACZ350	PR730 PR830 PR630 PR660	IC903 IC908 IC950 IC1008 IC928	P20A GC1010 GC1025 GC1030 GC1030	MP3000 F25M F30M F40M T60M	KC522M KUC20M KC525M KUC30M KC935M KC7140 KC720	GH330 AH120 AH3135	AP20M GP20M MP6120 VP15TF UP20M MP6130 VP30RT	ATH80D PCA08M ACS05E PCA12M PC20M JX1005 TB6005 JX1020 CY9020 TB6045 CY250 PTH30E JP4160 JM4160 PTH40H	VC935	WKP25 WKP35 WKP45	TT2510 TT7070 TT7080 TT7030 TT8020	QM3 ZM3	DH102 JC5003 JC5015 JC5030 JC5040
	M	PC210F★ PC5300 PC9530 PC5400★	ACM100 ACP200 ACM300 ACP300 ACZ350	PR730 PR1025 PR630 PR660 PR1535 PR660	IC903 IC900 IC250 IC928 IC328	GC1125 GC1025 GC2030 GC1030	F25M F30M F40M	KC5510 KC7020 KC522M KC725M KC735M KC7030 KC722	AH120 AH140 AH3135	MP7130 MP7140	JX1020 CY9020 JX1015 TB6020 CY250 JX1045 TB6045 JX1060 TB6060	VC928 VC902 VC901	WQM35 WSM35S WSP45 WSM45S	TT9030 TT9080 TT8020	QM3 ZM3	JC5003 JC5015 JC5030 JC5040
	K	PC8110★ PC6510 PC5300		PR510 PR905	DT7150 IC900 IC910 IC950 IC350		MK2050	KC510M KC915M KC520M	AH120	VP10MF VP15TF VP20RT		VC903 VC928 VC902 VC901		TT6290 TT6030 TT6060		JC5003 JC5015
	S	PC5300 PC5400★	AC520U	PR620 PR660 PR1535	IC328 IC408	GC1025 GC1040 S40T	F40M MS2050	KC510M KCU30M		VP15TF VP30RT MP9130	ACS05E		WSM35S WSM45S	TT9030 TT8020 TT8080		

CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Milling	P	CN2000 CN30	T250A	TN100M TC60M	IC30N			KT195M	NS540 NS740	NX2525 NX4545	CH550 CH570			CT3000 CT7000	C50	
	M		T250A			CT530										
	K									NX2525						

★ : PVD Coating cermet ★ : New Grade

M

OLD-FASHIONED PRODUCT INFORMATION



Old-fashioned product information

M02 Grade
M02 External Holder
M03 Fine Tool
M03 Threading Tool
M03 Mill-Max
M04 Cen-Mill
M04 Jip Drill
M04 LPD/SPD/NPD



Grade

ISO material code		Old grade	New grade
Coating grade	P	NC310, NC3020	NC3215
		NC320, NC3020, NC3120, NC3220	NC3225
		NC330	NC3030
	M	PC3530, PC3525, PC3535, PC3500	PC3600
	K	NC6110, NC6210, NC6215	NC6315
	S	PC8010	PC8110
	P, M, K, S	PC8520, PC215K	PC5300
		PC225F	PC205F
Cermet		CN1000	CN1500
		CT10, CN200	CN2000

- Korloy always study and develops cutting-edge technology tools and grades which covers higher speed and feed conditions
- Korloy guarantees better performance and wide stock-management range for the new grade

External holder

Designation	Insert	Old parts name						New holder	Page
		Lever	Screw	Shim	Shim pin	Wrench	Shim pin Wrench		
PCBNR□□□□-□19	CN**1906	LV6	VHX1027	SC63	SP6	HW40L	-	PCBNR□□□□-□19N	**B153**
PCBNR□□□□-□25	CN**2509	LV8	VHX1236	SC83	SP8	HW50L	-	PCBNR□□□□-□25N	
PCLNR□□□□-□19	CN**1906	LV6	VHX1027	SC63	SP6	HW40L	-	PCLNR□□□□-□19N	**B154**
PCLNR□□□□-□25	CN**2509	LV8	VHX1236	SC83	SP8	HW50L	-	PCLNR□□□□-□25N	
PSBNR□□□□-□19	SN**1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSBNR□□□□-□19N	**B157**
PSBNR□□□□-□25	SN**2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSBNR□□□□-□25N	
PSDNN□□□□-□19	SN**1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSDNN□□□□-□19N	**B157**
PSDNN□□□□-□25	SN**2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSDNN□□□□-□25N	
PSKNR□□□□-□19	SN**1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSKNR□□□□-□19N	**B158**
PSKNR□□□□-□25	SN**2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSKNR□□□□-□25N	
PSSNR□□□□-□19	SN**1906	LV6	VHX1027	SS63	SP6	HW40L	-	PSSNR□□□□-□19N	**B158**
PSSNR□□□□-□25	SN**2507	LV8	VHX1236	SS83	SP8	HW50L	-	PSSNR□□□□-□25N	

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service

Designation	Insert	Old parts name				New holder	Page
		Wedge clamp	Screw	Washer	Others		
WTENN□□□□-□16 (Old Type: MTEEN)	TN**1604	CMH5R1	MHX0523	WA4	Same as before	WTEEN□□□□-□16	**B161**
WTJNR□□□□-□16 (Old Type: MTJNR)	TN**1604	CMH5R1	MHX0523	WA4	Same as before	WTJNR□□□□-□16	**B161**
WTXNR□□□□-□16 (Old Type: MTXNR)	TN**1604	CMH5R1	MHX0523	WA4	Same as before	WTXNR□□□□-□16	**B161**

- Old parts are not interchangeable with new type holder part
- Good performance and convenient use of New type holder gives customer best quality of service

Fine tool

Designation	Insert		Old parts name		New holder	Page
			Screw	Wrench		
FTIH	FTIH08****	FTG08, FTT08, FTF08	PTKA02508	TW08P	NFTIH	C56
	FTIH11****	FTG11, FTT11, FTF11	PTKA03510	TW15P		
	FTIH14****	FTG14, FTT14, FTF14	PTKA0412	TW15P		
	FTIH16****	FTG16, FTT16, FTF16	PTKA0512	TW20P		

• Old inserts and parts are not interchangeable with new fine tool
• Good performance and convenient use of new fine tool gives customer best quality of service

Threading tool

Designation	Insert		Old parts name						New holder	Page
			Clamp	Clamp screw	Shim	Screw	C-ring	Wrench		
ETH	~ETH3**R	ECTR3***	CH5R3	CHX0513	ST32C1	SHX0310	CR04	HW20L,HW25L	ER(L)H-*	D31
	~ETH4**R	ECTR4***	CH6R4	CHX0621	ST42C1	SHX0310	CR05	HW20L,HW30L		
ITH	~ITH2**R	ICTR2***	CH5R3	CHX0513	ST32C1	FTKA02565	CR04	TW07P	IR(L)H-*	D32
	~ITH3**R	ICTR3***	CH5R3	CHX0513	ST32C1	SHX0310	CR04	TW15P,HW20L,HW25L		
	~ITH4**R	ICTR4***	CH6R4	CHX0621	ST42C1	SHX0310	CR05	HW20L,HW30L		

• Old inserts and parts are not interchangeable with threading holders
• Good performance and convenient use of new fine tool gives customer best quality of service

Mill-Max

Designation	Insert	Old parts name					New holder	Page
		Locator	Wedge	Wedge screw	Locator screw	Wrench		
AD(ADM)4000	SD**1203	LAS4R/L	WASR/L	WTX0817	LTX0512	TW25	ADN(ADNM)4000	E42
AD(ADM)5000	SD**1504	LAS5R/L	WASR/L	WTX0817	LTX0512	TW25	ADN(ADNM)5000+	E43
ADN(ADNM)5000	SD**1504	LADN5R/L	WEPN5R/L	DHA0821F	LTX0514	HW40		E43
EP(EPM)4000	SP**1203	LES4R/L LES4R1/L1 (Ø80 ~ Ø100)	WESR/L	WTX0817 WTX0813 (Ø80 ~ Ø100)	LTX0512	TW25	EPN(EPNM)4000	E48
EP(EPM)5000	SP**1504	LES5R/L LES5R1/L1 (Ø80 ~ Ø100)	WESR/L	WTX0817 WTX0813 (Ø80 ~ Ø100)	LTX0512	TW25	EPN(EPNM)5000+	E49
EPN(EPNM)5000	SP**1504	LEPN5R/L LEPN5R1/L1 (Ø80 ~ Ø100)	WEPN5R/L	DHA0821F DHA0817F (Ø80 ~ Ø100)	LTX0514	HW40		E49
PP(PPM)4000	TP**2204	LPT4R/L LPT4R1/L1 (Ø80 ~ Ø100)	WESR/L	WTX0817 WTX0813 (Ø80 ~ Ø100)	LTX0512	TW25	PPN(PPNM)4000	E51

• Parts are not interchangeable with new mill-max cutters
• Good performance and convenient use of new mill-max gives customer best quality of service

Cen-Mill

Designation	Insert		Old parts name		New product	Page
			Screw	Wrench		
HE	Ø25	MCMT080308EN ZCMT080308ER	FTNA0307	TW09P	AMS****M	E164~E166
	Ø32, 40, 50	MCMT09T308EN ZCMT09T308ER	FTNA0408	TW15P		
LE (LEM)	LOCX1205ZZ		FTNB0411	TW15S	AMC****M	E151~E153
SE	Ø25	MPMT090308	FTNA0408	TW15S	AMS****MH	E167~E168
	Ø32, 40	MPMT120408	FTNA0513	TW20S		
TM	MIT100,150,200,300,400 MET100,150,200,300,400		FTNB0411 (TM632R) FTNA0513	TW15L (TM632R) TW20L	TMS(I)	D49
PM	EDCW1604ZDF/TR		FTNA0513	TW20L	RM4Z	E105~E106
CE (Code changed)	SPG(M)N1203**				CE45-****R-S32 (New code)	E315~E317

- Old inserts and parts are not interchangeable with new milling product
- New product : Alpha mill which has unique alpha-curve edge guarantees wide range machining and good performance.
- Good performance and convenient use of new milling tool gives customer best quality of service

Jip Drill

Designation	Insert		Old parts name		New product	Page
			Screw	Wrench		
JD	~JD200	WCMT030208-C20	FTNA02565	TW07P	K□D (KING-DRILL)	G12~G26
	~JD250	WCMT040208-C20				
	~JD300	WCMT050308-C20	FTNA0307	TW09P		
	~JD410	WCMT06T308-C20	FTGA03508			
	~JD580	WCMT080408-C20	FTNA0408	TW15P		

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service

LPD/SPD/NPD

Designation	Insert		Old parts name		New product	Page
			Screw	Wrench		
LPD	~LPD135	LPMT040203-DF	FTNA0204	TW06P	K□D (KING-DRILL)	G12~G26
SPD	~SPD155	SPM(E)T050203-DM, DF, DS, DA	FTNA0204	TW06P		
	~SPD195	SPM(E)T060204-DM, DS, DR, DA	FTKA02206S	TW07S		
	~SPD225	SPM(E)T070204-DM, DS, DR, DA	FTKA02565	TW07S		
NPD	~NPD245	NPM(E)T222408-DM, DS, DR, DA	FTKA02565	TW07S		
	~NPD285	NPM(E)T252808-DM, DS, DR, DA	FTKA0307	TW09S		
	~NPD325	NPM(E)T293208-DM, DS, DR, DA	FTKA0307	TW09S		
	~NPD405	NPM(E)T334008-DM, DS, DR, DA	FTKA03508	TW15S		
	~NPD505	NPM(E)T415008-DM, DS, DR, DA	FTKA0410	TW15S		
	~NPD605	NPM(E)T516012-DM, DS, DR, DA	FTNC04511	TW20S		

- Old inserts and parts are not interchangeable with new indexable drill
- Good performance and convenient use of new indexable drill gives customer best quality of service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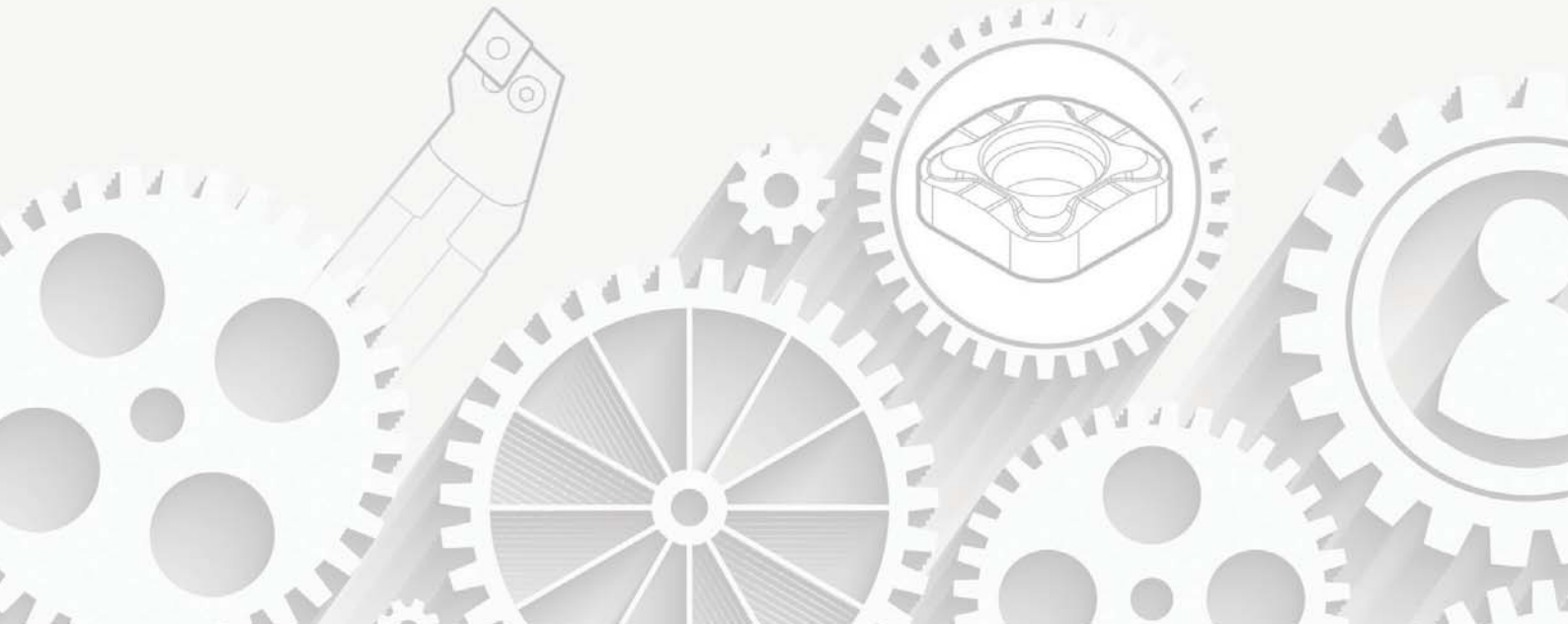

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CCET-KF	Auto tools Insert (ISO type)	**B113**
CCET-KF	Auto tools Insert (ISO type)	**B62, 109**
CCET-KM	Auto tools Insert (ISO type)	**B113**
CCET-KM	Auto tools Insert (ISO type)	**B62, 109**
CCGT-AK	Aluminum Insert_Positive (Screw on System)	**B87**
CCGT-AR	Aluminum Insert_Positive (Screw on System)	**B87**
CCGT-KF	Turning Insert_Positive (Screw on System)	**B63**
CCGT-KM	Turning Insert_Positive (Screw on System)	**B63**
CCGT-VP1	Auto tools Insert (ISO type)	**B113**
CCGT-VP1	Turning Insert_Positive (Screw on System)	**B63**
CCLNR/L	Insert for Ceramic Holder	**B179**
CCLR4000	Composite Router Endmill (Flat type)	**F98**
CCMT	PCD Insert_Positive	**B98**
CCMT-C25	Turning Insert_Positive (Screw on System)	**B65**
CCMT-HMP	Turning Insert_Positive (Screw on System)	**B64**
CCMT-MP	Turning Insert_Positive (Screw on System)	**B65**
CCMT-VF	Turning Insert_Positive (Screw on System)	**B64**
CCMT-VL	Turning Insert_Positive (Screw on System)	**B64**
CCMT-VP1	Turning Insert_Positive (Screw on System)	**B64**
CCMW	cBN Insert_Positive (Regrinding)	**B97**
CCR2000	Composite Router Endmill (Flat type)	**F97**
CCRR6000	Composite Router Endmill (Flat type)	**F99**
CCRR8000	Composite Router Endmill (Flat type)	**F99**
CCT	Solid Chamfer Tool	**E319**
CD	Drill Insert (Center Drill)	**G42**
CDEW-NAF	Milling Insert (Aero Mill)	**E06**
CDEW-NAW	Milling Insert (Aero Mill)	**E06**

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CDEW-XAF	Milling Insert (Aero Mill)	**E07**
CDEW-XAW	Milling Insert (Aero Mill)	**E07**
CDEW-XCF	Milling Insert (Aero Mill)	**E07**
CDH	Drill Insert (Center Drill)	**G42**
CE	Cen-mill	**M04**
CE	Chamfer Tool (Back & Front Champer)	**E315**
CE	Chamfer Tool (Long Champer)	**E316**
CE	Multi-functional Chamfer Tool	**E317**
CET	Solid Chamfer Tool	**E318**
CFE2000	C-Max (Flat type)	**F85**
CFNE2000	C-Max (Long Neck Flat type)	**F85**
CJ	Brazed Tools (Chuck jaws)	**H11**
CKFNR/L…RW	Bearing Solution	**B138**
CKGNR…RW	Bearing Solution	**B138**
CKJNR/L	Holder (Clamp on System)	**B163**
CKNNR/L	Holder (Clamp on System)	**B163**
CKUNR/L	Boring Bar (Clamp on System)	**B191**
CMSNR/L…B	Bearing Solution	**B135**
CMSNR/L…F	Bearing Solution	**B135**
CNGG-VP1	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B26**
CNGG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B26**
CNHQ	Milling Insert (Side milling cutter_Tangential type)	**E07**
CNMA	cBN Insert_Negative(Regrinding)	**B97**
CNMA	Turning Insert_Negative (Multi Lock / Lever Lock System)	**B26**
CNMG-B25	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B30**
CNMG-GR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B30**
CNMG-HA	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B27**
CNMG-LP	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B27**
CNMG-LW	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B30**
CNMG-MK	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B28**
CNMG-MM	Turning Insert (Save Turn)	**B101**
CNMG-MM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B29**
CNMG-MP	Turning Insert (Save Turn)	**B101**
CNMG-MP	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B29**
CNMG-RK	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B31**
CNMG-RM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B31**
CNMG-VB	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B26**
CNMG-VC	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B27**
CNMG-VF	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B26**
CNMG-VL	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B27**
CNMG-VM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B30**
CNMG-VP1	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B26**
CNMG-VP2	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B28**
CNMG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B30**

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CNMG-VP4	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B31**
CNMG-VQ	Turning Insert (Save Turn)	**B101**
CNMG-VQ	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B28**
CNMG-VR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B31**
CNMG-VW	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B27**
CNMM	PCD Insert_Negative/Positive	**B98**
CNMM-GH	Turning Insert_Negative (Multi Lock / Lever Lock System)	**B32**
CNMM-GR	Turning Insert_Negative (Lever Lock System)	**B32**
CNMM-HA	Turning Insert_Negative (Lever Lock System)	**B32**
CNMM-VH	Turning Insert_Negative (Lever Lock System)	**B32**
CNMM-VT	Turning Insert_Negative (Lever Lock System)	**B32**
CNMX	PCD Insert_Negative/Positive	**B98**
CPGT	Turning Insert_Positive (Screw on System)	**B66**
CPGT-HMP	Turning Insert_Positive (Screw on System)	**B66**
CPM	Tooling System (CPM)	**I 18**
CPMH	Milling Insert (T-Cutter)	**E07**
CPMT	Milling Insert (T-Cutter)	**E07**
CPMT	PCD Insert_Negative/Positive	**B98**
CPMT-C25	Turning Insert_Positive (Screw on System)	**B66**
CPMT-VF	Turning Insert_Positive (Screw on System)	**B66**
CPMT-VL	Turning Insert_Positive (Screw on System)	**B66**
CRDNN	Insert for Ceramic Holder	**B179**
CRE2000	C-Max (Radius type)	**F87**
CRGNR/L	Insert for Ceramic Holder	**B179**
CRNE2000	C-Max (Long Neck Radius type)	**F87**
CSBNR/L...BS	Bearing Solution	**B139**
CSDNN	Insert for Ceramic Holder	**B179**
CSDPN	Holder (Clamp on System)	**B163**
CSGNR/L...RW	Bearing Solution	**B138**
CSKNR/L	Insert for Ceramic Holder	**B180**
CSKNR/L...BS	Bearing Solution	**B139**
CSKPR/L	Boring Bar (Clamp on System)	**B191**
CSKPR/L	Cartridge (Clamp on System)	**B222**
CSKPR/L	Holder (Clamp on System)	**B164**
CSKPR/L...B	Bearing Solution	**B137**
CTFNR/L	Insert for Ceramic Holder	**B180**
CTFPR/L	Boring Bar (Clamp on System)	**B191**
CTFPR/L	Cartridge (Clamp on System)	**B222**
CTFPR/L	Holder (Clamp on System)	**B164**
CTGNR/L	Insert for Ceramic Holder	**B180**
CTGNR/L...BS	Bearing Solution	**B139**
CTGPR/L	Holder (Clamp on System)	**B164**
CTSPR/L	Cartridge (Clamp on System)	**B222**
CTTPR/L	Cartridge (Clamp on System)	**B223**

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CTWPR/L	Cartridge (Clamp on System)	**B223**

D

DB	Multi functional Insert (Grooving Tools)	**C57**
DBC	Tooling System (DBC)	**I 65**
DBE2000	D Endmill (Ball type)	**F92~93**
DBE4000	D Endmill (Ball type)	**F94**
DBH	Multi functional holder (Grooving Tools)	**C57**
DC	Multi functional holder (Grooving Tools)	**C57**
DC	Tooling System	**I 21**
DCBNR/L	Holder (Double clamp system)	**B148**
DCET-KF	Auto tools Insert (ISO type)	**B113**
DCET-KF	Turning Insert_Positive (Screw on System)	**B67**
DCET-KM	Auto tools Insert (ISO type)	**B113**
DCET-KM	Turning Insert_Positive (Screw on System)	**B67**
DCGT-AK	Aluminum Insert_Positive (Screw on System)	**B88**
DCGT-AR	Aluminum Insert_Positive (Screw on System)	**B88**
DCGT-KF	Turning Insert_Positive (Screw on System)	**B67**
DCGT-KM	Turning Insert_Positive (Screw on System)	**B68**
DCGT-VP1	Auto tools Insert (ISO type)	**B113**
DCGT-VP1	Turning Insert_Positive (Screw on System)	**B68**
DCGW	cBN Insert_Positive (Regrinding)	**B97**
DCKNR/L	Holder (Double clamp system)	**B148**
DCLNR/L	Boring Bar (Double clamp system)	**B185**
DCLNR/L	Holder (Double clamp system)	**B148**
DCLNR/L	HSK Tooling System	**B210, 214**
DCLNR/L	KM Tooling System	**B214**
DCLNR/L	KM Tooling System	**B216**
DCMNN	HSK Tooling System	**B210**
DCMNN	KM Tooling System	**B216**
DCMT	PCD Insert_Negative/Positive	**B98**
DCMT-C25	Turning Insert_Positive (Screw on System)	**B69**
DCMT-HMP	Turning Insert_Positive (Screw on System)	**B69**
DCMT-MP	Turning Insert_Positive (Screw on System)	**B69**
DCMT-VF	Turning Insert_Positive (Screw on System)	**B68**
DCMT-VL	Turning Insert_Positive (Screw on System)	**B69**
DCMT-VP1	Turning Insert_Positive (Screw on System)	**B69**
DCS	Tooling System	**I 21**
DDJNR/L	Holder (Double clamp system)	**B149**
DDJNR/L	HSK Tooling System	**B210**
DDJNR/L	KM Tooling System	**B216**
DDNNN	HSK Tooling System	**B210**
DDNNN	KM Tooling System	**B217**

D

DDUNR/L	Boring Bar (Double clamp system)	**B185**
DF	Side Cutter	**E352**
DFE2000	D Endmill (Flat type)	**F90**
DFE4000	D Endmill (Flat type)	**F91**
DHE	DHE Tooling System	**I 07~09**
DNGG-VP1	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B33**
DNGG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B33**
DNMA	cBN Insert_Negative (Regrinding)	**B97**
DNMA	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B33**
DNMG-B25	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B38**
DNMG-GR	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B38**
DNMG-HA	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B34**
DNMG-LP	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B35**
DNMG-LW	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B37**
DNMG-MK	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B36**
DNMG-MM	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B36**
DNMG-MM	Turning Insert_Save Turn	**B101**
DNMG-MP	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B36**
DNMG-MP	Turning Insert_Save Turn	**B101**
DNMG-RK	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B38**
DNMG-RM	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B39**
DNMG-VB	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B33**
DNMG-VC	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B35**
DNMG-VF	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B34**
DNMG-VL	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B34**
DNMG-VM	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B37**
DNMG-VP1	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B34**
DNMG-VP2	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B35**
DNMG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B37**
DNMG-VP4	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B39**
DNMG-VQ	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B35**
DNMG-VQ	Turning Insert_Save Turn	**B101**
DNMG-VR	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B39**
DNMG-VW	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B34**
DNMM	PCD Insert_Negative/Positive	**B98**
DNMX	PCD Insert_Negative/Positive	**B98**
DNMX-SH	Turning Insert_Negative (Multi Lock/Lever Lock, HSK Tooling System)	**B39**
DSBNR/L	Holder (Double clamp system)	**B149**
DSC	Tooling System (DSC series)	**I 11~16**
DSDNN	Holder (Double clamp system)	**B150**
DSK	Tooling System (BT-DSK)	**I 32~33**
DSKNR/L	Boring Bar (Double clamp system)	**B185**
DSKNR/L	Holder (Double clamp system)	**B150**
DSSNR/L	Holder (Double clamp system)	**B150**

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DST	Tooling System (DST series)	**I 38~39**
DTFNR/L	Boring Bar (Double clamp system)	**B186**
DTFNR/L	Holder (Double clamp system)	**B151**
DTGNR/L	Holder (Double clamp system)	**B151**
DTN	Tooling System (DTN series)	**I 41**
DVJNR/L	Holder (Double clamp system)	**B151**
DVVNN	Holder (Double clamp system)	**B152**
DWLNR/L	Boring Bar (Double clamp system)	**B186**
DWLNR/L	Holder (Double clamp system)	**B152**

E

EF(M)4000	Mill-max	**E46**
EH	Parting off Tools	**C60**
EM06H9M	R+ Endmill (Roughing endmill)	**F75**
EM09CA	R+ Endmill (Roughing endmill with finishing capability)	**F70**
EM11CA	R+ Endmill (Roughing endmill for wave form of Al)	**F70**
EM11PM	R+ Endmill (4F Roughing endmill)	**F73**
EM16PM	R+ Endmill (Roughing endmill for fine pitches)	**F73**
EM17PM	R+ Endmill (Roughing endmill for fine pitches)	**F74**
EM36CA	R+ Endmill (Long type roughing endmill for fine pitches)	**F71**
EM37CA	R+ Endmill (Roughing endmill for fine pitches)	**F71**
EM38CA	R+ Endmill (Standard roughing endmill)	**F72**
EM43CA	R+ Endmill (Standard roughing endmill for fine pitches)	**F72**
EN(M)4000	Mill-Max	**E47**
EP(M)4000	Mill-Max	**M03**
EP(M)5000	Mill-Max	**M03**
EPN(M)4000	Mill-Max	**E48**
EPN(M)5000	Mill-Max	**M03**
EPN(M)5000+	Mill Max Plus	**E49**
ER	Tooling System (ER Collet)	**I 35**
ER(L)	Thread Insert	**D10~30**
ER(L)H	Thread External Holder (Screw on System)	**D31**
ER(L)H-C	Thread External Holder (Clamp on System)	**D31**
ERM	Thread Insert	**D10~13**
ESB	Parting off Tools (Inserts)	**C60**
EV2525R/L-105-3	HSK Tooling System	**B215**
EV2525R/L-112	HSK Tooling System	**B215**
EV2525R/L-115	HSK Tooling System	**B215**
EXT	Tooling System (Extension Bar)	**I 72**

F

FBB	Tooling System (FBB Bite)	I 64
FBC	Tooling System (FBC)	I 63
FBH	Tooling System (FBH series)	I 58~60
FGD	MGT Insert	C26
FGHH	MGT Holder (Face Grooving)	C34
FGM	MGT Insert	C26
FGVH	MGT Holder (Face Grooving)	C35
FMA	Tooling System (FMA series)	I 46
FMAC(M)3000	Future Mill	E211
FMAC(M)3000-A	Future Mill (Aluminum body)	E213
FMAC(M)4000	Future Mill	E212
FMAC(M)4000-A	Future Mill (Aluminum body)	E214
FMAS3000	Future Mill	E215
FMAS4000	Future Mill	E216
FMC	Tooling System (FMC series)	I 47~48
FME4000	F Endmill (Standard)	F26
FMLE4000	F Endmill (Long)	F26
FMM	MGT Insert	C26
FMPC(M)3000	Future Mill	E217
FMPC(M)3000-A	Future Mill (Aluminum body)	E219
FMPC(M)4000	Future Mill	E218
FMPC(M)4000-A	Future Mill (Aluminum body)	E220
FMPS3000	Future Mill	E221
FMPS4000	Future Mill	E222
FMRC(M)3000	Future Mill	E223
FMRC(M)4000	Future Mill	E224
FMRC(M)4000	Future Mill_P-Positive	E238
FMRC(M)5000	Future Mill	E225
FMRC(M)5000	Future Mill_P-Positive	E239
FMRC(M)6000	Future Mill	E226
FMRC(M)6000	Future Mill_P-Positive	E240
FMRCM3000	Future Mill_P-Positive	E237
FMRM1000	Future Mill	E233
FMRM1500	Future Mill	E233
FMRM2000	Future Mill	E234
FMRM2500	Future Mill	E234
FMRM2500	Future Mill_P-Positive	E245
FMRM3000	Future Mill	E235
FMRM3000	Future Mill_P-Positive	E246
FMRM4000	Future Mill	E236
FMRM4000	Future Mill_P-Positive	E237
FMRM5000	Future Mill	E236
FMRM5000	Future Mill_P-Positive	E248
FMRS1000	Future Mill	E227

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FMRS1500	Future Mill	E227
FMRS2000	Future Mill	E228
FMRS2500	Future Mill	E228
FMRS2500	Future Mill_P-Positive	E241
FMRS3000	Future Mill	E229
FMRS3000	Future Mill_P-Positive	E242
FMRS4000	Future Mill	E230
FMRS4000	Future Mill_P-Positive	E243
FMRS5000	Future Mill	E231
FMRS5000	Future Mill_P-Positive	E244
FMRS6000	Future Mill	E232
FMRS6000	Future Mill_P-Positive	E244

G

GBE	GBE (Single edge type)	E301
GBEM	GBE (Modular type)	E303
GBE-M	GBE (Multi edge type)	E302
GERC	Tooling System (GERC Collet)	I 35
GFIK	Multi functional (Grooving Tools)	C59
GFIP	Multi functional (Grooving Tools)	C58
GFT	Multi functional (Grooving Tools)	C58
GH	Multi functional Insert (Grooving Tools)	C59
GO	Multi functional Insert (Grooving Tools)	C59
GR	Multi functional Insert (Grooving Tools)	C59
GS	Multi functional Insert (Grooving Tools)	C59
GSK	Tooling System (GSK series)	I 29~30
GW	Multi functional Insert (Grooving Tools)	C58

H

HAVE	HAVE (Multi Edge)	E308
HAVE	HAVE (Single Edge)	E309
HBRE	Broach Reamer	G109
HC	Tooling System (HC slim collet)	I 35
HDDCM7000	Mill Max Heavy	E53
HDDCM9000	Mill Max Heavy	E53
HE	Cen-Mill	M04
HECN	Milling Insert (High feed Cutter)	E07
HFMM	HFM modular	E256
HFMS1000	HFM shank	E254
HPEN	Milling Insert (High feed Cutter)	E07
HPEN-WC	Milling Insert (High feed Cutter)	E07
HRAG	Tooling System (Angular Head Series)	I 52

H

HRMC(M)13	HRM	E273
HRMC(M)15	HRM	E274
HRMDC(M)09	HRMDouble	E262
HRMDC(M)13	HRMDouble	E263
HRMDC(M)16	HRMDouble	E264
HRMDM 06	HRMDouble	E270
HRMDM 09	HRMDouble	E271
HRMDM 13	HRMDouble	E272
HRMDS06	HRMDouble	E265
HRMDS09	HRMDouble	E266
HRMDS13	HRMDouble	E268
HRMM08	HRM	E278
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HSK100A	HSKTooling System (Modular)	E195
HSK100A AM3000	HSKTooling System (Multi edge)	E192
HSK100A AM4000	HSKTooling System (Multi edge)	E193
HSK63A	HSKTooling System (Modular)	E195
HSK63A AM1000	HSKTooling System (Multi edge)	E189
HSK63A AM1000HS	HSKTooling System (Single edge)	E178
HSK63A AM1500	HSKTooling System (Multi edge)	E190
HSK63A AM1500HS	HSKTooling System (Single edge)	E179
HSK63A AM2000	HSKTooling System (Multi edge)	E191
HSK63A AM2000HS	HSKTooling System (Single edge)	E180
HSK63A AM3000HS	HSKTooling System (Single edge)	E181
HSK63A AM4000HS	HSKTooling System (Single edge)	E182
HSK63A/100A PAX5000	Pro-L Mill	E336
HSK-FMA	Tooling System (Damping pro)	I 78
HSK-FMC	Tooling System (Damping pro)	I 79
HT	Tooling System (Other)	I 81

I

IG	Multi functional Insert (Grooving Tools)	C57
IGH	Multi functional Insert (Grooving Tools)	C57
IPBE2000	I+ Endmill (Ball type)	F37
IPBE4000	I+ Endmill (Ball type)	F39
IPFE2000	I+ Endmill (Flat type)	F33
IPFE4000	I+ Endmill (Flat type)	F35
IPLBE2000	I+ Endmill (Long Ball type)	F38
IPLFE2000	I+ Endmill (Long Flat type)	F34
IPLFE4000	I+ Endmill (Long Flat type)	F36

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IPLRE2000	I+ Endmill (Long Radius type)	F42
IPLRE4000	I+ Endmill (Long Radius type)	F44
IPRE2000	I+ Endmill (Radius type)	F40~41
IPRE4000	I+ Endmill (Radius type)	F43
IR(L)	Thread Insert	D10~30
IR(L)H	Thread Internal Holder (Screw on System)	D32
IR(L)H-C	Thread Internal Holder (Clamp on System)	D32
IRB	Indexable Reamer (Stuffed hole)	G103
IRM	Thread Insert	D10~11
IRT	Indexable Reamer (Throughout hole)	G102

J

JD	Jip drill	M04

K

K2D	King Drill (for large diameter drilling)-2D	G26
K2D	King Drill (for through coolant system with a lathe)-2D	G22
K2D	King Drill-2D	G12~13
K3D	King Drill (for large diameter drilling)-3D	G26
K3D	King Drill (for through coolant system with a lathe)-3D	G23
K3D	King Drill-3D	G14~16
K3D*	King Drill (for machining a tap foundation hole)-3D	G14~15
K4D	King Drill (for large diameter drilling)-4D	G26
K4D	King Drill (for through coolant system with a lathe)-4D	G24
K4D	King Drill-4D	G17~18
K5D	King Drill-5D	G19~20
KAC	Tooling System (Angular Head Series)	I 56
KAG	Tooling System (Angular Head Series)	I 54
KAH	Tooling System (Angular Head Series)	I 55
KCP	Tooling System (Others)	I 82
KCR	Cermet Reamer	G108
KEL-ANN	Milling insert (Storm Mill)	E10
KEL-MF	Milling insert (Gear cutter)	E10
KEL-QNN	Milling insert (Storm Mill)	E10
KGDS	Gun Dril (Single Lip type)	G96
KGDT	Gun Dril (Twin Lip type)	G97
KGEHR/L	Multi functional (KGT Holder)	C14
KGEHR/L-D00A	Multi functional (Auto tools Holder)	C16
KGEHR/L-DOOA	Auto tools (KGT type)	B122
KGEHR/L-T00	Multi functional (KGT Holder)	C16
KGEUR/L	Multi functional (KGT Holder)	C18
KGEVR/L-T00	Multi functional (KGT Holder)	C17

K

KGFHR/L	Multi functional (KGT Holder)	C20
KGFVR/L	Multi functional (KGT Holder)	C19
KGGN-A	Multi functional Insert (KGT)	C13
KGGN-B	Multi functional Insert (KGT)	C13
KGGN-R	Multi functional Insert (KGT)	C13
KGIUR/L	Multi functional (KGT Holder)	C21
KGIVR/L	Multi functional (KGT Holder)	C22
KGMI-T	Multi functional Insert (KGT)	C12
KGML-LP	Auto tools Insert (KGT type)	B122
KGML-LP	Multi functional Insert (KGT)	C13
KGML-RP	Auto tools Insert (KGT type)	B122
KGML-RP	Multi functional Insert (KGT)	C13
KGMN-C	Auto tools Insert (KGT type)	B122
KGMN-L	Auto tools Insert (KGT type)	B122
KGMN-L	Multi functional Insert (KGT)	C12
KGMN-R	Auto tools Insert (KGT type)	B122
KGMN-R	Multi functional Insert (KGT)	C12
KGMN-T	Auto tools Insert (KGT type)	B122
KGMN-T	Multi functional Insert (KGT)	C12
KGMR-LP	Auto tools Insert (KGT type)	B122
KGMR-LP	Multi functional Insert (KGT)	C12
KGMR-RP	Auto tools Insert (KGT type)	B122
KGMR-RP	Multi functional Insert (KGT)	C12
KGTB	KGT Blade for Parting off	C23
KHU	Tooling System (Angular Head Series)	I 53
KMB	Tooling System (KMB)	I 66
KM-DCLNR/L	KM Tooling System	B219
KNUX-11	Turning Insert_Negative (Clamp on System)	B40
KNUX-12	Turning Insert_Negative (Clamp on System)	B40
KRGN-A	Multi functional Insert (KGT)	C13
KRMN-C	Multi functional Insert (KGT)	C12

L

LBE08/10/12/16/20/25/30/32	Laser Mill (Carbide Shank-Ball, Corner R type)	E295
LBE08/10/12/16/20/25/30/32	Laser Mill (Steel Shank-Ball, Corner R type)	E296
LBE12/16/20/25/30/32	Laser Mill (Steel Shank-Ball, Corner R type)	E296
LBE-MHD	Laser Mill (Modular type)	E299
LBH	Milling Insert (Laser Mill)	E08
LBH-KF	Milling Insert (Laser Mill)	E08
LBH-KH	Milling Insert (Laser Mill)	E08
LBS	Milling Insert (Laser Mill)	E08
LCF	Milling Insert (Laser Mill)	E09
LDET	Milling Insert (Pro-L Mill)	E09

L

LE(M)	Cen-mill	M04
LFH	Milling Insert (Laser Mill)	E09
LNCS	Milling Insert (Rich Mill)	E10
LNE	Milling Insert (Gear cutter)	E10
LNEX-MA	Milling Insert (Rich Mill)	E11
LNEX-MF	Milling Insert (Rich Mill)	E10
LNEX-MM	Milling Insert (Rich Mill)	E11
LNKT	Milling Insert (TP2P)	E10
LNMX-MF	Milling Insert (Rich Mill)	E10
LNMX-MM	Milling Insert (Rich Mill)	E11
LPD	LPD	M04
LPEW	Milling Insert (HFM)	E12
LPMT-MF	Milling Insert (HFM)	E11
LPMW	Milling Insert (HFM)	E12
LR	Milling Insert (Laser Mill)	E09
LRE10/12	Laser Mill (Steel Shank-Corner R type)	E298
LRE10/12/16/20/25/30/32	Laser Mill (Carbide Shank-Ball, Corner R type)	E297
LRE12/16/25/30/32	Laser Mill (Steel Shank, Corner R type)	E298
LRH	Milling Insert (Laser Mill)	E09
LXET-MA	Milling Insert (Pro-L Mill)	E12
LXET-ML	Milling Insert (Pro-L Mill)	E12

M

MAH	Tooling System (Angular Head Series)	I 51
MAPD000HR/L-Z0	Aero Mill-Mini	E136
MAPDS000HR/L-Z0	Aero Mill-Mini	E135
MAT	Modular Adaptor (Steel Shank)	E342
MAT-C	Modular Adaptor (Carbide Shank)	E343
MBBR	Auto tools (MSB Tools_Back Boring)	B127
MBCR	Auto tools (MSB Tools_Copying)	B126
MBFR	Auto tools ((MSB Tools_Chamfering)	B127
MBR	Auto tools ((MSB Tools_Boring)	B126
MCER/L	HSK Tooling System (Cartridge)	B213
MCER/L	KM Tooling System (Cartridge)	B219
MCER/L	Multi functional (MGT Cartridge)	C38
MCFR/L	HSK Tooling System	B214
MCFR/L	Multi functional (MGT Cartridge)	C38
MCHR/L	HSK Tooling System	B213
MCHR/L	KM Tooling System	B218
MCHR/L	Multi functional (MGT Holder)	C37
MCKNR/L	Holder (Multi Lock System)	B165
MCLNR/L	Boring Bar (Multi Lock System)	B192
MCLNR/L	Holder (Multi Lock System)	B165

M

MCMNN	Holder (Multi Lock System)	**B165**
MCRNR/L	Holder (Multi Lock System)	**B166**
MCVR/L	Multi functional (MGT Holder)	**C37**
MD	Tooling System (Modular System)	**I 70~71**
MDJNR/L	Holder (Multi Lock System)	**B166**
MDNNN	Holder (Multi Lock System)	**B166**
MDQNR/L	Holder (Multi Lock System)	**B167**
MDUNR/L	Boring Bar (Multi Lock System)	**B192**
MFMN	Multi functional Insert (MGT Cartridge, MGT)	**C26**
MGEHR/L	Auto tools (MGT type)	**B123**
MGEHR/L	Multi functional (MGT for Aluminum Wheel)	**C41**
MGEHR/L	Multi functional (MGT Holder)	**C28**
MGEHR/L-15	Multi functional (MGT for Aluminum Wheel)	**C41**
MGEUR/L	Multi functional (MGT Holder)	**C29**
MGEVR/L	Multi functional (MGT Holder)	**C30**
MGEXR/L	Multi functional (MGT for Aluminum Wheel)	**C42**
MGFHR/L	Multi functional (MGT Holder)	**C33**
MGFR	Auto tools (MSB Tools_Face Grooving)	**B129**
MGFVR/L	Multi functional (MGT Holder)	**C33**
MGGN-A	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGGN-M	Multi functional Insert (MGT Cartridge, MGT)	**C26**
MGIUR/L	Multi functional (MGT Holder)	**C31**
MGIUR/L-MR	Multi functional (MGT for Aluminum Wheel)	**C41**
MGIUR/L-MV	Multi functional (MGT for Aluminum Wheel)	**C42**
MGIVR/L	Multi functional (MGT Holder)	**C32**
MGIXR/L-MR	Multi functional (MGT for Aluminum Wheel)	**C42**
MGMN	Auto tools Insert (MGT type)	**B123**
MGMN-G	Multi functional Insert (MGT Cartridge, MGT)	**C26**
MGMN-L	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMN-M	Multi functional Insert (MGT Cartridge, MGT)	**C26**
MGMN-R	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMN-T	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMR/L-PS	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGMR/L-PT	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MGR	Auto tools (MSB Tools_Square Grooving)	**B128**
MGRR	Auto tools (MSB Tools_Round Grooving)	**B129**
MLD	Mach long Solid Drill	**G81**
MLD	Mach long Solid Drill Plus	**G76~78**
MLDP	Mach long Solid Drill(Pilot Drills with oil hole for MLD)	**G81**
MPMT	Milling Insert	**E13**
MRGN-A	Multi functional (MGT for Aluminum Wheel)	**C40**
MRGN-A	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MRMN-M	Multi functional Insert (MGT Cartridge, MGT)	**C27**
MSBNR/L	Holder (Multi Lock System)	**B167**

M

MSD	Mach Solid Drill	**G59~62**
MSDH	Mach Solid Drill (Oil hole type)	**G63~66**
MSDNN	Holder (Multi Lock System)	**B167**
MSDP(H)	Mach Solid Drill Plus	**G47~51**
MSDP-5C	Mach Solid Drill Plus CFRP	**G54**
MSFD-2P	Mach Solid flat Drill	**G70~71**
MSFD-3P	Mach Solid flat Drill	**G72~73**
MSKNR/L	Boring Bar (Multi Lock System)	**B192**
MSKNR/L	Holder (Multi Lock System)	**B168**
MSRNR/L	Holder (Multi Lock System)	**B168**
MSSNR/L	Holder (Multi Lock System)	**B169**
MT	Multi functional (Multi Turn)	**B131**
MTENN	Holder (Multi Lock System)	**B169**
MTFNR/L	Boring Bar (Multi Lock System)	**B193**
MTFNR/L	Holder (Multi Lock System)	**B169**
MTGNR/L	Holder (Multi Lock System)	**B170**
MTJNR/L	Holder (Multi Lock System)	**B170**
MTR	Auto tools (MSB Tools_Threading)	**B130**
MVGN	Multi functional Insert (MGT for Aluminum Wheel)	**C40**
MVJNR/L	Holder (Multi Lock System)	**B170**
MVQNR/L	Holder (Multi Lock System)	**B171**
MVUNR/L	Boring Bar (Multi Lock System)	**B193**
MVVNN	Holder (Multi Lock System)	**B171**
MWLNR/L	Boring Bar (Multi Lock System)	**B193**
MWLNR/L	Holder (Multi Lock System)	**B171**

N

NFTFR/L	Multi functional Insert (New Fine Tools)	**C56**
NFTGR/L	Multi functional Insert (New Fine Tools)	**C55**
NFTIH	Multi functional (New Fine Tools Holder)	**C56**
NFTTR/L	Multi functional Insert (New Fine Tools)	**C55**
NPD	NPD	**M04**
NPM	Tooling System (NPM series)	**I 20**
NU-CCGW	cBN Insert_Negative/Positive (Multi-Corner Type)	**B95**
NU-CNGA	cBN Insert_Negative (Multi-Corner Type)	**B94**
NU-CNMA	cBN Insert_Negative (One-Use Type)	**B94**
NU-DCGW	cBN Insert_Positive (Multi-Corner Type)	**B95**
NU-DNGA	cBN Insert_Negative (Multi-Corner Type)	**B94**
NU-SNGA	cBN Insert_Negative/Positive (Multi-Corner Type)	**B94**
NU-TCGW	cBN Insert_Positive (One-Use Type)	**B95**
NU-TNGA	cBN Insert_Negative/Positive (Multi-Corner Type)	**B94**
NU-TPGB	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-TPGN	cBN Insert_Positive (Multi-Corner Type)	**B96**

N

NU-TPGW	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-VBGW	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-VCGW	cBN Insert_Positive (Multi-Corner Type)	**B96**
NU-VNGA	cBN Insert_Negative/Positive (Multi-Corner Type)	**B94**

O

OFCN	Milling Insert (Double Mill)	**E13**
OFCW	Milling Insert (Double Mill)	**E13**
OFKR-MA	Milling Insert (Double Mill)	**E13**
OFKR-MF	Milling Insert (Double Mill)	**E13**
OFKR-MM	Milling Insert (Double Mill)	**E13**
OFKT-MA	Milling Insert (Double Mill)	**E13**
OFKT-MF	Milling Insert (Double Mill)	**E13**
OFKT-MM	Milling Insert (Double Mill)	**E14**
ONHX-MA	Milling Insert (Rich Mill)	**E14**
ONHX-MF	Milling Insert (Rich Mill)	**E14**
ONHX-ML	Milling Insert (Rich Mill)	**E14**
ONHX-MM	Milling Insert (Rich Mill)	**E14**
ONHX-W	Milling Insert (Rich Mill)	**E14**
ONMX-MF	Milling Insert (Rich Mill)	**E14**
ONMX-MM	Milling Insert (Rich Mill)	**E14**
ORC	Milling Insert (O-Ring Cutter)	**E14**
ORC	O-Ring Cutter	**E311**

P

PAC(M)2000	Pro-A Mill	**E328**
PAC(M)4000	Pro-A Mill	**E328**
PALCM	Pro-A Mill	**E337**
PALS(Multi edge)	Pro-A Mill	**E340**
PALS(Single edge)	Pro-A Mill	**E338**
PAM2000	Pro-A Mill	**E330**
PAS2000	Pro-A Mill	**E329**
PAS4000	Pro-A Mill	**E329**
PAXC(M)5000	Pro-X Mill	**E331**
PAXC(M)6000	Pro-X Mill	**E332**
PAXM5000	Pro-X Mill	**E335**
PAXS5000	Pro-X Mill	**E333**
PAXS6000	Pro-X Mill	**E334**
PBAC(M)5000	Power Buster	**E63**
PBE2000	H Endmill (Ball type)	**F12**
PBPCM6000	Power Buster	**E65**
PBX100	Brazed Tools (Auto Tool Bits)	**H10**

P

PBZC(M)5000	Power Buster	**E64**
PCBNR/L	Holder (Lever Lock System)	**B153**
PCBNR/L	Holder (Save Turn)	**B102**
PCKNR/L	Holder (Lever Lock System)	**B153**
PCLNR/L	Boring Bar (Lever Lock System)	**B187**
PCLNR/L	Boring Bar (Save Turn)	**B105**
PCLNR/L	Holder (Lever Lock System)	**B154**
PCLNR/L	Holder (Save Turn)	**B102**
PCLNR/L	HSK Tooling System	**B211**
PCLNR/L	KM Tooling System	**B217**
PCMNN	HSK Tooling System	**B211**
PCMNN	KM Tooling System	**B217**
PDD	PCD Drill	**G91**
PDE1000	PCD Endmill (Flat type)	**F101**
PDE2000	PCD Endmill (Flat type)	**F101**
PDF	PCD Face Cutter	**E137**
PDJNR/L	Holder (Lever Lock System)	**B154**
PDJNR/L	Holder (Save Turn)	**B102**
PDJNR/L	HSK Tooling System	**B211**
PDJNR/L	KM Tooling System	**B218**
PDNNN	HSK Tooling System	**B211**
PDNNN	KM Tooling System	**B218**
PDNNR/L	Holder (Lever Lock System)	**B155**
PDNNR/L	Holder (Save Turn)	**B103**
PDQNR/L	Holder (Save Turn)	**B103**
PDR	PCD Reamer	**G107**
PDSNR/L	Boring Bar (Lever Lock System)	**B187**
PDUNR/L	Boring Bar (Lever Lock System)	**B188**
PDUNR/L	Boring Bar (Save Turn)	**B105**
PDZNR/L	Boring Bar (Save Turn)	**B106**
PES2000	Turbo Mill	**E56**
PES3000	Turbo Mill	**E56**
PES4000	Turbo Mill	**E56**
PF(M)4000	Mill-Max	**E50**
PH	Multi functional (Parting off Tools)	**C60**
PM	Cen-mill	**M04**
PNEJ	Side Cutter	**E15**
PNEJ-C	Side Cutter	**E15**
PNH4000	High feed Cutter	**E366**
PNH5000	High feed Cutter	**E366**
POB	Multi functional Insert (Parting off Tools)	**C60**
PP(M)4000	Mill-Max	**M03**
PPH4000	High feed Cutter	**E367**
PPN(M)4000	Mill-Max	**E51**

P

PRDCN	Holder (Lever Lock System)	B156
PRDCN	HSK Tooling System	B212
PRE4000	H Endmill (Radius type)	F13
PRGCR/L	Holder (Lever Lock System)	B156
PRGCR/L	HSK Tooling System	B212
PSBNR/L	Holder (Lever Lock System)	B157
PSBNR/L	Holder (Save Turn)	B103
PSDNN	Holder (Lever Lock System)	B157
PSDNN	Holder (Save Turn)	B104
PSKNR/L	Boring Bar (Lever Lock System)	B189
PSKNR/L	Boring Bar (Save Turn)	B106
PSKNR/L	Holder (Lever Lock System)	B158
PSKNR/L	Holder (Save Turn)	B104
PSSNR/L	Holder (Lever Lock System)	B158
PSSNR/L	Holder (Save Turn)	B104
PT	Tap (Point Tap)	D70
PTFNR/L	Boring Bar (Lever Lock System)	B189
PTFNR/L	Holder (Lever Lock System)	B159
PTGNR/L	Holder (Lever Lock System)	B159
PTTNR/L	Holder (Lever Lock System)	B160
Pull Stud Bolt	Tooling System (Others)	I 83
PWLNR/L	Boring Bar (Lever Lock System)	B190
PWLNR/L	Holder (Lever Lock System)	B160
PWLNR/L	Holder (Save Turn)	B105
PWLNR/L	Holder (Save Turn)	B106
PXL(S)	Pro-L Mill	E341

Q

QCGT	Multi functional Insert (Multi Turn)	B131
QCMT	Multi functional Insert (Multi Turn)	B131

R

RAFCB	Side Milling Cutter (Radial type-Full side cutter)	E348
RAFCP	Side Milling Cutter (Radial type-Full side cutter)	E348
RAHCB	Side Milling Cutter (Radial type-Half side cutter)	E349
RAHCP	Side Milling Cutter (Radial type-Half side cutter)	E349
RB	Brazed Tools (Square Blank)	H05
RC	Milling Insert (BFE)	E15
RCGT-AK	Aluminum Insert_Positive (Screw on System)	B89
RCGT-AR	Aluminum Insert_Positive (Screw on System)	B89
RCMT-VM	Turning Insert_Positive (Screw on System)	B70
RCMX1	Turning Insert_Positive (Screw on System)	B70

R

RDC	Tooling System (Reducer Bar)	I 73
RDCT-MA	Milling Insert (Future Mill)	E15
RDHW	Milling Insert (Future Mill)	E15
RDKT-MF	Milling Insert (Future Mill)	E15
RDKT-ML	Milling Insert (Future Mill)	E16
RDKT-MM	Milling Insert (Future Mill)	E16
RDKW	Milling Insert (Future Mill)	E16
REKR-MM	Milling Insert (Double Mill)	E16
RI	Drill (Indexable Reamer Insert)	G101
RM16AC(M)6000	Rich Mill	E126
RM16AC(M)8000	Rich Mill	E127
RM3PC(M)3000	Rich Mill	E86
RM3PC(M)4000	Rich Mill	E87
RM3PC(M)5000	Rich Mill	E88
RM3PM3000	Rich Mill	E91
RM3PM4000	Rich Mill	E91
RM3PS3000	Rich Mill	E89
RM3PS4000	Rich Mill	E90
RM4PC(M)3000	Rich Mill	E92
RM4PC(M)4000	Rich Mill	E93
RM4PFCB3000	Rich Mill	E94
RM4PFCB4000	Rich Mill	E95
RM4PFCP3000	Rich Mill	E98
RM4PFCP4000	Rich Mill	E99
RM4PHCB3000	Rich Mill	E96
RM4PHCB4000	Rich Mill	E97
RM4PHCP3000	Rich Mill	E100
RM4PHCP4000	Rich Mill	E101
RM4PM3000	Rich Mill	E104
RM4PS3000	Rich Mill	E102
RM4PS4000	Rich Mill	E103
RM4ZC(M)3000	Rich Mill	E105
RM4ZC(M)4000	Rich Mill	E105
RM4ZM3000	Rich Mill	E106
RM4ZS3000	Rich Mill	E106
RM6PC(M)-WN08	Rich Mill	E108
RM6PCM-WN04	Rich Mill	E107
RM6PS-WN04	Rich Mill	E109
RM6PS-WN08	Rich Mill	E110
RM8AC(M)4000	Rich Mill	E111
RM8AC(M)5000	Rich Mill	E113
RM8EC(M)4000	Rich Mill	E115
RM8EC(M)5000	Rich Mill	E117
RM8QC(M)4000	Rich Mill	E119

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RMH8AC(M)4000	Rich Mill	**E112**
RMH8AC(M)5000	Rich Mill	**E114**
RMH8EC(M)4000	Rich Mill	**E116**
RMH8EC(M)5000	Rich Mill	**E118**
RMH8QC(M)4000	Rich Mill	**E120**
RMT8A(M)4000	Rich Mill	**E121**
RMT8A(M)5000	Rich Mill	**E122**
RMT8E(M)4000	Rich Mill	**E123**
RMT8E(M)5000	Rich Mill	**E124**
RMT8Q(M)	Rich Mill	**E125**
RNMG-B25	Turning Insert_Negative	**B40**
RPCT-MA	Milling Insert (Future Mill P-Positive)	**E16**
RPET-ML	Milling Insert (Future Mill P-Positive)	**E16**
RPMT-MF	Milling Insert (Future Mill P-Positive)	**E16**
RPMT-MM	Milling Insert (Future Mill P-Positive)	**E16**
RPMW	Milling Insert (Future Mill P-Positive)	**E16**
RT	Brazed Tools (Ring blank)	**H07**
RT	Tap (Roll Tap)	**D67, 72**

S

SBBR/L	Auto Tools Insert (Blade type)	**B116**
SBCR/L	Auto Tools Insert (Blade type)	**B117**
SBCR/L	Auto Tools Insert (Multi functional type)	**B119**
SBGR/L	Auto Tools Insert (Blade type)	**B116**
SBHR/L	Holder (Auto Tools_Blade type)	**B116**
SBHR/L-X	Holder (Auto Tools_Blade type)	**B116**
SBR/L	Auto Tools Insert (Multi functional type)	**B119**
SBTR/L	Auto Tools Insert (Blade type)	**B116**
SC	Tooling System (Others)	**I 82**
SCACR/L	Holder (Auto Tools_ISO type)	**B109**
SCACR/L	Holder (Screw on System)	**B172**
SCGT-AK	Aluminum Insert_Positive (Screw on System)	**B90**
SCGT-AR	Aluminum Insert_Positive (Screw on System)	**B90**
SCKN	Milling Insert (Future Mill)	**E17**
SCLCR/L	Boring Bar (Screw on System)	**B194**
SCLCR/L	Compact Mini	**B204**
SCLCR/L	Holder (Auto Tools_ISO type)	**B109**
SCLCR/L	Holder (Screw on System)	**B172**
SCLPR/L	Boring Bar (Screw on System)	**B195**
SCMT	PCD Insert_Negative/Positive	**B98**
SCMT-C25	Turning Insert_Positive (Screw on System)	**B71**
SCMT-HMP	Turning Insert_Positive (Screw on System)	**B71**
SCMT-MP	Turning Insert_Positive (Screw on System)	**B71**
SCMT-VF	Turning Insert_Positive (Screw on System)	**B70**
SCMT-VL	Turning Insert_Positive (Screw on System)	**B71**
SCRH	Drill (Chucking Reamer)	**G105**
SCRS	Drill (Chucking Reamer)	**G105**
SDACR/L	Holder (Screw on System)	**B172**
SDC	Tooling System (SDC series)	**I 24~28**
SDCN	Milling Insert (Mill-max, High feed Cutter)	**E17**
SDET-MA	Milling Insert (Future Mill)	**E17**
SDET-MF	Milling Insert (Future Mill)	**E17**
SDET-MM	Milling Insert (Future Mill)	**E17**
SDJCR/L	Holder (Auto Tools-ISO Type)	**B109**
SDJCR/L	Holder (Screw on System)	**B173**
SDKN-CM	Milling Insert (Mill-Max)	**E17**
SDKN-MU	Milling Insert (Mill-Max)	**E18**
SDKN-SU	Milling Insert (Mill-Max, Turbo Mill)	**E18**
SDKR-MX	Milling Insert (Mill-Max, Turbo Mill)	**E18**
SDMT-MM	Milling Insert (Tank Mill, GBE)	**E18**
SDNCN	Holder (Auto Tools-ISO Type)	**B110**
SDNCN	Holder (Screw on System)	**B173**
SDQCR/L	Boring Bar (Screw on System)	**B196**
SDUCR/L	Boring Bar (Screw on System)	**B197**
SDXT-MA	Milling Insert (Future Mill)	**E18**
SDXT-MF	Milling Insert (Future Mill)	**E18**
SDXT-MM	Milling Insert (Future Mill)	**E18**
SDZCR/L	Boring Bar (Screw on System)	**B198**
SE	Cen-mill	**M04**
SECA	Milling Insert	**E18**
SECN	Milling Insert (Mill-Max)	**E19**
SEET-MA	Milling Insert (Future Mill)	**E19**
SEET-MF	Milling Insert (Future Mill)	**E19**
SEET-MM	Milling Insert (Future Mill)	**E19**
SEEW	Milling Insert (Future Mill)	**E19**
SEEW-W	Milling Insert (Future Mill)	**E19**
SEKN-SU	Milling Insert (Mill-Max)	**E19**
SEKR-MF1	Milling Insert (Mill-Max)	**E19**
SEKR-MX	Milling Insert (Mill-Max)	**E20**
SEMN	Milling Insert	**E20**
SEXT-MF	Milling Insert (Future Mill)	**E20**
SEXT-MM	Milling Insert (Future Mill)	**E20**
SEXT-MR	Milling Insert (Future Mill)	**E20**
SFCN	Milling Insert (Mill-Max)	**E20**
SGBR/L	Auto Tools Insert (Multi functional type)	**B120**
SGR/L	Auto Tools Insert (Multi functional type)	**B120**
SK-FMC	Tooling System (SMB)	**I 80**

S

SL	Sleeve	**B130**
SLA	Tooling System (SLA series)	**I 44~45**
SMB	Tooling System (SMB)	**I 67**
SMBB	Multi functional(Saw-man_Block)	**C52**
SMH	Tooling System (SMH)	**I 68**
SNCF-MF	Milling Insert (Rich Mill)	**E20**
SNCF-MM	Milling Insert (Rich Mill)	**E21**
SNCN	Milling Insert (Mill Max)	**E21**
SNEF	Milling Insert (High feed Cutter)	**E21**
SNEU-MF	Milling Insert (Shave Mill)	**E21**
SNEU-TBW	Milling Insert (Shave Mill)	**E22**
SNEU-WMF	Milling Insert (Shave Mill)	**E22**
SNEW	Milling Insert (Aero Mill)	**E22**
SNEW-NAF	Milling Insert (Aero Mill-Mini)	**E22**
SNEW-NAW	Milling Insert (Aero Mill-Mini)	**E22**
SNEW-XAF	Milling Insert (Aero Mill-Mini)	**E23**
SNEW-XAW	Milling Insert (Aero Mill-Mini)	**E23**
SNEX	Milling Insert (Cube Mill)	**E22**
SNEX-CU1	Milling Insert (Cube Mill)	**E22**
SNEX-MA	Milling Insert (Rich Mill)	**E22**
SNEX-MF	Milling Insert (Rich Mill)	**E23**
SNEX-ML	Milling Insert (Rich Mill)	**E22**
SNEX-MM	Milling Insert (Rich Mill)	**E23**
SNEX-W	Milling Insert (Rich Mill)	**E21**
SNGA	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B41**
SNGG	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B41**
SNGG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B41**
SNGN	Turning Insert_Negative (Lever Lock System/Ceramic Holder)	**B42**
SNGX	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B42**
SNHT-WX	Milling Insert (Wind Mill)	**E23**
SNKN	Milling Insert (Mill-Max)	**E23**
SNMA	cBN Insert_Negative(Regrinding)	**B97**
SNMA	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B42**
SNMF-MF	Milling Insert (Rich Mill)	**E20**
SNMF-MM	Milling Insert (Rich Mill)	**E21**
SNMG-B25	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**
SNMG-GR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-HA	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-LP	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-MK	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B44**
SNMG-MM	Turning Insert (Save Turn)	**B101**
SNMG-MM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B44**
SNMG-MP	Turning Insert (Save Turn)	**B101**
SNMG-MP	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**

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SNMG-RK	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-RM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-VB	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VC	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VF	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VL	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VM	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**
SNMG-VP2	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B43**
SNMG-VP3	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B45**
SNMG-VP4	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B46**
SNMG-VQ	Turning Insert (Save Turn)	**B101**
SNMG-VQ	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B44**
SNMG-VR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B47**
SNMM-GH	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B47**
SNMM-GR	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B47**
SNMM-VH	Turning Insert_Negative (Lever Lock System)	**B47**
SNMM-VT	Turning Insert_Negative (Lever Lock System)	**B47**
SNMN	Turning Insert_Negative (Ceramic Holder)	**B48**
SNMX	Turning Insert_Negative (Multi Lock/Lever Lock System)	**B48**
SNMX-MF	Milling Insert (Rich Mill)	**E23**
SNMX-MM	Milling Insert (Rich Mill)	**E23**
SNUN	Turning Insert_Negative (Ceramic Holder)	**B48**
SP	Multi functional Insert (Bearing Solution)	**B140**
SP	Multi functional Insert (Saw-man)	**C51**
SP	Tap (Spiral Tap)	**D66, 71**
SPB	Multi functional (Saw-man_Blades)	**C52**
SPB(M)	Side cutter	**E351**
SPB-S	Multi functional (Bearing Solution)	**B140**
SPB-S	Multi functional (Saw-man_Blades)	**C52**
SPCN	Milling Insert (Mill-Max)	**E24**
SPD	SPD	**M04**
SPEN-WC	Milling Insert (High feed Cutter)	**E24**
SPET-ND	Drill Insert	**G04**
SPEX	Milling Insert	**E24**
SPEX-W	Milling Insert	**E24**
SPFE4000	S+ Endmill (Flat type)	**F64**
SPFN	Milling Insert(Side cutter)	**E25**
SPGA	Turning Insert_Positive	**B72**
SPGN	PCD Insert_Negative/Positive	**B99**
SPGN	Turning Insert_Positive	**B72**
SPGR-F	Turning Insert_Positive (Clamp on System)	**B72**
SPGR-M	Turning Insert_Positive (Clamp on System)	**B73**
SPGT	Turning Insert_Positive (Screw on System)	**B73**
SPGW	PCD Insert_Negative/Positive	**B98**

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SPH	Multi functional (Saw-man_Holder)	**C53**
SPH-S	Multi functional (Saw-man_Holder)	**C53**
SPKN-MU	Milling Insert (Mill-Max)	**E25**
SPKN-SU	Milling Insert (Mill-Max)	**E25**
SPKR-MX	Milling Insert (Mill-Max)	**E25**
SPLFE4000	S+ Endmill (Long flat type)	**F64**
SPMN	Milling Insert (Chamfer tools)	**E25**
SPMR-F	Turning Insert_Positive (Clamp on System)	**B73**
SPMR-M	Turning Insert_Positive (Clamp on System)	**B73**
SPMT	Milling Insert (Tank Mill, GBE, BTTooling System)	**E25**
SPMT-KC	Milling Insert (Chamfer tools)	**E25**
SPMT-LD	Drill Insert	**G04**
SPMT-MM	Milling Insert (Tank Mill, GBE)	**E25**
SPMT-PD	Drill Insert (King Drill)	**G04**
SPMT-VF	Turning Insert_Positive (Clamp on System)	**B73**
SPP(M)	Side cutter	**E350**
SPS	Side cutter	**E352**
SPUN	Turning Insert_Positive	**B73**
SR	Brazed Tools (Round bars blank)	**H07**
SR	Tap (Spiral Roll Tap)	**D68, 73**
SRCPR/L...B	Bearing Solution	**B136**
SRDCN	Holder (Screw on System)	**B173**
SRGCR/L	Holder (Screw on System)	**B174**
SRGPR/L...E	Bearing Solution	**B136**
SRGPR/L...F	Bearing Solution	**B136**
SSBCR/L	Holder (Screw on System)	**B174**
SSBEA2000	Solid Endmills for Aluminum (Ball type)	**F78**
SSDCN	Holder (Screw on System)	**B174**
SSDP	Carbide Drill (SSDP)	**G87~88**
SSEA2000	Solid Endmills for Aluminum (Flat type)	**F77**
SSEA3000	Solid Endmills for Aluminum (Flat type)	**F77**
SSKCR/L	Boring Bar (Screw on System)	**B198**
SSKCR/L	Cartridge (Screw on System)	**B224**
SSKCR/L	Holder (Screw on System)	**B175**
SSKPR/L	Boring Bar (Screw on System)	**B198**
SSKPR/L...B	Bearing Solution	**B137**
SSSCR/L	Cartridge (Screw on System)	**B224**
SSSCR/L	Holder (Screw on System)	**B175**
ST	Brazed Tools (Helix blank)	**H08**
ST	Tap (Straight Tap)	**D65, 69**
STACR/L	Holder (Auto Tools-ISO Type)	**B110**
STACR/L	Holder (Screw on System)	**B175**
STFCR/L	Boring Bar (Screw on System)	**B199**
STFCR/L	Cartridge (Screw on System)	**B224**

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STFCR/L	Holder (Screw on System)	**B176**
STFPR/L	Boring Bar (Screw on System)	**B200**
STGCR/L	Holder (Screw on System)	**B176**
STLBR/L	Compact Mini	**B204**
STMD2L	Solid Threading Endmills (ISO Metric / UN)	**D59~60**
STMD3T	Solid Threading Endmills (ISO Metric / UN)	**D57~58**
STMHC	Solid Threading Endmills (ISO Metric)	**D51~54**
STMHCC	Solid Threading Endmills (ISO Metric)	**D55**
STMHCD	Solid Threading Endmills (ISO Metric)	**D56**
STMHCR	Solid Threading Endmills (ISO Metric)	**D55**
STR/L	Auto Tools Insert (FGT type)	**B120**
STTCR/L	Cartridge (Screw on System)	**B225**
STTCR/L	Holder (Screw on System)	**B176**
STUBR/L	Compact Mini	**B204**
STUPR/L	Compact Mini	**B205**
STWCR/L	Cartridge (Screw on System)	**B225**
STWPR/L	Boring Bar (Screw on System)	**B201**
SVABR/L	Holder (Screw on System)	**B177**
SVACR/L	Holder (Auto Tools-ISO Type)	**B112**
SVAPR/L	Holder (Auto Tools-ISO Type)	**B110**
SVHBR/L	Holder (Screw on System)	**B177**
SVJBR/L	Holder (Auto Tools-ISO Type)	**B111**
SVJBR/L	Holder (Screw on System)	**B177**
SVJCR/L	Boring Bar (Screw on System)	**B201**
SVJCR/L	Holder (Auto Tools-ISO Type)	**B111**
SVJCR/L	Holder (Screw on System)	**B178**
SVJPR/L	Holder (Auto Tools-ISO Type)	**B111**
SVM4000	Shave Mill	**E368**
SVMM4000	Shave Mill	**E368**
SVPBR/L	HSK Tooling System	**B212**
SVQBR/L	Boring Bar (Screw on System)	**B201**
SVQCR/L	Boring Bar (Screw on System)	**B202**
SVUBR/L	Boring Bar (Screw on System)	**B202**
SVUCR/L	Boring Bar (Screw on System)	**B202**
SVUM6000	Shave Mill Ultra	**E369**
SVUM6000-B	Shave Mill Ultra	**E370**
SVVBN	Holder (Screw on System)	**B178**
SVVBN	HSK Tooling System	**B212**
SVVCN	Holder (Screw on System)	**B178**
SVVPN	Holder (Auto Tools-ISO Type)	**B112**
SWLCR/L	Boring Bar (Screw on System)	**B203**
SWUBR/L	Compact Mini	**B206**
SXGNR/L	Holder (Auto Tools-FGT Type)	**B119**

T

TAFCB	Side Milling Cutter (Tangential type-Full side cutter)	**E346**
TAFCP	Side Milling Cutter (Tangential type-Full side cutter)	**E346**
TAHCB	Side Milling Cutter (Tangential type-Half side cutter)	**E347**
TAHCP	Side Milling Cutter (Tangential type-Half side cutter)	**E347**
TB	Brazed Tools (Taper bits)	**H13**
TB	Multi functional Insert (Grooving Tools)	**C46~49**
TBC	Tooling System (TBC)	**I 63**
TBGT	Turning Insert_Positive (Compact Mini)	**B74**
TBGW	PCD Insert_Negative/Positive	**B99**
TBH	Multi functional (Grooving Tools)	**C50**
TB-M	Multi functional Insert (Grooving Tools)	**C46~49**
TBMT-VL	Turning Insert_Positive (Screw on System)	**B74**
TC	Tooling System	**I 21**
TCA	TCA Tap adaptor)	**I 42**
TCGT-AK	Aluminum Insert_Positive (Screw on System)	**B91**
TCGT-AR	Aluminum Insert_Positive (Screw on System)	**B91**
TCGT-KF	Turning Insert_Positive (Screw on System)	**B75**
TCGT-VP1	Turning Insert_Positive (Screw on System)	**B75**
TCMT	PCD Insert_Negative/Positive	**B99**
TCMT-C25	Turning Insert_Positive (Screw on System)	**B76**
TCMT-HMP	Turning Insert_Positive (Screw on System)	**B75**
TCMT-MP	Turning Insert_Positive (Screw on System)	**B76**
TCMT-VF	Turning Insert_Positive (Screw on System)	**B75**
TCMT-VL	Turning Insert_Positive (Screw on System)	**B75**
TCMT-VP1	Turning Insert_Positive (Screw on System)	**B75**
T-CNMA	cBN Insert_Negative(Regrinding)	**B97**
TCRS	Drill (Chucking Reamer)	**G106**
T-DCGW	cBN Insert_Positive(Regrinding)	**B97**
TEC(E)N	Milling Insert (Turbo Mill)	**E26**
TEEN	Milling Insert (Turbo Mill)	**E26**
TER	TER Tap Collet)	**I 43**
TFCN	Milling Insert (Mill-Max)	**E26**
TFE	T-Cutter	**E320**
THE	Tank Mill	**E280**
TM	Cen-mill	**M04**
TM	Thread Milling Inserts (ISO Metric)	**D44~49**
TMRS	Drill (Machine Reamer)	**G106**
TNGA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGG	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGG-SC	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B49**
TNGN	Turning Insert_Negative (Ceramic Holder)	**B50**
TNMA	cBN Insert_Negative(Regrinding)	**B97**
TNMA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B50**

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TNMG-B25	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-GR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-HA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-LP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-LW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-MK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-MM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-MP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-RK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-RM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-VB	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B50**
TNMG-VC	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-VF	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-VL	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMG-VM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-VP2	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B53**
TNMG-VP4	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-VQ	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B52**
TNMG-VR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B54**
TNMG-VW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B51**
TNMM-GH	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TNMM-GR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TNMN	Turning Insert_Negative (Ceramic Holder)	**B55**
TNMX	Milling Insert (Power Buster)	**E26**
TNMX	PCD Insert_Negative/Positive	**B98**
TNMX	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TNMX-SH	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	**B55**
TOEH	Turning Insert_Positive	**B76**
TP2PC(M)	TP2P	**E284**
TP2PS	TP2P	**E285**
TPCN	Milling Insert (Mill-max, Side cutter)	**E26**
TPD	Drill Insert (TPDB)	**G35**
TPD	Drill Insert (TPDC)	**G30**
TPDB-3D	Drill (TPDB)	**G36**
TPDB-5D	Drill (TPDB)	**G37**
TPDB-8D	Drill (TPDB)	**G38**
TPDC3D	Drill (TPDC)	**G31**
TPDC5D	Drill (TPDC)	**G31**
TPDC8D	Drill (TPDC)	**G31**
TPGB	cBN Insert_Positive(Regrinding)	**B97**
TPGB	PCD Insert_Negative/Positive	**B99**
TPGH	Turning Insert_Positive	**B77**
TPGN	PCD Insert_Negative/Positive	**B99**

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TPGN	Turning Insert_Positive	**B77**
TPGR-F	Turning Insert_Positive (Clamp on System)	**B77**
TPGR-M	Turning Insert_Positive (Clamp on System)	**B77**
TPGT	PCD Insert_Negative/Positive	**B99**
TPGT	Turning Insert_Positive (Screw on System)	**B78**
TPGW	PCD Insert_Negative/Positive	**B99**
TPGX	PCD Insert_Positive	**B78**
TPKN-MU	Milling Insert (Mill-Max)	**E27**
TPKN-SU	Milling Insert (Mill-Max)	**E27**
TPKR-MX	Milling Insert (Mill-Max)	**E27**
TPMR-F	Turning Insert_Positive (Clamp on System)	**B78**
TPMR-M	Turning Insert_Positive (Clamp on System)	**B78**
TPMT-MP	Turning Insert_Positive (Screw on System)	**B79**
TPMT-VF	Turning Insert_Positive (Screw on System)	**B79**
TPMT-VL	Turning Insert_Positive (Screw on System)	**B79**
TPUN	Turning Insert_Positive	**B79**
TSDM	Top Solid drill	**G90**
T-VNMA	cBN Insert_Negative(Regrinding)	**B97**
TWX-KC	Milling Insert (Multi functional Chamfer Tool)	**E27**

U

UNJ (Unified Constant Thread)	Threading	**D26**

V

VBGT	Turning Insert_Positive (Screw on System)	**B80**
VBGT-AK	Aluminum Insert_Positive (Screw on System)	**B92**
VBGT-AR	Aluminum Insert_Positive (Screw on System)	**B92**
VBGT-KF	Turning Insert_Positive (Screw on System)	**B80**
VBGT-KM	Turning Insert_Positive (Screw on System)	**B80**
VBGT-VP1	Turning Insert_Positive (Screw on System)	**B80**
VBMT	PCD Insert_Negative/Positive	**B99**
VBMT	Turning Insert_Positive (Screw on System)	**B81**
VBMT-HMP	Turning Insert_Positive (Screw on System)	**B81**
VBMT-MP	Turning Insert_Positive (Screw on System)	**B81**
VBMT-VB	Turning Insert_Positive (Screw on System)	**B80**
VBMT-VF	Turning Insert_Positive (Screw on System)	**B80**
VBMT-VL	Turning Insert_Positive (Screw on System)	**B81**
VBMT-VP1	Turning Insert_Positive (Screw on System)	**B81**
VBMW	cBN Insert_Positive(Regrinding)	**B97**
VCET-KF	Auto Tools Insert (ISO type)	**B114**
VCET-KF	Auto Tools Insert (ISO type)	**B82, 114**
VCET-KM	Auto Tools Insert (ISO type)	**B114**
VCET-KM	Auto Tools Insert (ISO type)	**B82, 114**
VCGT-AK	Aluminum Insert_Positive (Screw on System)	**B93**
VCGT-AR	Aluminum Insert_Positive (Screw on System)	**B93**
VCGT-KF	Turning Insert_Positive (Screw on System)	**B82**
VCGT-KM	Turning Insert_Positive (Screw on System)	**B82**
VCGT-VP1	Auto Tools Insert (ISO type)	**B114**
VCGT-VP1	Auto Tools Insert (ISO type)	**B82, 114**
VCGX-VP1	Auto Tools Insert (ISO type)	**B114**
VCGX-VP1	Auto Tools Insert (ISO type)	**B83, 114**
VCKT-MA	Milling Insert (Pro-A Mill)	**E27**
VCMT	PCD Insert_Negative/Positive	**B99**
VCMT-HMP	Turning Insert_Positive (Screw on System)	**B83**
VCMT-MP	Turning Insert_Positive (Screw on System)	**B83**
VCMT-VF	Turning Insert_Positive (Screw on System)	**B83**
VCMT-VL	Turning Insert_Positive (Screw on System)	**B83**
VCMT-VP1	Turning Insert_Positive (Screw on System)	**B83**
VDKT-MA	Milling Insert (Pro-A Mill)	**E27**
VETR	Thread Insert (Vertical Type)	**D33**
VFE4000	V-Endmill (Flat type)	**F16**
VNGG-HA	Turning Insert_Negative (Multi Lock System)	**B56**
VNGG-VP3	Turning Insert_Negative (Multi Lock System)	**B56**
VNMA	cBN Insert_Negative (Regrinding)	**B97**
VNMG-HA	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-LP	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-MK	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-MM	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-MP	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-RM	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-VB	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VC	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VF	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VL	Turning Insert_Negative (Multi Lock System)	**B56**
VNMG-VM	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-VP3	Turning Insert_Negative (Multi Lock System)	**B57**
VNMG-VQ	Turning Insert_Negative (Multi Lock System)	**B57**
VNMX	PCD Insert_Negative/Positive	**B98**
VPET-KF	Auto Tools Insert (ISO type)	**B114**
VPET-KF	Auto Tools Insert (ISO type)	**B84, 114**
VPET-KM	Auto Tools Insert (ISO type)	**B114**
VPET-KM	Auto Tools Insert (ISO type)	**B84, 114**
VPGT-VP1	Auto Tools Insert (ISO type)	**B114**
VPGT-VP1	Auto Tools Insert (ISO type)	**B84, 114**
VPGT-VP1	Turning Insert_Positive (Screw on System)	**B84**
VTH	Vertical Type Holder	**D33**

V

VZD-LA, LBA	Vulcan Drill	G85
VZD-MA, MBA	Vulcan Drill	G84

W

WBGT	Turning Insert_Positive (Compact Mini)	B85
WCMT-C20N	Drill Insert (WPDC)	G04
WCMT-C21N	Drill Insert (WPDC)	G05
WDKT-MH	Milling Insert (HRM)	E27
WFSB(M)	Wind Mill (Boss type)	E355
WFSP(M)	Wind Mill (Plane type)	E356
WNGG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B58
WNGX-MA	Milling Insert (HRMDouble)	E28
WNGX-ML	Milling Insert (HRMDouble)	E28
WNGX-MM	Milling Insert (HRMDouble)	E28
WNMA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B58
WNMG-B25	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B60
WNMG-GR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B60
WNMG-HA	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B58
WNMG-LP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B59
WNMG-LW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B60
WNMG-MK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B59
WNMG-MM	Turning Insert (Save Turn)	B101
WNMG-MM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B59
WNMG-MP	Turning Insert (Save Turn)	B101
WNMG-MP	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B60
WNMG-RK	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B61
WNMG-RM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B61
WNMG-VB	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B58
WNMG-VC	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B59
WNMG-VF	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B58
WNMG-VL	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B58
WNMG-VM	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B60
WNMG-VP2	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B59
WNMG-VP3	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B60
WNMG-VP4	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B61
WNMG-VQ	Turning Insert (Save Turn)	B101
WNMG-VQ	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B59
WNMG-VR	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B61
WNMG-VW	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B58
WNMM-B25	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B61
WNMX-MF	Milling Insert (HRMDouble)	E28
WNMX-MM	Milling Insert (HRMDouble)	E28
WNMX-SH	Turning Insert_Negative (Lever Lock/Wedge Clamp/Multi Lock System)	B61

W

WPDC-5D	Drill (WPDC Dual insert cartridge)	G44
WPDC-5D	Drill (WPDC Single insert catridge)	G44
WPDC-5D	Drill (WPDC Standard type)	G43
WPDC-6.5D	Drill (WPDC Dual insert cartridge)	G44
WPDC-6.5D	Drill (WPDC Single insert catridge)	G44
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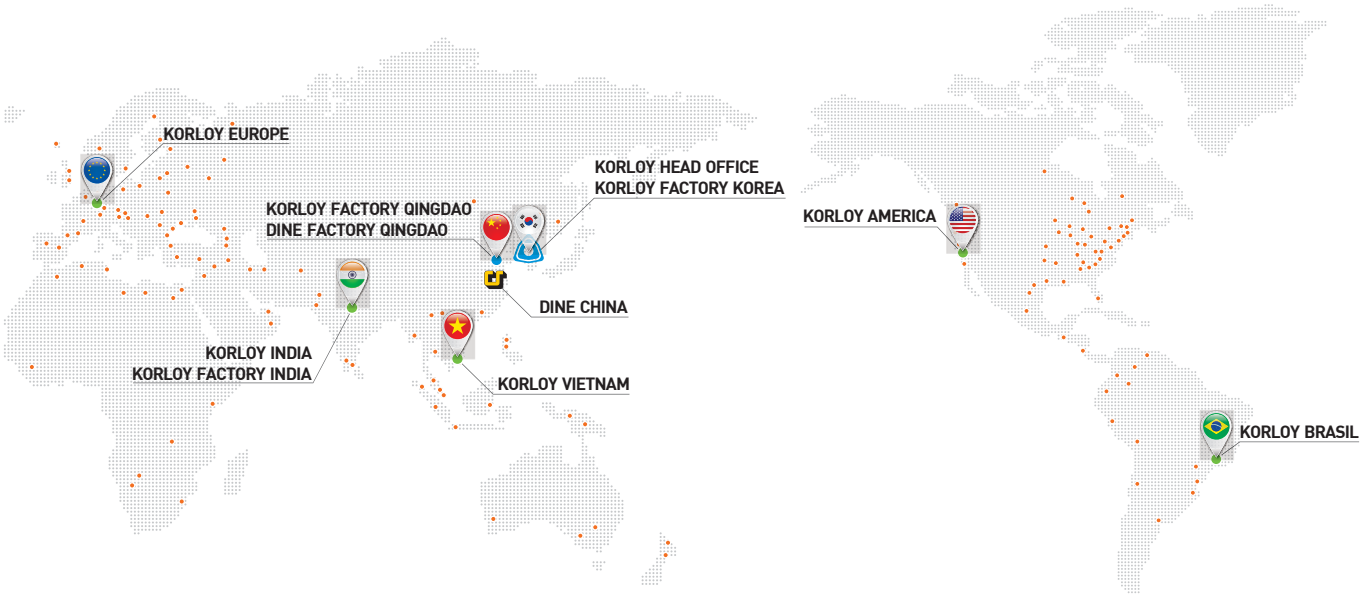

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