2008

E-1

We Create Your Tomorrow!

CUTTING TOOLS

KORLOY®

GRADES

TURNING

MILLING

DRILLING

OTHERS

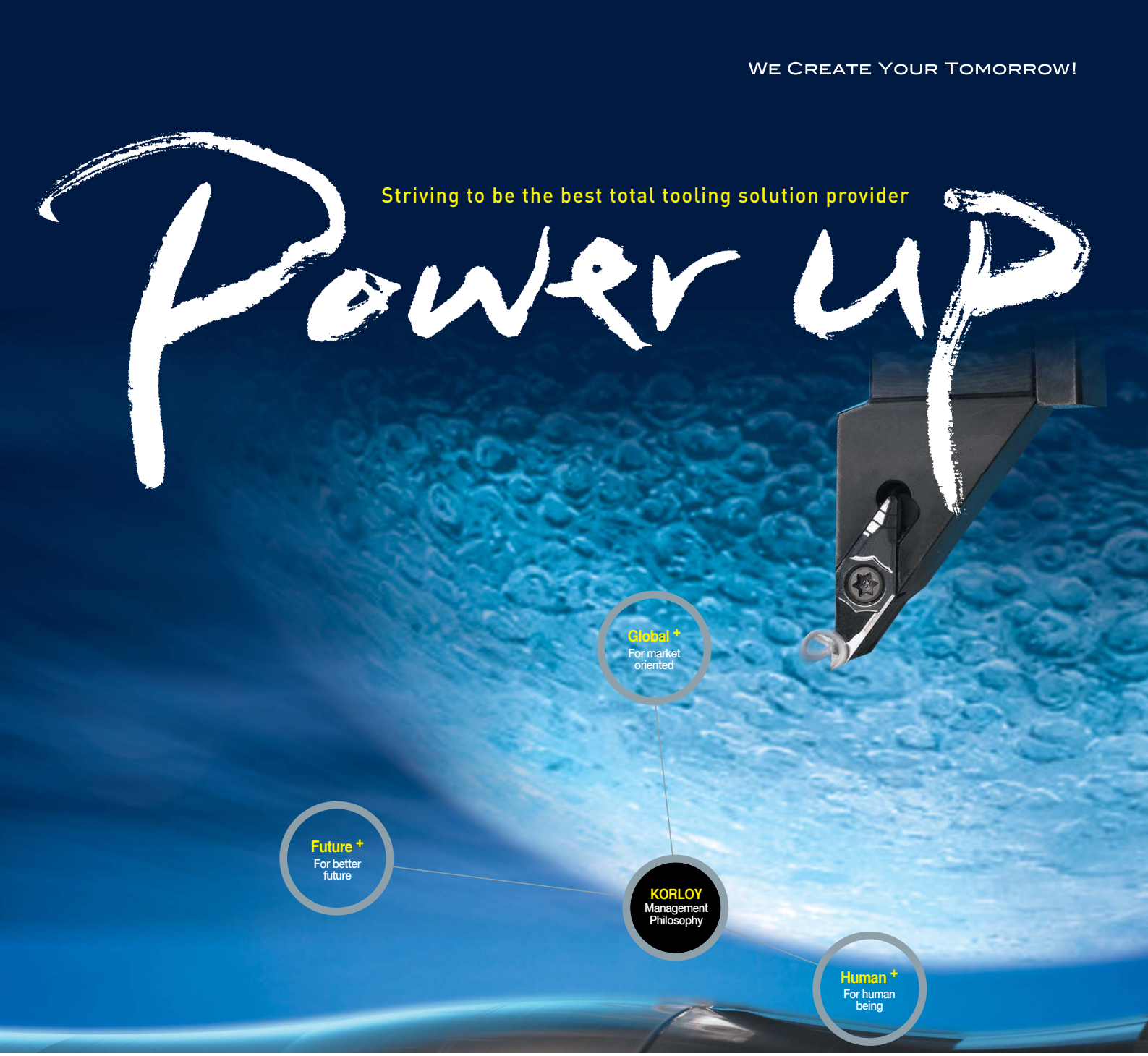
KORLOY Inc.

Total Tooling System

WE CREATE YOUR TOMORROW!

Striving to be the best total tooling solution provider

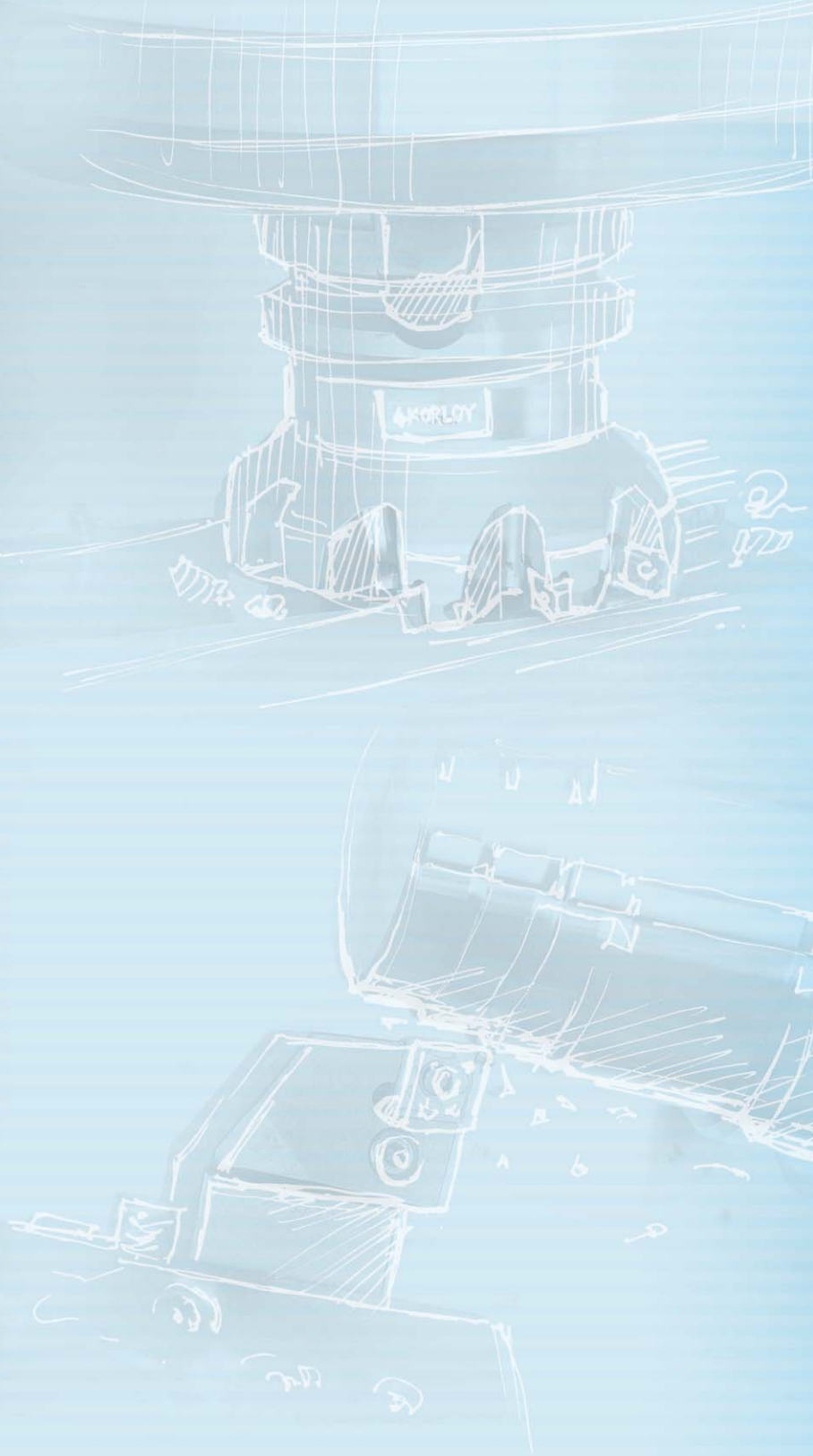
Power UP



Korloy will progress through the 21st century through innovation & ingenuity.

KORLOY INC. is a total cutting tool manufacturer who produces carbide, coated carbide and etc.
Since 1966, constant innovation has led KORLOY INC. to be the best carbide cutting tool manufacturer in Korea, who tries to be one of the world top class on the field of cutting tool manufacture.
KORLOY INC. is exporting to over 60 nations throughout the world.
The products of **KORLOY INC.** have been getting better and better reputation by virtue of creative, progressive and technical human-resource with up-to-date manufacturing machine as well as Technology Oriented and Market Oriented Management Philosophy.
KORLOY INC. will do the best to be a World best cutting tool Manufacturer hoping constant interest and support from our generous customers.

KORLOY Inc.
Total Tooling System



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SAFETY GUIDE OF CARBIDE PRODUCTS

KORLOY Inc. continuously trying to develop safe and good quality products.
Please be aware of safety guidance first written below, prior to use KORLOY Inc. products.

* It is a general guidance of handling of cemented carbide tools written above.
* For more information, please contact us.
* KORLOY does not take any responsibility for any accident caused by in-appropriated changes of the products or abusing of tools.

1. PL (Product Liability)

In accordance with the PL (Product Liability) law, we have attached label of WARNING on the case of KORLOY products.
But there's no warning on the surface of tools. Please read this safety guidance before using carbide tools and educate the safety guidance to engineers working at the field.

2. Basic characteristics of CEMENTED CARBIDE tools

Cemented carbide tools are made of carbides, nitrides, carbonitrides, oxides of W, Ti, Al, Si, Ta, B etc and metal component like Co,Ni, Cr, 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. Pre-cautions for CEMENTED CARBIDE tools

1) Cemented carbides are extremely hard but brittle at the same time.
   Impactive shock and clamping with excessive power could cause fracture and break of tool.
2) Cemented carbides have large sepcific gravity, thus they require special attention as heavy material when you handle big size or large quantity.
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 un-desirable conditions like extremly high or low temperature.
4) There are several cemented carbide products having sharp cutting edges.
   Be careful not to handle the tools with bare hand which may cause cut or injury.
   Especially when put out the tools from the case, do not touch the cutting edgies and be careful not to drop it.
5) Storing carbide tools at corrosive atmosphere may cause erosion which cause poor toughness
6) Please refer to catalouge, safety guidance prior to handle the tools
7) Do not absue tools at in-appropriate condition

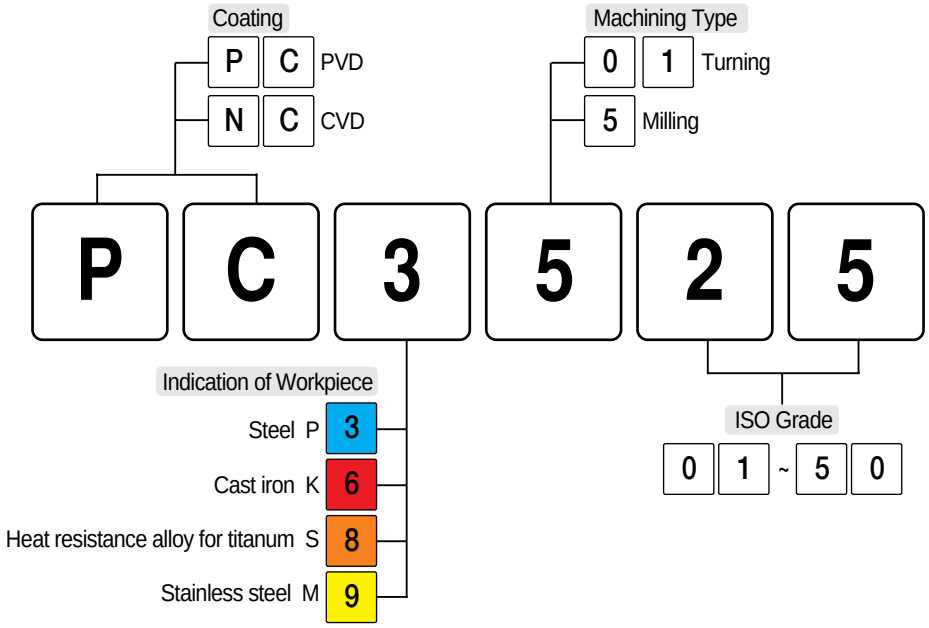
4. Pre-cautions for machining (grinding, welding, EDM) of CEMENTED CARBIDE tools

1) Surface condition can affect the toughness of tool, so it is recommended to use diamond grinding wheel.
2) Grinding of cemented carbide cause mist and dust. It contains harmful composition like Co, thus it is recommended to use mask, mist collection and other protective facilities. If the dust gets in your skin and eye, washing out with running water immediately.
3) In case of grinding with coolant, coolant contains harmful metal components which cause environmental problem.
   Treat the coolant very well to get rid of trouble.
4) Check crack first after re-grinding carbide tool.
5) Marking with laser and ele ctric pen may cause crack on carbide tool. The crack can cause shortened tool life.
6) EDM of carbide may cause residual crack on carbide tool, so if necessary, remove the crack with grinding processing
7) Brazing of carbide tools at the extremly high or low temperature compare with melting point of brazing materials may cause loosening or break
8) Using a oil base coolant may cause fire due to over-heat or frame, thus prepare to prevent fire.

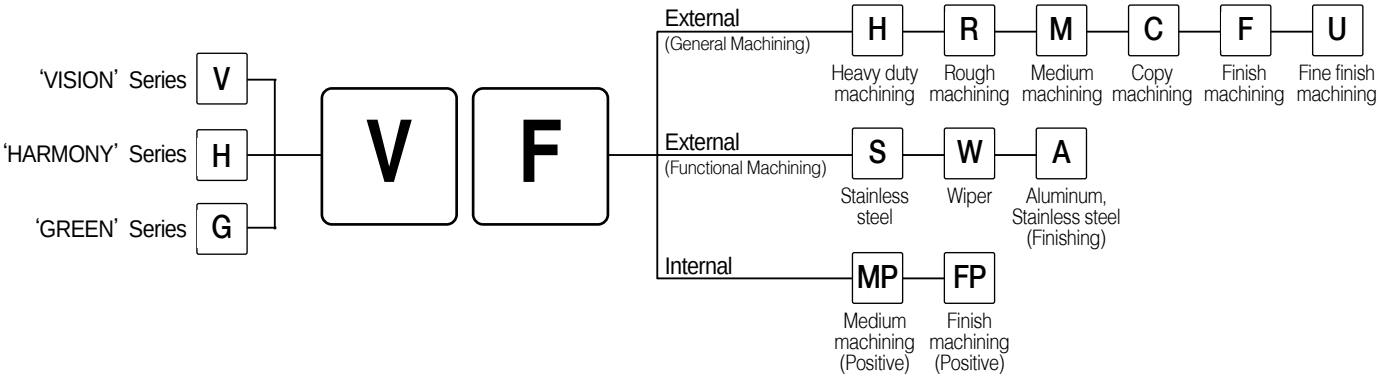
5. METALCUTTING SAFETY

	DANGEROUS FACTOR	SAFETY COUNTERPLAN
Cutting tools	· Sharp cutting edge of cutting tools may cut your bare-hand.	· Take gloves when pull out the insert from the case or mount it on the machine.
	· In-appropriate condition or usage may cause flagmentation and expel of part of tools that may cause injury.	· Use glasses or safety cover for your safety. · Use the tools within the recommended range. · Please refer to catalogue and safety guide first.
	· Severe load on tool and premature wear of cutting edge may bring excessive cutting force on tool, and it may cause fracture of tools that may cause injure.	· Use glasses or safety cover for your safety. · Change the tool at proper time.
	· Chips evacuated during the cutting are so hot and sharp that may cause a burn and a cut.	· Use glasses or safety cover for your safety. · Stop the machine first and take safety glove and use hook to get rid of chips.
	· If you touch the surface of workpiece immediately after the cutting operation, it may cause a burn.	· Use gloves or safety cover for your safety.
	· Be aware of a fire and a explosion may brought by the hot chips and spark 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 happen due to the balancing trouble of machine.	· Use glasses or safety cover for your safety. · Check it first that if there's any chattering, vibration or strange noise prior to your main cutting operation.
	· Touching of the burr remained on the workpiece with 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 workpiece may cause the fracture of tool and injure of body.	· Clamp the workpiece tightly.
	· Tools are operated to right-hand direction normally. Left-hand direction operation can cause fracture of tool and injure of body.	· 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 cause flying out from the tool during the cutting, and it may cause injure.	· Chcek the clamping of inserts and parts prior to machining, and do use original parts only.
	· Over loaded clamping of inserts by using of zig (such as pipe) may cause dangerous drop out of parts and inserts by fracture.	· Do not use zig inappropriately.
	· In case of high speed machining, parts and inserts can be dropped out by centrifugal force.	· Use within recommended condition. · Use glasses or safety cover for your safety.
Rotating tools	· Since cutter has sharp cutting edges, bare-hand touch may cause a cut.	· Use gloves or safety cover for your safety.
	· It is dangerous to take glove with rotating machine. · It is also dangerous to be contacted body or clothes 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 troble may cause a fracture and flying out of tool which may cause injure.	· RPM should be controled within recommended condition. · Check the balance of rotating part periodically.
	· In case of drilling, core bottom part chip of drilled region can be flying out with high speed.	· Use gloves or safety cover for your safety.
	· The edges of small diameter drill are sharp and easy to break.	· Use gloves or profer safety cover for your safety.
Brazed tools	· Fragmentation and flying 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 of carbide tip after several brazing.	· Do not use brazing carbide tip that brazed several times.
	· Abusing may cause fragmentation of machine and tool that very dangerous.	· Stick to safety regulation.

■ Grade Name for Coated Carbide



■ Chip Breaker



■ 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
Horse power requirement	Pc	kW
Specific cutting resistance	kc	MPa

TERM	CODE	UNIT
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

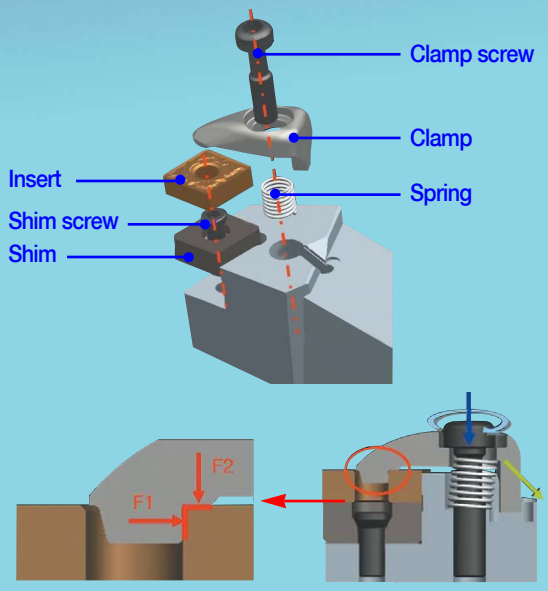
ISO9001

KORLOY Is ISO9001Certified

NEW

Double Clamp Holder

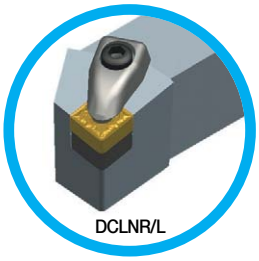
Stable clamping with Double clamp system

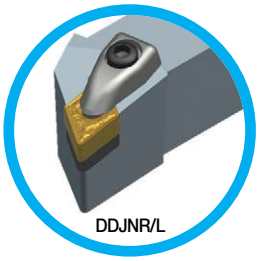


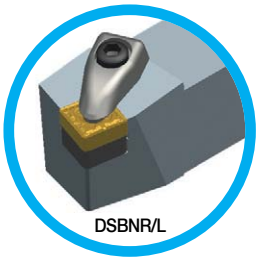
Features

- Simple and powerful clamping system operated by only clamp screw
- Powerful two ways clamping system (upper and internal) is suitable for machining in very tough cutting conditions
- When assembled with holder it can be set precisely due to the special rear of clamp
- Stable structure design and high quality clamp ensure durability at frequent insert change.
- Compact and optimized design for avoiding chip interference and powerful clamping.

DCBNR/L


DCLNR/L


DDJNR/L


DSBNR/L

DSDNN

DSKNR/L

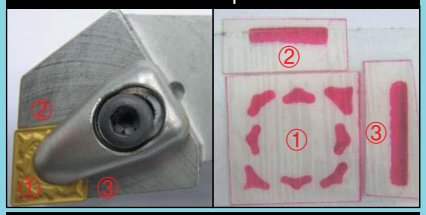
DSSNR/L

DWLNR/L

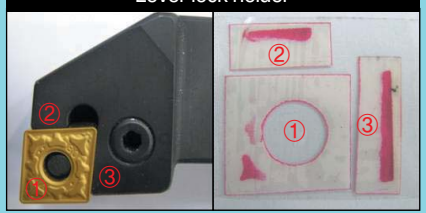
Effects

Stable clamping

Double clamp holder

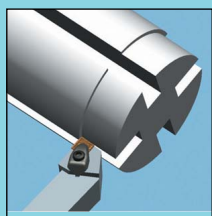


Lever lock holder

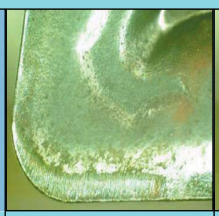


※ Powerful two ways clamping system pushes insert to both bottom and sides tightly.

Improving cutting performance



Cutting condition
- Insert : CNMG120408-VM
- Workpiece : SCM440(4grooves)
- Cutting speed : 200m/min
- Depth of cut : 2.0mm
- Feed : 0.157mm/rev



Double clamp holder
Cutting Time : 35 min.

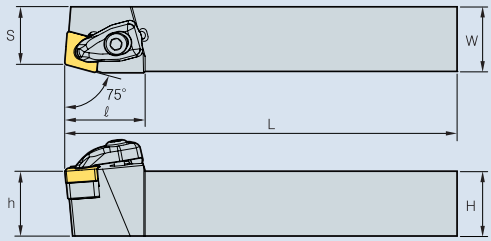
Lever lock holder
Cutting Time : 35 min.

Rmax	Rz	Ra	Rmax	Rz	Ra
4.4	4.1	0.6	5.5	5.1	0.7

※ Ensures stable tool life at interrupted cutting condition due to powerful clamping
※ Reducing micro vibration shows better surface finish than conventional tools

Double Clamp Holder

DCBNR/L



(mm)

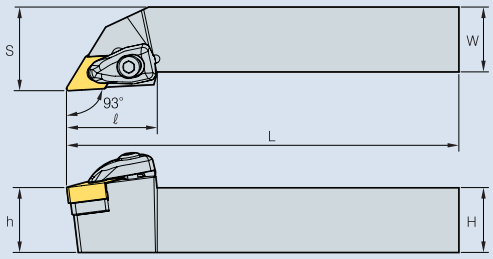
Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Insert
DCBNR/L	2020-K12	○	○	20	20	125	17	20	31	CN□□1204□□
	2525-M12	○	○	25	25	150	22	25	31	
	3225-P12	○	○	32	25	170	22	32	31	

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30L

• Applicable inserts, see pages **B20~B22, B56~B59, B61**

DDJNR/L



(mm)

Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Insert
DDJNR/L	2020-K15	○	○	20	20	125	25	20	35	DN□□1506□□
	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□□
	2525-M15-3	○	○	25	25	150	32	25	35	
	3232-P15-3	○	○	32	32	170	40	32	35	

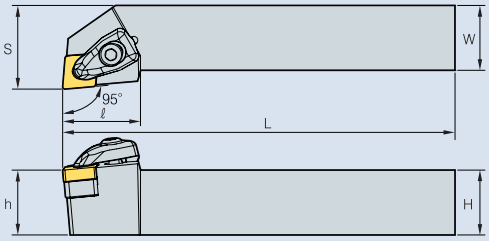
∗ Only shim can be replaced :
2020-K15 and K15-3 /
2525-M15 and M15-3 /
3232-P15 and P15-3

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
DN□□1504□□	CVH4	CHX0518	SD44V	FTKA0410	SPR0714	HW30L
DN□□1506□□	CVH4	CHX0518	SD43V	FTKA0410	SPR0714	HW30L

• Applicable inserts, see pages **B23, B24, B56~B59**

DCLNR/L



(mm)

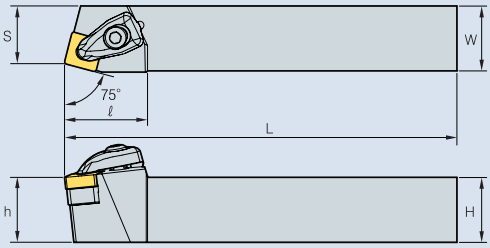
Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Insert
DCLNR/L	2020-K12	●	●	20	20	125	25	20	30	CN□□1204□□
	2525-M12	●	●	25	25	150	32	25	30	
	3225-P12	○	○	32	25	170	32	32	30	
	3232-P12	○	○	32	32	170	40	32	30	

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
CN□□1204□□	CVH4	CHX0518	SC44V	FTKA0410	SPR0714	HW30L

• Applicable inserts, see pages **B20~B22, B56~B59, B61**

DSBNR/L



(mm)

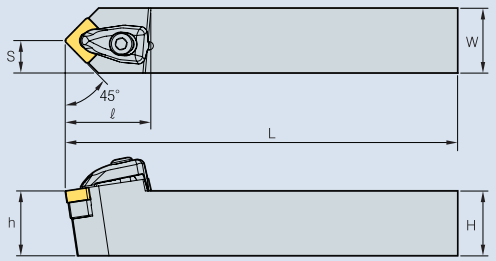
Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Insert
DSBNR/L	2020-K12	○	○	20	20	125	17	20	32	SN□□1204□□
	2525-M12	○	○	25	25	150	22	25	32	
	3225-P12	○	○	32	25	170	22	32	32	
	3232-P12	○	○	32	32	170	27	32	32	

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30L

• Applicable inserts, see pages **B26~B29, B56~B59**

DSDNN New



(mm)

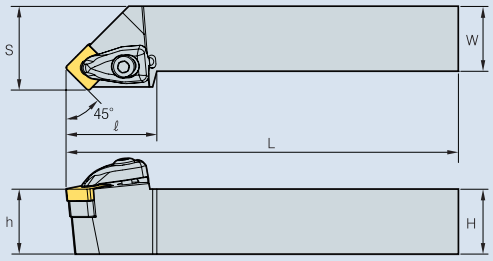
Designation		Stock	H	W	L	S	h	ℓ	Insert
DSDNN	2020-K12	○	20	20	125	10	20	33	SN□□1204□□
	2525-M12	○	25	25	150	12.5	25	33	
	3225-P12	○	32	25	170	12.5	32	33	
	3232-P12	○	32	32	170	16	32	33	

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30L

• Applicable inserts, see pages **B26~B29, B56~B59**

DSSNR/L New



(mm)

Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Insert
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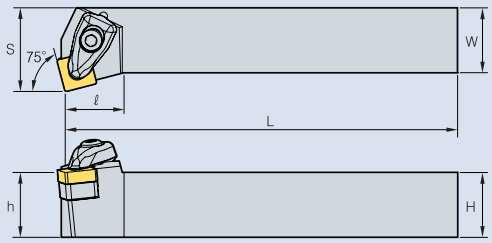
	2525-M12	○	○	25	25	150	32	25	35	
	3225-P12	○	○	32	25	170	32	32	35	
	3232-P12	○	○	32	32	170	40	32	35	

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30L

• Applicable inserts, see pages **B26~B29, B56~B59**

DSKNR/L New



(mm)

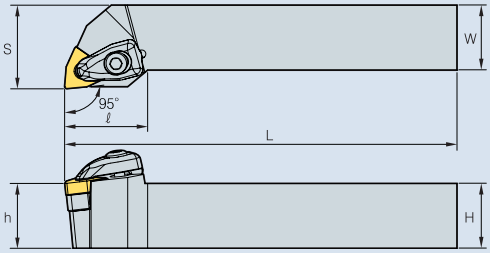
Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Insert
DSKNR/L	2020-K12	○	○	20	20	125	25	20	23	SN□□1204□□
	2525-M12	○	○	25	25	150	32	25	23	
	3232-P12	○	○	32	25	170	40	32	23	

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
SN□□1204□□	CVH4	CHX0518	SS44V	FTKA0410	SPR0714	HW30L

• Applicable inserts, see pages **B26~B29, B56~B59**

DWLNR/L New



(mm)

Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Insert
DWLNR/L	2020-K08	○	○	20	20	125	25	20	32	WN□□0804□□
	2525-M08	●	○	25	25	150	32	25	32	

● : Stock item ○ : Under preparing for stock

Parts	Clamp	Clamp Screw	Shim	Shim Screw	Spring	Wrench
WN□□0804□□	CVH4	CHX0518	SW44V	FTKA0410	SPR0714	HW30L

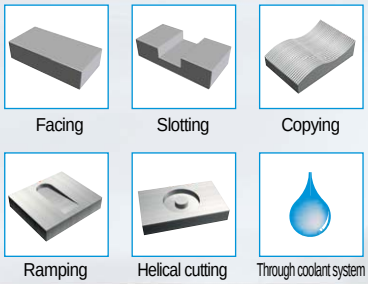
• Applicable inserts, see pages **B35~B36**

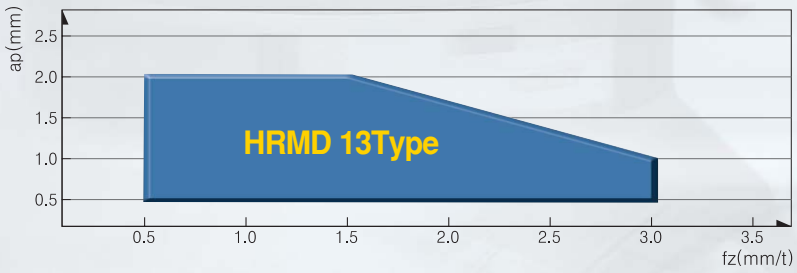
NEW

HRMD Double Sided insert

- High rake angle cutting edge realized high feed and multi functional machining due to reduced cutting load.
- HRMD has improved economical aspect to use 6 cutting edges compared to HRM tool with positive insert.
- Negative geometry has been designed for rigidity of cutting edge and double sided function.
- HRMD insert with symmetrical cutting edge is applicable to be both-R and L type machining.
- Simple screw on system and stable upholding are able to achieve strong clamping force.

Application range





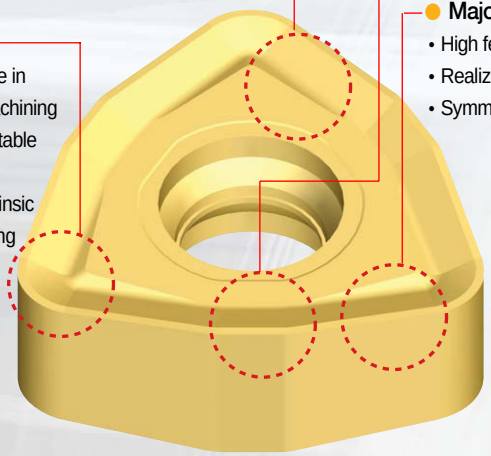
Features of insert

Chip breaker
- Reduction of cutting load due to high rake angle
- Improvement of chip flow
- Prevention of damage on clamping face of insert

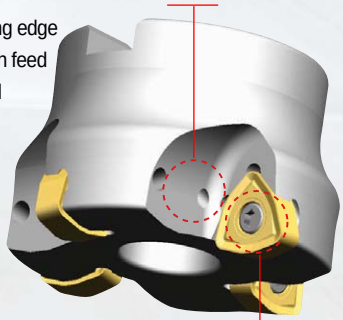
Nose-R
- Security of rigid edge in ramping, pocket machining
- Round edge line suitable for high feed
- Insert geometry extrinsic to R/L type machining

Minor cutting edge
- Improvement of surface roughness
- Design for decreasing thrust force

Major cutting edge
- High feed by application of high rake cutting edge
- Realization of low cutting resistance in high feed
- Symmetrical insert design for R/L type tool



Through coolant system
- Direct cooling for improvement of chip control
- Longer tool life due to reduced cutting temperature



Simple screw on system
- Powerful clamping of screw on system
- Wide contact face for stable upholding
- Wide chip pocket for better chip evacuation

■ Code System

①	②	③	④	⑤	⑥	⑦	⑧	⑨
HRM	D	C	M	13	063	H	R	- 5

① High Removal Milling

② Double Sided Insert

③ Tool type
C : Cutter
S : Shank

④ Arbor type
M : Metric
A : Inch

⑤ I/C size of insert
13 : 12.7mm

⑥ Tool diameter
ISO : mm
AISI : inch

⑦ Coolant type
H : Thru-hole
Unmarked : No thru-hole

⑧ Hand of tool
R : Right
L : Left

⑨ Number of tooth
5 : 5 teeth

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
HRM	D	S	13	35	H	R	- 2	S	32

① High Removal Milling

② Double Sided Insert

③ Tool type
C : Cutter
S : Shank

④ I/C size of insert
13 : 12.7mm

⑤ Tool diameter
ISO : mm
AISI : inch

⑥ Coolant type
H : Thru-hole
Unmarked : No thru-hole

⑦ Hand of tool
R : Right
L : Left

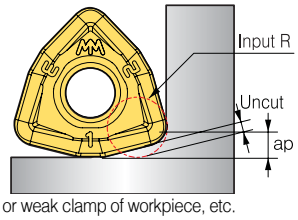
⑧ Number of tooth
2 : 2 teeth

⑨ Tool length
S : Standard type
M : Middle type
L : Long type

⑩ Shank diameter
Ø32mm

■ Corner R programming

Designation	Cutting condition		Approx. R (mm)	
	Max.ap (mm)	Max.fz (mm/t)	Input. R	Uncut
WNMX130520ZNN-MM	2	3	3	0.8



• 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.

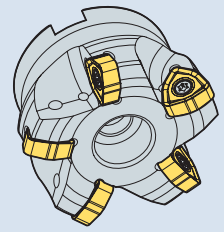
■ Recommended cutting condition

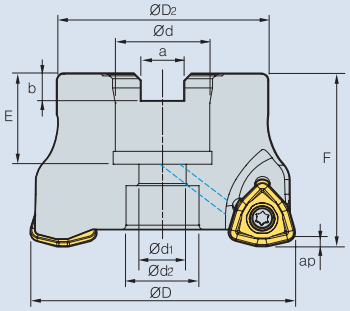
Workpiece		Hardness	Grade	vc (m/min)	fz (mm/t)
P	General structural steel (Mild steel)	Under 200HB	PC3525 PC3545	180 (100~230)	1.0 ~ 2.0
	SM50C, SCM440, etc	Under 30HRC	PC3525 PC3545	160 (100 ~ 200)	1.0 ~ 1.5
	Carbon steel Alloy steel, STD, etc	30~40 HRC	PC3525 PC3545	120 (80~130)	0.8 ~ 1.3
	Pre-hardened steel (NAK80, PX-5, etc)	40~50 HRC	PC3525	100 (70~120)	0.8 ~ 1.0
M	Stainless steel (STS304, STS316, etc)	Under 270HB	PC9530 PC8520	120 (70~160)	0.8 ~ 1.3
K	Cast iron (GC300, etc)	Under 350N/㎟	PC6510	150 (100~200)	1.2 ~ 1.8

HRMDCM13

New

AA 76°





(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Bolt
HRMDCM	13050HR-3	○		3	50	42	22	10.4	6.3	21	40	11	17	2	0.3	SB1025
	13050HR-4	○		4	50	42	22	10.4	6.3	21	40	11	17	2	0.3	SB1025
	13063HR-4	○		4	63	49	22	10.4	6.3	21	40	11	18	2	0.5	SB1025
	13063HR-5	○		5	63	49	22	10.4	6.3	21	40	11	18	2	0.5	SB1025
	13080HR-5	○		5	80	57	27	12.4	7	23	50	14	20	2	1	SB1230
	13080HR-6	○		6	80	57	27	12.4	7	23	50	14	20	2	1	SB1230
	13100HR-6	○		6	100	67	32	14.4	8	25	50	18	26	2	1.6	SB1630
	13100HR-7	○		7	100	67	32	14.4	8	25	50	18	26	2	1.6	SB1630

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
FTKA0412B	TW15S

● Available Arbors

Designation		Arbors
HRMDCM	13050HR-3	
	13050HR-4	BT30 / BT40 / BT50 FMC22
	13063HR-4	SK30 / SK40 / SK50 FMC22
	13063HR-5	
	13080HR-5	BT40 / BT50 FMC27
	13080HR-6	SK30 / SK40 / SK50 FMC27
	13100HR-6	BT40 / BT50 FMC32
	13100HR-7	SK40 / SK50 FMC32

• Detail cutter spec. see pages E172~E174

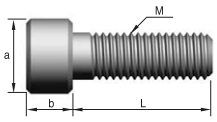
● Available Inserts

WNMX-MM

Designation	Coated					
	PC3525	PC3535	PC3545	PC8520	PC9530	PC6510
WNMX 130520ZNN-MM	○	○	○	○	○	○

● : Stock item ○ : Under preparing for stock

● Available Bolts

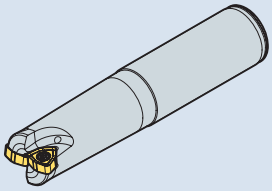


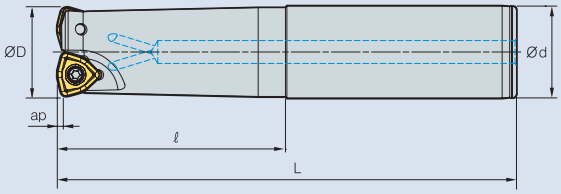
Designation	Dimensions(mm)			
	a	b	L	pitch
SB1025	16	10	25	1.5
SB1230	18	12	30	1.75
SB1630	24	16	30	2

HRMDS13

New

AA 76°





(mm)

Designation		Stock R	Stock L	⊚	øD	ød	L	ℓ	ap	kg
HRMDS	1332HR-2S32	○		2	32	32	150	70	2	0.8
	1332HR-2M32	○		2	32	32	200	120	2	1
	1332HR-2L32	○		2	32	32	300	180	2	1.6
	1333HR-2S32	○		2	33	32	150	70	2	0.8
	1333HR-2M32	○		2	33	32	200	70	2	1.1
	1333HR-2L32	○		2	33	32	300	70	2	1.7
	1335HR-2S32	○		2	35	32	150	50	2	0.8
	1335HR-2M32	○		2	35	32	200	50	2	1.1
	1335HR-2L32	○		2	35	32	300	50	2	1.7
	1340HR-3S32	○		3	40	32	150	50	2	0.8
	1340HR-3M32	○		3	40	32	250	50	2	1.4
	1340HR-3L32	○		3	40	32	300	50	2	1.7
	1340HR-3S40	○		3	40	40	150	60	2	1.2
	1340HR-3M40	○		3	40	40	250	130	2	2.1
	1340HR-3L40	○		3	40	40	300	180	2	2.6
	1340HR-3S42	○		3	40	42	150	60	2	1.4
	1340HR-3M42	○		3	40	42	250	130	2	2.3
	1340HR-3L42	○		3	40	42	300	180	2	2.7

● : Stock item ○ : Under preparing for stock

● Parts

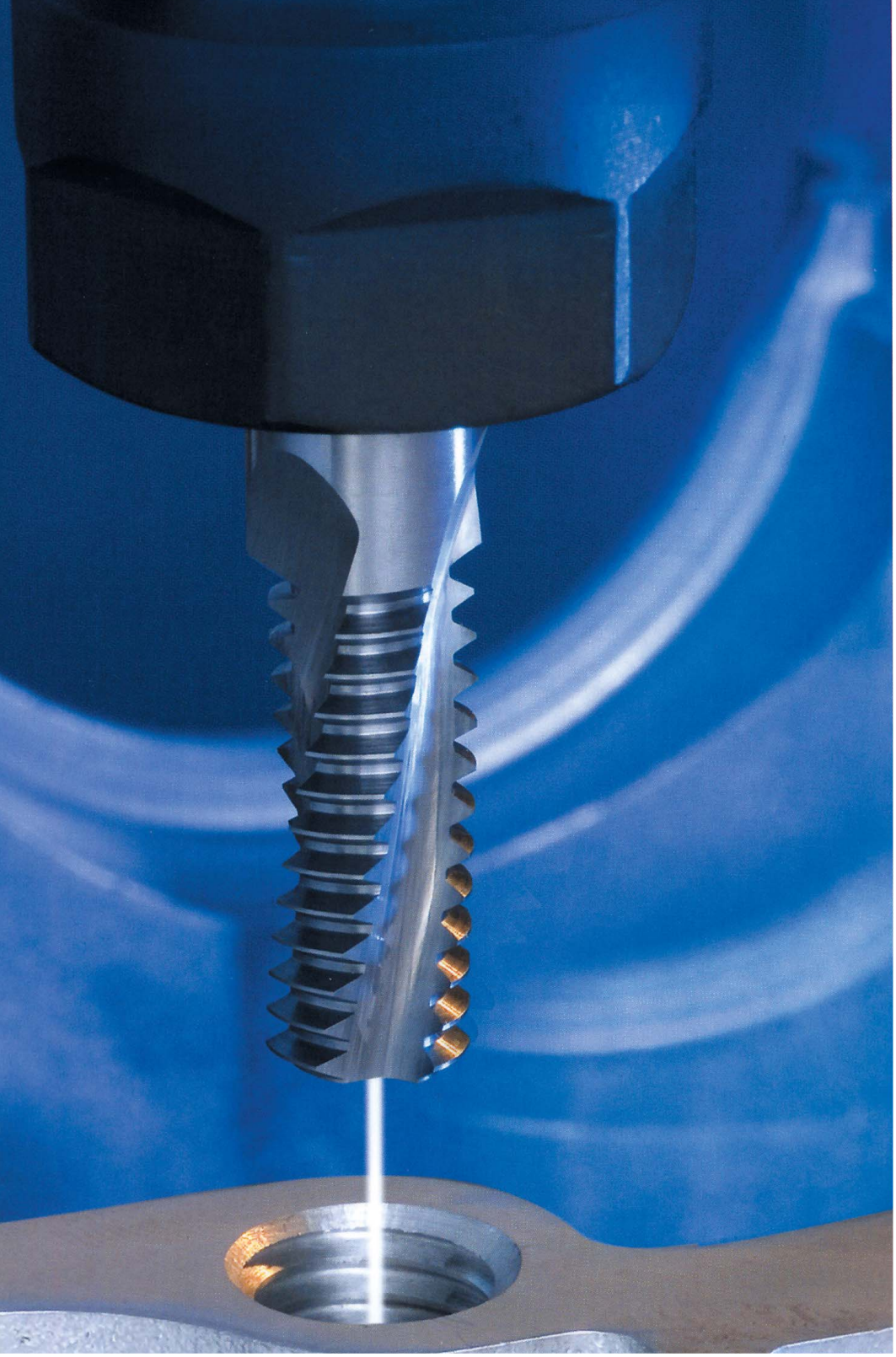
Screw	Wrench
FTKA0412B	TW15S

● Available Inserts

WNMX-MM

Designation	Coated PC3525	PC3535	PC3545	PC8520	PC9530	PC6510
WNMX 130520ZNN-MM	○	○	○	○	○	○

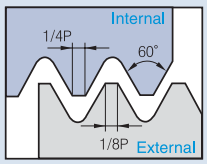
● : Stock item ○ : Under preparing for stock



Solid Threading Endmills

ISO Metric

Internal



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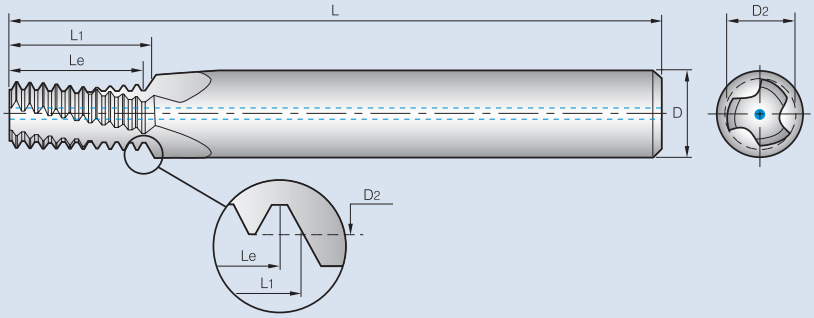


Defined by : R262 (DIN 13)
Tolerance class : 6H

■ Helical Flutes with Thru-Hole Coolant

1.5D ($L_1 \leq 1.5 \times$ Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
M Coarse	M Fine	mm	Internal	D	D_2	L	Le	L_1	z	zt	mm
M3×0.5	M3.5-M16×0.5	0.5	STMHC04024L04-I0.50ISO	4	2.40	45	4.5	4.7	3	9	2.5
M4×0.7		0.7	STMHC04031L06-I0.70ISO	4	3.15	45	6.3	6.6	3	9	3.3
M5×0.8		0.8	STMHC04039L07-I0.80ISO	4	3.90	45	7.2	7.6	3	9	4.2
M6×1.0	M8-M40×1.0	1.0	STMHC06048L09-I1.00ISO	6	4.80	57	9.0	9.5	3	9	5.0
M8×1.25		1.25	STMHC08065L13-I1.25ISO	8	6.50	61	12.5	13.1	3	10	6.8
M10×1.5	M12-M48×1.5	1.5	STMHC10082L15-I1.50ISO	10	8.20	73	15.0	15.7	3	10	8.5
M12×1.75		1.75	STMHC10099L18-I1.75ISO	10	9.90	73	17.5	18.4	4	10	10.2
M14×2.0	M17-M80×2.0	2.0	STMHC12116L21-I2.00ISO	12	11.60	73	20.0	21.0	4	10	12.0
M16×2.0	M17-M80×2.0	2.0	STMHC14136L25-I2.00ISO	14	13.60	92	24.0	25.0	4	12	14.0

■ Helical Flutes with Thru-Hole Coolant

2D ($L_1 \leq 2 \times$ Thread Diameter)

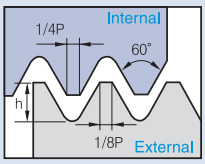
Thread		Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
M Coarse	M Fine	mm	Internal	D	D_2	L	Le	L_1	z	zt	mm
M3×0.5	M3.5-M16×0.5	0.5	STMHC04024L06-I0.50ISO	4	2.40	45	6.0	6.2	3	12	2.5
	M4-×0.5	0.5	STMHC04032L08-I0.50ISO	4	3.20	45	8.0	8.2	3	16	3.5
	M5-×0.5	0.5	STMHC06042L10-I0.50ISO	6	4.20	57	10.0	10.2	3	20	4.5
M4×0.7		0.7	STMHC04031L08-I0.70ISO	4	3.15	45	8.4	8.7	3	12	3.3
	M6-×0.75	0.75	STMHC06050L12-I0.75ISO	6	5.00	57	12.0	12.4	3	16	5.3
M5×0.8		0.8	STMHC04039L10-I0.80ISO	4	3.90	45	10.4	10.8	3	13	4.2
M6×1.0	M8-M40×1.0	1.0	STMHC06048L12-I1.00ISO	6	4.80	57	12.0	12.5	3	12	5.0
	M8-×1.0	1.0	STMHC08067L16-I1.00ISO	8	6.70	61	16.0	16.5	3	16	7.0
	M10-×1.0	1.0	STMHC10087L20-I1.00ISO	10	8.70	73	20.0	20.5	3	20	9.0
	M12-×1.0	1.0	STMHC12107L24-I1.00ISO	12	10.70	73	24.0	24.5	4	24	11.0
M8×1.25		1.25	STMHC08065L16-I1.25ISO	8	6.50	61	16.2	16.9	3	13	6.8
	M10-×1.25	1.25	STMHC10085L20-I1.25ISO	10	8.50	73	20.0	20.6	3	16	8.8
M10×1.5	M12-M48×1.5	1.5	STMHC10082L20-I1.50ISO	10	8.20	73	19.5	20.2	3	13	8.5
	M12-×1.5	1.5	STMHC10099L24-I1.50ISO	10	9.90	73	24.0	24.7	4	16	10.5
	M14-×1.5	1.5	STMHC12119L29-I1.50ISO	12	11.90	80	28.5	29.2	4	19	12.5
	M16-×1.5	1.5	STMHC14139L32-I1.50ISO	14	13.90	92	31.5	32.2	4	21	14.5
M12×1.75		1.75	STMHC10099L25-I1.75ISO	10	9.90	73	24.5	25.4	4	14	10.2
M14×2.0	M17-M80×2.0	2.0	STMHC12116L29-I2.00ISO	12	11.60	80	28.0	29.0	4	14	12.0
M16×2.0	M17-M80×2.0	2.0	STMHC14136L33-I2.00ISO	14	13.60	92	32.0	33.0	4	16	14.0
M18×2.5		2.5	STMHC16148L36-I2.50ISO	16	14.80	92	35.0	36.2	4	14	15.5
M 20×2.5		2.5	STMHC18171L41-I2.50ISO	18	17.10	102	40.0	41.2	4	16	17.5
M 24×3.0		3.0	STMHC20199L49-I3.00ISO	20	19.90	102	48.0	49.5	4	16	21.0

* Bore Diameter applies to smallest thread Dia.

Maximum thread length = $L_1 - \frac{\text{Pitch}}{4}$

American UN

Internal



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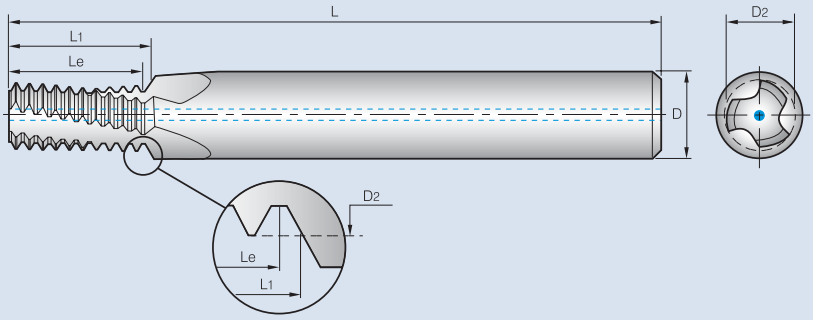


Defined by : ANSI B1.1.74
Tolerance class : 2B

■ Helical Flutes with Thru-Hole Coolant

1.5D ($L_1 \leq 1.5 \times$ Thread Diameter)

Thread			Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
UNC	UNF	UNEF	tpi	Internal	D	D_2	L	Le	L_1	z	zt	mm
No.10-24	5/16" ,3/8"×24	9/16"-11/16"×24	24	STMHC04035L07-I24UNC	4	3.58	45	7.4	7.9	3	7	3.8
No.10-24	5/16" ,3/8"×24	9/16"-11/16"×24	24	STMHC06041L08-I24UNC	6	4.15	57	8.5	9.0	3	8	4.5
1/4"×20	7/16" ,1/2"×20	3/4"-1"×20	20	STMHC06048L09-I20UNC	6	4.88	57	8.9	9.5	3	7	5.2
5/16"×18	9/16" ,5/8"×18	11/16"-1 11/16"×18	18	STMHC08061L11-I18UNC	8	6.15	61	11.3	12.0	3	8	6.5
3/8"×16	3/4"×16		16	STMHC08076L15-I16UNC	8	7.65	61	14.3	15.1	3	9	8.0
7/16"×14	7/8"×14		14	STMHC10090L17-I14UNC	10	9.00	73	16.3	17.2	3	9	9.3
1/2"×13			13	STMHC12104L20-I13UNC	12	10.35	73	19.5	20.5	4	10	10.8
9/16"×12	1"-1 1/2"×12		12	STMHC12118L22-I12UNC	12	11.80	73	21.2	22.2	4	10	12.3

■ Helical Flutes with Thru-Hole Coolant

2D ($L_1 \leq 2 \times$ Thread Diameter)

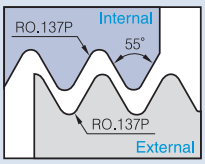
Thread			Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
UNC	UNF	UNEF	tpi	Internal	D	D_2	L	Le	L_1	z	zt	mm
	No.10-32	No. 12-3/8"×32	32	STMHC04038L09-I32UNF	4	3.80	45	9.5	9.9	3	12	4.0
		No. 12-3/8"×32	32	STMHC06044L11-I32UNEF	6	4.40	57	11.1	11.5	3	14	4.7
	No.12, 1/4"×28	7/16"; 1/2"×28	28	STMHC06043L11-I28UNF	6	4.30	57	10.9	11.3	3	12	4.6
	1/4"×28	7/16"; 1/2"×28	28	STMHC06052L13-I28UNF	6	5.15	57	12.7	13.1	3	14	5.5
		7/16"; 1/2"×28	28	STMHC10099L22-I28UNEF	10	9.90	73	21.8	22.2	3	24	10.2
No.12-24	5/16", 3/8"×24	9/16"-11/16"×24	24	STMHC04035L10-I24UNC	4	3.58	45	9.5	10.0	3	9	3.8
No.10-24	5/16", 3/8"×24	9/16"-11/16"×24	24	STMHC06041L11-I24UNC	6	4.15	57	10.6	11.1	3	10	4.5
	5/16", 3/8"×24	9/16"-11/16"×24	24	STMHC08066L16-I24UNF	8	6.68	61	15.9	16.4	3	15	6.8
	3/8"×24	9/16"-11/16"×24	24	STMHC10082L19-I24UNF	10	8.20	73	19.0	19.6	3	18	8.5
		9/16"-11/16"×24	24	STMHC14129L29-I24UNEF	14	12.90	92	28.6	29.1	4	27	13.2
1/4"×20	7/16", 1/2"×20	3/4"-1"×20	20	STMHC06048L13-I20UNC	6	4.88	57	12.7	13.3	3	10	5.2
	7/16", 1/2"×20	3/4"-1"×20	20	STMHC10096L22-I20UNF	10	9.60	73	21.6	22.2	3	17	9.8
	1/2"×20	3/4"-1"×20	20	STMHC12111L26-I20UNF	12	11.10	80	25.4	26.0	3	20	11.5
		3/4"-1"×20	20	STMHC18174L38-I20UNEF	18	17.40	102	38.1	38.7	4	30	17.8
5/16"×18	9/16", 5/8"×18	11/16"-1 11/16"×18	18	STMHC08061L16-I18UNC	8	6.15	61	15.5	16.2	3	11	6.5
	9/16", 5/8"×18	11/16"-1 11/16"×18	18	STMHC14125L28-I18UNF	14	12.50	92	28.2	28.9	4	20	12.8
	5/8"×18	11/16"-1 11/16"×18	18	STMHC16141L31-I18UNF	16	14.10	92	31.0	31.7	4	22	14.5
3/8"×16	3/4"×16		16	STMHC08076L19-I16UNC	8	7.65	61	19.0	19.8	3	12	8.0
	3/4"×16		16	STMHC18170L38-I16UNF	18	17.00	102	38.1	38.8	4	24	17.5
7/16"×14	7/8"×14		14	STMHC10090L22-I14UNC	10	9.00	73	21.8	22.7	3	12	9.3
	7/8"×14		14	STMHC20199L44-I14UNF	20	19.90	102	43.5	44.4	4	24	20.5
1/2"×13			13	STMHC12104L26-I13UNC	12	10.35	80	25.4	26.4	4	13	10.8
9/16"×12	1"-1 1/2"×12		12	STMHC12118L28-I12UNC	12	11.80	80	27.5	28.6	4	13	12.3
	1"-1 1/2"×12		12	STMHC20199L51-I12UNF	20	19.90	102	50.8	51.9	4	24	23.5
5/8"×11			11	STMHC14131L33-I11UNC	14	13.10	92	32.3	33.5	4	14	13.5
3/4"×10			10	STMHC16159L39-I10UNC	16	15.90	92	38.1	39.4	4	15	16.5
7/8"×9			9	STMHC20190L46-I9UNC	20	19.00	102	45.2	46.6	4	16	19.5
1"×8			8	STMHC20199L52-I8UNC	20	19.90	102	50.8	52.4	4	16	22.0

* Bore Diameter applies to smallest thread Dia.

Maximum thread length = $L_1 - \frac{\text{Pitch}}{4}$

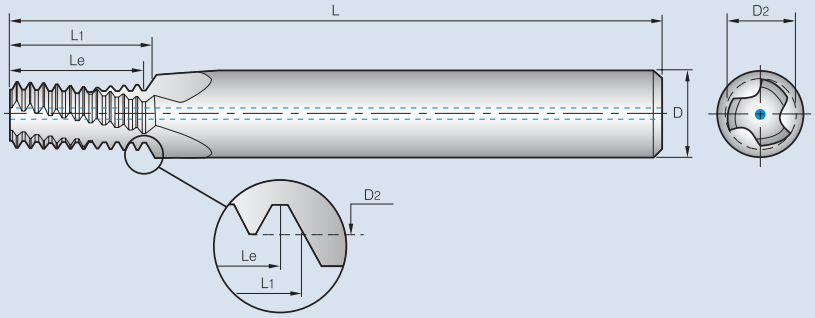
Whitworth

External / Internal



Defined by : B.S.84 : 1956
DIN 259, ISO228/1 : 1982

Tolerance class : Medium class A



■ Helical Flutes with Thru-Hole Coolant

2D ($L_1 \leq 2 \times$ Thread Diameter)

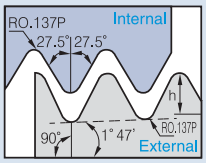
Thread		Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
BSW	BSF	tpi	External / Internal	D	D_2	L	Le	L_1	z	zt	mm
	1/4"×26	26	STMHC06050L13-EI26BSF	6	5.00	57	12.7	13.2	3	13	5.3
	5/16"×22	22	STMHC08063L16-EI22BSF	8	6.35	61	16.2	16.7	3	14	6.7
1/4"×20	3/8"×20	20	STMHC06044L13-EI20BSW	6	4.45	57	12.7	13.3	3	10	5.0
	3/8"×20	20	STMHC08076L19-EI20BSF	8	7.65	61	19.0	197	3	15	8.2
5/16"×18	7/16"×18	18	STMHC06058L16-EI18BSW	6	5.85	57	15.5	16.2	3	11	6.5
	7/16"×18	18	STMHC10092L23-EI18BSF	10	9.20	73	22.6	23.3	3	16	9.7
3/8"×16	1/2", 9/16"×16	16	STMHC08072L19-EI16BSW	8	7.20	61	19.0	19.8	3	12	7.9
	1/2", 9/16"×16	16	STMHC12105L26-EI16BSF	12	10.50	80	25.4	26.2	4	16	11.1
	9/16"×16	16	STMHC14122L29-EI16BSF	14	12.15	92	28.6	29.4	4	18	12.6
7/16"×14	5/8", 11/16"×14	14	STMHC10085L22-EI14BSW	10	8.50	73	21.8	22.7	3	12	9.2
	5/8", 11/16"×14	14	STMHC14134L31-EI14BSF	14	13.40	92	30.8	31.7	4	17	14.0
	11/16"×14	14	STMHC16150L35-EI14BSF	16	15.00	92	34.5	35.4	4	19	15.6
1/2"×12	3/4"×12	12	STMHC10096L26-EI12BSW	10	9.65	73	25.4	26.5	3	12	10.5
9/16"×12	3/4"×12	12	STMHC12113L28-EI12BSW	12	11.25	80	27.5	28.6	4	13	12.1
	3/4"×12	12	STMHC18162L39-EI12BSF	18	16.20	102	38.1	39.2	4	18	16.8
5/8"×11	7/8"×11	11	STMHC14126L33-EI11BSW	14	12.60	92	32.3	33.5	4	14	13.4
11/16"×11		11	STMHC16142L35-EI11BSW	16	14.20	92	34.6	35.8	4	15	15.0

* Bore Diameter applies to smallest thread Dia.

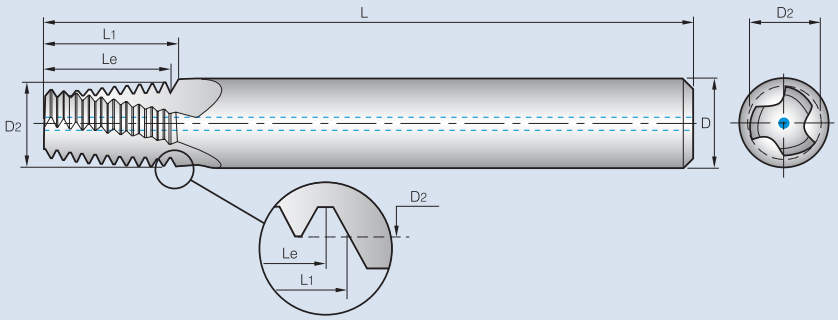
Maximum thread length = $L_1 - \frac{\text{Pitch}}{4}$

BSPT

External / Internal



Defined by : B.S.21 : 1985
Tolerance class : Standard BSPT



■ Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
Standard	tpi	External / Internal	D	D2	L	Le	L1	z	zt	mm
1/16"×28	28	STMHC06059L10-EI28BSPT	6	5.90	57	10.0	10.2	3	11	6.7
1/8"×28	28	STMHC08076L10-EI28BSPT	8	7.65	61	10.0	10.2	3	11	8.7
1/4"×19	19	STMHC10099L15-EI19BSPT	10	9.90	73	14.7	15.4	3	11	11.8
3/8"×19	19	STMHC12111L15-EI19BSPT	12	11.15	73	14.7	15.4	4	11	15.2
1/2", 3/4"×14	14	STMHC16142L22-EI14BSPT	16	14.25	92	21.8	22.7	4	12	19.0
1", 1 1/2", 2", 2 1/2"×11	11	STMHC20196L28-EI11BSPT	20	19.60	102	27.7	28.9	4	12	30.7

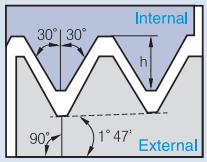
* Bore Diameter applies to smallest thread Dia.

Maximum thread length = $L_1 - \frac{Pitch}{4}$

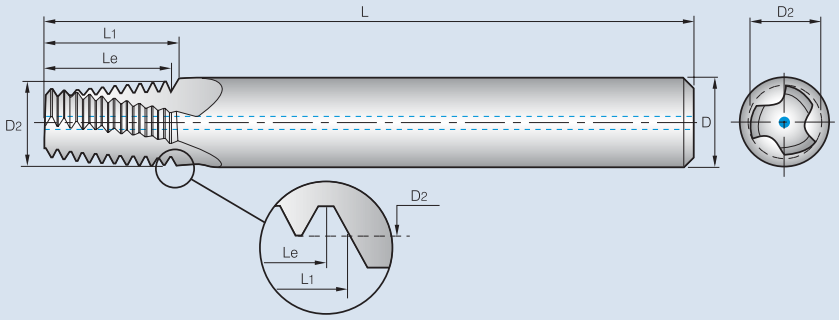
NPT

External / Internal

New



Defined by : USAS B2.1:1968
Tolerance class : Standard NPT



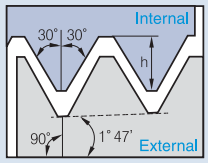
■ Helical Flutes with Thru-Hole Coolant

Thread	Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
Standard	tpi	External / Internal	D	D2	L	Le	L1	z	zt	mm
1/16"×27	27	STMHC06059L09-EI27NPT	6	5.90	57	9.4	9.9	3	10	6.3
1/8"×27	27	STMHC08076L09-EI27NPT	8	7.65	61	9.4	9.9	3	10	8.5
1/4"×18	18	STMHC10099L14-EI18NPT	10	9.90	73	14.1	14.8	3	10	11.1
3/8"×18	18	STMHC12111L14-EI18NPT	12	11.15	73	14.1	14.8	4	10	14.5
1/2", 3/4"×14	14	STMHC16142L19-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	STMHC20196L23-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	STMHC20196L33-EI8NPT	20	19.60	102	31.7	33.3	4	10	66.5, 82.1

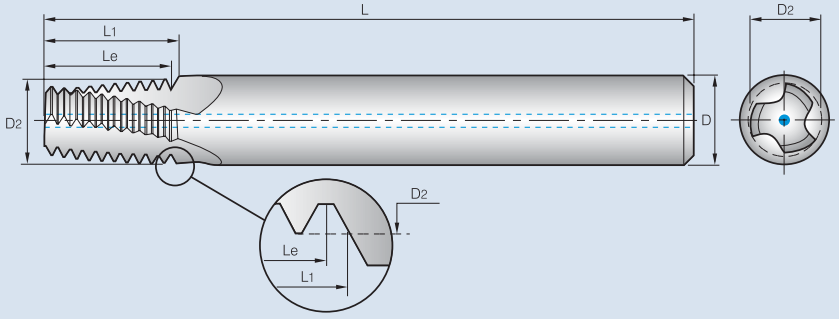
NPTF

External / Internal

New



Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF



■ Helical Flutes with Thru-Hole Coolant

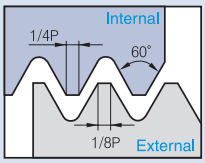
Thread	Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
Standard	tpi	External / Internal	D	D2	L	Le	L1	z	zt	mm
1/16"×27	27	STMHC06059L09-EI27NPTF	6	5.90	57	9.4	9.9	3	10	6.3
1/8"×27	27	STMHC08076L09-EI27NPTF	8	7.65	61	9.4	9.9	3	10	8.5
1/4"×18	18	STMHC10099L14-EI18NPTF	10	9.90	73	14.1	14.8	3	10	11.1
3/8"×18	18	STMHC12111L14-EI18NPTF	12	11.15	73	14.1	14.8	4	10	14.5
1/2", 3/4"×14	14	STMHC16142L19-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	STMHC20196L23-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	STMHC20196L33-EI8NPTF	20	19.60	102	31.7	33.3	4	10	66.3, 82.1

* Bore Diameter applies to smallest thread Dia.

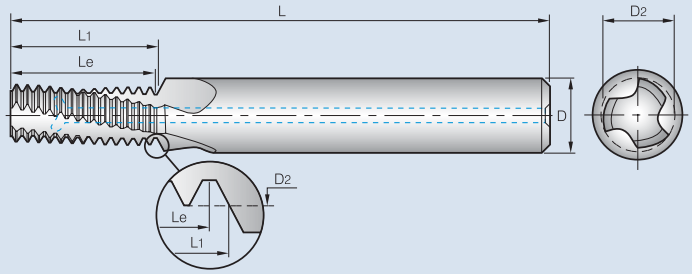
Maximum thread length = $L_1 - \frac{Pitch}{4}$

ISO Metric

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



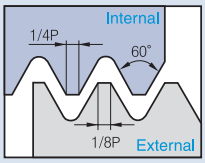
■ Helical Flutes with Radial Cooling

2D (L1≤2×Thread Diameter)

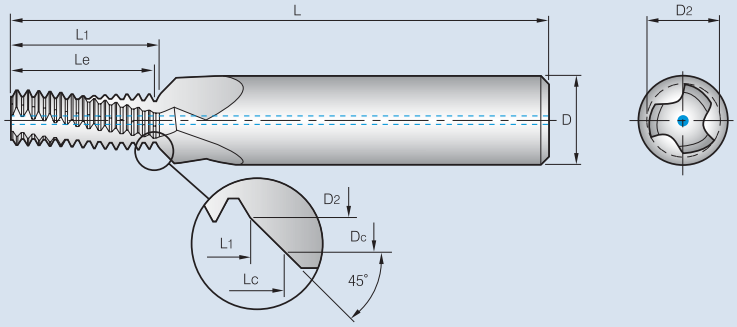
Thread		Pitch	Ordering Code	Dimensions(mm)					No.of Flute	Tooth	Bore Dia*.
M Coarse	M Fine	mm	Internal	D	D2	L	Le	L1	z	zt	mm
M6×1.0	M8-M40×1.0	1.0	STMHCR06048L12-I1.00ISO	6	4.8	57	12.0	12.5	3	12	5.0
	M10×1.0	1.0	STMHCR10087L20-I1.00ISO	10	8.7	73	20.0	20.5	3	20	9.0
	M12×1.0	1.0	STMHCR12107L24-I1.00ISO	12	10.7	73	24.0	24.5	4	24	11.0
M8×1.25		1.25	STMHCR08065L16-I1.25ISO	8	6.5	64	16.3	16.9	3	13	6.8
M10×1.5	M12-M48×1.5	1.5	STMHCR10082L20-I1.50ISO	10	8.2	73	19.5	20.3	3	13	8.5
	M12×1.5	1.5	STMHCR10099L24-I1.50ISO	10	9.9	73	24.0	24.8	4	16	10.5
	M14×1.5	1.5	STMHCR12119L29-I1.50ISO	12	11.9	84	28.5	29.3	4	19	12.5
	M16×1.5	1.5	STMHCR14139L32-I1.50ISO	14	13.9	84	31.5	32.3	4	21	14.5
M12×1.75		1.75	STMHCR10099L25-I1.75ISO	10	9.9	73	24.5	25.4	4	14	10.2

ISO Metric

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



■ Helical Flutes with Thru-Hole Coolant - Thru & Chamfer

2D (L1≤2×Thread Diameter)

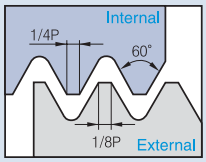
Thread		Pitch	Ordering Code	Dimensions(mm)							No.of Flute	Tooth	Bore Dia*.
M Coarse	M Fine	mm	Internal	D	D2	Dc	L	Le	L1	Lc	z	zt	mm
M6×1.0	M8-M40×1.0	1.0	STMHCC08048L12-I1.00ISO	8	4.8	6.3	61	12.0	12.5	13.3	3	12	5.0
	M10×1.0	1.0	STMHCC12087L20-I1.00ISO	12	8.7	10.3	73	20.0	20.5	21.3	3	20	9.0
	M12×1.0	1.0	STMHCC14107L24-I1.00ISO	14	10.7	12.3	80	24.0	24.5	25.3	4	24	11.0
M8×1.25		1.25	STMHCC10065L16-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	STMHCC12082L20-I1.50ISO	12	8.2	10.3	80	19.5	20.3	21.3	3	13	8.5
	M12×1.5	1.5	STMHCC14099L24-I1.50ISO	14	9.9	12.3	80	24.0	24.8	26.0	4	16	10.5
	M14×1.5	1.5	STMHCC16119L29-I1.50ISO	16	11.9	14.3	92	28.5	29.3	30.5	4	19	12.5
	M16×1.5	1.5	STMHCC18139L32-I1.50ISO	18	13.9	16.3	92	31.5	32.3	33.5	4	21	14.5
M12×1.75		1.75	STMHCC14099L25-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.

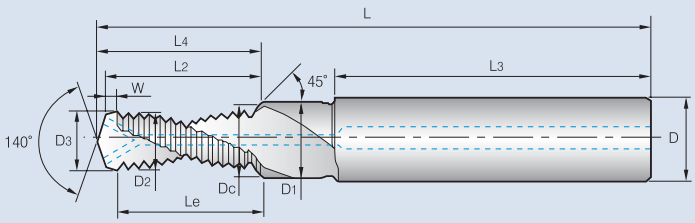
Maximum thread length = $L_1 - \frac{Pitch}{4}$

ISO Metric

Internal



Defined by : R262 (DIN 13)
Tolerance class : 6H



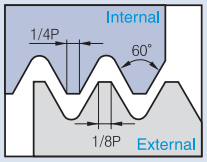
■ Drill, Chamfer & Thread with Thru-Hole Coolant

Thread	Ordering Code	Pitch	Dimensions(mm)											No.of Flute	Tooth
ISO 2×Do Coarse	Internal	mm	L	L_4	L_2	L_3	W	Le	D_3	D	D_1	Dc	D_2	z	zt
M6×1.0	STMHCD-IM6×1.0ISO-2D	1.00	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	STMHCD-IM8×1.25ISO-2D	1.25	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	STMHCD-IM10×1.5ISO-2D	1.50	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	STMHCD-IM12×1.75ISO-2D	1.75	89.0	27.1	25.5	45	1.5	24.0	10.3	14	13.5	12.3	9.74	2	12
ISO 2.5×Do Coarse															
M6×1.0	STMHCD-IM6×1.0ISO-2.5D	1.00	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	STMHCD-IM8×1.25ISO-2.5D	1.25	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	STMHCD-IM10×1.5ISO-2.5D	1.50	79.0	27.9	26.6	45	1.5	25.1	8.5	12	11.0	10.3	8.08	2	15

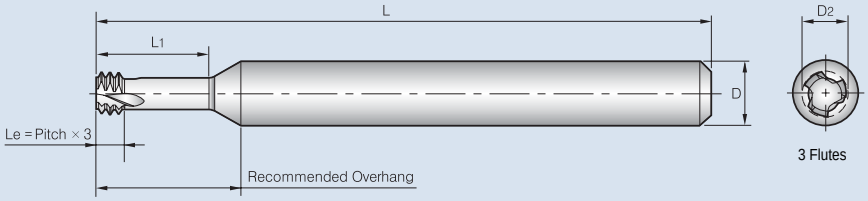
ISO Metric

Internal

New



Defined by : R262 (DIN 13)
Tolerance class : 6H



■ Deep Threading

2D (L1≤2×Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
M Coarse	M Coarse	mm	Internal	D	D2	L	L1	z	zt	mm
M1.6×0.35		0.35	STMD3T03012L034-I0.35ISO	3	1.20	30	3.4	3	3	1.25
M2×0.4		0.4	STMD3T06015L042-I0.4ISO	6	1.55	57	4.2	3	3	1.6
M2.2×0.45		0.45	STMD3T06016L046-I0.45ISO	6	1.65	57	4.6	3	3	1.75
M2.5×0.45		0.45	STMD3T06019L052-I0.45ISO	6	1.95	57	5.2	3	3	2.05
M3×0.5	M3.5-M16×0.5	0.5	STMD3T06024L062-I0.5ISO	6	2.40	57	6.2	3	3	2.5
M3.5×0.6		0.6	STMD3T06027L073-I0.6ISO	6	2.75	57	7.3	3	3	2.9
M4×0.7		0.7	STMD3T06031L083-I0.7ISO	6	3.15	57	8.3	3	3	3.3
M5×0.8		0.8	STMD3T06040L104-I0.8ISO	6	4.05	57	10.4	3	3	4.2
M6×1.0	M8-M40×1.0	1.00	STMD3T06048L125-I1.0ISO	6	4.80	57	12.5	3	3	5.0
M8×1.25		1.25	STMD3T08065L166-I1.25ISO	8	6.50	63	16.6	3	3	6.8
M10×1.5	M12-M48×1.50	1.50	STMD3T10082L208-I1.50ISO	10	8.20	73	20.8	3	3	8.5
M12×1.75		1.75	STMD3T10099L250-I1.75ISO	10	9.90	73	25.0	3	3	10.3

■ Deep Threading

3D (L1≤3×Thread Diameter)

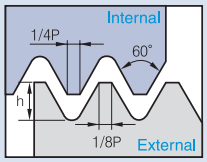
Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
M Coarse	M Coarse	mm	Internal	D	D2	L	L1	z	zt	mm
M1.6×0.35		0.35	STMD3T03012L050-I0.35ISO	3	1.20	30	5.0	3	3	1.25
M2×0.4		0.4	STMD3T06015L062-I0.4ISO	6	1.55	57	6.2	3	3	1.6
M2.5×0.45		0.45	STMD3T06019L077-I0.45ISO	6	1.95	57	7.0	3	3	2.05
M3×0.5	M3.5-M16×0.5	0.5	STMD3T06024L092-I0.5ISO	6	2.40	57	9.2	3	3	2.5
M4×0.7		0.7	STMD3T06031L123-I0.7ISO	6	3.15	57	12.3	3	3	3.3
M5×0.8		0.8	STMD3T06040L154-I0.8ISO	6	4.05	57	15.4	3	3	4.2
M6×1.0	M8-M40×1.0	1.00	STMD3T06048L185-I1.0ISO	6	4.80	57	18.5	3	3	5.0
M8×1.25		1.25	STMD3T08065L246-I1.25ISO	8	6.50	63	24.6	3	3	6.8

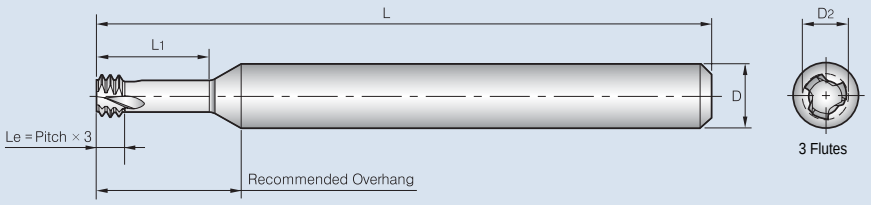
* Bore Diameter applies to smallest thread Dia.

Maximum thread length = $L_1 - \frac{Pitch}{4}$

American UN

Internal





Defined by : ANSI B1.1.74
Tolerance class : 2B

■ Deep Threading

2D (L1≤2×Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
UNC	UNF	tpi	Internal	D	D2	L	L1	z	zt	mm
	No.1-72	72	STMD3T06014L039-I72UN	6	1.45	57	3.9	3	3	1.6
No.1-64	No.2-64	64	STMD3T06014L042-I64UN	6	1.40	57	4.2	3	3	1.5
No.2-56	No.3-56	56	STMD3T06016L050-I56UN	6	1.65	57	5.0	3	3	1.8
No.3-48	No.4-48	48	STMD3T06019L060-I48UN	6	1.90	57	6.0	3	3	2.1
No.4, No.5-40	No.6-40	40	STMD3T06021L060-I40UN	6	2.10	57	6.0	3	3	2.3
No.5-40	No.6-40	40	STMD3T06024L072-I40UN	6	2.45	57	7.2	3	3	2.6
	No.8-36	36	STMD3T06033L087-I36UN	6	3.30	57	8.7	3	3	3.5
No.6, No.8-32	No.10-32	32	STMD3T06025L074-I32UN	6	2.55	57	7.4	3	3	2.8
No.8-32	No.10-32	32	STMD3T06032L100-I32UN	6	3.20	57	10.0	3	3	3.5
	1/4"×28	28	STMD3T06052L132-I28UN	6	5.25	57	13.2	3	3	5.5
No.10-24	5/16"×24	24	STMD3T06035L102-I24UN	6	3.58	57	10.2	3	3	3.9
	5/16"×24	24	STMD3T08066L165-I24UN	8	6.68	63	16.5	3	3	6.9
1/4"×20	7/16"×20	20	STMD3T06048L134-I20UN	6	4.88	57	13.4	3	3	5.2
	7/16"×20	20	STMD3T010095L230-I20UN	10	9.55	73	23.0	3	3	9.9
3/8"×16		16	STMD3T08067L191-I16UN	8	6.70	63	19.1	3	3	8.0
7/16"×14		14	STMD3T10090L233-I14UN	10	9.00	73	23.3	3	3	9.4

■ Deep Threading

3D (L1≤3×Thread Diameter)

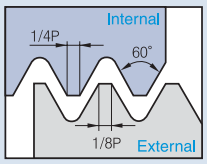
Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
UNC	UNF	tpi	Internal	D	D2	L	L1	z	zt	mm
	No.1-72	72	STMD3T06014L057-I72UN	6	1.45	57	5.75	3	3	1.6
No.4, No.5-40	No.6-40	40	STMD3T06021L090-I40UN	6	2.10	57	9.0	3	3	2.3
No.5-40	No.6-40	40	STMD3T06024L100-I40UN	6	2.45	57	10.0	3	3	2.6
No.6, No.8-32	No.10-32	32	STMD3T06025L110-I32UN	6	2.55	57	11.0	3	3	2.8
No.8-32	No.10-32	32	STMD3T06032L130-I32UN	6	3.20	57	13.0	3	3	3.4
	1/4"×28	28	STMD3T06052L196-I28UN	6	5.25	57	19.6	3	3	5.5
	5/16"×24	24	STMD3T08066L245-I24UN	8	6.68	63	24.5	3	3	6.9
1/4"×20	7/16"×20	20	STMD3T06048L198-I20UN	6	4.88	57	19.8	3	3	5.1

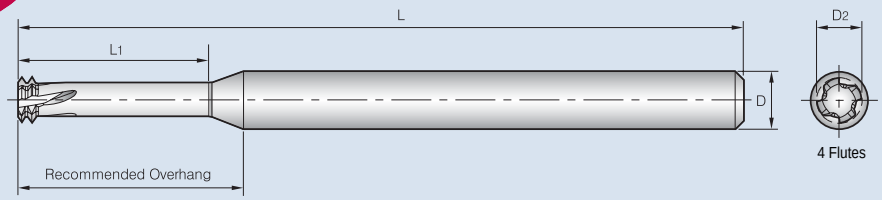
* Bore Diameter applies to smallest thread Dia.

ISO Metric

Internal

New





Defined by : R262 (DIN 13)
Tolerance class : 6H

• Left Hand Tool

■ Deep Threading for Hard Materials(~HRC62)

2D (L1≤2×Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
M Coarse	M Fine	mm	Internal	D	D2	L	L1	z	zt	mm
M2×0.4		0.4	STMD2L06015L042-I0.4ISO	6	1.55	76	4.60	4	2	1.6
M2.2×0.45		0.45	STMD2L06016L046-I0.45ISO	6	1.65	76	5.05	4	2	1.8
M2.5×0.45		0.45	STMD2L06019L052-I0.45ISO	6	1.95	76	5.65	4	2	2.05
M3×0.5	M3.5-M16×0.5	0.5	STMD2L06024L062-I0.5ISO	6	2.40	76	6.75	4	2	2.55
M3.5×0.6		0.6	STMD2L06027L073-I0.6ISO	6	2.75	76	7.90	4	2	2.95
M4×0.7		0.7	STMD2L06031L083-I0.7ISO	6	3.15	76	9.05	4	2	3.35
M5×0.8		0.8	STMD2L06040L104-I0.8ISO	6	4.05	76	11.20	4	2	4.3
M6×1.0	M8-M40×1.0	1.0	STMD2L06048L125-I1.0ISO	6	4.80	76	13.50	4	2	5.1
M8×1.25		1.25	STMD2L08065L166-I1.25ISO	8	6.50	80	17.85	4	2	6.8
M10×1.5	M12-M48×1.50	1.5	STMD2L08079L208-I1.50ISO	8	7.90	80	22.30	4	2	8.6
M12×1.75		1.75	STMD2L10099L250-I1.75ISO	10	9.90	101	26.75	4	2	10.4

■ Deep Threading for Hard Materials(~HRC62)

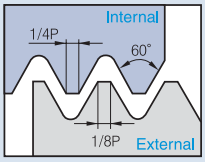
3D (L1≤3×Thread Diameter)

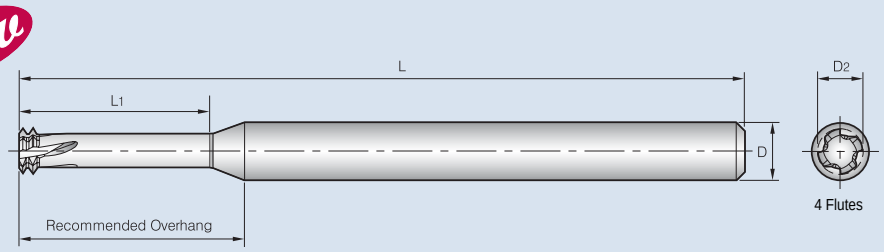
Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
M Coarse	M Fine	mm	Internal	D	D2	L	L1	z	zt	mm
M2×0.4		0.4	STMD2L06015L062-I0.4ISO	6	1.55	76	6.60	4	2	1.6
M2.2×0.45		0.45	STMD2L06019L077-I0.45ISO	6	1.95	76	8.15	4	2	2.05
M3×0.5	M3.5-M16×0.5	0.5	STMD2L06024L092-I0.5ISO	6	2.40	76	9.75	4	2	2.55
M4×0.7		0.7	STMD2L06031L123-I0.7ISO	6	3.15	76	13.05	4	2	3.35
M5×0.8		0.8	STMD2L06040L154-I0.8ISO	6	4.05	76	16.20	4	2	4.3
M6×1.0	M8-M40×1.0	1.0	STMD2L06048L185-I1.0ISO	6	4.80	76	19.50	4	2	5.1
M8×1.25		1.25	STMD2L08065L246-I1.25ISO	8	6.50	80	25.85	4	2	6.8

* Bore Diameter applies to smallest thread Dia.

American UN

Internal





Defined by : ANSI B1.1.74
Tolerance class : 2B

• Left Hand Tool

■ Deep Threading for Hard Materials(~HRC62)

2D (L1≤2×Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
UNC	UNF	tpi	Internal	D	D2	L	L1	z	zt	mm
No.2-56	No.3-56	56	STMD2L06016L050-I56UN	6	1.65	76	5.45	4	2	1.80
No.3-48	No.4-48	48	STMD2L06019L060-I48UN	6	1.90	76	6.53	4	2	2.10
No.4-40 ; No.5-40	No.6-40	40	STMD2L06021L060-I40UN	6	2.10	76	6.64	4	2	2.35
No.5-40	No.6-40	40	STMD2L06024L072-I40UN	6	2.45	76	7.84	4	2	2.65
	No.8-36	36	STMD2L06033L087-I36UN	6	3.30	76	9.41	4	2	3.55
No.6-32 ; No.8-32	No.10-32	32	STMD2L06025L074-I32UN	6	2.55	76	8.20	4	2	2.85
No.8-32	No.10-32	32	STMD2L06032L100-I32UN	6	3.20	76	10.79	4	2	3.50
	1/4"-28	28	STMD2L06052L132-I28UN	6	5.25	76	14.11	4	2	5.55
No.10-24	5/16"-24	24	STMD2L06035L102-I24UN	6	3.58	76	11.26	4	2	3.90
	5/16"-24	24	STMD2L08066L165-I24UN	8	6.68	76	17.56	4	2	7.00
1/4"-20	7/16"-20	20	STMD2L06048L134-I20UN	6	4.88	76	14.67	4	2	5.20
	7/16"-20	20	STMD2L10095L230-I20UN	10	9.55	101	24.27	4	2	9.90
3/8"×16		16	STMD2L08076L197-I16UN	8	7.65	80	21.29	4	2	8.00
7/16"-14		14	STMD2L10090L233-I14UN	10	9.00	101	25.11	4	2	9.50
1/2"-13		13	STMD2L10099L256-I13UN	10	9.90	101	27.55	4	2	10.90

■ Deep Threading for Hard Materials(~HRC62)

3D (L1≤3×Thread Diameter)

Thread		Pitch	Ordering Code	Dimensions(mm)				No.of Flute	Tooth	Bore Dia*.
UNC	UNF	tpi	Internal	D	D2	L	L1	z	zt	mm
No.4-40, No.5-40	No.6-40	40	STMD2L06021L090-I40UN	6	2.10	76	9.64	4	2	2.35
No.5-40	No.6-40	40	STMD2L06024L100-I40UN	6	2.45	76	10.64	4	2	2.65
No.6-32, No.8-32	No.10-32	32	STMD2L06025L110-I32UN	6	2.55	76	11.79	4	2	2.85
No.8-32	No.10-32	32	STMD2L06032L130-I32UN	6	3.20	76	13.79	4	2	3.50
	1/4"-28	28	STMD2L06052L196-I28UN	6	5.25	76	20.51	4	2	5.55
	5/16"-24	24	STMD2L08066L245-I24UN	8	6.68	80	25.56	4	2	7.00
1/4"-20	7/16"-20	20	STMD2L06048L198-I20UN	6	4.88	76	21.07	4	2	5.20
7/16"-14		14	STMD2L10090L335-I14UN	10	9.00	101	35.31	4	2	9.50

* Bore Diameter applies to smallest thread Dia.

MEMO

Grade/Chip breaker

A

Contents

Grades

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The feature of korloy grades ----- A04

Chip breakers

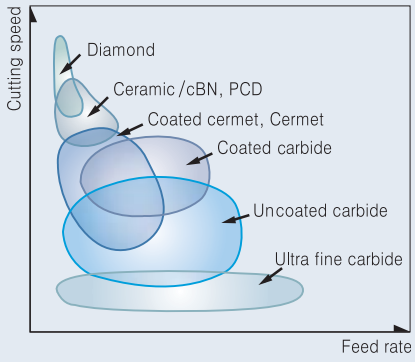
For Turning ---------- A06
For Milling ---------- A08
For Drilling ---------- A09

Grades

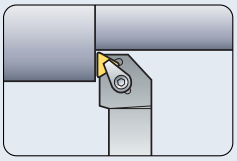
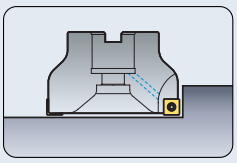
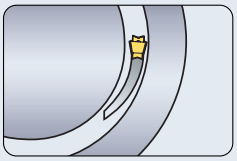
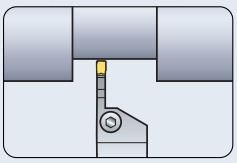
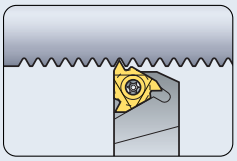
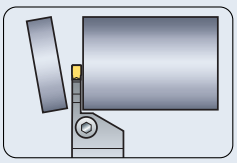
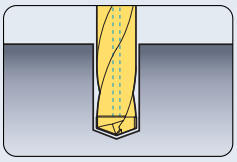
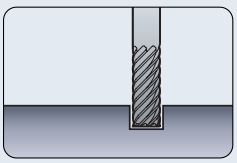
Korloy grades system

Cutting Tool	Uncoated carbide	P	For steel	ST05	ST10	ST15	ST20	ST30A	ST30N	ST30	ST40	ST45	ST46
		M	For Stainless steel	U10	U20	ST30A	U40						
		K	For cast iron	H02	H01	H05	H10	G10					
		N	Non-ferrous metal	H01									
	Coated carbide for turning	P	For steel	NC3010	NC3020	NC3120	NC3030	NC500H					
		M	For Stainless steel	PC8010	NC9020	NC3030	PC9030						
		K	For cast iron	NC305K	NC6110	NC6010	NC315K						
		S	Heat resistance super alloy	PC8010									
	Coated carbide for milling	P	For steel	NCM325	PC230	PC3525	PC3535	NCM335	PC3545				
		M	For Stainless steel	NCM325	PC8520	PC9530	NCM335	PC3545					
		K	For cast iron	PC205K	PC6510	PC215K							
		S	Heat resistance super alloy	PC8520									
	Coated carbide for Drills, Endmills	Coated	For general	PC203F	PC205F	PC210F	PC215F	PC220F	PC220	PC225F			
		Carbide	For general	H01	FG2	FA1	FA2	FS1	FCC				
	Cermet	P	For steel	CN1000	CT10	CN2000	CN20	CN30					
		K	For cast iron	CN1000									
	Coated cermet	P	For steel	CC105	CC115	CC125							
	cBN	P	For steel	KB320	KB330	KB350	KB360						
		K	For cast iron	KB410	KB350	KB370							
		S	Heat resistance super alloy	KB370									
		H	Hardened steel	KB410	KB420	KB425	DNC300	DNC200	KB320	KB330	KB370		
	PCD	N	Non-ferrous metal	DP90	DP150	DP200							
	Diamond Coating	N	For turning	ND1000									
			For milling	ND2000									
	DLC Coating	N	For turning	PD1000									
			For milling	PD2000									
			For endmills	PD3000									
Wear resistance Tool	Ultra fine grain cemented carbide	Z	Ultra fine grain cemented carbide	FA1	FS1	FCC							
	Uncoated carbide	V	Wear parts	D1	D2	D3	G5	G6	K20G				
		I	For corrosion resistance	IN10	IN20	IN40							
Mining Tool	Uncoated carbide	E	For general	GR10	GR20	GR30	GR35	GR40	GR50				

■ Application range



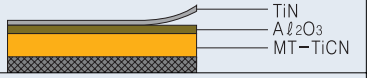
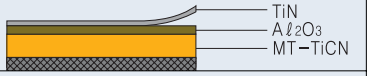
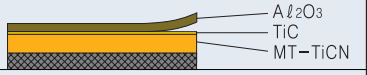
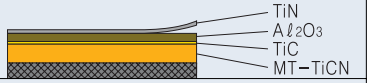
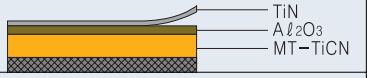
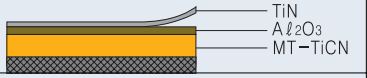
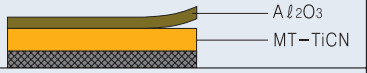
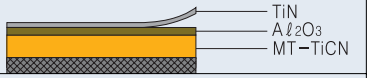
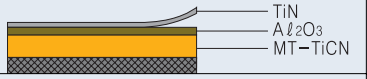
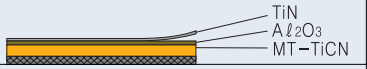
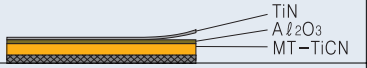
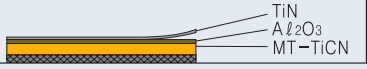
Grade selection system

	P	M	K	N	S	H
Turning 	NC3010 NC3020 NC3120 NC3030 NC500H	NC9020 NC3030 PC9030	KB410 KB350 KB370 NC305K NC6110 NC6010 NC315K	DP90 DP150 DP200 ND1000 H01 PD1000 PC230 PC130	KB370 PC8010	KB410 KB420 KB425 DNC300 DNC200 KB320 KB330 KB370
Milling 	NCM325 NCM335 PC3525 PC3535 PC3545	NCM325 NCM335 PC9530 PC3545	PC6510 PC215K		PC8520	
Face grooving 	NC3120 PC3525 PC230	PC9030	PC215K PC6510			
Grooving 	NC3010 NC3020 NC3120 NC3030 PC3535 PC230	NC9020 NC3030 PC9030	NC305K NC6110 NC6010 PC215K NC315K		PC8010	
Threading 	PC230 PC3030T PC130		PC215K			
Parting off 	NC3010 NC3120 NC3030 PC230 NC500H NCM325	PC9030	PC6510		PC8010	
Drilling 	PC3525 PC3535 FA1 ST30A NCM325	PC9530 FA1	PC6510 H01 FA1	H01 FA1	PC8520	
Endmilling 	PC203F PC210F PC220F PC220 PC225F FA1 FA2 FG2 FCC	PC210F	PC203F FG2 FA1 FA2	H01 FG2 FA2	PC205F PC215F	PC203F PC205F PC215F

Grades

The features of korloy grades

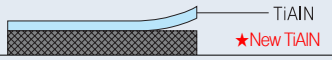
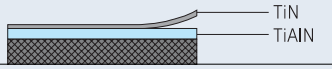
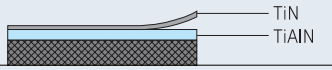
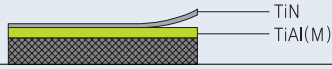
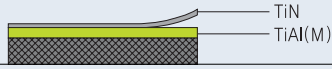
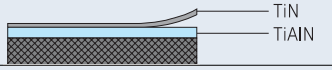
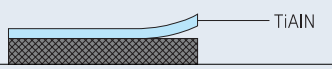
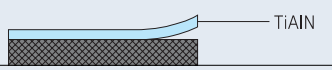
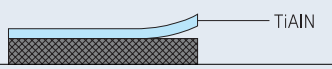
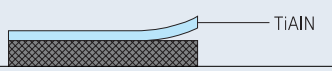
■ CVD coating

Grades	ISO	Coating layer	Features	Application					
				Turning	Grooving	Parting	Threading	Milling	Drilling
NC3010	P05~P15		• For high speed machining of steel. • Optimal for high speed machining of steel due to the combination of high hardness substrate and CVD Aℓ2O3 coating.	○	○	○			
NC3020	P25~P40		• For medium cutting of steel. • Excellent combination of tough substrate and Aℓ2O3 coating having superior chipping resistance provide stable and consistent cutting performance.	○	○				
NC3120	P15~P30		• Medium to roughing for steel. • Combining excellent fracture resistance substrate with chipping resistance and heat resistance Aℓ2O3 increased stability.	○	○				
NC3030	P25~P35 M15~M25		• For medium to roughing, intermittent cutting of steel and stainless steel. • Combination of toughest substrate and Aℓ2O3 coating having superior chipping resistance provide wide coverage.	○	○	○			
NC500H	P25~P40		• For heavy duty cutting of steel. • Combination of substrate having superior plastic deformation resistance and Aℓ2O3 coating having superior chipping resistance provide excellent quality on heavy-duty cutting.	○		○			
NC305K	K01~K10		• For high speed cutting of cast iron. • Combination of hard substrate and thick CVD Aℓ2O3 coating provide excellent wear resistance.	○	○				
NC6110	K05~K15		• General cutting for gray cast iron and ductile cast iron. • Tough substrate and improved adhesion of thick Aℓ2O3 show superior wear resistance.	○	○				
NC6010	K10~K15		• For general, high efficient cutting of cast iron.(gray & ductile) • Combination of tough substrate and thick CVD Aℓ2O3 coating provide wide coverage of cast iron machining.	○	○				
NC315K	K10~K20		• For effective cutting of cast iron at interrupted cutting. • Combination of soft substrate and thick CVD Aℓ2O3 coating provide stable cutting with out breakage.	○	○				
NC9020	M10~M20		• For high speed cutting of stainless steel. • Matching of special substrate having excellent thermal stability and CVD coating having superior chipping resistance provide longer tool life.	○	○				
NCM325	P20~P30 M20~M30		• For high speed milling of steel and stainless steel. • Optimized grade for steel & stainless steel milling by employing proper substrate(optimal hardness & toughness combination) and hard coating.			○		○	○
NCM335	P30~P40 M30~M40		• For interrupted and rough milling of steel and stainless steel. • Toughest substrate with hard coating provide stable cutting even at severe interrupted cutting.					○	

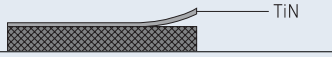
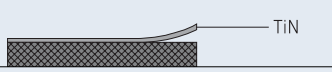
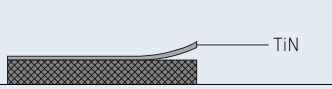
■ Un-coated Carbide

Grades	ISO	Features	Application					
			Turning	Grooving	Parting	Threading	Milling	Drilling
ST05	P05	• WC-TiC-TaC-Co Excellent thermal shock resistance and plastic deformation resistance.	○					
ST10	P10		○			○		
ST15	P15		○					
ST20	P20		○				○	
ST30N	P30		○				○	
ST30	P30		○					
ST30A	P30			○	○		○	
ST40	P40		○				○	
ST46	P45		○					
ST45	P45		○					
U10	M20	• WC-TiC-TaC-Co Comprehensive grades with excellent thermal shock and hardness.	○				○	
U20	M25		○				○	
U40	M35		○				○	
H02	K05	• WC-Co Hard and strong grades.	○					
H01	K10		○	○			○	○
H05	K15		○				○	
H10	K20		○				○	
G10	K20		○	○			○	

■ PVD coating

Grades	ISO	Coating layer	Features	Application					
				Turning	Grooving	Parting	Threading	Milling	Drilling
PC3525	P15~P35		• Superior wear resistance and crater wear resistance to PC3535. • Improved wear resistance and crater wear resistance show excellent milling performance at high speed cutting.		○	○		○	○
PC3535	P20~P35		• For milling & turning of steel • K-Gold coating • Comprehensive grade can cover wide application range due to special substrate that equipped with optimal wear resistance and toughness and PVD TiAlN.					○	○
PC3545	P30~P50		• For medium & roughing of steel • K-Gold coating • Tough exclusive substrate with Nano-TiAlN provide excellent wear resistance and toughness at the same time.	○				○	
PC8010	S01~S20		• For high speed machining of difficult-to-cut material and stainless steel. Hard coating guarantees pro-longed tool life at difficult-to-cut material cutting. • K-Gold coating	○	○	○			
PC8520	S20~S30		• For medium & roughing of difficult-to-cut material and stainless steel. • Tough substrate with hard coating provide stable tool life at interrupted cutting. • K-Gold coating					○	○
PC6510	K01~K15		• High speed cast iron milling grade having superior wear resistance. • K-Gold coating • Available for machining of aluminum as well.		○	○		○	
PC215K	K15~K30		• Optimal grade for milling of cast iron at medium to low speed cutting. • Available for machining of aluminum as well.	○	○		○	○	
PC9030	M20~M35		• For medium to roughing, interrupted turning of stainless steel • Toughest sub-micron substrate with PVD TiAlN guarantee superior property of prevent build-up-edge, thus extended and consistent tool life can be acquired.	○	○	○	○		
PC9530	M20~M35		• For medium to rough milling of stainless steel. • Toughest sub-micron substrate provide excellent cutting performance at high feed machining.					○	○
PC230	P20~P30		• Excellent wear resistance and tough substrate is suitable for milling in high speed cutting and stainless steel	○	○	○			

■ Coated Cermet

Grades	ISO	Coating layer	Features	Application					
				Turning	Grooving	Parting	Threading	Milling	Drilling
CC105	P05		• PVD coated cermet • For high speed light cutting of steel and cast iron. • Optimal for precise boring.	○					
CC115	P15, K15		• PVD coated cermet • For medium to high speed light cutting of steel and cast iron. • Wet and dry machining is available.	○					
CC125	P20		• PVD coated cermet • For medium to high speed light cutting of steel and cast iron. • Wet and dry machining is available.					○	

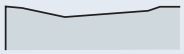
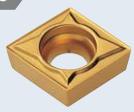
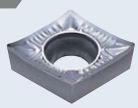
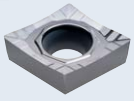
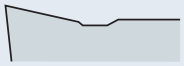
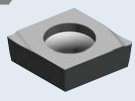
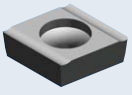
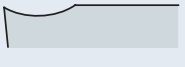
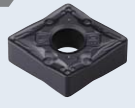
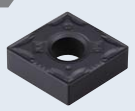
■ Cermet

Grades	ISO	Features	Application					
			Turning	Grooving	Parting	Threading	Milling	Drilling
CN1000	P10, K10	• Comprehensive grade can cover from finishing to roughing of steel.	○					
CN2000	P20	• Special cermet developed with functionally gradient material technology.	○					
CT10	P10	• Cermet for general machining	○	○	○			
CN20	P20	• Exclusive for steel milling	○	○	○	○	○	
CN30	P30	• Toughest cermet having enough toughness					○	

Chip breakers

■ KORLOY Chip Breaker For Turning

	Geometry	Cutting edge	Application range (feed rate 0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3 mm/rev; depth of cut 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 mm)	Features
V Series	VG		0.1~0.35 0.5~2.5	For finishing • Ensures stable chip flow even at very small depth of cut. • Suitable for copying.
	VQ		0.1~0.4 1.0~3.0	For Medium to Finish Cutting • Strong cutting edge makes excellent cutting performance at interrupted cutting.
	VF		0.05~0.35 0.3~2.5	For Finishing • Good chip control quality on varied depth of cut. • Excellent cutting edge strength has been acquired due to the special chip-breaker.
	VW		0.15~0.5 0.5~3.5	For Finishing (Wiper) • Improved surface roughness at shallow depth of cut and high feed due to strong cutting edge.
	VM		0.1~0.5 1.0~5.0	For Medium cutting • Wide available chip control range from medium-finishing to medium-roughing. • Suitable chip breaker for CNC machining.
H Series	HU		0.03~0.25 0.1~1.5	For Ultra-fine Finishing, Finishing • Suitable for a machining need fine surface finish and a machining generate low cutting force due to sharp cutting edge design. • Specially designed chip breaker ensure stable chip control at ultra fine finishing condition.
	HC		0.08~0.4 0.8~4.0	For Medium to Finish Cutting • Excellent for copying of special shape. • Smooth chip control at shallow cut as well as deep depth of cut.
	HR		0.25~0.65 2.5~7.0	For Roughing • Excellent chip control at deep depth of cut and fast feed rate. • Strong cutting edge makes excellent cutting performance at intermittent cutting.
	HA		0.1~0.4 0.8~3.5	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.
	HS		0.1~0.4 1.0~4.0	For Medium cutting of Stainless steel • Exclusive design for stainless steel cutting provide longer tool life. • Wear resistance have been reinforced through high rake angle of chip breaker land.
G Series	GM		0.1~0.5 0.7~4.0	For Medium to Light cutting • Excellent chip control at general cutting conditions. • Strong cutting edge strength provides good performance at intermittent and fast feed cutting.
	GR		0.3~0.8 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.

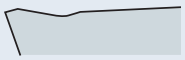
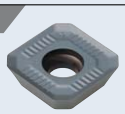
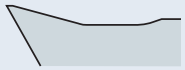
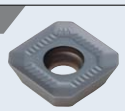
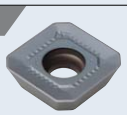
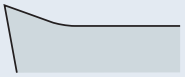
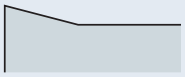
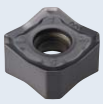
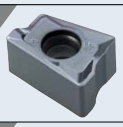
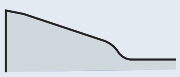
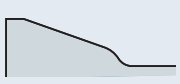
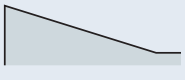
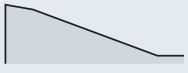
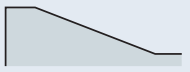
	Geometry	Cutting edge	Application range	Features
G Series	GH		0.3~1.3 3.0~11.0	For Heavy duty cutting • Suitable for heavy duty cutting due to strong cutting edge. • Wide chip control range with low cutting force.
	GS		0.15~0.5 1.5~5.5	For Medium to Roughing of Stainless-steel • Exclusive chip breaker for stainless steel.
B Series	B25		0.5~1.0 4.0~10.0	For General cutting • Suitable for general cutting condition cutting.
H-posi Series	HFP		0.05~0.25 0.1~1.5	For Finishing • Excellent chip control at shallow depth of cut and low feed rate. • Excellent surface finish of work piece due to reduced cutting force. • Suitable for fine boring.
	HMP		0.05~0.4 0.5~3.5	For Medium cutting • Excellent chip control at wide range of cutting conditions. • Suitable for stainless steel cutting.
C Series	C25 		0.1~0.3 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.
AL Series	AK 		0.03~0.5 0.1~5.0	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.
	AR 		0.05~0.6 0.1~6.0	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 		0.01~0.15 0.04~2.00	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 		0.01~0.15 0.04~2.00	For Medium to Finish cutting • Improved chip control makes tool life long and better machining.
Wiper tool Series	LW 		0.15~0.6 1.0~5.0	For Medium cutting (Wiper) • Guarantees excellent surface roughness and good chip controls at high feed machining.
	VW 		0.15~0.5 0.5~3.5	For Finishing (Wiper) • Improved surface roughness at shallow depth of cut and high feed due to strong cutting edge.

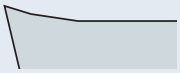
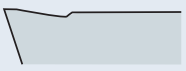
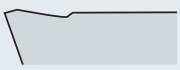
feed rate (mm/rev)
0.04 0.063 0.10 0.16 0.25 0.4 0.63 1.0 1.6 2.5 4.0 6.3

depth of cut (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

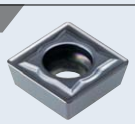
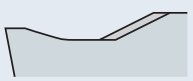
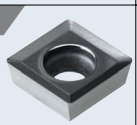
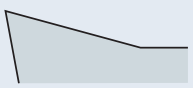
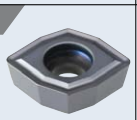
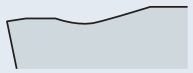
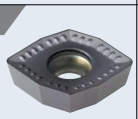
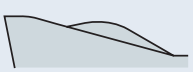
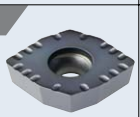
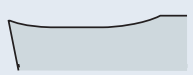
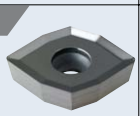
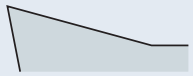
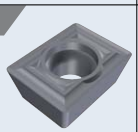
Chip breakers

■ KORLOY Chip Breaker For Milling

Geometry		Cutting edge	Application range (feed rate (mm/t): 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 (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
MX Series	MX		0.1~0.3 / 1.0~5.0	For General Milling • Possible to increase productivity through increase feed and depth. • Excellent heat resistance due to the special chip breaker design of top face of insert.
Futur Mill Series	MF 		0.05~0.2 / 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.
	MM 		0.05~0.3 / 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		0.1~0.35 / 0.5~5.0	For Aluminum Milling • Suitable design for aluminum machining like sharp cutting edge, mirror face of insert top which prevent built-up-edge, provide excellent cutting performance.
RichMill Series-RM8	MA		0.05~0.35 / 0.3~6.0	For Aluminum • Sharp cutting edge and buffed 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.
	MM 		0.1~0.4 / 0.5~6.0	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining.
RichMill Series-RM4	MF 		0.05~0.3 / 1.0~14.0	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		0.05~0.3 / 0.5~14.0	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining.
RichMill Series-RMT	MF		0.05~0.2 / 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		0.05~0.3 / 0.5~8.0	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining.
RichMill Series-RM16	MF		0.05~0.4 / 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.
	MM		0.1~0.45 / 0.5~5.5	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining.
	W		0.05~0.3 / 0.3~2.0	For Finishing of Milling (Wiper) • Wiper insert provides improved surface roughness due to special cutting edge.

	Geometry	Cutting edge	Application range	Features
Alpha Mill Series	MA		feed rate (mm/t): 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 (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 0.1~0.4 0.5~16	For Aluminum • Sharp cutting edge and buffed 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		0.1~0.25 0.5~16	For Medium to Roughing of Milling • Suitable geometry design for general milling has wider ranges of machining.

■ KORLOY Chip Breaker For Drilling

	Geometry	Cutting edge	Application range	Features
SPDrill Series	DF		feed rate (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 cutting speed (m/min): 30 60 90 120 150 180 210 240 270 300 330 900 0.02~0.12 70~170	For Finishing of Drilling • As a chip breaker for general drilling, it guarantees long tool life and good performance at low speed & feed and specially applies to difficult-to-cut material.
	DM 		0.04~0.15 70~170	General steel, cast iron • As a chip breaker for general drilling, it minimizes cutting load and shows excellent chip control in especially small hole making so that it ensures longer tool life and excellent machining.
	DS		0.04~0.15 50~120	For Stainless steel Drilling • As an insert for stainless steel drilling, combination of high rake angle and convex dot put on top face make good chip control and long last tool life at the same time.
	DA 		0.04~0.16 150~300	For Aluminum Drilling • As an insert for aluminum drilling, it has sharp cutting edge and polished mirror top face. It prevents built-up-edge, thus get great chip flow.
NPDrill Series	DM 		0.06~0.25 70~170	For Medium cutting of Drilling • Major application of steel and cast iron. • Strong cutting edge suitable for interrupted hole drilling.
	DS 		0.06~0.18 50~120	For Stainless steel Drilling • Suitable design for stainless steel drilling having sharp edge and chip breaker
	DR 		0.04~0.18 30~90	For Roughing of Soft steel • Roughing of soft steel. • Strong cutting edge suitable for interrupted hole drilling provides excellent cutting performance.
	DA 		0.06~0.25 50~300	For Aluminum Drilling • Suitable design for aluminum machining. • Sharp cutting edge and buffed surface prevent built-up-edge. • It provides excellent cutting performance in high speed aluminum drilling.
LPDrill Series	DF 		0.02~0.10 70~150	For Finishing of Drilling • Suitable design for small hole drilling. • It provides excellent cutting performance in high speed and feed.

MEMO

KORLOY

Turning B

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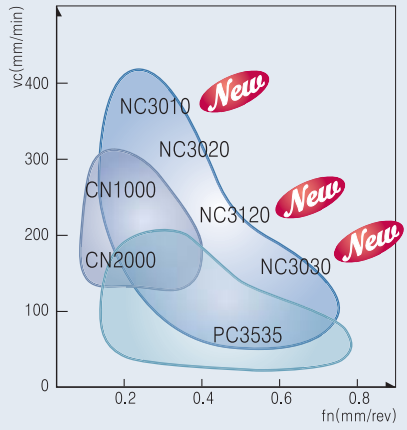
The best way to choose KORLOY turning inserts

Selection system

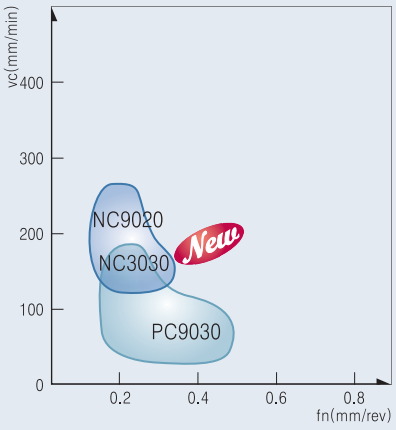
Workpiece	P						M				K				N			S			H		
ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	N10	N20	N30	S01	S10	S20	H01	H10	H20
Coated carbide	NC3010 New										NC305K												
	NC3020						NC9020				NC6110 New												
	NC3120 New							NC3030 New			NC6010												
	NC3030 New							PC9030			NC315K							PC8010					
	NC500H																						
Cermet	CN1000 New										CN1000 New												
	CT10																						
	CN2000																						
	CN20																						
cBN											KB350										KB320		
											KB360										KB330		
Uncoated carbide	ST05																						
	ST10							U10				H02											
	ST15							U20				H01											
	ST20											H05											
			ST30N	ST40								H10											
			ST30		ST46					U40		G10											
					ST45																		

Application range of turning grades

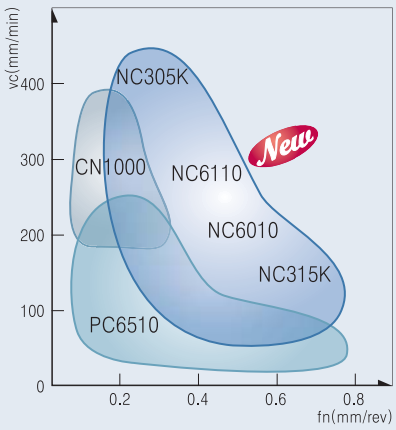
1) Steel (P)



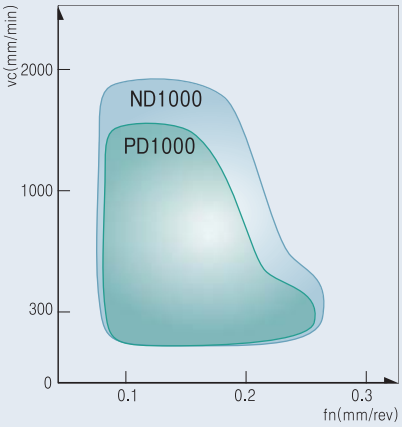
2) Stainless steel (M)



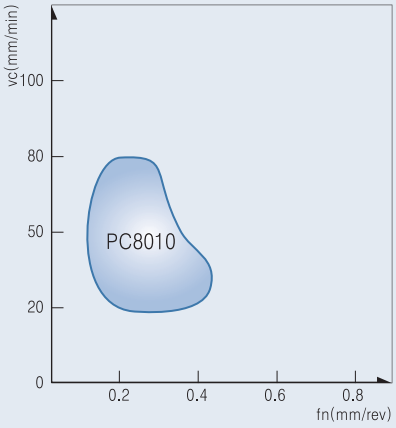
3) Cast iron (K)



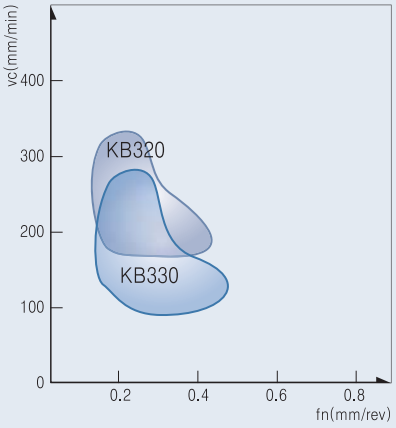
4) Non-ferrous metal (N)



5) Heat resistant alloy (S)



6) Hardened steel (H)



KORLOY CVD Coated Grades

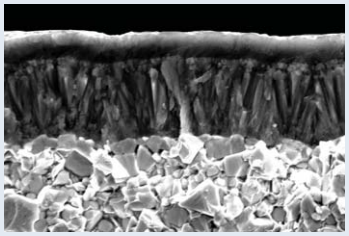
■ Features

- Korloy's special crystal structure of coated layer shows us both excellent wear resistance and impact resistance
- New coating technology improves the adhesion of applying multi-layers
- Using the latest technology we increased stability and tool-life in various cutting conditions.

Improved surface roughness
• UImproved the exterior and performance by new coating technology

Enhance Chipping resistance
• UDecreased chipping and fracture by improved adhesion of multi-layers

Enhance wear resistance
• USpecial crystal structure of new coating layer increased wear resistance



CVD coated microstructure of NC3000 series

■ Selection system

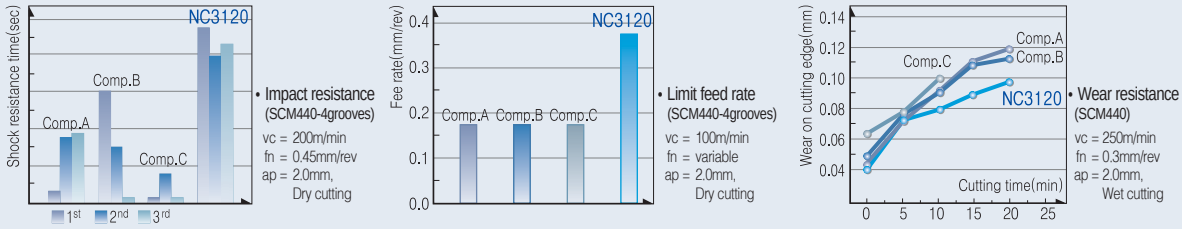
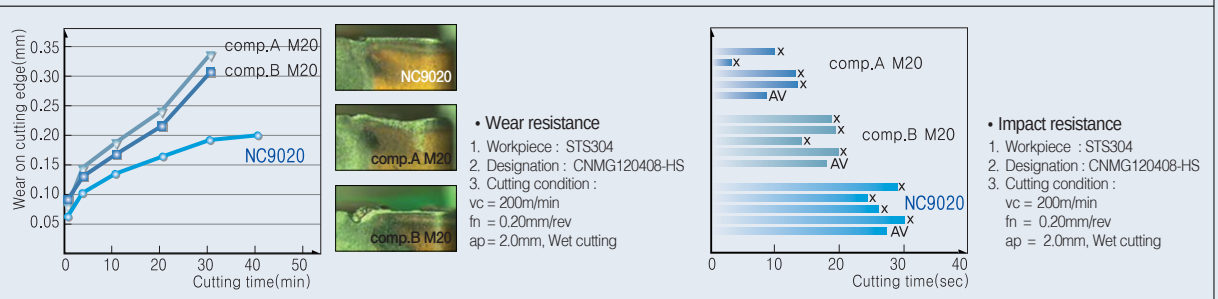
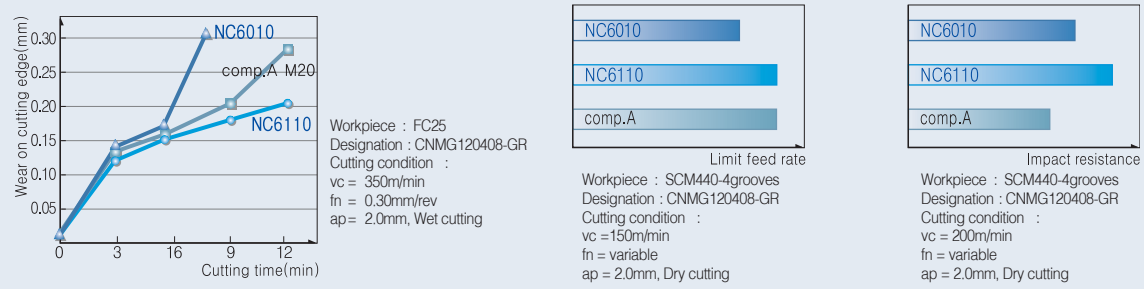
Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	NC3010 New	300 (200~400)	P01	NC3010 New
					P10	
					P15	
			NC3020		P20	NC3020
		Interrupted cutting	NC3120 New	250 (150~350)		NC3120 New
			NC3030 New	150 (100~200)	P30	NC3030 New
			NC500H	100 (50~150)	P40	NC500H
M	Stainless steel	Continuous cutting	NC9020	200 (150~250)	M10	NC9020
					M20	NC3030 New
		Interrupted cutting	NC3030 New	140 (100~200)	M30	
					M40	
K	Cast iron	Continuous cutting	NC305K	270 (150~300)	K05	NC305K
			NC6110 New	350 (250~450)	K10	NC6110 New
		Interrupted cutting	NC6010	300 (200~350)	K15	NC6010
			NC315K	200 (150~250)	K20	NC315K

■ The features of CVD turning grades

CVD Coated grades	ISO	Features
NC3010	P05 ~ P15	• High speed cutting for steel. • Combining excellent wear resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability. • MT-TiCN + Al_2O_3 + TiN
NC3020	P15 ~ P25	• High speed cutting for steel. • Combining excellent wear resistance substrate with chipping resistance and heat resistance Al_2O_3 increased stability. • MT-TiCN + Al_2O_3 + TiN
NC3120	P15 ~ P30	• 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 M15 ~ M25	• For general cutting, interrupted cutting and roughing operations in steel and stainless steel. • Combining excellent 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
NC9020	M10 ~ M20	• High speed cutting for stainless steel. • Combination of excellent heat resistance substrate and chipping resistance prevents built-up edge. • 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
NC305K	K01 ~ K10	• High speed cutting for cast iron. • Strengthened substrate and improved adhesion of thick Al_2O_3 show superior wear resistance. • MT-TiCN + Al_2O_3 + TiN
NC6110	K05 ~ K15	• General cutting for gray cast iron and ductile cast iron. • Tough substrate and improved adhesion of thick Al_2O_3 show superior wear resistance. • MT-TiCN + Al_2O_3
NC6010	K10 ~ K15	• General cutting for gray cast iron and ductile cast iron. • It has good performance in interrupted cutting coundition. • MT-TiCN + Al_2O_3 + TiN
NC315K	K10 ~ K20	• Interrupted cutting and high-efficiency machining for cast iron. • Tough substrate and improved adhesion of thick Al_2O_3 show superior wear resistance. • MT-TiCN + Al_2O_3 + TiN

Turning Grades

■ Cutting performance

Workpiece		Cutting performance
P	Steel (NC3120)	
M	Stainless steel (NC9020)	
K	Cast iron (NC6110)	

• Impact resistance (SCM440-4grooves)
vc = 200m/min
fn = 0.45mm/rev
ap = 2.0mm,
Dry cutting

• Limit feed rate (SCM440-4grooves)
vc = 100m/min
fn = variable
ap = 2.0mm,
Dry cutting

• Wear resistance (SCM440)
vc = 250m/min
fn = 0.3mm/rev
ap = 2.0mm,
Wet cutting

• Wear resistance
1. Workpiece : STS304
2. Designation : CNMG120408-HS
3. Cutting condition :
vc = 200m/min
fn = 0.20mm/rev
ap = 2.0mm, Wet cutting

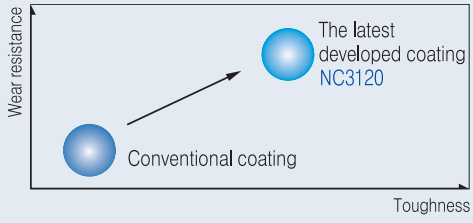
• Impact resistance
1. Workpiece : STS304
2. Designation : CNMG120408-HS
3. Cutting condition :
vc = 200m/min
fn = 0.20mm/rev
ap = 2.0mm, Wet cutting

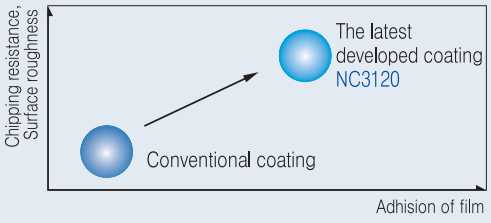
Workpiece : FC25
Designation : CNMG120408-GR
Cutting condition :
vc = 350m/min
fn = 0.30mm/rev
ap = 2.0mm, Wet cutting

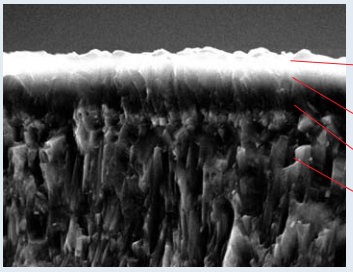
Workpiece : SCM440-4grooves
Designation : CNMG120408-GR
Cutting condition :
vc = 150m/min
fn = variable
ap = 2.0mm, Dry cutting

Workpiece : SCM440-4grooves
Designation : CNMG120408-GR
Cutting condition :
vc = 200m/min
fn = variable
ap = 2.0mm, Dry cutting

■ New CVD coating (NC3120)



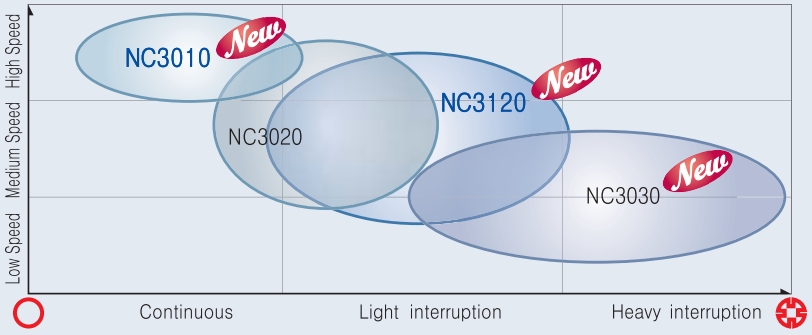


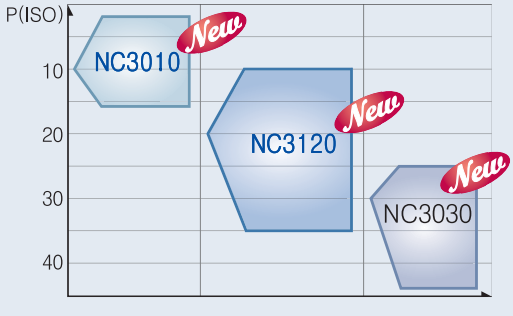


● The features of NC3120 coating

- Improved surface roughness and toughness by new coating technology.
- Applied excellent wear resistance Al_2O_3
- Improved coating adhesion by special inter layers.
- Applied excellent wear resistance and toughness columnar MT-CVD.

※ New technology and newly developed coating show excellent toughness and adhesion wear resistance during steel machining.
※ Increased stability at various cutting condition.



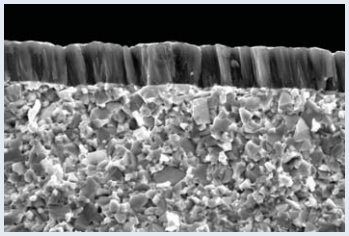


KORLOY PVD Coated Grades

■ Features

‣ Newly developed TiAlN is suitable for high speed cutting and has better wear resistance and impact resistance than conventional TiAlN, Resulting in increasing stability.

Improved wear resistance
• Improved Adhesion between substrate and coating as well as increased hardness.
Improved impact resistance
• Combining excellent fracture resistance and plastic deformation resistance substrate with newly developed PVD coated ensure stability even in heavy interrupted cutting.



PVD coated microstructure

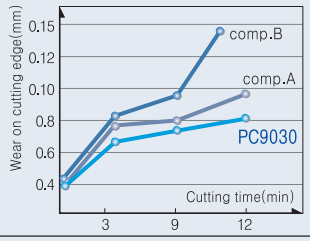
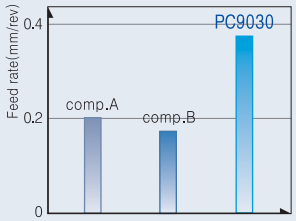
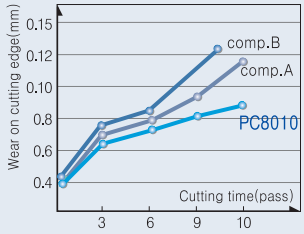
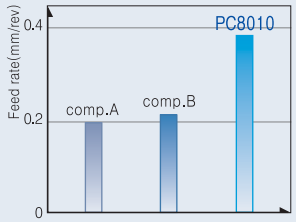
■ Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
M	Stainless steel	Continuous cutting	PC9030	130 (50~180)	M20	PC9030
		Interrupted cutting			M30	
S	Heat resistant alloy	Continuous cutting	PC8010	60 (50~70)	S10	PC8010
		Interrupted cutting			S20	

■ The features of KORLOY PVD coated grade

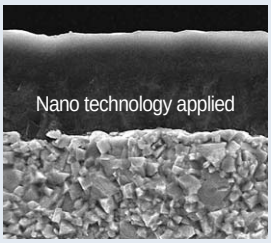
PVD Coated Grades	ISO	Features
PC9030	M20 ~ M35	• Medium,roughing and heavy interrupted cutting for stainless steel. • TiAlN coating. • Combination of tough ultra fine grain substrate and PVD coated preventing from built-up edge ensure stable tool life.
PC8010	M01 ~ M10 S01 ~ S20	• Improved welding resistance shows excellent performance during difficult-to-cut material machining and stainless steel cutting in high speed. • K-Gold coating.

■ Cutting performance

Workpiece		Cutting performance
M	Stainless steel (PC9030)	 • Wear resistance (STS304) vc = 200m/min fn = 0.25mm/rev ap= 1.5mm, Wet cutting  • Limit feed rate (ST316-4grooves) vc = 150m/min fn = variable ap = 1.5mm, Wet cutting
S	Heat resistant alloy (PC8010)	 • Wear resistance (Inconel & Titanium alloy) vc = 60m/min fn = 0.2mm/rev ap= 1.0mm  • Limit feed rate (Inconel & Titanium alloy) vc = 60m/min fn = 0.2mm/rev ap= 1.0mm

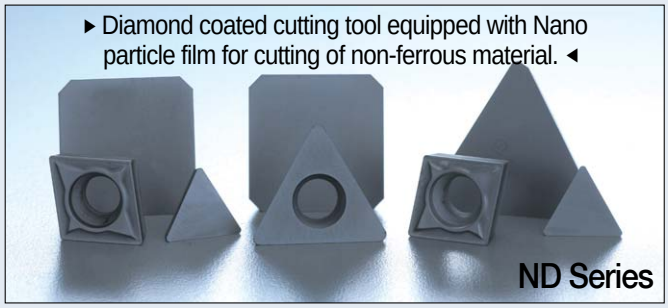
KORLOY Diamond Coated Grades

■ Special Features



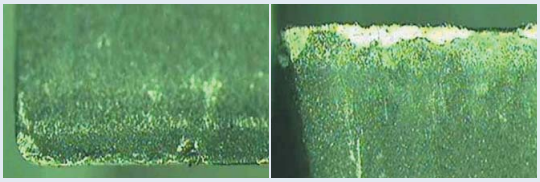
Cross-sectional view of ND1000 / ND2000

- An increased tool life of up to 150% due to our Nano technology.
- Thanks to the nano-size (~100nm) diamond particles, the friction co-efficient has been decreased. Less friction leads to better chip flow
- Due to the minimized built-up on the cutting edge, machined surfaces retain a better finish.

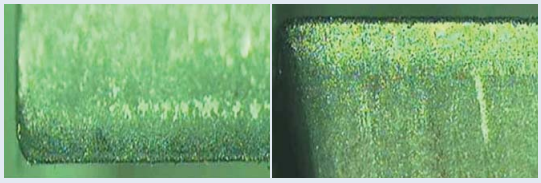


■ Cutting Performance of ND2000

● ND200



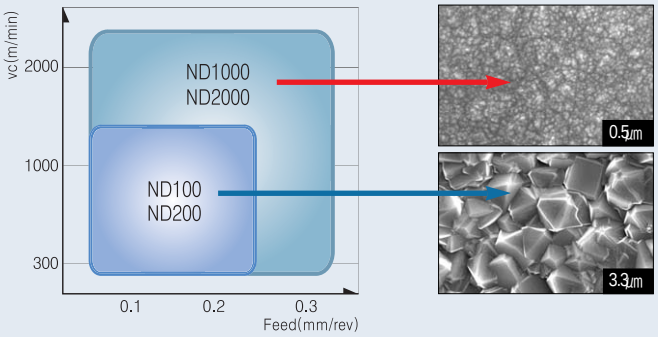
● ND2000



(APKT1604PDFR-MA, AMS3063S)

- Cutting length : 10m
- Speed(vc) : 950m/min
- Feed(fn) : 0.15mm/rev
- Workpiece : AC8A
- Depth of cut(ap) : 5mm
- Coolant : Dry

■ Application range & Surface morphology of ND1000 / ND2000



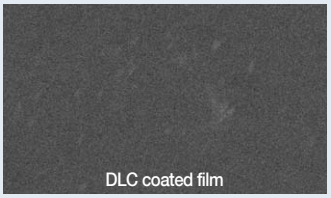
■ Available Products

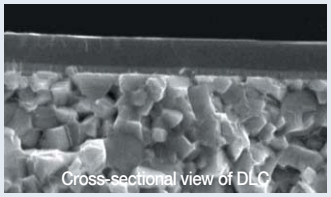
- AR Chip breaker
- AK Chip breaker
- Insert for Aluminum machining

KORLOY DLC Coated Grades

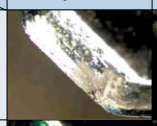
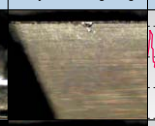
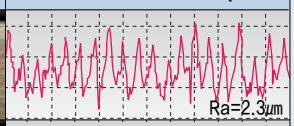
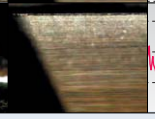
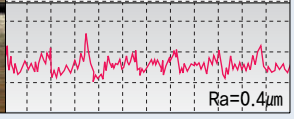
■ Special Features

- Hardness of film is up to Hv 7000, tool life is 3~6times of the 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, end-mill



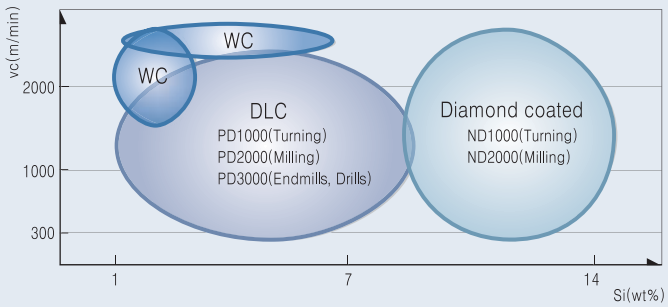


■ Cutting performance (built- up edge / surface finish, FMACM3100R)

View / Grade	Top face	Major cutting edge	Surface finish of workpiece
Carbide			 Ra=2.3㎛
DLC			 Ra=0.4㎛

- Workpiece : AC2B
- Cutting length : 12m
- Cutting condition :vc=1500m/min, fn=0.15mm/rev, ap=2mm, Dry

■ Application range

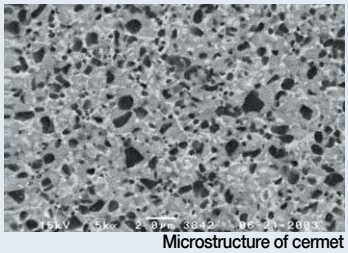


- DLC : Diamond Like Carbon
- WC : Uncoated carbide

KORLOY Cermet Grades

Features

- Our cermet, carbon nitride based, consists of TiN and TiCN that minimize grain size , much better toughness,wear resistance and heat resistance than conventional cermet.



• Black : "core"
• Gray : rim
• White : binder

Microstructure of cermet

Selection system

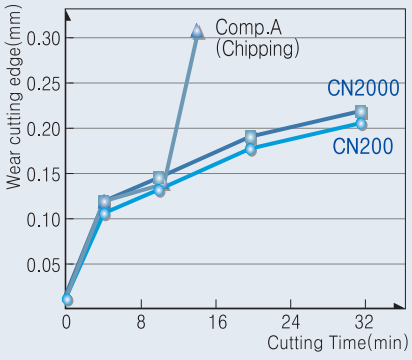
Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	CN1000 (New)	230 (150 ~ 300)	P10	CN1000 (New), CT10
			CT10			
		Interrupted cutting	CN20	180 (130 ~ 230)	P20	CN20, CN2000 (New)
			CN2000 (New)			
K	Cast iron	Finishing	CN1000 (New)	230 (150 ~ 300)	K01	CN1000 (New)
					K10	

The features of KORLOY main cermet grade

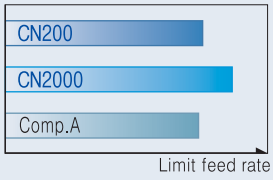
Cermet	ISO	Features
CN1000	P05 ~ P15 K05 ~ K10	• High hardness cermet for steel, cast iron, sintered metal • Functionally gradient material cermet as a next generation cermet
CT10	P05 ~ P15	• For turning and milling for steel • Excellent wear resistance cermet
CN2000	P10 ~ P20	• Wide ranges from finishing to roughing in steel machining • Functionally gradient material cermet as a next generation cermet
CN20	P10 ~ P20	• For general turning and milling for steel • General purpose grade provided with both wear resistance and toughness

Cutting performance

• CN2000 Cutting performance - Example

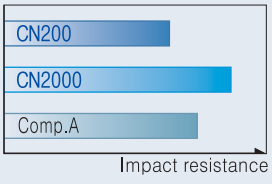


• Workpiece : S45C
• Designation : CNMG120408-VQ
• Cutting condition :
vc=200m/min
fn=0.31mm/rev
ap=1.5mm, Dry cutting



Limit feed rate

• Workpiece : S45C-4grooves
• Designation : CNMG120408-VQ
• Cutting condition : vc=100m/min
fn=variable
ap=1.5mm
Dry cutting



Impact resistance

• Workpiece : S45C-4grooves
• Designation : CNMG120408-VQ
• Cutting condition : vc=200m/min
fn=variable
ap=1.5mm
Dry cutting

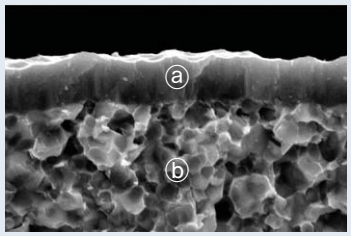
Properties of cermet

ISO	Grade	Hardness	TRS	Specific Gravity
P	CN1000	<1900	180<	6.5~7.5
	CT10	<1700	180<	6.5~7.5
	CN2000	<1750	200<	6.8~7.0
	CN20	<1600	220<	7.0~7.2
K	CN1000	<1900	180<	6.5~7.5

KORLOY Coated Cermet Grades

Features

- Impact resistance and superior toughness substrate prevent from chipping at initial stage and fracture, ensuring longer tool life.
- Lubricant coating layer inducing chip flows reduces the loads on the insert



ⓐ High hardness, smooth coating
ⓑ Tough substrate

Selection system

Workpiece		Machining types	Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	CC105	300 (250 ~ 350)	P05	CC105
		Interrupted cutting	CC115	280 (230 ~ 330)	P10	CC115
			CC125	230 (150 ~ 300)	P20	CC125

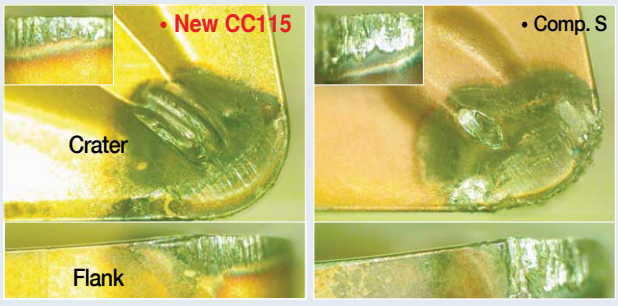
The features of KORLOY coated cermet grade

Coated cermet	ISO	Features
CC105	P01 ~ P10	• PVD coated Cermet. • Light cutting for steel and cast iron in high speed machining. • Optimized for precision boring.
CC115	P10 ~ P20	• PVD coated Cermet. • Light cutting for steel and cast iron in medium or high speed machining. • Dry and wet cutting are available.
CC125	P12	• PVD coated Cermet. • High toughness cermet for milling.

Cutting performance

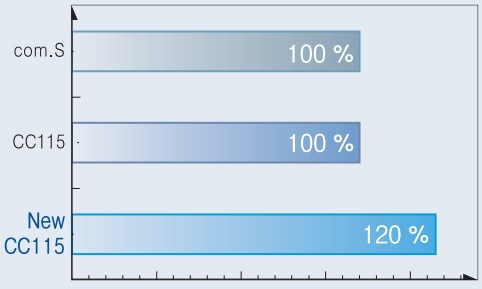
• **CC115 Cutting performance - Example1**

< Wear resistance test in multi machining >



Workpiece : S45C
Designation : CNMG120408-VQ
Cutting condition : vc=390m/min, fn=0.15mm/rev, ap=1.5mm, Wet cutting

< Impact resistance test >

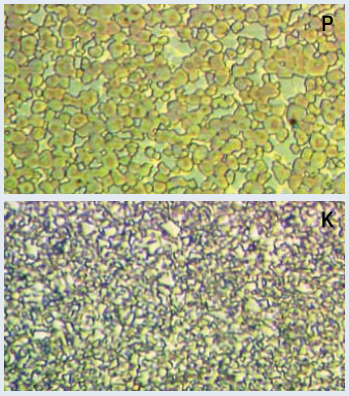


Workpiece : S45C-4grooves
Designation : CNMG120408-VQ
Cutting condition : vc=200m/min, fn=0.2mm/rev, ap=1.5mm, Dry cutting

KORLOY Uncoated Carbide Grades

Features

- Korloy's uncoated cemented carbides are designed to optimize machining with uniform quality. Furthermore, Korloy's cemented carbide manufactured by top quality tungsten carbides, cobalt and refractory carbides (TiC,TaC) has good toughness and wear resistance



Advantages

- P.M.K cemented carbide can be applied for various workpiece.
- Excellent thermal crack resistance makes it possible to machine in wet cutting.
- Fine grain and minimizing chemical affinity to workpiece developed by Special design
- High toughness and low cutting force.

Selection system

Workpiece		Recommended grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	ST10	150 (100 ~ 200)	P10	ST10
		ST15	140 (90 ~ 190)	P20	ST15
		ST20	130 (70 ~ 180)	P30	ST20
		ST30A	130 (70 ~ 180)		ST30A
K	Cast iron	H02	150 (100 ~ 200)	K01	H02
		H01, H05	140 (100 ~ 200)	K10	H01
		H10, G10	130 (90 ~ 190)	K20	H05
	Alloyed aluminum	H01	500 (300 ~ 800)		H10
	Alloyed copper	H01	200 (150 ~ 300)	K30	G10

Main application

ISO	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 harmonized 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

Properties of Uncoated Carbide

ISO	Grade	Hardness (H_RA)	TRS (kgf/mm^2)	Young' s modulus (10^3kgf/mm^2)	Thermal expansion coefficient(10^{-6}/℃)	Thermal conductivity (cal/cm·sec·℃)
P	ST05	92.7	140	-	-	-
	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U10	92.4	170	47	-	-
	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
	U40	89.2	270	-	-	-
K	H02	93.2	185	61	4.4	105
	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105

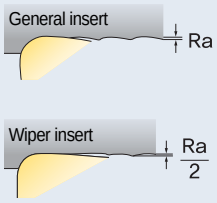
* GPa = 102kg/mm^2, 1W/mk = 2.39×10^{-3}cal/cm · sec · ℃

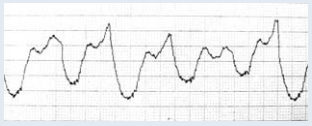
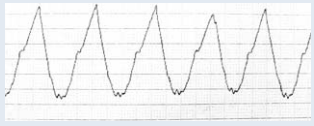
KORLOY Wiper inserts

■ Korloy's New Wiper System

- Excellent surface roughness (2 times higher) at normal feed
- Shallow depth of cut, excellent surface roughness and high productivity at high feed (2 times higher than general) and finishing
- Wiper cutting edge and suitable for high feed design reduce cutting force at high feed machining

- Theoretical surface roughness : $R\,max = \frac{(fz^2 \times 1000)}{8r}$		Ra (compared to general chip breaker)	Cutting force -Back force- (compared to general insert)
		down	up
Application range	Cutting condition	Workpiece shape	Workpiece- Free
For medium and finishing	Shallow depth of cut and high feed	Short and thick shape cutting force	Cutting steel cast iron

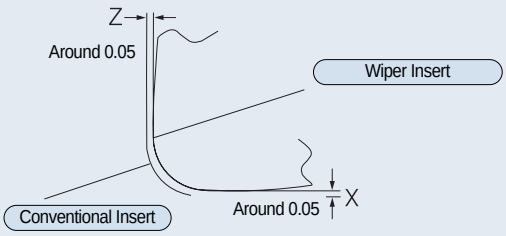


Wiper insert (5.5 Rmax)	General insert (19.6 Rmax)
	

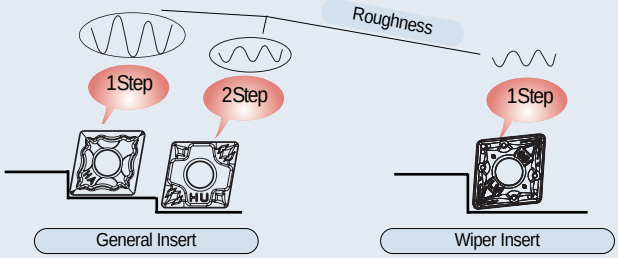
(M/T: SCM440, vc=200m/min , ap=1.0mm, fn=0.5mm/rev)

- Wiper inserts Rmax surface roughness is 4 times better than general inserts.
- 1step finishing surface roughness can be obtained to provide higher productivity.

• Cutting performance



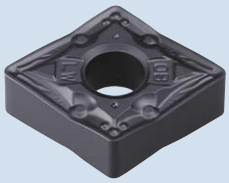
• Improving productivity



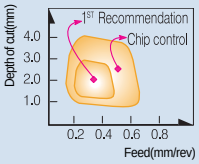
2step finishing surface roughness | 1step finishing surface roughness

■ The Features of Korloy's Wiper Inserts

● LW breaker (Negative)

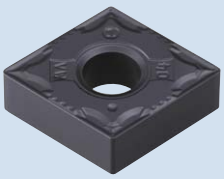


- Curvilinear cutting edge : reducing cutting force
- Cutting edge for deep depth of cut : Good chip control & lower cutting load
- For shallow depth of cut C/B design : Enough chip-pocket for good chip flow
- For medium and roughing : During machining heat and frictional area reduce.

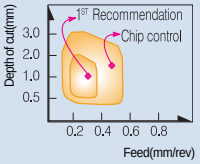


<Chip Control Range>
: Cutting condition
- Insert : CNMG120408-LW
- Workpiece : S45C
- Cutting speed : 200 m/min

● VW breaker (Negative)

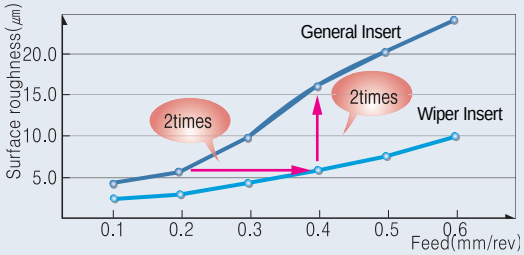


- For finishing : Excellent chip control
- Stable clamping : Close to cutting edge design
- Similar cutting edge to C/B for medium : strong cutting edge
- 3-dimensional dot design at cutting corner : Reducing cutting force and good chip control at shallow depth of cut



<Chip Control Range>
: Cutting condition
- Insert : CNMG120408-VW
- Workpiece : S45C
- Cutting speed : 200 m/min

● The comparison of surface roughness



• Cutting condition
Insert : CNMG120408-LW, VW
Cutting speed : 200m/min
Depth of cut : 1.5mm
Workpiece : SCM440

Chips from general feed machining

Chips from high feed machining

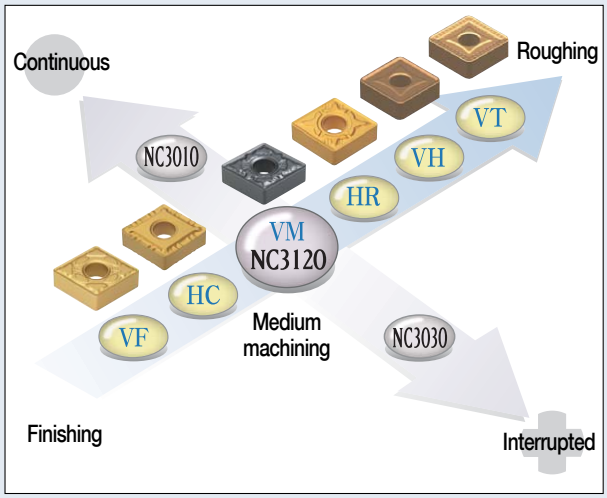
■ Notice

- When you exchange general inserts for wiper insert, please confirm the cutting edge position because wiper insert has different cutting edge position from general insert.
- For better surface roughness at high feed machining, please notice that the wiper insert shows better performance at straight machining than at round and taper machining

Applications range of chip breakers

■ Negative inserts

P



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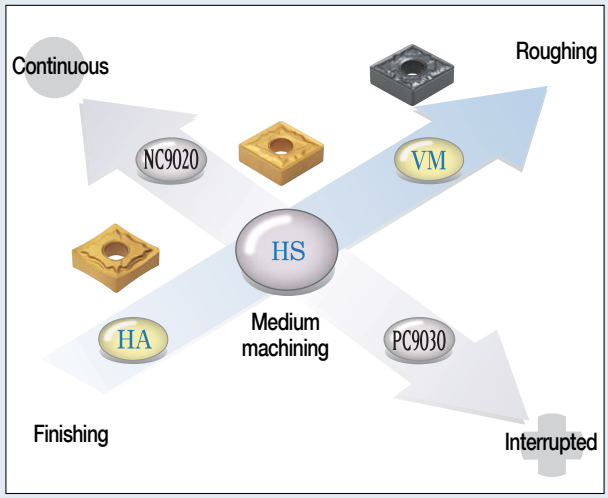

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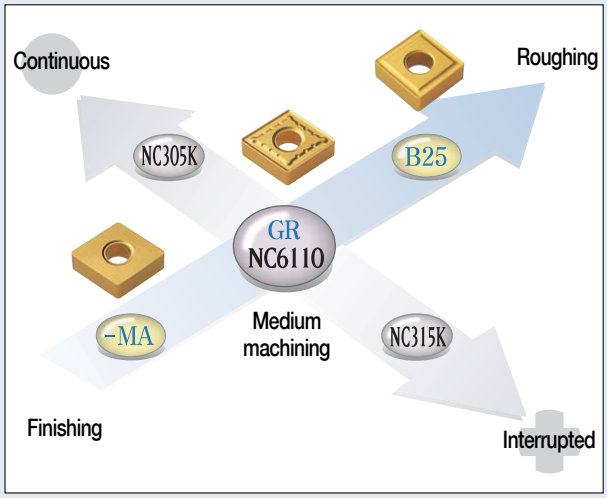
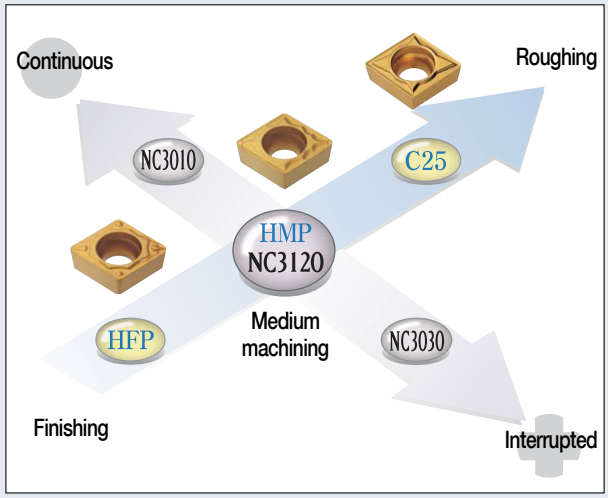


■ Positive inserts

P



Machining types

- Continuous cutting
- General cutting
- Interrupted cutting

Turning Chip Breakers

Recommended chip breaker for workpiece

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

Workpiece		Selecting C/B and grades					Insert shape					
		chip breaker(C/B), insert shape & feed			Grades & Cutting speed		80°	55°	90°	60°	35°	80°
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[NEGA] CN□G	[NEGA] DN□G	[NEGA] SN□G	[NEGA] TN□G	[NEGA] VN□G	[NEGA] WN□G
Negative	0.1 ~ 0.5 ~ 1.5 Ultra-finishing	HU		0.03 0.10 ~ 0.25	CT10	280	CNG(M)G P. 01	DNG(M)G P. 01	SNG(M)G P. 01	TNG(M)G P. 01		
	0.3 ~ 1.0 ~ 3.5 finishing	VF		0.05 0.15 ~ 0.35	NC3010 NC3120	310 270	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	0.8 ~ 1.5 ~ 3.5 medium to finishing	HA		0.10 0.20 ~ 0.40	NC3010 NC3120	300 230	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	0.8 ~ 1.5 ~ 3.0 medium machining	HC		0.08 0.20 ~ 0.40	NC3010 NC3120	290 250	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
	1.0 ~ 2.5 ~ 5.0 roughing	VM		0.10 0.25 ~ 0.50	NC3010 NC3120 NC3030 CN2000	270 230 210 220	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	2.5 ~ 4.0 ~ 7.0 heavy roughing	HR		0.25 0.45 ~ 0.65	NC3010 NC3120 NC3030	150 130 100	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[POSI] CC□T	[POSI] DC□T	[POSI] SC□T	[POSI] TC□T	[POSI] VC□T,VB□T	[POSI] WC□T
Positive	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 0.15 ~ 0.25	NC3010 NC3120 CC105	280 250 250	CCG(M)T P. 01	DCG(M)T P. 01	SCG(M)T P. 01	TCG(M)T P. 01	VCG(M)T P. 01	
	0.5 ~ 1.5 ~ 3.5 medium to finishing medium machining	HMP		0.08 0.20 ~ 0.40	NC3010 NC3120 CN2000	260 230 230	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01	VCMT P. 01	
	1.0 ~ 2.0 ~ 3.0 medium machining	C25		0.10 0.25 ~ 0.35	NC3010 NC3120	250 220	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

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

Workpiece		Selecting C/B and grades					Insert shape					
		chip breaker(C/B), insert shape & feed			Grades & Cutting speed		80°	55°	90°	60°	35°	80°
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[NEGA] CN□G	[NEGA] DN□G	[NEGA] SN□G	[NEGA] TN□G	[NEGA] VN□G	[NEGA] WN□G
Negative	0.3 ~ 1.0 ~ 3.5 finishing	VF		0.05 0.15 ~ 0.35	NC3010 NC3020 NC3120	220 200 190	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	0.8 ~ 1.5 ~ 3.0 medium to finishing	HC		0.08 0.20 ~ 0.40	NC3010 NC3020 NC3120 NC3030	210 190 180 160	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
	1.0 ~ 2.5 ~ 5.0 roughing	VM		0.10 0.25 ~ 0.50	NC3010 NC3020 NC3120 NC3030	200 180 170 150	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	2.5 ~ 4.0 ~ 7.0 heavy roughing	HR		0.25 0.45 ~ 0.65	NC3010 NC3020 NC3120 NC3030	170 150 150 130	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[POSI] CC□T	[POSI] DC□T	[POSI] SC□T	[POSI] TC□T	[POSI] VC□T,VB□T	[POSI] WC□T
Positive	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 0.15 ~ 0.25	NC3010 NC3020 NC3120 CC105	220 190 180 200	CCG(M)T P. 01	DCG(M)T P. 01	SCG(M)T P. 01	TCG(M)T P. 01	VCG(M)T P. 01	
	0.5 ~ 1.5 ~ 3.5 medium to finishing medium machining	HMP		0.08 0.20 ~ 0.40	NC3010 NC3020 NC3120 NC3030 CN2000	210 190 180 150 170	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01	VCMT P. 01	
	1.0 ~ 2.0 ~ 3.0 medium machining	C25		0.1 0.25 ~ 0.35	NC3010 NC3020 NC3120 NC3030	200 180 170 150	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01		

● : The first recommended cutting condition

Turning Chip Breakers

Recommended chip breaker for workpiece

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

Workpiece		Selecting C/B and grades					Insert shape					
		chip breaker(C/B), insert shape & feed			Grades & Cutting speed		80°	55°	90°	60°	35°	80°
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[NEGA] CN□G	[NEGA] DN□G	[NEGA] SN□G	[NEGA] TN□G	[NEGA] VN□G	[NEGA] WN□G
Negative	0.3 ~ 1.0 ~ 3.5	VF		0.08 0.15 ~ 0.30	NC3010 NC3020 NC3120	130 110 110	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	0.8 ~ 1.5 ~ 3.0	HC		0.10 0.20 ~ 0.35	NC3010 NC3020 NC3120 NC3030	150 130 130 110	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
	1.0 ~ 2.5 ~ 5.0	VM		0.15 0.25 ~ 0.50	NC3010 NC3020 NC3120 CN2000	130 110 100 90	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	2.5 ~ 4.0 ~ 7.0	HR		0.25 0.35 ~ 0.60	NC3010 NC3020 NC3120 NC3030	100 90 90 80	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[POSI] CC□T	[POSI] DC□T	[POSI] SC□T	[POSI] TC□T	[POSI] VC□T,VB□T	[POSI] WC□T
Positive	0.1 ~ 0.5 ~ 1.5	HFP		0.05 0.10 ~ 0.20	NC3010 NC3020 NC3120 CC105	130 120 110 120	CCG(M)T P. 01	DCG(M)T P. 01	SCG(M)T P. 01	TCG(M)T P. 01	VCG(M)T P. 01	
	0.5 ~ 1.5 ~ 3.5	HMP		0.08 0.15 ~ 0.25	NC3010 NC3020 NC3120 CN2000	120 110 110 100	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01	VCMT P. 01	
	1.0 ~ 2.0 ~ 3.0	C25		0.10 0.20 ~ 0.30	NC3010 NC3020 NC3120 NC3030	110 100 100 90	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

■ Materials : STS430, STS444, STS416, SS432, etc
Ferritic, Martensitic Stainless steel
Hardness : 135~275HB

Workpiece		Selecting C/B and grades						Insert shape					
		chip breaker(C/B), insert shape & feed			Grades & Cutting speed			80°	55°	90°	60°	35°	80°
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)		[NEGA] CN□G	[NEGA] DN□G	[NEGA] SN□G	[NEGA] TN□G	[NEGA] VN□G	[NEGA] WN□G
Negative	0.5 ~ 1.5 ~ 2.5 medium to finishing	HA		0.03 0.15 ~ 0.30	NC9020 PC9030	190 170		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	1.0 ~ 2.5 ~ 4.0 medium marchining	HS		0.1 0.25 ~ 0.40	NC9020 PC9030	180 160		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	1.5 ~ 3.0 ~ 5.5 Interrupted heavy roughing	GS		0.15 0.3 ~ 0.50	NC9020 PC9030	170 140		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
	2.0 ~ 4.5 ~ 6.5 continuous heavy roughing	VM		0.20 0.40 ~ 0.60	NC9020 PC9030	160 120		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)		[POSI] CC□T	[POSI] DC□T	[POSI] SC□T	[POSI] TC□T	[POSI] VC□T,VB□T	[POSI] WC□T
Positive	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 0.15 ~ 0.25	NC9020 PC9030	180 160		CCG(M)T P. 01	DCG(M)T P. 01	SCG(M)T P. 01	TCG(M)T P. 01	VCG(M)T P. 01	
	0.5 ~ 1.5 ~ 3.0 medium to finishing	HMP		0.10 0.50 ~ 0.30	NC9020 PC9030	170 150		CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01	VCMT P. 01	
	1.0 ~ 1.5 ~ 3.0 medium machining	C25		0.15 0.25 ~ 0.35	NC9020 PC9030	160 140		CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01		

● : The first recommended cutting condition

Turning Chip Breakers

Recommended chip breaker for workpiece

■ Materials : STS304, STS316, STS347, STS387, STS202, etc
Austenitic Stainless steel
Hardness : 135~185HB

Workpiece		Selecting C/B and grades					Insert shape					
		chip breaker(C/B), insert shape & feed			Grades & Cutting speed		80°	55°	90°	60°	35°	80°
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[NEGA] CN□G	[NEGA] DN□G	[NEGA] SN□G	[NEGA] TN□G	[NEGA] VN□G	[NEGA] WN□G
Negative	0.5 ~ 1.5 ~ 2.5 medium to finishing	HA		0.03 0.15 ~ 0.30	NC9020 PC9030	160 140	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	1.0 ~ 2.5 ~ 4.0 medium machining	HS		0.1 0.25 ~ 0.40	NC9020 PC9030	150 130	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	1.5 ~ 3.0 ~ 5.5 Interrupted heavy roughing	GS		0.15 0.3 ~ 0.50	NC9020 PC9030	140 110	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
	2.0 ~ 4.5 ~ 6.0 continuous heavy roughing	VM		0.20 0.40 ~ 0.60	NC9020 PC9030	130 90	CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[POSI] CC□T	[POSI] DC□T	[POSI] SC□T	[POSI] TC□T	[POSI] VC□T,VB□T	[POSI] WC□T
Positive	0.1 ~ 0.5 ~ 1.5 finishing	HFP		0.05 0.15 ~ 0.25	NC9020 PC9030	150 130	CCG(M)T P. 01	DCG(M)T P. 01	SCG(M)T P. 01	TCG(M)T P. 01	VCG(M)T P. 01	
	0.5 ~ 1.5 ~ 3.0 medium to finishing	HMP		0.10 0.20 ~ 0.30	NC9020 PC9030	140 120	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01	VCMT P. 01	
	1.0 ~ 1.5 ~ 3.0 medium machining	C25		0.15 0.25 ~ 0.35	NC9020 PC9030	130 110	CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01		

● : The first recommended cutting condition

Recommended chip breaker for workpiece

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

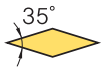
Workpiece		Selecting C/B and grades					Insert shape					
		chip breaker(C/B), insert shape & feed			Grades & Cutting speed		80°	55°	90°	60°	35°	80°
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[NEGA] CN□G	[NEGA] DN□G	[NEGA] SN□G	[NEGA] TN□G	[NEGA] VN□G	[NEGA] WN□G
Negative	0.1 ~ 0.4 ~ 1.0 finishing	C/B None		0.05 0.10 ~ 0.50	DBNX10 150 ~ 200 DBN500 200 ~ 500 DBN700 500 ~ 2000 NC305K 300 ~ 500 NC6110 250 ~ 450 NC6010 200 ~ 350 NC315K 150 ~ 300		CNMA P. 01	DNMA P. 01	SNG(M)G P. 01	TNG(M)G P. 01		
	0.5 ~ 2.0 ~ 3.5 medium to finishing	B25		0.2 0.35 ~ 0.6	NC305K 400~450 NC6110 300~400 NC6010 250~350 NC315K 150~250		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	
	1.0 ~ 2.5 ~ 4.0 medium machining	VM		0.15 0.30 ~ 0.50	NC305K 450~550 NC6110 350~450 NC6010 250~300 NC315K 200~250		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01	VNMG P. 01	WNMG P. 01
	1.0 ~ 3.0 ~ 4.5 heavy roughing	GR		0.20 0.35 ~ 0.50	NC305K 450~550 NC6110 350~450 NC6010 250~300 NC315K 200~250		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
	2.5 ~ 3.5 ~ 6.0 roughing	HR		0.25 0.35 ~ 0.60	NC305K 400~450 NC6110 300~400 NC6010 250~350 NC315K 150~250		CNMG P. 01	DNMG P. 01	SNMG P. 01	TNMG P. 01		WNMG P. 01
	4.3 ~ 6.5 ~ 10.0 heavy roughing	GH		0.30 0.70 ~ 1.10	NC6110 180 NC6010 150 NC315K 130		CNMM P. 01		SNMM P. 01			
Depth of cut (mm)		C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	[POSI] CC□T	[POSI] DC□T	[POSI] SC□T	[POSI] TC□T	[POSI] VC□T,VB□T	[POSI] WC□T
Positive	0.5 ~ 1.5 ~ 3.0 medium to finishing	HMP		0.08 0.20 ~ 0.40	NC305K 250 NC6110 230 NC6010 220 NC315K 200		CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01	VCMT P. 01	
	1.0 ~ 2.0 ~ 3.5 medium machining	C25		0.10 0.25 ~ 0.40	NC305K 250 NC6110 230 NC6010 220 NC315K 200		CCMT P. 01	DCMT P. 01	SCMT P. 01	TCMT P. 01		

● : The first recommended cutting condition

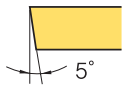
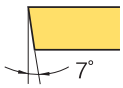
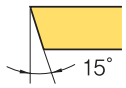
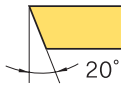
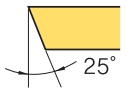
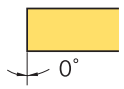
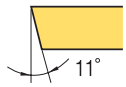
Turning Insert Code System (ISO)

C	N	M	G	12
1	2	3	4	5

1 CNMG120408-VM Insert Shape

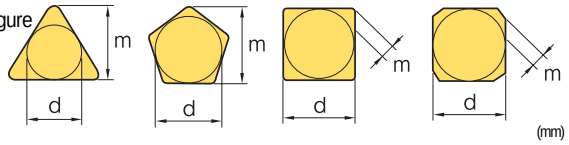
C	D	E	K	L
				
R	S	T	V	W

2 CNMG120408-VM Relief Angle

			
B	C	D	E
			Special
F	N	P	O

3 CNMG120408-VM Tolerance

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

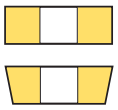
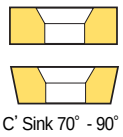
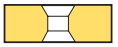
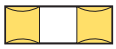
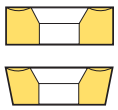
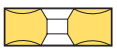
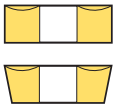
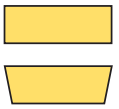
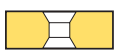
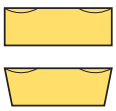
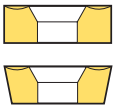
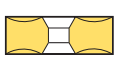
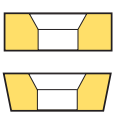
■ Tolerance on C,H,R,T,W class (Exceptional case)

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 class (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 CNMG120408-VM Cross Section Type

		
A	B C' Sink 70° - 90°	C C' Sink 70° - 90°
		
F	G	H C' Sink 70° - 90°
		
J C' Sink 70° - 90°	M	N
		
Q C' Sink 40° - 60°	R	T C' Sink 40° - 60°
		Special type
U C' Sink 40° - 60°	W C' Sink 40° - 60°	X

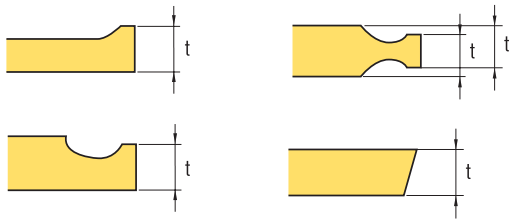
04 08 – VM

6 7 8

5 CNMG120408–VM
Cutting Edge Length, Diameter of Inscribed Circle

Symbol								IC
C	d	S	T	R	V	W		
Metric							Inch	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

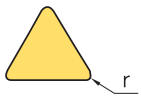
6 CNMG120408–VM
Height of Cutting Edge



Symbol		Height of Cutting Edge(t)	
Metric	Inch	mm	Inch
-	0.5(1)	0.79	1/32
T0	0.6	1.00	0.040
01	1(2)	1.59	1/16
T1	1.2	1.98	5.64
02	1.5(3)	2.38	3/32
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

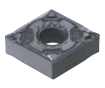
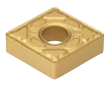
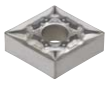
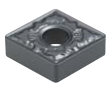
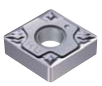
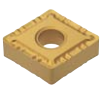
∗( ) Symbol for small size insert

7 CNMG120408–VM
Nose Radius (Nose R)



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)	

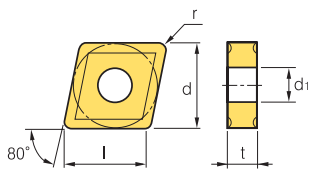
8 CNMG120408–VM
Chip Breaker for Turning

					
VG	VF	VQ	VW	VM	VH
					
VT	HU	HC	HA	HS	HR
GS	GM	GR	GH	B25	
HFP	HMP	C25	AK	AR	

CN○○ Rhombic 80° Negative

Workpiece			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC6010	NC315K	CN1000	CN2000	CN20	U20	H01	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		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders	Page
CNGG-HU	CNGG	120404-HU	12.4	12.7	4.76	0.4	5.16	0.03~0.25	0.10~1.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
For ultra finishing		120408-HU	12.0	12.7	4.76	0.8	5.16	0.03~0.25	0.10~1.50		
CNMA	CNMA	090308	8.8	9.52	3.18	0.8	3.18	0.10~0.30	0.50~3.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120404	12.4	12.7	4.76	0.4	5.16	0.15~0.60	1.00~5.00		
		120408	12.0	12.7	4.76	0.8	5.16	0.15~0.60	1.00~6.00		
		120412	11.6	12.7	4.76	1.2	5.16	0.15~0.70	1.50~6.00		
		120416	11.2	12.7	4.76	1.6	5.16	0.20~0.80	2.00~6.00		
For roughing	New	160608	15.3	15.88	6.35	0.8	6.35	0.15~0.70	2.00~6.00		
		160612	14.8	15.88	6.35	1.2	6.35	0.15~0.70	2.00~6.00		
		160616	14.4	15.88	6.35	1.6	6.35	0.15~0.50	2.00~10.00		
		190608	18.5	19.05	6.35	0.8	7.93	0.15~0.70	2.00~10.00		
		190612	18.1	19.05	6.35	1.2	7.93	0.15~0.70	2.00~10.00		
		190616	17.7	19.05	6.35	1.6	7.93	0.20~1.00	3.00~10.00		
CNMG-B25	CNMG	120404-B25	12.4	12.7	4.76	0.4	5.16	0.17~0.45	1.00~5.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120408-B25	12.0	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00		
		120412-B25	11.6	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00		
		160608-B25	15.3	15.88	6.35	0.8	6.35	0.25~0.60	2.00~6.50		
		160612-B25	14.8	15.88	6.35	1.2	6.35	0.27~0.60	2.00~6.50		
For medium to roughing	New	160616-B25	14.4	15.88	6.35	1.6	6.35	0.27~0.60	2.00~6.50		
		190604-B25	18.9	19.05	6.35	0.4	7.93	0.20~0.45	3.00~8.00		
		190608-B25	18.5	19.05	6.35	0.8	7.93	0.25~0.60	3.00~8.00		
		190612-B25	18.1	19.05	6.35	1.2	7.93	0.30~0.60	3.00~8.00		
		190616-B25	17.7	19.05	6.35	1.6	7.93	0.23~0.70	3.00~8.00		
CNMG-GM	CNMG	090304-GM	9.2	9.52	3.18	0.4	3.81	0.05~0.30	0.90~3.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		090308-GM	8.8	9.52	3.18	0.8	3.81	0.10~0.45	1.00~3.50		
		120404-GM	12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00		
		120408-GM	12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		120412-GM	11.6	12.7	4.76	1.2	5.16	0.18~0.60	0.30~5.00		
For medium cutting		190608-GM	18.5	19.05	6.35	0.8	7.93	0.10~0.50	1.00~8.00		
CNMG-GR	CNMG	120408-GR	12.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120412-GR	11.6	12.7	4.76	1.2	5.16	0.25~0.50	1.30~7.00		
		120416-GR	11.2	12.7	4.76	1.6	5.16	0.25~0.60	1.80~6.00		
		160608-GR	15.3	15.88	6.35	0.8	6.35	0.20~0.70	1.00~8.00		
		160612-GR	14.8	15.88	6.35	1.2	6.35	0.25~0.70	1.30~8.00		
		160616-GR	14.4	15.88	6.35	1.6	6.35	0.25~0.75	1.80~8.00		
		190608-GR	18.5	19.05	6.35	0.8	7.93	0.20~0.70	1.70~10.00		
For roughing		190612-GR	18.1	19.05	6.35	1.2	7.93	0.30~0.75	1.70~10.00		
		190616-GR	17.7	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00		
	New	190624-GR	16.8	19.05	6.35	2.4	7.93	0.35~0.85	2.00~12.00		
		250724-GR	23.3	25.4	7.94	2.4	9.12	0.40~1.00	2.30~15.00		
		250924-GR	23.3	25.4	9.52	2.4	9.12	0.40~1.00	2.30~15.00		
CNMG-GS	CNMG	120404-GS New	12.4	12.7	4.76	0.4	5.16	0.05~0.25	0.10~3.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120408-GS	12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		120412-GS	11.6	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00		
	New	160608-GS	15.3	15.88	6.35	0.8	6.35	0.10~0.50	1.00~6.50		
For medium to finishing	New	160612-GS	14.8	15.88	6.35	1.2	6.35	0.13~0.65	1.00~6.50		
		190612-GS	18.1	19.05	6.35	1.2	7.93	0.13~0.65	1.00~7.80		
CNMG-HA	CNMG	120404-HA	12.4	12.7	4.76	0.4	5.16	0.05~0.20	0.80~3.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120408-HA	12.0	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50		
		120412-HA	11.6	12.7	4.76	1.2	5.16	0.13~0.55	0.80~3.50		
For medium to finishing											
CNMG-HC	CNMG	120404-HC	12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120408-HC	12.0	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		
		120412-HC	11.6	12.7	4.76	1.2	5.16	0.17~0.50	1.00~4.00		
For medium to finishing											

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

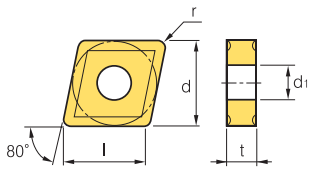
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

Note)CNMG-HA(H01) has smooth chip control due to buffed on top surface

CNOO Rhombic 80° 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		Coated									Cermet			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC6110	CN1000	CN2000	CC115	H01	G10	l	d	t	r	d1	fn	ap		
CNMG-HR	CNMG	120404-HR New															12.4	12.7	4.76	0.4	5.16	0.15~0.30	0.80~6.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
For roughing		120408-HR	●	●	●	●											12.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00		
		120412-HR	●	●	●	●	●										11.6	12.7	4.76	1.2	5.16	0.25~0.70	1.30~7.00		
		120416-HR															11.2	12.7	4.76	1.6	5.16	0.32~0.75	1.80~7.00		
		160608-HR		●	●												15.3	15.88	6.35	0.8	6.35	0.20~0.50	1.00~8.00		
		160612-HR	●	●	●	●											14.8	15.88	6.35	1.2	6.35	0.25~0.70	1.30~8.00		
		160616-HR	●														14.4	15.88	6.35	1.6	6.35	0.30~0.80	1.80~8.00		
		160624-HR															13.6	15.88	6.35	2.4	6.35	0.32~0.90	2.30~10.00		
		190608-HR		●	●												18.5	19.05	6.35	0.8	7.93	0.20~0.50	1.70~10.00		
		190612-HR		●	●		●										18.1	19.05	6.35	1.2	7.93	0.25~0.70	1.30~10.00		
		190616-HR	●	●	●	●											17.7	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00		
		190624-HR															16.8	19.05	6.35	2.4	7.93	0.32~0.90	2.30~10.00		
		250924-HR															23.3	25.4	9.52	2.4	9.12	0.40~1.00	2.30~10.00		
CNMG-HS	CNMG	090304-HS							●	●							9.2	9.52	3.18	0.4	3.81	0.05~0.20	1.00~2.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
For medium to finishing		090308-HS							●	●							8.8	9.52	3.18	0.8	3.81	0.10~0.20	1.00~2.50		
		120404-HS						●	●	●							12.4	12.7	4.76	0.4	5.16	0.05~0.20	1.00~4.50		
		120408-HS						●	●	●							12	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.50		
		120412-HS						●	●	●							11.6	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50		
		160612-HS							●	●							14.8	15.88	6.35	1.2	6.35	0.13~0.55	2.00~6.00		
		160616-HS							●	●							14.4	15.88	6.35	1.6	6.35	0.15~0.60	2.00~6.00		
		190612-HS						●	●	●							18.1	19.05	6.35	1.2	7.93	0.13~0.55	2.00~7.30		
		190616-HS						●	●	●							17.7	19.05	6.35	1.6	7.93	0.15~0.60	2.00~7.30		
CNMG-HU	CNMG	120404-HU	●		○												12	12.7	4.76	0.8	5.16	0.05~0.25	0.10~1.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
For ultra finishing		120408-HU	●		○												11.6	12.7	4.76	1.2	5.16	0.10~0.35	0.20~1.50		
		120412-HU															11.6	12.7	4.76	1.2	5.16	0.12~0.40	0.30~1.50		
CNMG-LW	CNMG	120408-LW	●		●	●					○						12.0	12.7	4.76	0.8	5.16	0.15~0.60	1.00~5.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
New		120412-LW	●		●						○						11.6	12.7	4.76	1.2	5.16	0.20~0.70	1.00~6.00		
Wiper medium cutting																									
CNMG-VF	CNMG	090304-VF	●		●												9.2	9.52	3.18	0.4	3.81	0.07~0.30	0.50~1.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
For finishing		090308-VF	●		●												8.8	9.52	3.18	0.8	3.81	0.10~0.30	0.50~1.50		
		120404-VF	●		●												12.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		120408-VF	●		●												12.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
		120412-VF			●												11.6	12.7	4.76	1.2	5.16	0.10~0.50	0.60~1.50		
CNMG-VG	CNMG	090304-VG										●	●	○			9.2	9.52	3.18	0.4	3.81	0.07~0.30	0.50~1.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
New		090308-VG										●	●	○			8.8	9.52	3.18	0.8	3.81	0.10~0.30	0.50~1.50		
		120404-VG										●	●	○			12.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
For finishing		120408-VG										●	●	○			12.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
CNMG-VM	CNMG	090304-VM	●		○	○							●				9.2	9.52	3.18	0.4	3.81	0.05~0.30	0.90~3.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
New		090308-VM	●		○	○							●				8.8	9.52	3.18	0.8	3.81	0.10~0.45	1.00~3.50		
		120404-VM	●		●	●				●	●		●				12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00		
		120408-VM	●		●	●		●	●	●	●		●				12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
For finishing		120412-VM	●		●	●		●			●						11.6	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00		
		160608-VM	●		○	○											15.3	15.88	6.35	0.8	6.35	0.10~0.50	1.00~6.70		
		160612-VM			○	○											14.8	15.88	6.35	1.2	6.35	0.13~0.60	1.30~6.70		
		190608-VM	●		○	○											18.5	19.05	6.35	0.8	7.93	0.10~0.50	1.00~8.10		
		190612-VM	●		○	○											18.1	19.05	6.35	1.2	7.93	0.13~0.60	1.30~8.10		
CNMG-VQ	CNMG	090304-VQ										●	●	○			9.2	9.52	3.18	0.4	3.81	0.05~0.30	0.05~3.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
New		090308-VQ										●	●	○			8.8	9.52	3.18	0.8	3.81	0.08~0.30	0.08~4.00		
		120404-VQ										●	●	●			12.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~4.00		
For medium to finishing		120408-VQ										●	●	●			12.0	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		

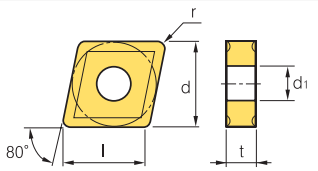
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

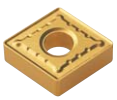
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

CN○○ Rhombic 80° 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		Coated								Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC6110	CN1000	CN2000	CN20	U20	H01	G10	l	d	t	r	d1	fn	ap		
CNMG-VW For wiper finishing	CNMG	120404-VW	●		●						○							12.4	12.7	4.76	0.4	5.16	0.10~0.30	0.50~3.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120408-VW	●		●						○							12.0	12.7	4.76	0.8	5.16	0.15~0.50	0.50~4.00		
CNMM-GH For heavy	CNMM	120408-GH		●	●	●												12.0	12.7	4.76	0.8	5.16	0.30~0.60	2.50~8.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120412-GH		●	●	●												11.6	12.7	4.76	1.2	5.16	0.30~0.70	2.50~8.00		
		160412-GH																14.8	15.88	4.76	1.2	6.35	0.30~0.70	2.50~8.00		
		160424-GH																13.6	15.88	4.76	2.4	6.35	0.30~1.20	2.50~8.00		
		160612-GH				●												14.8	15.88	6.35	1.2	6.35	0.30~0.90	2.50~8.00		
		160616-GH																14.4	15.88	6.35	1.6	6.35	0.30~1.20	2.50~8.00		
		160624-GH																13.6	15.88	6.35	2.4	6.35	0.30~1.50	2.50~8.00		
		190608-GH																18.5	19.05	6.35	0.8	7.93	0.30~0.60	2.50~8.00		
		190612-GH	●	●	●	●	●											18.1	19.05	6.35	1.2	7.93	0.30~0.70	3.00~8.00		
		190616-GH		●	●	●	●											17.7	19.05	6.35	1.6	7.93	0.45~0.90	3.00~8.00		
		190624-GH		●	●													16.8	19.05	6.35	2.4	7.93	0.55~1.20	4.00~9.00		
	New	250716-GH																24.12	25.4	7.94	1.6	9.12	0.50~1.00	4.50~10.00		
		250724-GH		●	●	●												23.3	25.4	7.94	2.4	9.12	0.55~1.20	5.00~12.00		
		250924-GH		●	●	●	●											23.3	25.4	9.52	2.4	9.12	0.55~1.20	5.00~12.00		
	New	250950-GH																20.56	25.4	9.52	5.0	9.12	0.65~1.30	6.00~12.00		
CNMM-GM For medium cutting	CNMM	120408-GM																12.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
CNMM-GR  For roughing	CNMM	120408-GR																12.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99
		120412-GR																11.6	12.7	4.76	1.2	5.16	0.25~0.50	1.30~7.00		
		190612-GR																18.1	19.05	6.35	1.2	7.93	0.30~0.75	1.70~10.00		
		190616-GR																17.7	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00		
CNMM-HA For medium to finishing	CNMM	120408-HA																12.9	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50	MCKNR/L MCLNR/L MCMNN MCRNR/L PCBNR/L PCLNR/L	B69 B70 B76 B97 B99

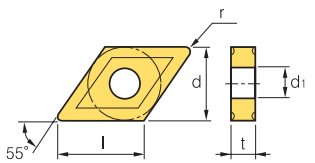
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

DN○○ 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



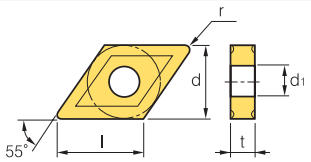
Inserts	Designation		Coated									Cermet			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	NC6010	NC315K	CN1000	CN2000	CN20	H01	G10	l	d	t	r	d1	fn	ap		
DNGG-HU	DNGG	150604-HU																15.0	12.7	6.35	0.4	5.16	0.05~0.25	0.10~1.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
For ultra finishing		150608-HU																14.7	12.7	6.35	0.8	5.16	0.10~0.30	0.20~1.50		
DNMA	DNMA	110408								○								10.8	9.52	4.76	0.8	3.81	0.17~0.45	0.80~3.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150404																15.1	12.7	4.76	0.4	5.16	0.17~0.55	0.40~4.00		
		150408								●	●							14.7	12.7	4.76	0.8	5.16	0.25~0.55	0.80~4.00		
For roughing		150412								●								14.4	12.7	4.76	1.2	5.16	0.25~0.65	1.50~4.00		
		150604																15.1	12.7	6.35	0.4	5.16	0.17~0.55	0.40~4.00		
		150608	●							●	●	●						14.7	12.7	6.35	0.8	5.16	0.25~0.55	0.80~4.00		
		150612									●							14.4	12.7	6.35	1.2	5.16	0.25~0.65	1.20~4.00		
		190608																18.5	15.88	6.35	0.8	7.93	0.30~0.80	2.50~13.00		
DNMG-B25	DNMG	150402-B25																15.2	12.7	4.76	0.2	5.16	0.15~0.40	0.50~3.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150404-B25			○	●												15.1	12.7	4.76	0.4	5.16	0.17~0.45	1.00~4.00		
		150408-B25		●	●	●				●								14.7	12.7	4.76	0.8	5.16	0.17~0.55	1.50~4.00		
		150412-B25																14.4	12.7	4.76	1.2	5.16	0.25~0.55	1.50~4.00		
For medium to roughing	New	150425-B25																14.4	12.7	4.76	2.5	5.16	0.35~0.65	2.50~5.50		
		150602-B25																15.2	12.7	6.35	0.2	5.16	0.15~0.40	0.50~3.50		
		150604-B25	●	●	●	●		○		●			●	●	●			15.1	12.7	6.35	0.4	5.16	0.17~0.55	1.50~4.00		
		150608-B25	●	●	●	●		○	●	●			●	●	●			14.7	12.7	6.35	0.8	5.16	0.17~0.55	1.50~4.00		
		150612-B25				○		○		●								14.4	12.7	6.35	1.2	5.16	0.25~0.55	1.50~4.00		
	New	150625-B25																14.4	12.7	6.35	2.5	5.16	0.35~0.65	2.50~5.50		
DNMG-GM	DNMG	110308-GM																10.8	9.52	3.18	0.8	3.81	0.10~0.50	1.00~4.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		110404-GM		●	●													11.2	9.52	4.76	0.4	3.81	0.05~0.30	0.90~4.00		
		110408-GM		●	●													10.8	9.52	4.76	0.8	3.81	0.10~0.50	1.00~4.00		
		150404-GM		●	●	●							●	●				15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00		
		150408-GM		●	●	●							●	●				14.7	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
For medium cutting		150412-GM																14.4	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00		
		150604-GM		●	●	●							●	●	●			15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.90~5.00		
		150608-GM	●	●	●	●							●	●	●			14.7	12.7	6.35	0.8	5.16	0.10~0.50	1.00~5.00		
		150612-GM	●	●	●	●												14.4	12.7	6.35	1.2	5.16	0.13~0.60	1.30~5.00		
DNMG-GR	DNMG	150408-GR		●	●	●				●								14.7	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150412-GR								○								14.4	12.7	4.76	1.2	5.16	0.25~0.90	1.30~7.00		
		150416-GR																14.0	12.7	4.76	1.6	5.16	0.30~0.75	1.80~7.00		
For roughing		150608-GR	●	●	●	●				●	●	●						14.7	12.7	6.35	0.8	5.16	0.20~0.50	1.00~7.00		
		150612-GR		●	●	●				●	●							14.4	12.7	6.35	1.2	5.16	0.25~0.70	1.30~7.00		
		150616-GR		●	●													14.0	12.7	6.35	1.6	5.16	0.20~0.75	1.80~7.00		
DNMG-GS	DNMG	150404-GS																15.1	12.7	4.76	0.4	5.16	0.07~0.40	1.00~5.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150408-GS						●										14.7	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		150412-GS																14.4	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00		
For medium to finishing		150604-GS						●	●									15.1	12.7	6.35	0.4	5.16	0.07~0.40	1.00~5.00		
		150608-GS						●	●									14.7	12.7	6.35	0.8	5.16	0.10~0.50	1.00~5.00		
		150612-GS																14.4	12.7	6.35	1.2	5.16	0.10~0.65	1.00~5.00		
DNMG-HA	DNMG	150404-HA					●		●							●		15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150408-HA					●		●							●		14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50		
		150604-HA		●	●		●	●	●							●		15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.80~3.50		
For medium to finishing		150608-HA		●	●		●	●	●							●		14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.80~3.50		
DNMG-HC	DNMG	150404-HC	●															15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.05~3.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150408-HC	●	●	○			○										14.7	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		
		150412-HC																14.4	12.7	4.76	1.2	5.16	0.13~0.50	0.90~4.00		
For medium to finishing		150604-HC	●	●	●			○										15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.80~4.00		
		150608-HC	●	●	●	●		○										14.7	12.7	6.35	0.8	5.16	0.08~0.40	0.80~4.00		
		150612-HC		●	●													14.4	12.7	6.35	1.2	5.16	0.13~0.50	0.90~4.00		
DNMG-HR	DNMG	150408-HR		●		●												14.7	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150412-HR				○												14.4	12.7	4.76	1.2	5.16	0.25~0.70	1.30~7.00		
		150416-HR																14.0	12.7	4.76	1.6	5.16	0.30~0.75	1.80~7.00		
For roughing		150608-HR	●	●	●	●												14.7	12.7	6.35	0.8	5.16	0.20~0.50	1.00~7.00		
		150612-HR	●	●	●	○												14.4	12.7	6.35	1.2	5.16	0.25~0.70	1.30~7.00		
		150616-HR		●	●													14.0	12.7	6.35	1.6	5.16	0.20~0.75	1.80~7.00		
	New	190612-HR																18.05	15.88	6.35	1.2	7.93	1.20~0.75	1.80~8.00		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜
Note)DNMG-HA(H01) has smooth chip control due to buffed on top surface

DN○○ Rhombic 55° Negative

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		Coated									Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC6110	NC315K	CN1000	CN2000	CC115	U20	H01	G10	l	d	t	r	d1	fn	ap		
DNMG-HS	DNMG	110404-HS							●	●									11.2	9.525	4.76	0.4	3.81	0.05~0.35	0.80~2.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		110408-HS							●	●									10.8	9.525	4.76	0.8	3.81	0.10~0.40	1.00~2.50		
		150404-HS							●	●									15.1	12.7	4.76	0.4	5.16	0.05~0.35	0.80~4.00		
		150408-HS						●	●	●									14.7	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.00		
		150412-HS								●									14.4	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50		
		150604-HS						●	●	●									15.1	12.7	6.35	0.4	5.16	0.05~0.35	0.80~4.00		
		150608-HS						●	●	●									14.7	12.7	6.35	0.8	5.16	0.10~0.40	1.00~4.50		
		150612-HS								●									14.4	12.7	6.35	1.2	5.16	0.10~0.55	1.00~4.50		
DNMG-HU	DNMG	150404-HU																	15.1	12.7	4.76	1.2	5.16	0.05~0.25	0.10~1.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150408-HU																	14.7	12.7	4.76	0.8	5.16	0.10~0.30	0.20~1.50		
		150412-HU																	14.4	12.7	4.76	1.2	5.16	0.15~0.35	0.30~1.50		
		150604-HU																	15.1	12.7	6.35	0.4	5.16	0.05~0.25	0.10~1.50		
		150608-HU																	14.7	12.7	6.35	0.8	5.16	0.10~0.30	0.20~1.50		
		150612-HU																	14.4	12.7	6.35	1.2	5.16	0.15~0.35	0.30~1.50		
DNMG-LW	DNMG	150408-LW	○		○						○								14.7	12.7	4.76	0.8	5.16	0.15~0.50	0.70~4.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150412-LW	○		○						○								14.4	12.7	4.76	1.2	5.16	0.20~0.60	1.00~5.00		
		150608-LW	○		○						○								14.7	12.7	6.35	0.8	5.16	0.15~0.50	0.70~4.50		
		150612-LW	○		○						○								14.4	12.7	6.35	1.2	5.16	0.20~0.60	1.00~5.00		
DNMG-VF	DNMG	110402-VF			●														11.4	9.52	4.76	0.2	3.81	0.05~0.20	0.20~1.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		110404-VF	○		●														11.2	9.52	4.76	0.4	3.81	0.07~0.30	0.50~1.50		
		110408-VF	○		●														10.8	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
		150404-VF	○		●														15.1	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		150408-VF	○		●														14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
		150412-VF																	14.4	12.7	4.76	1.2	5.16	0.15~0.50	0.60~1.50		
		150604-VF	●		●														15.1	12.7	6.35	0.4	5.16	0.13~0.30	0.50~1.50		
		150608-VF	●		●														14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.50~1.50		
		150612-VF			●														14.4	12.7	6.35	1.2	5.16	0.15~0.50	0.60~1.50		
DNMG-VG	DNMG	110404-VG											●	●	○				11.2	9.525	4.76	0.4	3.81	0.07~0.30	0.50~1.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		110408-VG											●	●	○				10.8	9.525	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
		150404-VG											●	●	○				15.1	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		150408-VG											●	●	○				14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
		150604-VG											●	●	○				15.1	12.7	6.35	0.4	5.16	0.13~0.30	0.50~1.50		
		150608-VG											●	●	○				14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.50~1.50		
DNMG-VM	DNMG	110404-VM												●					11.2	9.52	4.76	0.4	3.81	0.05~0.30	0.90~4.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		110408-VM	○		○									●					10.8	9.52	4.76	0.8	3.81	0.10~0.50	1.00~4.00		
		110412-VM	○		○														10.3	9.52	4.76	1.2	3.81	0.13~0.50	1.30~4.00		
		150404-VM	○		●	●			○		●			●					15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00		
		150408-VM	○		●	●			○		●			●					14.7	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		150412-VM												●					14.4	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00		
		150604-VM	○		●	●			○	●				●					15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.90~5.00		
		150608-VM	●		●	●			●	●				●					14.7	12.7	6.35	0.8	5.16	0.10~0.50	1.00~5.00		
		150612-VM							○					●					14.4	12.7	6.35	1.2	5.16	0.13~0.60	1.30~5.00		
DNMG-VQ	DNMG	110404-VQ											●	●	●				11.2	9.52	4.76	0.4	3.81	0.05~0.30	0.50~3.50	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		110408-VQ											●	●	○				10.8	9.52	4.76	0.8	3.81	0.08~0.40	0.80~4.00		
		150404-VQ											●	●	○				15.1	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50		
		150408-VQ											●	●	○				14.7	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		
		150604-VQ											●	●	●				15.1	12.7	6.35	0.4	5.16	0.05~0.30	0.80~4.00		
		150608-VQ											●	●	●				14.7	12.7	6.35	0.8	5.16	0.08~0.40	0.80~4.00		
DNMG-VW	DNMG	150404-VW			○														15.1	12.7	4.76	0.4	5.16	0.10~0.35	0.30~3.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150408-VW	○		○	●					○								14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.30~3.00		
		150604-VW			○														15.1	12.7	6.35	0.4	5.16	0.10~0.35	0.30~3.00		
		150608-VW	○		○	○					○								14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.30~3.00		
DNMP	DNMP	150408																	14.7	12.7	4.76	0.8	5.16	0.10~0.40	0.30~3.00	MDJNR/L MDNNN MDQNR/L MDUNR/L PDJNR/L PDNNR/L PDSNR/L PDUNR/L	B70 B71 B77 B97 B99
		150608																	14.7	12.7	6.35	0.8	5.16	0.10~0.40	0.30~3.00		

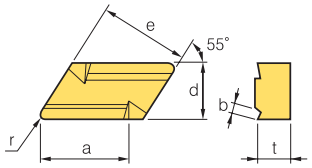
For medium to finishing
For ultra finishing
For wiper medium cutting
For finishing
For finishing
For finishing
For medium to finishing
For wiper finishing
For medium to finishing

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

KN○○ Parallelogram 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



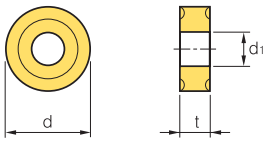
Inserts	Designation		Coated									Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	NC9020	PC9030	NC6110	NC6010	CT10	CN2000	CN20	ST10	H01	G10	a	d	t	r	b	fn	ap		
KNUX-11 For medium to roughing	KNUX	160405-R11	●	●	●	●	●	●	●	●	●				●			19.2	9.52	4.76	0.5	2.2	0.20~0.35	1.00~6.00	CKJNR/L CKNNR/L CKUNR/L	B67 B96
		160410-R11	●	●	●	●				●	●							18.8	9.52	4.76	1.0	2.2	0.30~0.60	1.50~6.00		
		160405-L11	●	●	●	●		●										19.2	9.52	4.76	0.5	3.2	0.20~0.35	1.00~6.00		
		160410-L11	●	●	●	●												18.8	9.52	4.76	1.0	3.2	0.30~0.60	1.50~6.00		
KNUX-12 For medium to roughing	KNUX	160405-R12	●	●	●	●		○										19.2	9.52	4.76	0.5	2.2	0.25~0.35	1.50~6.00	CKJNR/L CKNNR/L CKUNR/L	B67 B96
		160410-R12		●	●	●												18.8	9.52	4.76	1.0	2.2	0.40~0.70	1.50~6.00		
		160405-L12		●	●	○		○										19.2	9.52	4.76	0.5	3.2	0.25~0.35	1.50~6.00		
		160410-L12		●	●	●												18.8	9.52	4.76	1.0	3.2	0.40~0.70	1.50~6.00		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

RN○○ Round 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



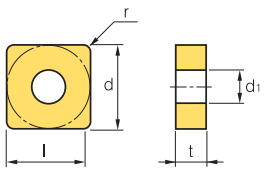
Inserts	Designation		Coated									Cermet			Uncoated			Dimensions (mm)			Cutting Condition		Available toolholders	Page
			NC3010	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	CT10	CN2000	CN20	U20	H01	G10	d	t	d1	fn	ap		
RNMG-B25 For medium to roughing	RNMG	090300-B25			●														9.52	3.18	3.81	0.90~4.50	0.09~0.90		
		120400-B25			●														12.7	4.76	5.16	1.20~4.80	0.12~1.20		
		150600-B25			●														15.88	6.4	6.35	1.15~1.50	1.50~7.50		
		190600-B25			●														19.05	6.35	7.93	1.90~7.60	0.19~1.90	-	-
		250600-B25																	25.4	6.35	9.12	2.50~10.00	0.25~2.50		
		250900-B25			●														25.4	9.52	9.12	2.50~10.00	0.25~2.50		
		310900-B25																	31.75	9.52	12.7	3.50~13.00	0.30~2.50		

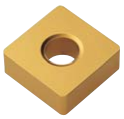
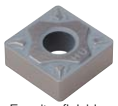
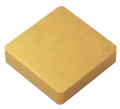
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

SN○○ Square 90° Negative

Workpiece			Coated									Cermet			Uncoated		
			NC3010	NC3030	NC3120	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	CT10	CN2000	CN20	ST30A	H01	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



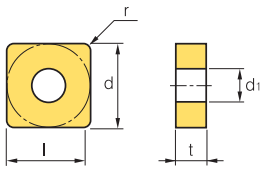
Inserts	Designation		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders	Page
SNGA  For roughing	SNGA	090304	9.1	9.52	3.18	0.4	3.81	0.17~0.50	0.50~4.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		090308	8.7	9.52	3.18	0.8	3.81	0.17~0.50	0.50~4.50		
		120404	12.3	12.7	4.76	0.4	5.16	0.15~0.60	1.50~8.00		
		120408	11.9	12.7	4.76	0.8	5.16	0.15~0.60	1.50~8.00		
		120412	11.5	12.7	4.76	1.2	5.16	0.20~0.80	1.50~8.00		
		150608	15.0	15.875	6.35	0.8	6.35	0.20~0.80	2.00~10.00		
		150616	14.2	15.875	6.35	1.6	6.35	0.20~0.90	2.00~10.00		
		190608	18.2	19.05	6.35	0.8	7.93	0.15~0.60	3.00~12.00		
		190612	17.8	19.05	6.35	1.2	7.93	0.20~0.80	3.00~12.00		
SNGG For medium cutting	SNGG	090304R	9.1	9.52	3.18	0.4	3.81	0.12~0.35	1.00~3.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		090308R	8.7	9.52	3.18	0.8	3.81	0.15~0.35	1.00~3.00		
		120404R	12.3	12.7	4.76	0.4	5.16	0.15~0.35	1.00~4.00		
		120408R	11.9	12.7	4.76	0.8	5.16	0.15~0.35	1.00~4.00		
		120412R	11.5	12.7	4.76	1.2	5.16	0.15~0.35	1.00~4.00		
		090304L	9.1	9.525	3.18	0.4	3.81	0.12~0.35	1.00~3.00		
		090308L	8.7	9.525	3.18	0.8	3.81	0.15~0.35	1.00~3.00		
		120404L	12.3	12.7	4.76	0.4	5.16	0.15~0.35	1.00~4.00		
		120408L	11.9	12.7	4.76	0.8	5.16	0.15~0.35	1.00~4.00		
		120412L	11.5	12.7	4.76	1.2	5.16	0.15~0.35	1.00~4.00		
SNGG-HU  For ultra finishing	SNGG	120408-HU	11.9	12.7	4.76	0.8	5.16	0.10~0.30	0.20~1.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
SNGN  For roughing	SNGN	090302	9.32	9.52	3.18	0.2	3.81	0.05~0.30	0.50~4.00	CSDNN CSKNR/L	B90 B91
		090304	9.1	9.52	3.18	0.4	3.81	0.10~0.35	0.50~4.00		
		090308	8.7	9.52	3.18	0.8	3.81	0.10~0.40	1.00~4.00		
		120304	12.3	12.7	3.18	0.4	5.16	0.13~0.50	1.30~5.00		
		120308	11.9	12.7	3.18	0.8	5.16	0.15~0.60	1.50~6.00		
		120312	11.5	12.7	3.18	1.2	5.16	0.17~0.60	1.70~6.00		
		120402	12.5	12.7	4.76	0.2	5.16	0.10~0.45	1.00~5.00		
		120404	12.3	12.7	4.76	0.4	5.16	0.13~0.50	1.30~5.00		
		120408	11.9	12.7	4.76	0.8	5.16	0.15~0.60	1.50~6.00		
		120412	11.5	12.7	4.76	1.2	5.16	0.17~0.60	1.70~6.00		
		120424	10.3	12.7	4.76	2.4	5.16	0.20~0.65	2.00~6.00		
		150402	15.67	15.88	4.76	0.2	6.35	0.10~0.50	0.50~6.00		
		150408	15.0	15.88	4.76	0.8	6.35	0.15~0.60	1.50~8.00		
		150412	14.6	15.88	4.76	1.2	6.35	0.17~0.60	2.00~8.00		
		150416	14.2	15.88	4.76	1.6	6.35	0.20~0.65	2.50~8.50		
		190402	18.85	19.05	4.76	0.2	7.93	0.10~0.60	2.00~8.50		
		190412	17.8	19.05	4.76	1.2	7.93	0.17~0.70	2.50~10.00		
		190416	17.45	19.05	4.76	1.6	7.93	0.20~0.75	2.50~10.00		
		250604	25.0	25.4	6.35	0.4	9.12	0.30~0.80	3.00~12.00		
		250616	23.8	25.4	6.35	1.6	9.12	0.35~1.00	4.00~12.00		
SNGX For roughing	SNGX	120408R	11.9	12.7	4.76	0.8	5.16	1.00~4.00	0.15~0.35	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

SN○○ Square 90° 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		Coated												Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC6010	NC315K	CN1000	CN2000	CN20	U20	H01	G10	l	d	t	r	d1	fn	ap		
SNMA	SNMA	090304 New																			9.1	9.52	3.18	0.4	3.81	0.10~0.45	0.50~4.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		090308																			8.7	9.52	3.18	0.8	3.81	0.15~0.50	0.50~4.50		
		090312																			8.32	9.52	3.18	1.2	3.81	0.20~0.50	0.50~4.50		
		120402																			12.5	12.7	4.76	0.2	5.16	0.10~0.50	1.00~4.50		
		120404																			12.3	12.7	4.76	0.4	5.16	0.15~0.60	1.00~5.00		
		120408	●									●	●	●				●		●	11.9	12.7	4.76	0.8	5.16	0.15~0.70	1.00~6.00		
		120412	●			○					●	●	●								11.5	12.7	4.76	1.2	5.16	0.20~0.80	1.50~6.00		
		120416				○						●									11.1	12.7	4.76	1.6	5.16	0.30~1.00	2.00~6.00		
	New	120430																			9.7	12.7	4.76	3.0	5.16	0.30~0.70	2.50~5.00		
		150612										●									14.6	15.88	6.35	1.2	6.35	0.20~0.80	2.00~8.00		
		150616																			14.2	15.88	6.35	1.6	6.35	0.25~0.85	2.50~10.00		
		190608																			18.2	19.05	6.35	0.8	7.93	0.20~0.80	2.00~10.00		
		190612				○						●	●	●							17.8	19.05	6.35	1.2	7.93	0.20~0.80	2.00~10.00		
		190616				○						●	●	●							17.4	19.05	6.35	1.6	7.93	0.25~0.85	2.50~10.00		
		190624																			16.6	19.05	6.35	2.4	7.93	0.35~0.90	3.00~10.00		
		250724										○									23.0	25.4	7.94	2.4	9.12	0.40~1.00	3.00~13.00		
		250924										○									23.0	25.4	9.52	2.4	9.12	0.40~1.00	3.00~13.00		
SNMG-B25	SNMG	090308-B25		●	●	●						○									8.7	9.52	3.18	0.8	3.81	0.17~0.45	0.80~3.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120404-B25	●	●	●	●			○			●			●						12.3	12.7	4.76	0.4	5.16	0.17~0.45	1.00~3.50		
		120408-B25	●	●	●	●			●	●		●			●						11.9	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00		
		120412-B25		●	●	●						●									11.5	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00		
		120416-B25				●															11.1	12.7	4.76	1.6	5.16	0.35~0.70	2.50~5.00		
	New	120420-B25																			10.7	12.7	4.76	2.0	5.16	0.40~0.70	3.00~5.00		
		150608-B25				●															15.0	15.88	6.35	0.8	6.35	0.25~0.60	1.50~6.00		
		150612-B25		●	●	○															14.6	15.88	6.35	1.2	6.35	0.25~0.60	2.00~6.00		
		150616-B25		●	●																14.2	15.88	6.35	1.6	6.35	0.35~0.70	2.00~6.00		
		190608-B25	●	●	●	●						●									18.2	19.05	6.35	0.8	7.93	0.25~0.60	3.00~8.00		
		190612-B25	●	●	●	●	●					●									17.8	19.05	6.35	1.2	7.93	0.30~0.60	3.00~8.00		
		190616-B25	●	●	●	●															17.4	19.05	6.35	1.6	7.93	0.35~0.70	3.00~8.00		
		250716-B25	●			○						○									23.8	25.4	7.94	1.6	9.12	0.35~0.70	4.00~12.00		
		250724-B25				○						○									23.0	25.4	7.94	2.4	9.12	0.50 ~1.00	5.00~12.00		
SNMG-GM	SNMG	120404-GM		●	●										●						12.3	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120408-GM	●	●	●	●									●		●				11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		120412-GM				●															11.5	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00		
SNMG-GR	SNMG	120404-GR																			12.3	12.7	4.76	0.4	5.16	0.15~0.45	0.08~6.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120408-GR	●	●	●	●	●					●	●	●							11.9	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00		
		120412-GR		●	●	●	●					●	●	●							11.5	12.7	4.76	1.2	5.16	0.20~0.50	1.00~7.00		
		150608-GR				●															15.0	15.88	6.35	0.8	6.35	0.25~0.60	1.00~7.00		
		150612-GR	●	●	●	●	●														14.6	15.88	6.35	1.2	6.35	0.29~0.75	1.40~7.00		
		190608-GR		●	●	●															18.2	19.05	6.35	0.8	7.93	0.30~0.80	1.70~9.00		
		190612-GR		●	●	●	●						●								17.8	19.05	6.35	1.2	7.93	0.30~0.80	1.70~9.00		
		190616-GR		●	●	●															17.4	19.05	6.35	1.6	7.93	0.31~0.82	1.90~12.30		
		250724-GR				●															23.0	25.4	7.94	2.4	9.12	0.45~1.20	2.60~14.00		
		250924-GR		●	●	●															23.0	25.4	9.52	2.4	9.12	0.50~1.20	2.60~14.00		
SNMG-GS	SNMG	120404-GS							●												12.3	12.7	4.76	0.4	5.16	0.10~0.45	0.80~4.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120408-GS		●		●			●	●											11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		120412-GS							●												11.5	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00		
		120416-GS																			11.1	12.7	4.76	1.6	5.16	0.15~0.70	1.00~5.00		
SNMG-HA	SNMG	120404-HA		●	●				●	●									●		12.3	12.7	4.76	0.4	5.16	0.10~0.35	0.80~3.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120408-HA			●				●	●									●		11.9	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50		
		120412-HA																			11.5	12.7	4.76	1.2	5.16	0.13~0.55	0.80~3.50		

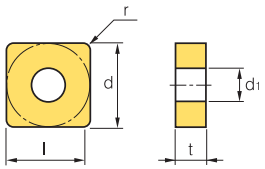
For medium to roughing (SNMA)
For medium to roughing (SNMG-B25)
For medium cutting (SNMG-GM)
For roughing (SNMG-GR)
For medium to finishing (SNMG-GS)
For medium to finishing (SNMG-HA)

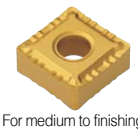
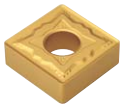
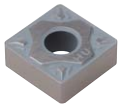
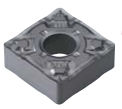
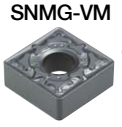
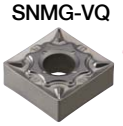
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜
Note)SNMG-HA(H01) has smooth chip control due to buffed on top surface

SN○○ Square 90° 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		Coated									Cermet		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC6110	CN1000	CN2000	U20	H01	G10	l	d	t	r	d1	fn	ap		
SNMG-HC  For medium to finishing	SNMG	120404-HC	●	●	●	○											12.3	12.7	4.76	0.4	5.16	0.05~0.35	0.80~4.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120408-HC	●	●	●	○											11.9	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		
SNMG-HR For roughing	SNMG	120408-HR															11.9	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120412-HR	●		●												11.5	12.7	4.76	1.2	5.16	0.25~0.70	1.30~7.00		
		120416-HR															11.1	12.7	4.76	1.6	5.16	0.32~0.75	1.80~7.00		
		150608-HR	●	●	●	●											15	15.88	6.35	0.8	6.35	0.20~0.50	1.80~8.00		
		150612-HR		●	●	●											14.6	15.88	6.35	1.2	6.35	0.20~0.70	1.30~8.00		
		150616-HR															14.2	15.88	6.35	1.6	6.35	0.30~0.80	1.80~8.00		
		150624-HR															13.4	15.88	6.35	2.4	6.35	0.32~0.90	2.20~8.00		
		190608-HR	●	●													18.2	19.05	6.35	0.8	7.93	0.20~0.50	1.00~10.00		
		190612-HR	●	●	●		●										17.8	19.05	6.35	1.2	7.93	0.25~0.70	1.30~10.00		
		190616-HR	●	●	●	●											17.4	19.05	6.35	1.6	7.93	0.30~0.80	1.80~10.00		
		190624-HR															16.6	19.05	6.35	2.4	7.93	0.32~0.90	2.30~10.00		
		250724-HR															23	25.4	7.94	2.4	9.12	0.40~1.20	2.30~15.00		
		250924-HR		●	●	●											23	25.4	9.52	2.4	9.12	0.40~1.20	2.30~15.00		
SNMG-HS  For medium to finishing	SNMG	090304-HS								●							9.1	9.52	3.18	0.4	3.81	0.05~0.25	1.00~2.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		090308-HS								●							8.7	9.52	3.18	0.8	3.81	0.10~0.30	1.00~2.50		
		120404-HS							●	●							12.3	12.7	4.76	0.4	5.16	0.05~0.30	1.00~4.50		
		120408-HS						●	●	●							11.9	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.50		
		120412-HS						●	●	●							11.5	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50		
		150612-HS						●	●	●							14.6	15.88	6.35	1.2	6.35	0.13~0.55	1.00~6.10		
		150616-HS															14.2	15.88	6.35	1.6	6.35	0.15~0.60	1.00~4.50		
		190612-HS						●	●	●							17.8	19.05	6.35	1.2	7.93	0.13~0.55	1.00~7.60		
		190616-HS						●		●							17.4	19.05	6.35	1.6	7.93	0.15~0.60	1.00~7.60		
SNMG-HU  For ultra finishing	SNMG	120404-HU															12.3	12.7	4.76	0.4	5.16	0.05~0.25	0.10~1.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120408-HU															11.9	12.7	4.76	0.8	5.16	0.10~0.35	0.20~1.50		
		120412-HU															11.5	12.7	4.76	1.2	5.16	0.12~0.35	0.30~1.50		
SNMG-VF For finishing	SNMG	090304-VF			●												9.1	9.52	3.18	0.4	3.81	0.07~0.30	0.50~1.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120404-VF			●	○											12.3	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		120408-VF	●		●	○											11.9	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
SNMG-VG  For finishing	SNMG	090304-VG										●	●				9.1	9.52	3.18	0.4	3.81	0.07~0.30	0.50~1.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		090308-VG										●	●				8.7	9.52	3.18	0.8	3.81	0.10~0.30	0.50~1.50		
		120404-VG										●	●				12.3	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		120408-VG										●	●				11.9	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
SNMG-VM  For medium cutting	SNMG	090304-VM	○		○								●				9.1	9.52	3.18	0.4	3.81	0.05~0.30	0.90~3.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		090308-VM	○		○	●							●				8.7	9.52	3.18	0.8	3.81	0.10~5.00	1.00~3.50		
		120404-VM	○		○	●					○		●				12.3	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00		
		120408-VM	●		●	●		●	●	●	●		●				11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		120412-VM	○		○	○					○		●				11.5	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00		
		190612-VM			○	○											17.8	19.05	6.35	1.2	7.93	0.25~0.60	2.50~7.50		
SNMG-VQ  For medium to finishing	SNMG	090304-VQ										●	●				9.1	9.52	3.18	0.4	3.81	0.05~0.30	0.05~3.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		090308-VQ										●	●				8.7	9.52	3.18	0.8	3.81	0.08~0.30	0.08~4.00		
		120404-VQ										●	●				12.3	12.7	4.76	0.4	5.16	0.05~0.30	0.80~4.00		
		120408-VQ										●	●				11.9	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		

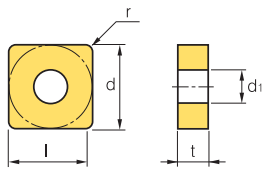
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

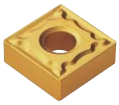
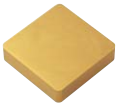
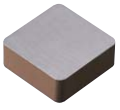
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

SN○○ Square 90° 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		Coated								Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC6110	CN1000	CN2000	CN20	ST30A	H01	G10	l	d	t	r	d1	fn	ap		
SNMM-GH For heavy	SNMM	120408-GH		●	●	●												11.9	12.7	4.76	0.8	5.16	0.30~0.60	2.50~8.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120412-GH		●	●	●												11.5	12.7	4.76	1.2	5.16	0.30~0.70	2.50~8.00		
		150612-GH		●	●	●												14.6	15.88	6.35	1.2	6.35	0.30~0.70	2.50~8.00		
		190612-GH		●	●	●												17.8	19.05	6.35	1.2	7.93	0.30~0.70	3.00~8.00		
		190616-GH		●	●	●	●											17.4	19.05	6.35	1.6	7.93	0.45~1.00	4.00~9.00		
		190624-GH		●	●	●												16.6	19.05	6.35	2.4	7.93	0.55~1.20	4.00~9.00		
		250724-GH		●	●	●	●											23	25.4	7.94	2.4	9.12	0.55~1.20	5.00~12.00		
		250924-GH		●	●	●	●											23	25.4	9.52	2.4	9.12	0.55~1.20	5.00~12.00		
		250932-GH																22.2	25.4	9.52	3.2	9.12	0.55~1.20	5.00~12.00		
SNMM-GM  For medium cutting	SNMM	120408-GM																11.9	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120412-GM																11.5	12.7	4.76	1.2	5.16	0.13~0.60	1.30~5.00		
SNMM-GR For roughing	SNMM	120408-GR																11.9	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
		120412-GR																11.5	12.7	4.76	1.2	5.16	0.25~0.65	1.30~7.00		
		190612-GR																17.8	19.05	6.35	1.2	7.93	0.25~0.65	1.30~11.50		
		190616-GR																17.4	19.05	6.35	1.6	7.93	0.32~0.85	1.80~11.50		
SNMN  For medium to roughing	SNMN	120304																12.3	12.7	3.18	0.4	5.16	0.17~0.45	1.00~3.50	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B90 B91
		120308																11.9	12.7	3.18	0.8	5.16	0.23~0.60	1.50~6.00		
		120312																11.5	12.7	3.18	1.2	5.16	0.25~0.60	2.00~5.00		
		120404																12.3	12.7	4.76	0.4	5.16	0.17~0.45	1.00~3.50		
		120408																11.9	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00		
		120412																11.5	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00		
		150404																15.48	15.88	4.76	0.4	6.35	0.20~0.50	1.50~6.00		
		150408																15.0	15.88	4.76	0.8	6.35	0.25~0.60	1.50~6.00		
		150412																11.5	12.7	4.76	1.2	6.35	0.25~0.60	2.00~6.00		
		190416																17.4	19.05	4.76	1.6	7.93	0.35~0.70	2.00~6.00		
SNMX For roughing	SNMX	120408R																11.9	12.7	4.76	0.8	5.16	0.15~0.35	1.00~4.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B71 B72 B78 B79 B80 B97 B100
SNUN  For medium to roughing	SNUN	120408													●			11.9	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00	MSBNR/L MSDNN MSKNR/L MSRNR/L MSSNR/L PSBNR/L PSDNN PSKNR/L PSSNR/L	B90 B91
		120412													●			11.5	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00		
		190412																17.4	19.05	4.76	1.2	5.16	0.30~1.00	3.00~10.00		
		120412TN																11.5	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00		
		250724TN																23	25.4	7.94	2.4	9.12	0.30~1.20	3.00~12.00		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19

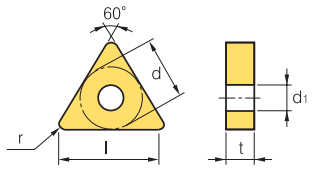
● : Stock item ○ : Under preparing for stock

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

TN○○ Triangular 60° 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		Coated									Cermet		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3030	NC500H	PC8010	PC9030	NC305K	NC6110	NC6010	NC315K	CT10	CN20	U20	H01	G10	l	d	t	r	d1	fn	ap		
TNGA For roughing	TNGA	110302																10.5	6.35	3.18	0.2	2.4	0.05~0.30	0.20~3.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		110304																10.0	6.35	3.18	0.4	2.4	0.05~0.30	0.40~3.00		
		160304																15.5	9.52	3.18	0.4	3.81	0.10~0.35	0.40~4.00		
		160402																16.0	9.52	4.76	0.2	3.81	0.10~0.30	0.20~4.00		
		160404											●					15.5	9.52	4.76	0.4	3.81	0.10~0.35	0.40~5.00		
		160408																14.5	9.52	4.76	0.8	3.81	0.12~0.40	0.50~5.00		
		220304																21.0	12.7	3.18	0.4	5.16	0.10~0.35	0.50~5.00		
		220402																21.73	12.7	4.76	0.1	5.16	0.05~0.30	0.20~3.00		
		220404																21.0	12.7	4.76	0.4	5.16	0.10~0.35	0.40~5.00		
		220408																20.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~5.00		
		220412																19.0	12.7	4.76	1.2	5.16	0.12~0.45	1.00~5.50		
		270612																24.5	15.88	6.35	1.2	6.35	0.12~0.45	1.00~7.00		
		270624																21.3	15.88	6.35	2.4	6.35	0.20~0.55	2.00~7.00		
TNGG For medium cutting	TNGG	110304R																10.0	6.35	3.18	0.4	2.4	0.05~0.30	0.05~0.25	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		160402R											●					16.0	9.52	4.76	0.2	3.81	0.08~0.30	0.50~3.50		
		160404R											●	●				15.5	9.52	4.76	0.4	3.81	0.12~0.30	1.00~3.50		
		160408R											●					14.5	12.7	4.76	0.8	3.81	0.15~0.35	1.30~3.50		
		220404R											●					21.0	12.7	4.76	0.4	5.16	0.12~0.30	1.00~5.00		
		220408R											○					20.0	12.7	4.76	0.8	5.16	0.15~0.35	1.30~5.00		
		220412R																19.0	12.7	4.76	1.2	5.16	0.17~0.40	1.50~5.00		
		110304L																10.0	6.35	4.76	0.4	2.4	0.05~0.30	0.05~0.25		
		160402L																16.0	9.52	4.76	0.2	3.81	0.08~0.30	0.50~3.50		
		160404L											●	●				15.5	9.52	3.18	0.4	3.81	0.12~0.30	1.00~3.50		
		160408L											●					14.5	12.7	4.76	0.8	3.81	0.15~0.35	1.30~3.50		
		220404L											○					21.0	12.7	4.76	0.4	5.16	0.12~0.30	1.00~5.00		
		220408L											●					20.0	12.7	4.76	0.8	5.16	0.15~0.35	1.30~5.00		
		220412L																19.0	12.7	4.76	1.2	5.16	0.17~0.40	1.50~5.00		
TNGG-HU For ultra finishing	TNGG	160404-HU																15.5	9.52	4.76	0.4	3.81	0.05~0.25	0.10~1.50	MTENNS, MTFNR/L MTGNR/L, MTJNR/L PTFNR/L, PTGNR/L PTTNR/L, WTENN WTJNR/L, WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		160408-HU																14.5	9.52	4.76	0.8	3.81	0.10~0.30	0.20~1.50		
TNGG-SC New For finishing	TNGG	160402R-SC											●			○		16.0	9.525	4.76	0.2	3.81	0.03~0.20	0.10~1.50	MTENNS, MTFNR/L MTGNR/L, MTJNR/L PTFNR/L, PTGNR/L PTTNR/L, WTENN WTJNR/L, WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		160404R-SC											●			●		15.5	9.525	4.76	0.4	3.81	0.05~0.25	0.30~2.00		
		160402L-SC																16.0	9.525	4.76	0.2	3.81	0.03~0.20	0.10~1.50		
		160404L-SC																15.5	9.525	4.76	0.4	3.81	0.05~0.25	0.30~2.00		
TNGN For medium cutting	TNGN	110302																10.47	6.35	3.18	0.2	2.4	0.05~0.25	0.20~2.50	CTFNR/L CTGNR/L	B91
		110304																10.0	6.35	3.18	0.4	2.4	0.10~0.30	0.50~2.50		
		110308																9.0	6.35	3.18	0.8	2.4	0.10~0.30	0.80~2.50		
		160302																16.0	9.52	3.18	0.2	3.81	0.05~0.30	0.20~3.00		
		160304																15.5	9.52	3.18	0.4	3.81	0.10~0.30	0.50~4.00		
		160308																14.5	9.52	3.18	0.8	3.81	0.10~0.40	0.80~4.00		
		160404																15.5	9.52	4.76	0.4	3.81	0.10~0.40	0.50~4.00		
		160408																14.5	9.52	4.76	0.8	3.81	0.10~0.40	1.00~4.00		
		160412																13.5	9.52	4.76	1.2	3.81	0.10~0.50	1.50~4.50		
		220404																21.0	12.7	4.76	0.4	5.16	0.10~0.35	1.00~4.00		
		220408																20.0	12.7	4.76	0.8	5.16	0.15~0.40	1.50~5.00		
		220412																19.0	12.7	4.76	1.2	5.16	0.20~0.50	1.50~5.00		
		220416																18.2	12.7	4.76	1.6	5.16	0.20~0.55	1.50~5.00		
		220424																17.4	12.7	4.76	2.4	5.16	0.30~0.65	2.00~5.00		
		270630																19.7	15.88	6.35	3.0	6.35	0.35~0.70	2.00~5.00		
TNMA For roughing	TNMA	110308																9.0	6.35	3.18	0.8	2.4	0.05~0.30	0.50~3.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		160404																15.5	9.525	4.76	0.4	3.81	0.10~0.30	1.00~4.00		
		160408																14.5	9.52	4.76	0.8	3.81	0.10~0.40	1.00~4.00		
		160412																13.5	9.52	4.76	1.2	3.81	0.10~0.50	1.50~4.50		
	New	160416																12.5	9.52	4.76	1.6	3.81	0.15~0.55	1.50~4.50		
		220404																21.0	12.7	4.76	0.4	5.16	0.10~0.35	1.00~4.00		
		220408																20.0	12.7	4.76	0.8	5.16	0.15~0.40	1.50~5.00		
		220412																19.0	12.7	4.76	1.2	5.16	0.20~0.50	1.50~5.00		
		220416																18.2	12.7	4.76	1.6	5.16	0.25~0.55	1.50~5.00		
		220420																16.8	12.7	4.76	2.0	5.16	0.30~0.65	2.00~5.00		
		220432																16.5	12.7	4.76	3.2	5.16	0.35~0.70	2.00~5.00		
	New	270608																25.4	15.88	6.35	0.8	6.35	0.20~0.45	2.00~7.00		
	New	270612																24.37	15.88	6.35	1.2	6.35	0.25~0.55	3.00~7.00		
	New	270616																23.34	15.88	6.35	1.6	6.35	0.30~0.65	3.00~7.00		
	New	330924																27.1	19.05	9.52	2.4	7.93	0.35~0.75	3.00~9.00		

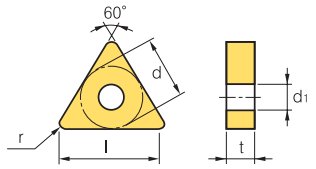
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

TN○○ Triangular 60° 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		Coated										Cermet			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC6110	NC6010	NC315K	CN1000	CN2000	CN20	H01	G10	l	d	t	r	d1	fn	ap		
TNMG-B25	TNMG	110308-B25			○													9.0	6.35	3.18	0.8	2.4	0.17~0.40	1.50~3.00	MTENNS	B73
		160304-B25																15.5	9.52	3.18	0.4	3.81	0.17~0.45	2.00~3.50	MTFNR/L	B74
		160308-B25				●											●	14.5	9.52	3.18	0.8	3.81	0.17~0.55	2.00~3.50	MTGNR/L	B80
		160312-B25																13.5	9.52	3.18	1.2	3.81	0.25~0.55	2.00~3.50	MTJNR/L	B81
		160316-B25																12.5	9.52	3.18	1.6	3.81	0.30~0.60	2.50~3.00	PTFNR/L	B89
		160404-B25	●	●	●	●			○		●			●				15.5	9.52	4.76	0.4	3.81	0.17~0.45	2.00~3.50	PTGNR/L	B98
		160408-B25	●	●	●	●			○	●	●			●				14.5	9.52	4.76	0.8	3.81	0.17~0.55	2.00~3.50	PTTNR/L	B100
		160412-B25			○	●												13.5	9.52	4.76	1.2	3.81	0.25~0.55	2.00~3.50	WTENN	
		160416-B25																12.5	9.52	4.76	1.6	3.81	0.30~0.60	2.50~3.00	WTJNR/L	
		220404-B25	●	●	●	●			○									21.0	12.7	4.76	0.4	5.16	0.17~0.45	1.50~5.00	WTXNR/L	
		220408-B25	●	●	●	●	●		○		●							20.0	12.7	4.76	0.8	5.16	0.17~0.55	2.00~5.00		
		220412-B25			○	●					○							19.0	12.7	4.76	1.2	5.16	0.25~0.55	2.00~5.00		
		220416-B25		●	●	●												18.2	12.7	4.76	1.6	5.16	0.30~0.60	2.00~5.00		
		220424-B25																17.2	12.7	4.76	2.4	5.16	0.35~0.70	3.00~7.00		
	New	220432-B25																16.5	12.7	4.76	3.2	5.16	0.40~0.75	3.50~7.00		
		270608-B25		●	●	●												25.5	15.88	6.35	0.8	6.35	0.17~0.55	2.00~5.00		
		270612-B25	●	●	●	●												24.5	15.88	6.35	1.2	6.35	0.25~0.55	3.00~7.00		
		270616-B25	●															23.5	15.88	6.35	1.6	6.35	0.30~0.60	3.00~7.00		
		330716-B25	●	●	●													29.0	19.05	7.94	1.6	7.93	0.35~0.70	3.00~9.00		
		330924-B25																27.1	19.05	9.52	2.4	7.93	0.40~0.80	3.00~9.00		
TNMG-GM	TNMG	160304-GM																15.5	9.52	3.18	0.4	3.81	0.05~0.30	0.80~5.00	MTENNS	B73
		160404-GM	●	●	●	●								●		●		15.5	9.52	4.76	0.4	3.81	0.05~0.30	0.80~5.00	MTFNR/L	B74
		160408-GM	●	●	●	●								●	●	●		14.5	9.52	4.76	0.8	3.81	0.10~0.50	1.00~5.00	MTGNR/L	B80
		160412-GM																13.5	9.52	4.76	1.2	3.81	0.13~0.60	1.30~5.00	MTJNR/L	B81
		220404-GM		●	●	●												21.0	12.7	4.76	0.4	5.16	0.05~0.30	0.90~6.30	PTFNR/L	B89
		220408-GM	●	●	●	●												20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.60	PTGNR/L	B98
		220412-GM		●	●	●												19.0	12.7	4.76	1.2	5.16	0.13~0.60	1.30~6.60	PTTNR/L	B100
TNMG-GR	TNMG	160408-GR	●	●	●	●					●	●	●					14.5	9.52	4.76	0.8	3.81	0.20~0.50	1.00~7.00	WTENN	
		160412-GR		●	●							●						13.5	9.52	4.76	1.2	3.81	0.23~0.54	1.20~8.00	WTJNR/L	
		220408-GR		●	●	●					●	●						20.0	12.7	4.76	0.8	5.16	0.22~0.61	1.10~7.80	WTXNR/L	
		220412-GR		●	●	●	●					●						19.0	12.7	4.76	1.2	5.16	0.28~0.78	1.20~7.80		
		220416-GR				●												18.2	12.7	4.76	1.6	5.16	0.31~0.75	1.50~7.80		
		270608-GR				●												25.5	15.88	6.35	0.8	6.35	0.31~0.75	1.50~7.80		
		270612-GR		●	●	●												24.5	15.88	6.35	1.2	6.35	0.31~0.75	1.50~7.80		
		270616-GR				●												23.5	15.88	6.35	1.6	6.35	0.36~1.00	1.60~7.80		
		330924-GR				●												27.1	19.05	9.52	2.4	7.93	0.40~1.00	2.00~9.00		
TNMG-GS	TNMG	160404-GS							●	●								15.5	9.52	4.76	0.4	3.81	0.05~0.35	1.00~4.50	MTENNS	B73
		160408-GS							●	●								14.5	9.52	4.76	0.8	3.81	0.10~0.50	1.00~5.00	MTFNR/L	B74
	New	160412-GS																13.5	9.52	4.76	1.2	3.81	0.13~0.65	1.00~5.00	MTGNR/L	B80
		220408-GS																20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.80	MTJNR/L	B81
																									PTFNR/L	B89
																									PTGNR/L	B98
																									PTTNR/L	B100
																									WTENN	
																									WTJNR/L	
																									WTXNR/L	
TNMG-HA	TNMG	160404-HA		●	●			●	●	●							●	15.5	9.52	4.76	0.4	3.81	0.05~0.30	0.80~3.50	MTENNS	B73
		160408-HA		●	●			●	●	●							●	14.5	9.52	4.76	0.8	3.81	0.10~0.40	0.80~3.50	MTFNR/L	B74
		160412-HA																13.5	9.52	4.76	1.2	3.81	0.13~0.55	0.80~3.50	MTGNR/L	B80
		220408-HA								●								20.0	12.7	4.76	0.8	5.16	0.10~0.40	0.80~5.30	MTJNR/L	B81
																									PTFNR/L	B89
																									PTGNR/L	B98
																									PTTNR/L	B100
																									WTENN	
																									WTJNR/L	
																									WTXNR/L	
TNMG-HC	TNMG	160404-HC	●	●	●													15.5	9.52	4.76	0.4	3.81	0.05~0.35	0.50~3.50	MTENNS	B73
		160408-HC	●	●	●	●												14.5	9.52	4.76	0.8	3.81	0.08~0.40	0.80~4.00	MTFNR/L	B74
		160412-HC																13.5	9.52	4.76	1.2	3.81	0.13~0.50	0.90~4.00	MTGNR/L	B80
		220408-HC	●	●	●													20.0	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00	MTJNR/L	B81
																									PTFNR/L	B89
																									PTGNR/L	B98
																									PTTNR/L	B100
																									WTENN	
																									WTJNR/L	
																									WTXNR/L	

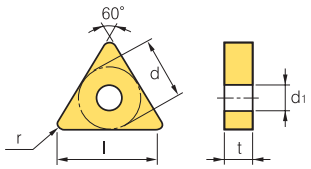
For medium to roughing
For medium cutting
For roughing
For medium to finishing
For medium to finishing
For medium to finishing

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜
Note)TNMG-HA(H01) has smooth chip control due to buffed on top surface

TN○○ Triangular 60° 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



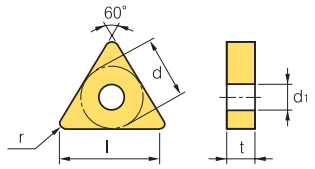
Inserts	Designation		Coated									Cermet			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC6110	CN1000	CN2000	CN20	H01	G10	l	d	t	r	d1	fn	ap		
TNMG-HR	TNMG	160408-HR	●		●												14.5	9.52	4.76	0.8	3.81	0.20~0.50	1.00~7.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
For roughing		160412-HR		●	●												13.5	9.52	4.76	1.2	3.81	0.25~0.60	1.30~7.00		
		220404-HR															21.0	12.7	4.76	0.4	5.16	0.20~0.45	1.00~7.50		
		220408-HR	●	●	●												20.0	12.7	4.76	0.8	5.16	0.20~0.50	1.00~8.00		
		220412-HR	●				●										19.0	12.7	4.76	1.2	5.16	0.25~0.60	1.30~8.00		
		220416-HR		●	●												18.2	12.7	4.76	1.6	5.16	0.32~0.70	1.80~8.00		
		270608-HR															25.5	15.88	6.35	0.8	6.35	0.35~0.50	1.80~13.00		
		270612-HR		●													24.5	15.88	6.35	1.2	6.35	0.35~0.70	2.30~13.00		
		270632-HR															19.2	15.88	6.35	3.2	6.35	0.40~0.90	3.00~13.00		
		330716-HR															29.0	19.05	7.94	1.6	7.93	0.40~0.70	1.80~9.00		
		330924-HR															27.1	19.05	9.52	2.4	7.93	0.45~0.90	3.30~16.00		
TNMG-HS	TNMG	160404-HS						●	●	●							15.5	9.52	4.76	0.4	3.81	0.08~0.35	0.50~4.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
For medium to finishing		160408-HS						●	●	●							14.5	9.52	4.76	0.8	3.81	0.10~0.40	1.00~4.50		
		160412-HS								●							13.5	9.52	4.76	1.2	3.81	0.13~0.55	1.00~4.50		
		220408-HS						●	●	●							20.0	12.7	4.76	0.8	5.16	0.10~0.40	1.00~6.30		
		220412-HS								●							19.0	12.7	4.76	1.2	5.16	0.13~0.55	1.00~6.30		
TNMG-HU	TNMG	160404-HU															15.5	9.52	4.76	0.4	3.81	0.05~0.25	0.10~1.50	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
For ultra finishing		160408-HU															14.5	9.52	4.76	0.8	3.81	0.10~0.30	0.20~1.50		
TNMG-LW	TNMG	160408-LW	○		○												14.5	9.52	4.76	0.8	3.81	0.15~0.50	0.70~4.50	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
New		160412-LW	○		○												13.5	9.52	4.76	1.2	3.81	0.20~0.60	1.00~5.00		
For wiper medium cutting																									
TNMG-VF	TNMG	110304-VF			●												10.0	6.35	3.18	0.4	2.4	0.05~0.20	0.20~1.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
For finishing		160404-VF			●												15.5	9.52	4.76	0.4	3.81	0.07~0.30	0.50~1.50		
		160408-VF	●		●												14.5	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
		160412-VF			●												13.5	9.52	4.76	1.2	3.81	0.15~0.50	0.50~1.50		
		220404-VF			●												21.0	12.7	4.76	0.4	5.16	0.10~0.40	0.50~1.50		
		220408-VF			●												20.0	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
TNMG-VG	TNMG	110304-VG										●	●				10.0	6.35	3.18	0.4	2.4	0.05~0.20	0.20~1.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
New		160404-VG										●	●				15.5	9.52	4.76	0.4	3.81	0.07~0.30	0.50~1.50		
For finishing		160408-VG										●	●				14.5	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
		220404-VG										●	●				21.0	12.7	4.76	0.4	5.16	0.10~0.40	0.50~1.50		
TNMG-VM	TNMG	110308-VM							○		○						9.0	6.35	3.18	0.8	2.4	0.05~0.30	0.80~4.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
New		160404-VM	●		●	●			○		●		●				15.5	9.52	4.76	0.4	3.81	0.05~0.30	0.90~5.00		
For medium cutting		160408-VM	●		●					●	●		●				14.5	9.52	4.76	0.8	3.81	0.10~0.50	1.00~5.00		
		160412-VM			●	●			○				●				13.5	9.52	4.76	1.2	3.81	0.13~0.60	1.30~5.00		
		220404-VM			○				○								21.0	12.7	4.76	0.4	5.16	0.05~0.30	0.90~6.60		
		220408-VM			○												20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.60		
		220412-VM			○												19.0	12.7	4.76	1.2	5.16	0.13~0.60	1.30~6.60		

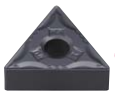
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = mm/rev Depth of cut(ap) = mm

TN○○ Triangular 60° 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		Coated									Cermet				Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	NC315K	CN1000	CN2000	CN20	CC115	H01	G10	l	d	t	r	d1	fn	ap		
TNMG-VQ New	TNMG	110304-VQ										●	●					10.0	6.35	3.18	0.4	2.4	0.05~0.30	0.50~3.50	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		160404-VQ										●	●		●			15.5	9.52	4.76	0.4	3.81	0.05~0.35	0.50~3.50		
		160408-VQ										●	●		●			14.5	9.52	4.76	0.8	3.81	0.08~0.40	0.80~4.00		
		220404-VQ										●	●					21.0	12.7	4.76	0.4	5.16	0.05~0.35	0.50~4.00		
For medium to finishing																										
TNMG-VW  New	TNMG	160404-VW								●								15.5	9.52	4.76	0.4	3.81	0.10~0.35	0.30~3.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		160408-VW								●								14.5	9.52	4.76	0.8	3.81	0.10~0.40	0.30~3.00		
For wiper finishing																										
TNMM-GH	TNMM	160408-GH				●												14.5	9.52	4.76	0.8	3.81	0.20~0.50	1.00~7.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		220408-GH																20.0	12.7	4.76	0.8	5.16	0.25~0.60	1.30~7.00		
		220412-GH		●	●	●												19.0	12.7	4.76	1.2	5.16	0.20~0.50	1.00~8.00		
		220416-GH			●	●												18.2	12.7	4.76	1.6	5.16	0.25~0.60	1.30~8.00		
		270616-GH																23.34	15.88	6.35	1.6	6.35	0.32~0.70	1.80~8.00		
		270624-GH																21.26	15.88	6.35	2.4	6.35	0.35~0.50	1.80~13.00		
For heavy		330924-GH																27.1	19.05	9.52	2.4	7.93	0.35~0.70	2.30~13.00		
TNMM-GM	TNMM	160412-GM																13.5	9.52	4.76	1.2	3.81	0.13~0.60	1.30~5.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		220408-GM																20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.00~6.60		
		220412-GM																19.0	12.7	4.76	1.2	5.16	0.13~0.60	1.30~6.60		
		220416-GM																18.2	12.7	4.76	1.6	5.16	0.15~0.65	1.50~7.00		
For medium cutting																										
TNMM-GR	TNMM	220408-GR																20.0	12.7	4.76	0.8	5.16	0.22~0.61	1.10~7.80	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		220412-GR																19.0	12.7	4.76	1.2	5.16	0.28~0.78	1.20~7.80		
		220416-GR																18.2	12.7	4.76	1.6	5.16	0.31~0.75	1.50~7.80		
For roughing																										
TNMN	TNMN	160408																14.5	9.52	4.76	0.8	3.81	0.10~0.30	1.00~4.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B91
		220408																20.0	12.7	4.76	0.8	5.16	0.15~0.40	1.50~5.00		
		220412																19.0	12.7	4.76	1.2	5.16	0.20~0.50	1.50~5.00		
For medium to roughing																										
TNMX	TNMX	160402R											●					16.5	9.52	4.76	0.2	3.81	0.10~0.30	0.50~3.00	MTENNS MTFNR/L MTGNR/L MTJNR/L PTFNR/L PTGNR/L PTTNR/L WTENN WTJNR/L WTXNR/L	B73 B74 B80 B81 B89 B98 B100
		160404R		●	●	●						●	●	●				15.5	9.52	4.76	0.4	3.81	0.12~0.30	1.00~3.50		
		160408R		●	●	●						●	●	●				14.5	9.52	4.76	0.8	3.81	0.15~0.35	1.30~3.40		
		220404R		●	●									●				21.0	12.7	4.76	0.4	5.16	0.12~0.30	1.00~5.00		
		220408R																20.0	12.7	4.76	0.8	5.16	0.15~0.35	1.30~5.00		
		160404L		●	●								●					15.5	9.52	4.76	0.4	3.81	0.12~0.30	1.00~3.50		
		160408L		●	●	●												14.5	9.52	4.76	0.8	3.81	0.15~0.35	1.30~3.40		
For medium to roughing																										

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19

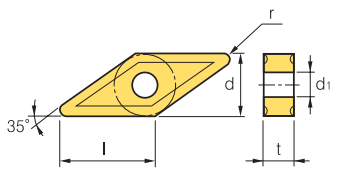
● : Stock item ○ : Under preparing for stock

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

VN○○ Rhombic 35° Negative

Workpiece			NC3010	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	CN1000	CT10	CN2000	CC115	H01	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		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders	Page
VNGG-HA For medium to finishing	VNGG	160408-HA	14.6	9.52	4.76	0.8	3.81	0.10~0.40	0.80~3.50	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
VNMG-GM For medium cutting	VNMG	160404-GM	15.6	9.52	4.76	0.4	3.81	0.08~0.45	0.50~3.50	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160408-GM	14.6	9.52	4.76	0.8	3.81	0.10~0.50	1.00~4.00		
VNMG-HA New For medium to finishing	VNMG	160404-HA	15.6	9.52	4.76	0.4	3.81	0.08~0.35	0.50~3.00	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160408-HA	14.6	9.52	4.76	0.8	3.81	0.10~0.40	0.80~3.50		
VNMG-HR New For roughing	VNMG	160408-HR	14.6	9.52	4.76	0.8	3.81	0.10~0.50	1.00~4.00	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
VNMG-HS For medium to finishing	VNMG	160404-HS	15.6	9.52	4.76	0.4	3.81	0.08~0.35	0.50~4.00	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160408-HS	14.6	9.52	4.76	0.8	3.81	0.10~0.40	1.00~4.50		
VNMG-VF For finishing	VNMG	160402-VF	16.1	9.52	4.76	0.2	3.81	0.06~0.20	0.30~1.00	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160404-VF	15.6	9.52	4.76	0.4	3.81	0.08~0.30	0.50~1.50		
		160408-VF	14.6	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
VNMG-VG New For finishing	VNMG	160404-VG	15.6	9.52	4.76	0.4	3.81	0.08~0.30	0.50~1.50	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160408-VG	14.6	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
VNMG-VM New For medium cutting	VNMG	160404-VM	15.6	9.52	4.76	0.4	3.81	0.08~0.45	0.50~3.50	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160408-VM	14.6	9.52	4.76	0.8	3.81	0.10~0.50	1.00~4.00		
		160412-VM	13.6	9.52	4.76	1.2	3.81	0.20~0.50	1.50~4.00		
		220404-VM	21.1	12.7	4.76	0.4	5.16	0.08~0.45	1.00~5.00		
		220408-VM	20.0	12.7	4.76	0.8	5.16	0.10~0.50	1.50~5.00		
VNMG-VQ New For medium to finishing	VNMG	160404-VQ	15.6	9.52	4.76	0.4	3.81	0.10~0.40	0.50~3.50	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160408-VQ	14.6	9.52	4.76	0.8	3.81	0.12~0.45	0.50~3.50		
VNMP For roughing	VNMP	160404	15.6	9.52	4.76	0.4	3.81	0.08~0.30	0.50~1.50	MVJNR/L MVQNR/L MVVNN MVUNR/L	B74 B75 B98
		160408	14.6	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

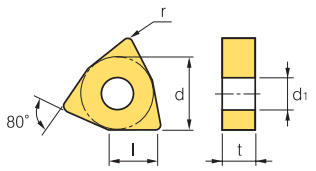
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

Note)VNMG-HA(H01) has smooth chip control due to buffed on top surface

WN○○ Trigon 80° 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		Coated										Cermet		Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC305K	NC6110	NC6010	NC315K	CT10	CN20	H01	G10	l	d	t	r	d1	fn	ap		
WNMA	WNMA	060404															6.2	9.52	4.76	0.4	3.81	0.10~0.30	0.50~3.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408									●	●					6.1	9.52	4.76	0.8	3.81	0.10~0.30	0.50~3.00		
		New 060412															6.0	9.52	4.76	1.2	3.81	0.10~0.40	1.00~3.00		
		New 080404															8.4	12.7	4.76	0.4	5.16	0.15~0.60	1.00~5.00		
		080408	●							●	●	●	●				8.3	12.7	4.76	0.8	5.16	0.15~0.60	1.00~6.00		
For roughing		080412									●	●					8.2	12.7	4.76	1.2	5.16	0.15~0.70	1.50~6.00		
WNMG-B25	WNMG	080404-B25									○	●					8.4	12.7	4.76	0.4	5.16	0.17~0.45	1.00~5.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		080408-B25	●	●	●	●		○			●	●					8.3	12.7	4.76	0.8	5.16	0.23~0.60	1.50~5.00		
		080412-B25									●						8.2	12.7	4.76	1.2	5.16	0.25~0.60	2.00~5.00		
For medium to roughing																									
WNMG-GM	WNMG	060404-GM	●	●	●	●											6.2	9.52	4.76	0.4	3.81	0.05~0.30	0.90~3.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408-GM	●	●	●	●											6.1	9.52	4.76	0.8	3.81	0.10~0.45	1.00~3.50		
		080404-GM		●	●	●											8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00		
		080408-GM	●	●	●	●											8.3	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
For medium cutting		080412-GM	●	●	●												8.2	12.7	4.76	1.2	5.16	0.18~0.60	0.30~5.00		
WNMG-GR	WNMG	New 080404-GR															0.4	12.7	4.76	0.4	5.16	0.15~0.50	0.08~6.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		080408-GR	●	●	●	●				●	●	●	●				8.3	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00		
		080412-GR	●	●	●	●					●	●	●				8.2	12.7	4.76	1.2	5.16	0.25~0.50	1.30~7.00		
For roughing		080416-GR	●														8.1	12.7	4.76	1.6	5.16	0.25~0.60	1.80~6.00		
WNMG-GS	WNMG	060404-GS						●									6.2	9.52	4.76	0.4	3.81	0.05~0.25	0.10~3.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408-GS						●									6.1	9.52	4.76	0.8	3.81	0.10~0.50	1.00~4.00		
		080404-GS		●	●			●	●								8.4	12.7	4.76	0.4	5.16	0.05~0.25	0.10~3.00		
		080408-GS		●	●			●	●								8.3	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
For medium to finishing		080412-GS						●									8.2	12.7	4.76	1.2	5.16	0.13~0.65	1.00~5.00		
WNMG-HA	WNMG	060404-HA					●		●							●	6.2	9.52	4.76	0.4	3.81	0.05~0.30	0.10~3.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408-HA					●		●							●	6.1	9.52	4.76	0.8	3.81	0.10~0.40	0.80~3.50		
		080404-HA		●	●		●	●	●							●	8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~3.50		
		080408-HA		●	●		●	●	●							●	8.3	12.7	4.76	0.8	5.16	0.10~0.40	0.80~3.50		
For medium to finishing		080412-HA															8.2	12.7	4.76	1.2	5.16	0.13~0.55	0.80~3.50		
WNMG-HC	WNMG	060404-HC	●														6.2	9.52	4.76	0.4	3.81	0.05~0.30	0.80~4.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		080404-HC															8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.80~4.00		
		080408-HC	●	●	●	●											8.3	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		
For medium to finishing																									
WNMG-HR	WNMG	060408-HR															6.1	9.52	4.76	0.8	3.81	0.20~0.40	1.00~5.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060412-HR															6.0	9.52	4.76	1.2	3.81	0.25~0.50	1.10~5.50		
		080408-HR	●	●	●	●											8.3	12.7	4.76	0.8	5.16	0.20~0.50	1.00~7.00		
		080412-HR	●	●	●	●											8.2	12.7	4.76	1.2	5.16	0.25~0.65	1.30~7.00		
For roughing		080416-HR															8.1	12.7	4.76	1.6	5.16	0.32~0.70	1.80~7.00		
WNMG-HS	WNMG	060404-HS					●	●	●								6.2	9.52	4.76	0.4	3.81	0.05~0.20	1.00~2.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408-HS					●	●	●								6.1	9.52	4.76	0.8	3.81	0.10~0.20	1.00~2.50		
		060412-HS						●	●								6.0	9.52	4.76	1.2	3.81	0.10~0.30	1.00~3.50		
		080404-HS					●	●	●								8.4	12.7	4.76	0.4	5.16	0.05~0.30	1.00~4.50		
		080408-HS					●	●	●								8.3	12.7	4.76	0.8	5.16	0.10~0.40	1.00~4.50		
For medium to finishing		080412-HS							●								8.2	12.7	4.76	1.2	5.16	0.13~0.55	1.00~4.50		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19

● : Stock item ○ : Under preparing for stock

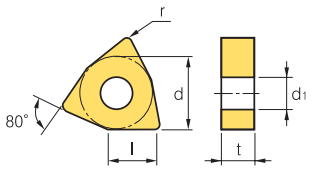
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

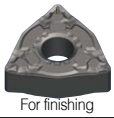
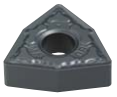
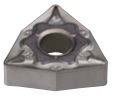
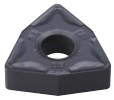
Note)WNMG-HA(H01) has smooth chip control due to buffed on top surface

WN○○ Trigon 80° 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		Coated									Cermet		Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3120	NC3030	NC5500H	PC8010	NC9020	PC9030	NC3305K	NC6110	NC315K	CN1000	CN2000	U20	H01	G10	l	d	t	r	d1	fn	ap		
WNMG-HU For ultra finishing	WNMG	080404-HU																8.4	12.7	4.76	0.4	5.16	0.10~0.30	0.20~1.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		080408-HU																8.3	12.7	4.76	0.8	5.16	0.10~0.30	0.50~1.50		
		080412-HU																8.2	12.7	4.76	1.2	5.16	0.10~0.35	0.80~1.50		
WNMG-LW New For Wiper medium cutting	WNMG	060408-LW	○	○							○							6.1	9.52	4.76	0.8	3.81	0.15~0.60	0.50~3.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060412-LW																6.0	9.52	4.76	1.2	3.81	0.20~0.70	0.80~3.50		
		080408-LW	●	●							○							8.3	12.7	4.76	0.8	5.16	0.15~0.60	1.00~5.00		
		080412-LW		○	○						○							8.2	12.7	4.76	1.2	5.16	0.20~0.70	1.00~6.00		
WNMG-VF For finishing	WNMG	060404-VF	●	●														6.1	9.52	4.76	0.4	3.81	0.07~0.30	0.50~1.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408-VF	●	●														6.1	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
		080404-VF	●	●														8.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		080408-VF		●														8.3	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
WNMG-VG  New For finishing	WNMG	060404-VG											●	●				6.2	9.52	4.76	0.4	3.81	0.07~0.30	0.50~1.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408-VG											●	●				6.1	9.52	4.76	0.8	3.81	0.10~0.40	0.50~1.50		
		080404-VG											●	●				8.4	12.7	4.76	0.4	5.16	0.07~0.30	0.50~1.50		
		080408-VG											●	●				8.3	12.7	4.76	0.8	5.16	0.10~0.40	0.50~1.50		
WNMG-VM  New For medium cutting	WNMG	060402-VM																6.47	9.525	4.76	0.2	3.81	0.05~0.30	0.90~3.50	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060404-VM		○										●				6.2	9.52	4.76	0.4	3.81	0.10~0.45	1.00~3.50		
		060408-VM	○	○							○			●				6.1	9.52	4.76	0.8	3.81	0.10~0.50	1.00~4.00		
		060412-VM		○														6.0	9.52	4.76	1.2	3.81	0.13~0.60	1.30~4.00		
		080404-VM	○	○										●				8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.90~5.00		
		080408-VM	●	●	●		●	●	●		●			●				8.3	12.7	4.76	0.8	5.16	0.10~0.50	1.00~5.00		
		080412-VM		●	●						●			●				8.2	12.7	4.76	1.2	5.16	0.10~0.50	1.00~5.00		
WNMG-VQ  New For medium to finishing	WNMG	060404-VQ											●	●				6.2	9.52	4.76	0.4	3.81	0.05~0.30	0.50~4.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		060408-VQ											●	●				6.1	9.52	4.76	0.8	3.81	0.08~0.30	0.80~4.00		
		080404-VQ											●	●				8.4	12.7	4.76	0.4	5.16	0.05~0.30	0.50~4.00		
		080408-VQ											●	●				8.3	12.7	4.76	0.8	5.16	0.08~0.40	0.80~4.00		
WNMG-VW  New For finishing	WNMG	080404-VW	●	●							○							8.4	12.7	4.76	0.4	5.16	0.10~0.30	0.50~3.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		080408-VW	●	●							○							8.3	12.7	4.76	0.8	5.16	0.15~0.50	0.50~4.00		
WNMM-B25 For medium to roughing	WNMM	100608-B25			●													10.0	15.88	6.35	0.8	6.35	0.30~0.80	3.00~8.00	MWLNR/L PWLNR/L WWLNR/L	B75 B81 B89 B98 B100
		130612-B25																12.0	19.05	6.35	1.2	7.93	0.40~0.90	4.00~10.00		

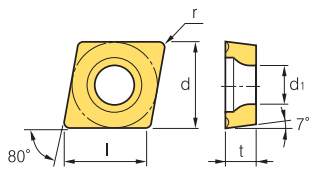
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

CC○○ Rhombic 80° 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		Coated										Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	CT10	CN2000	CN20	U20	H01	G10	l	d	t	r	d1	fn	ap		
CCET	CCET	0301005R																	3.6	3.5	1.39	0.05	1.9	0.01~0.05	0.10~0.30	SCLCR/L (Boring bar)	B107
		030101R																	3.5	3.5	1.39	0.1	1.9	0.01~0.05	0.10~0.30		
		030102R																	3.3	3.5	1.39	0.2	1.9	0.01~0.05	0.10~0.30		
		030104R																	3.1	3.5	1.39	0.4	1.9	0.01~0.05	0.10~0.30		
		0401005R																	4.3	4.3	1.79	0.05	2.3	0.01~0.10	0.10~0.50		
		040101R																	4.2	4.3	1.79	0.1	2.3	0.01~0.10	0.10~0.50		
		040102R																	4.1	4.3	1.79	0.2	2.3	0.01~0.10	0.10~0.50		
		040104R																	3.9	4.3	1.79	0.4	2.3	0.01~0.10	0.10~0.50		
		0301005L																	3.6	3.5	1.39	0.05	1.9	0.01~0.05	0.10~0.30	SCLCR/L (Boring bar)	B107
		030101L	○						○				○				○		3.5	3.5	1.39	0.1	1.9	0.01~0.05	0.10~0.30		
		030102L	○						●				●				●		3.3	3.5	1.39	0.2	1.9	0.01~0.05	0.10~0.30		
		030104L	○						○				○				○		3.1	3.5	1.39	0.4	1.9	0.01~0.05	0.10~0.30		
		0401005L																	4.3	4.3	1.79	0.05	2.3	0.01~0.10	0.10~0.50		
		040101L																	4.2	4.3	1.79	0.1	2.3	0.01~0.10	0.10~0.50		
		040102L	○						●				●				●		4.1	4.3	1.79	0.2	2.3	0.01~0.10	0.10~0.50		
		040104L	○						○				○				○		3.9	4.3	1.79	0.4	2.3	0.01~0.10	0.10~0.50		
CCGT-C05	CCGT	060202-C05																	6.2	6.35	2.38	0.2	2.8	0.06~0.11	0.06~1.70	SCACR/L SCLCR/L	B82 B101
		060204-C05																	6.0	6.35	2.38	0.4	2.8	0.08~0.17	0.10~1.70		
		09T304-C05												●					9.2	9.525	3.97	0.4	4.4	0.11~0.23	0.10~2.00		
		09T308-C05																	8.8	9.525	3.97	0.8	4.4	0.08~0.30	0.20~2.00		
		120404-C05																	12.4	12.7	4.76	0.4	5.5	0.07~0.27	0.10~2.70		
		120408-C05																	12.0	12.7	4.76	0.8	5.5	0.08~0.30	0.20~2.70		
CCGT-HFP	CCGT	060202-HFP		●	●														6.2	6.35	2.38	0.2	2.8	0.03~0.06	0.06~1.20	SCACR/L SCLCR/L	B82 B101
		060204-HFP		●	●														6.0	6.35	2.38	0.4	2.8	0.05~0.12	0.10~1.20		
		060208-HFP																	5.6	6.35	2.38	0.8	2.8	0.05~0.12	0.12~1.40		
		09T302-HFP		●	●														9.4	9.525	3.97	0.2	4.4	0.04~0.16	0.08~1.50		
		09T304-HFP		●	●	●			●										9.2	9.525	3.97	0.4	4.4	0.06~0.18	0.10~1.50		
		09T308-HFP		●	●														8.8	9.525	3.97	0.8	4.4	0.08~0.25	0.20~1.50		
		120404-HFP																	12.4	12.7	4.76	0.4	5.5	0.06~0.20	0.10~2.00		
		120408-HFP																	12.0	12.7	4.76	0.8	5.5	0.10~0.25	0.20~2.00		
CCGT-KF New	CCGT	0602003R-KF																	6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SCACR/L SCLCR/L	B117
		060201R-KF							○				○						6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		060202R-KF							○				○						6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70		
		09T3003R-KF																	9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50		
		09T301R-KF							○				○						9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		09T302R-KF							○				○						9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
For finishing (Auto Tool)		0602003L-KF																	6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SCACR/L SCLCR/L	B117
		060201L-KF							○				○						6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		060202L-KF							○				○						6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70		
		09T3003L-KF																	9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50		
		09T301L-KF							○				○						9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		09T302L-KF							○				○						9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
CCGT-KM New	CCGT	0602003R-KM																	6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SCACR/L SCLCR/L	B117
		060201R-KM																	6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		060202R-KM							○				○						6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70		
		09T3003R-KM																	9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.06~1.50		
		09T301R-KM																	9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		09T302R-KM							○				○						9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
For medium to finishing (Auto Tool)		0602003L-KM																	6.5	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SCACR/L SCLCR/L	B117
		060201L-KM																	6.5	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		060202L-KM							○				○						6.5	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.70		
		09T3003L-KM																	9.7	9.525	3.97	0.03	4.4	0.02~0.08	0.06~1.50		
		09T301L-KM																	9.7	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		09T302L-KM							○				○						9.7	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

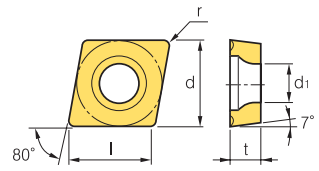
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

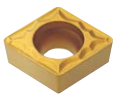
CC○○ Rhombic 80° Positive

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	Coated: NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC305K	NC6110	NC6010	NC315K	Cermet: CN1000	CT10	CN2000	CN20	Uncoated: H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders	Page
CCMT-C25 For medium cutting	CCMT 060202-C25		●	●	●								●		●	●			6.2	6.35	2.38	0.2	2.8	0.03~0.12	0.40~2.00	SCACR/L SCLCR/L	B82 B101
	060204-C25	●	●	●	●	○		●		●			●		●	●			6.0	6.35	2.38	0.4	2.8	0.05~0.15	0.60~2.30		
	060208-C25		●	●	●					●									5.6	6.35	2.38	0.8	2.8	0.07~0.20	0.80~2.30		
	080308-C25		●	●															7.2	7.94	3.18	0.8	3.4	0.08~0.25	0.80~2.30		
	09T304-C25	●	●	●	●	○	●	●		●			●		●	●			9.2	9.525	3.97	0.4	4.4	0.08~0.25	0.80~3.00		
	09T308-C25	●	●	●	●	○	●	●		●	●		●	●	●	●			8.8	9.525	3.97	0.8	4.4	0.10~0.30	1.00~3.00		
	120404-C25	●	●	●	●								●		●				12.4	12.7	3.97	0.4	5.5	0.10~0.32	0.80~3.00		
	120408-C25	●	●	●	●					●									12.0	12.7	4.76	0.8	5.5	0.12~0.36	1.20~3.50		
	120412-C25		●	●															11.6	12.7	4.76	1.2	5.5	0.15~0.40	1.40~3.50		
CCMT-HFP For finishing	CCMT 060202-HFP			●															6.2	6.35	2.38	0.2	2.8	0.03~0.06	0.08~1.20	SCACR/L SCLCR/L	B82 B101
	060204-HFP	○		●		○	○												6.0	6.35	2.38	0.4	2.8	0.05~0.12	0.10~1.20		
	060208-HFP																		5.6	6.35	2.38	0.8	2.8	0.05~0.12	0.10~1.40		
	09T302-HFP	○		●															9.4	9.525	3.97	0.2	4.4	0.04~0.16	0.08~1.50		
	09T304-HFP	○		●	●	○	○												9.2	9.525	3.97	0.4	4.4	0.06~0.18	0.10~1.50		
	09T308-HFP	○		○		○	○												0.8	9.525	3.97	0.8	4.4	0.08~0.25	0.20~1.50		
	120404-HFP	○		●															2.4	12.7	4.76	0.4	5.5	0.07~0.22	0.10~2.00		
	120408-HFP	○		○						○									12.0	12.7	4.76	0.8	5.5	0.08~0.30	0.12~2.20		
CCMT-HMP  For medium cutting	CCMT 060202-HMP	●	●	●		●	●	●											6.2	6.35	2.38	0.2	2.8	0.03~0.12	0.10~1.50	SCACR/L SCLCR/L	B82 B101
	060204-HMP	●	●	●	●	●	●	●	●	●	●		●		●				6.0	6.35	2.38	0.4	2.8	0.06~0.17	0.20~2.40		
	060208-HMP	●	●	●	●		●	●			●								5.6	6.35	2.38	0.8	2.8	0.08~0.23	0.40~2.40		
	09T302-HMP	●	●	●		●	●	●					●		●				9.4	9.525	3.97	0.2	4.4	0.07~0.22	0.10~2.00		
	09T304-HMP	●	●	●	●	●	●	●		●	●	●	●		●				9.2	9.525	3.97	0.4	4.4	0.08~0.23	0.30~3.00		
	09T308-HMP	●	●	●	●	●	●	●	●	●	●	●	●		●				8.8	9.525	3.97	0.4	4.4	0.10~0.30	0.50~3.00		
	120404-HMP	●	●	●	●		●	●	●	●	●		●		●				12.4	12.7	4.76	0.4	5.5	0.09~0.27	0.30~3.60		
	120408-HMP	●	●	●			●	●	●	●	●	●							12.0	12.7	4.76	0.8	5.5	0.24~0.36	1.00~3.60		
	120412-HMP																		11.6	12.7	4.76	1.2	5.5	0.14~0.43	0.70~3.60		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

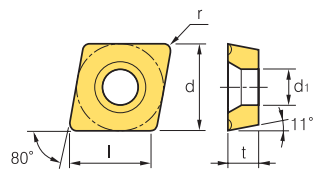
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

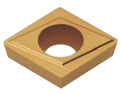
CP○○ Rhombic 80° Positive

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	Coated: NC3020	NC3120	NC3030	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	Cermet: CT10	CN2000	Uncoated: U20	H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders	Page
CPGT  For finishing	CPGT 080202											●					7.8	7.94	2.38	0.2	3.4	0.06~0.20	0.10~2.00	SCLPR/L (Boring bar)	B102
	080204											●					7.6	7.94	2.38	0.4	3.4	0.08~0.20	0.30~2.00		
	080208																7.2	7.94	2.38	0.8	3.4	0.10~0.25	0.50~2.00		
	090302																9.4	9.525	3.18	0.2	4.4	0.04~0.20	0.30~1.50		
	090304											●					9.2	9.525	3.18	0.4	4.4	0.06~0.25	0.50~2.00		
	090308																8.8	9.525	3.18	0.8	4.4	0.08~0.30	0.70~2.50		
CPGT-C05 For finishing	CPGT 080204-C05	●	●														7.6	7.94	2.38	0.4	3.4	0.02~0.15	0.50~1.70	SCLPR/L (Boring bar)	B102
	080208-C05	●	●														7.2	7.94	2.38	0.8	3.4	0.04~0.18	0.50~1.70		
	090304-C05	●	●														9.2	9.525	3.18	0.4	4.4	0.03~0.20	0.70~2.00		
	090305-C05	●	●									●					8.8	9.525	3.18	0.8	4.4	0.05~0.20	0.70~2.00		
CPGT-HMP For medium cutting	CPGT 090308-HMP																8.8	9.525	3.18	0.8	4.4	0.05~0.20	0.70~2.00	SCLPR/L (Boring bar)	B102

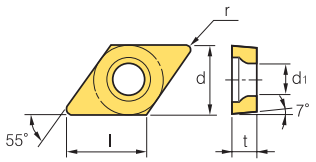
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

DC○○ Rhombic 55° 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		Coated										Cermet				Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC3005K	NC6110	NC6010	NC315K	CN1000	CT10	CN2000	CN20	H01	G10	l	d	t	r	d1	fn	ap		
DCGT-C05	DCGT	070202-C05																	7.5	6.35	2.38	0.2	0.8	0.06~0.11	0.06~1.50	SDACR/L SDJCR/L SDNCN SDQCR/L SDUCR/L SDZCR/L	B82 B83 B102 B103
		070204-C05																	7.3	6.35	2.38	0.4	0.8	0.05~0.17	0.08~1.50		
		11T302-C05																	11.4	9.52	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
		11T304-C05														●			11.2	9.52	3.97	0.4	4.4	0.06~0.23	0.10~2.00		
For finishing		11T308-C05																	10.8	9.52	3.97	0.8	4.4	0.08~0.30	0.20~2.00		
DCGT-HFP	DCGT	070202-HFP																	7.5	6.35	2.38	0.2	2.8	0.03~0.10	0.06~1.00	SDACR/L SDJCR/L SDNCN SDQCR/L SDUCR/L SDZCR/L	B82 B83 B102 B103
		070204-HFP		●	●														7.3	6.35	2.38	0.4	2.8	0.05~0.12	0.08~1.00		
		070208-HFP																	6.8	6.35	2.38	0.8	2.8	0.06~0.12	0.10~1.00		
	New	11T301-HFP																	11.51	9.525	3.97	0.1	4.4	0.03~0.13	0.06~1.00		
		11T302-HFP														●			11.4	9.52	3.97	0.2	4.4	0.04~0.15	0.08~1.50		
For finishing		11T304-HFP		●	●														11.2	9.52	3.97	0.4	4.4	0.06~0.20	0.10~1.50		
		11T308-HFP	●																10.8	9.52	3.97	0.8	4.4	0.08~0.25	0.20~1.50		
DCGT-KF	DCGT	0702003R-KF																	7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SDJCR/L SDNCN	B117 B118
		070201R-KF							○						○				7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		070202R-KF																	7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50		
		11T3003R-KF																	11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50		
	New	11T301R-KF							○						○				11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		11T302R-KF																	11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
For finishing (Auto Tool)		0702003L-KF																	7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SDJCR/L SDNCN	B117 B118
		070201L-KF							○						○				7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		070202L-KF																	7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50		
		11T3003L-KF																	11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50		
		11T301L-KF							○						○				11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		11T302L-KF																	11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
DCGT-KM	DCGT	0702003R-KM																	7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SDJCR/L SDNCN	B117 B118
		070201R-KM																	7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		070202R-KM							○						○				7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50		
		11T3003R-KM																	11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50		
	New	11T301R-KM																	11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		11T302R-KM							○						○				11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
For medium to finishing (Auto Tool)		0702003L-KM																	7.8	6.35	2.38	0.03	2.8	0.01~0.06	0.04~1.30	SDJCR/L SDNCN	B117 B118
		070201L-KM																	7.8	6.35	2.38	0.1	2.8	0.02~0.08	0.05~1.50		
		070202L-KM							○						○				7.8	6.35	2.38	0.2	2.8	0.03~0.11	0.06~1.50		
		11T3003L-KM																	11.6	9.525	3.97	0.03	4.4	0.02~0.08	0.05~1.50		
		11T301L-KM																	11.6	9.525	3.97	0.1	4.4	0.03~0.11	0.06~1.70		
		11T302L-KM							○						○				11.6	9.525	3.97	0.2	4.4	0.04~0.15	0.08~2.00		
DCMT-C25	DCMT	070202-C25												●		●			7.5	6.35	2.38	0.2	2.8	0.03~0.15	0.30~2.00	SDACR/L SDJCR/L SDNCN SDQCR/L SDUCR SDZCR/L	B82 B83 B102 B103
		070204-C25		●	●	●			●		○			●		●			7.3	6.35	2.38	0.4	2.8	0.05~0.20	0.50~2.50		
		070208-C25		●	●	●													6.8	6.35	2.38	0.8	2.8	0.06~0.25	0.80~2.50		
		11T302-C25												●		●			11.3	9.52	3.97	0.2	4.4	0.04~0.25	0.50~2.50		
For medium cutting		11T304-C25	●	●	●	●		●	●		●	●		●		●	●		11.2	9.52	3.97	0.4	4.4	0.08~0.30	0.80~3.00		
		11T308-C25	●	●	●	●		●	●		●	●	●	●		●	●		10.8	9.52	3.97	0.8	4.4	0.10~0.30	1.00~3.00		
DCMT-HFP	DCMT	070202-HFP			●														7.5	6.35	2.38	0.2	2.8	0.03~0.10	0.06~1.00	SDACR/L SDJCR/L SDNCN SDQCR/L SDUCR SDZCR/L	B82 B83 B102 B103
		070204-HFP	○		●														7.3	6.35	2.38	0.4	2.8	0.05~0.12	0.08~1.00		
		070208-HFP	○																6.8	6.35	2.38	0.8	2.8	0.06~0.12	0.10~1.00		
	New	11T301-HFP																	11.51	9.525	3.97	0.1	4.4	0.03~0.13	0.06~1.00		
		11T302-HFP	○		●														11.4	9.52	3.97	0.2	4.4	0.04~0.15	0.08~1.50		
For finishing		11T304-HFP	○		●														11.2	9.52	3.97	0.4	4.4	0.06~0.20	0.10~1.50		
		11T308-HFP			○														10.8	9.52	3.97	0.8	4.4	0.08~0.25	0.20~1.50		
DCMT-HMP	DCMT	070202-HMP	●	●	●	●													7.5	6.35	2.38	0.2	2.8	0.03~0.12	0.10~1.50	SDACR/L SDJCR/L SDNCN SDQCR/L SDUCR SDZCR/L	B82 B83 B102 B103
		070204-HMP	●	●	●	●	●	●	●		●	●		●		●			7.3	6.35	2.38	0.4	2.8	0.06~0.17	0.20~2.30		
		070208-HMP	●	●	●	●													6.8	6.35	2.38	0.8	2.8	0.08~0.23	0.40~2.30		
		11T302-HMP	●	●	●	●	●	●	●										11.4	9.52	3.97	0.2	4.4	0.04~0.22	0.10~2.00		
		11T304-HMP	●	●	●	●	●	●	●	●	●	●	●	●		●			11.2	9.52	3.97	0.4	4.4	0.08~0.23	0.30~3.00		
For medium cutting		11T308-HMP	●	●	●	●	●	●	●		●	●	●	●		●			10.8	9.52	3.97	0.8	4.4	0.10~0.30	0.50~3.00		

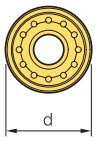
• Cutting edge geometry : **A06** ~ **A09** • Recommended chip breaker : **B12** ~ **B17** • Code system : **B18** ~ **B19**
● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

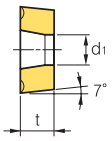
RC○○ Round R° Positive

Relief Angle : 7°

Workpiece			Coated										Cermet			Uncoated		
			NC3010	NC3020	NC3120	NC3030	NC500H	NC9020	NC6110	NC6010	NC315K	PC3545	CT10	CN2000	CN20	U20	H01	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		Dimensions (mm) l	d	t	d1	Cutting Condition fn	ap	Available toolholders	Page
RCMX	RCMX	1003M0	10.0	3.18	3.18	3.6	0.25~0.50	1.50~4.00	PRDCN PRGCR/L	B77 B78
For medium to roughing		1204M0	12.0	4.76	4.76	4.2	0.30~0.60	2.50~5.00		
		1606M0	16.0	6.35	6.35	5.2	0.40~0.70	3.00~7.00		
		2006M0	20.0	6.34	6.35	6.5	0.48~0.90	3.50~9.00		
		2507M0	25.0	7.94	7.94	7.25	0.55~1.20	4.00~12.00		
		3209M0	32.0	9.52	9.52	9.55	0.65~1.50	5.00~15.00		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

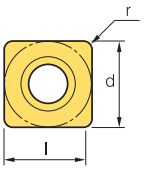
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

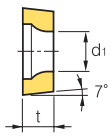
SC○○ Square 90° Positive

Relief Angle : 7°

Workpiece			Coated									Cermet			Uncoated		
			NC3010	NC3020	NC3120	NC3030	NC9020	PC9030	NC6110	NC6010	NC315K	CN1000	CN2000	CN20	H01	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		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders	Page
SCGT-C05	SCGT	09T304-C05	9.1	9.52	3.97	0.4	4.4	0.11~0.23	0.10~2.00	SSBCR/L SSDCN SSKCR/L SSSCR/L	B84 B85 B103
For finishing		09T308-C05	8.7	9.52	3.97	0.8	4.4	0.08~0.30	0.20~2.00		
		120408-C05	11.9	12.7	4.76	0.8	5.5	0.08~0.33	0.20~2.00		
SCGT-HFP	SCGT	09T304-HFP	9.1	9.52	3.97	0.4	4.4	0.05~0.25	0.10~1.50	SSBCR/L SSDCN SSKCR/L SSSCR/L	B84 B85 B103
For finishing											
SCMT-C25	SCMT	060204-C25	5.9	6.35	2.38	0.4	4.4	0.08~0.25	0.40~2.50	SSBCR/L SSDCN SSKCR/L SSSCR/L	B84 B85 B103
For medium cutting		09T304-C25	9.1	9.52	3.97	0.4	4.4	0.08~0.25	0.60~3.00		
		09T308-C25	8.7	9.52	3.97	0.8	4.4	0.10~0.30	1.00~3.00		
		120404-C25	12.3	12.7	4.76	0.4	5.5	0.10~0.30	0.80~3.80		
		120408-C25	11.9	12.7	4.76	0.8	5.5	0.12~0.38	1.20~3.80		
SCMT-HFP	SCMT	09T304-HFP	9.1	9.52	3.97	0.4	4.4	0.05~0.25	0.10~1.50	SSBCR/L SSDCN SSKCR/L SSSCR/L	B84 B85 B103
For finishing											
SCMT-HMP	SCMT	09T304-HMP	9.1	9.52	3.97	0.4	4.4	0.08~0.23	0.30~3.00	SSBCR/L SSDCN SSKCR/L SSSCR/L	B84 B85 B103
For medium cutting		09T308-HMP	8.7	9.52	3.97	0.8	4.4	0.10~0.30	0.50~3.00		
		120404-HMP	12.3	12.7	4.76	0.4	5.5	0.09~0.27	0.30~3.60		
		120408-HMP	11.9	12.7	4.76	0.8	5.5	0.12~0.36	0.60~3.60		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

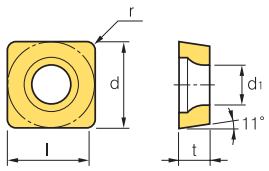
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

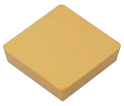
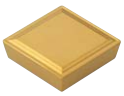
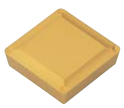
SP○○ Square 90° Positive

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		Coated										Cermet		Uncoated					Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3030	NC3120	NC500H	PC6510	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	CT10	CN2000	H01	ST30A	ST30N	ST20	G10	l	d	t	r	d1	fn	ap		
SPGA	SPGA	060204																			5.9	6.35	2.38	0.4	2.8	0.50~0.25	0.50~2.00	-	-
		090308T												●							8.7	9.52	3.18	0.8	4.4	0.10~0.25	0.70~3.00		
For medium to finishing		090308T-Z												●							8.7	9.52	3.18	0.8	3.4	0.10~0.25	0.70~3.00		
SPGN	SPGN	070202																			7.7	7.94	2.38	0.2	-	0.03~0.10	0.50~2.00	-	-
		070208																			7.8	7.94	2.38	0.8	-	0.10~0.25	0.70~3.00		
For medium to finishing		090302																			9.32	9.525	3.18	0.2		0.03~0.10	0.50~3.00		
		090304																			9.1	9.52	3.18	0.4	-	0.08~0.20	0.70~3.50		
		090308					●												●		8.7	9.52	3.18	0.8	-	0.10~0.25	0.70~3.50		
		120302																			12.5	12.7	3.18	0.2	-	0.03~0.20	0.50~3.00		
		120304																			12.3	12.7	3.18	0.4	-	0.08~0.20	1.00~5.00		
		120308	●	●													●			●	11.9	12.7	3.18	0.8	-	0.10~0.25	1.00~5.00		
		120312											●							●	10.5	12.7	3.18	1.2	-	0.15~0.30	1.00~5.00		
		120316																			10.1	12.7	3.18	1.6	-	0.18~0.33	1.00~5.00		
		120402																			12.5	12.7	4.76	0.2	-	0.03~0.20	0.50~3.00		
		120404																			12.3	12.7	4.76	0.4	-	0.08~0.20	1.00~5.00		
		120408																			11.9	12.7	4.76	0.8	-	0.10~0.25	1.00~5.00		
		120416																			11.1	12.7	4.76	1.6	-	0.18~0.33	1.00~5.00		
		120430																			9.7	12.7	4.76	3.0	-	0.20~0.60	2.00~5.00		
		120440																			8.7	12.7	4.76	4.0	-	0.25~0.70	3.00~5.00		
		150404																			15.48	15.88	4.76	0.4	-	0.08~0.20	1.50~7.00		
		150408																			15.0	15.88	4.76	0.8	-	0.10~0.25	1.50~7.00		
		150412																			14.8	15.88	4.76	1.2	-	0.15~0.30	1.50~7.00		
		150416																			14.2	15.88	4.76	1.6	-	0.18~0.33	1.50~7.00		
		150420																			13.88	15.88	4.76	2.0	-	0.20~0.45	1.50~7.00		
		190404																			18.65	19.05	4.76	0.4	-	0.08~0.20	1.50~9.00		
		190408																		●	18.25	19.05	4.76	0.8	-	0.10~0.25	1.50~9.00		
		190412																●			17.8	19.05	4.76	0.8	-	0.15~0.45	1.50~9.00		
		190416																		●	17.4	19.05	4.76	1.6	-	0.18~0.60	1.50~9.00		
		190424																			16.65	19.05	4.76	2.4		0.25~0.70	2.50~9.00		
SPGR-F	SPGR	090304-F																			9.1	9.52	3.18	0.4	-	0.05~0.20	0.30~2.00	CSDPN CSKPR/L	B67 B68 B96
		120304-F																			12.3	12.7	3.18	0.4	-	0.10~0.25	0.50~2.00		
For finishing																													
SPGR-M	SPGR	090308-M																			8.7	9.52	3.18	0.8	-	0.10~0.40	1.00~3.50	CSDPN CSKPR/L	B67 B68 B96
		120308-M																			11.9	12.7	3.18	0.8	-	0.20~0.40	1.50~4.00		
For medium cutting																													
SPGT	SPGT	090304R																			9.1	9.52	3.18	0.4	3.4	0.08~0.23	0.30~3.00	SSKPR/L (Boring bar)	B104
		090308R																			8.7	9.52	3.18	0.8	3.4	0.10~0.30	0.50~3.00		
		090304L												●							9.1	9.52	3.18	0.4	3.4	0.08~0.23	0.30~3.00		
For medium to finishing		090308L												●							8.7	9.52	3.18	0.8	3.4	0.10~0.30	0.50~3.00		
SPGT-C05	SPGT	090304-C05												●							9.1	9.52	3.18	0.4	4.4	0.11~0.23	0.10~2.00	SSKPR/L (Boring bar)	B104
		090308-C05																			8.7	9.52	3.18	0.8	4.4	0.08~0.30	0.20~2.00		
For finishing																													

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19

● : Stock item ○ : Under preparing for stock

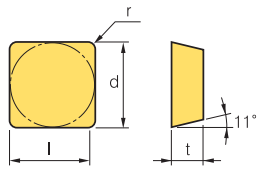
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

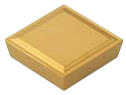
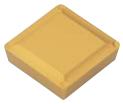
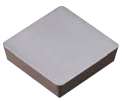
SP○○ Square 90° Positive

Relief Angle : 11°

Workpiece			Coated								Cermet			Uncoated		
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	CT10	CN2000	CN20	ST30A	H01	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		Dimensions (mm) l	d	t	r	Cutting Condition fn	ap	Available toolholders	Page
SPMR-F	SPMR	090304-F	9.1	9.52	3.18	0.4	0.05~0.20	0.30~2.00	CSDPN CSKPR/L (Boring bar)	B67 B68 B96
 For finishing		120304-F	12.3	12.7	3.18	0.4	0.10~0.25	0.50~2.00		
SPMR-M	SPMR	090308-M	8.7	9.52	3.18	0.8	0.10~0.40	1.00~3.50	CSDPN CSKPR/L (Boring bar)	B67 B68 B96
 For medium cutting		120308-M	11.9	12.7	3.18	0.8	0.10~0.40	1.50~4.00		
		120312-M	10.5	12.7	3.18	1.2	0.20~0.40	1.50~4.00		
SPUN	SPUN	120304	12.3	12.7	3.18	0.4	0.10~0.30	1.00~5.00		
 For medium to finishing		120308	11.9	12.7	3.18	0.8	0.15~0.40	1.00~5.00		
		150412	14.6	15.875	4.76	1.2	0.20~0.50	1.00~5.00		
		190412	17.8	19.05	4.76	1.2	0.20~0.50	1.50~7.00	-	-
		190416	17.45	19.05	4.76	1.6	0.25~0.60	2.00~7.00		
		250620	23.4	25.4	6.35	2.0	0.30~0.80	3.00~10.00		
		120308SN	11.9	12.7	3.18	0.8	0.15~0.40	1.00~5.00		

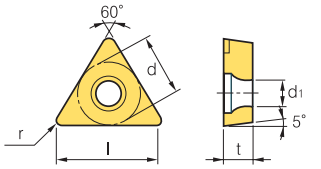
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

TB○○ Triangular 60° Positive

Relief Angle : 5°

Workpiece			Coated									Cermet		Uncoated		
			NC3010	NC3030	NC3120	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	CT10	CN2000	U20	H01	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		Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders	Page
TBGT	TBGT	060102L	6.4	3.97	1.59	0.2	2.16	0.05~0.20	0.10~1.30	STUBR/L (Compact mini)	B107
For finishing		060104L	5.8	3.97	1.59	0.4	2.16	0.08~0.20	0.10~1.30		

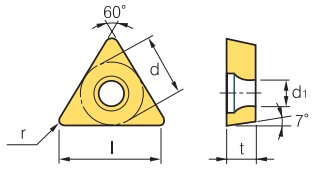
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

TC○○ Triangular 60° 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		Coated									Cermet				Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	NC9020	PC9030	NC6110	NC6010	NC315K	CN1000	CT10	CN2000	CN20	H01	G10	l	d	t	r	d1	fn	ap		
TCGT-C05	TCGT	090204-C05																8.59	5.56	2.38	0.4	2.5	0.05~0.19	0.10~1.70	STACR/L STFCR/L STGCR/L STTCR/L	B85 B86 B104
For finishing		110208-C05																9.0	6.35	2.38	0.8	0.8	0.08~0.22	0.10~1.70		
TCGT-HFP	TCGT	090204-HFP																8.59	5.56	2.38	0.4	2.5	0.05~0.19	0.10~1.70	STACR/L STFCR/L STGCR/L STTCR/L	B85 B86 B104
For finishing		110202-HFP																10.47	6.35	2.38	0.2	2.8	0.03~0.13	0.06~1.70		
		110204-HFP																9.96	6.35	2.38	0.4	2.8	0.05~0.19	0.10~1.70		
		16T304-HFP		●	●													15.46	9.525	2.38	0.4	4.4	0.07~0.26	0.10~1.70		
TCGT-KF	TCGT	0802003R-KF																8.16	4.76	2.38	0.03	2.3	0.01~0.06	0.04~1.30	STACR/L	B118
Neu		080201R-KF						○					○					7.98	4.76	2.38	0.1	2.3	0.02~0.08	0.05~1.50		
For finishing (Auto Tool)		080202R-KF																7.72	4.76	2.38	0.2	2.3	0.03~0.11	0.06~1.70		
		0802003L-KF																8.16	4.76	2.38	0.03	2.3	0.01~0.06	0.04~1.30	STACR/L	B118
		080201L-KF						○					○					7.98	4.76	2.38	0.1	2.3	0.02~0.08	0.05~1.50		
		080202L-KF																7.72	4.76	2.38	0.2	2.3	0.03~0.11	0.06~1.70		
TCMT-C25	TCMT	090204-C25	●	●	●				●									8.59	5.56	2.38	0.4	2.5	0.06~0.18	0.40~2.50	STACR/L STFCR/L STGCR/L STTCR/L	B85 B86 B104
For medium cutting		090208-C25	●	●	●				●									7.55	5.56	2.38	0.8	2.5	0.08~0.25	0.80~2.50		
		110202-C25		●	●													10.5	6.35	2.38	0.2	2.8	0.04~0.12	0.40~2.00		
		110204-C25	●	●	●	●			●			●	●	●	●			10.0	6.35	2.38	0.4	2.8	0.06~0.20	0.60~2.50		
		110208-C25	●	●	●	●	●	●	●			●	●	●				9.0	6.35	2.38	0.8	0.8	0.08~0.25	0.80~2.50		
		16T304-C25	●	●	●	●	●	●	●			●	●	●	●			15.5	9.52	3.97	0.4	4.4	0.08~0.28	0.80~3.00		
		16T308-C25	●	●	●	●	●	●	●			●	●	●	●			14.5	9.52	3.97	0.8	4.4	0.10~0.30	1.00~3.00		
TCMT-HFP	TCMT	090204-HFP	○		○													8.6	5.56	2.38	0.4	2.5	0.05~0.19	0.10~1.70	STACR/L STFCR/L STGCR/L STTCR/L	B85 B86 B104
		110202-HFP											●					7.6	5.56	2.38	0.2	2.5	0.03~0.13	0.06~1.70		
		110204-HFP	○		○													10.5	6.35	2.38	0.4	2.8	0.05~0.19	0.10~1.70		
Neu		16T302-HFP																10.0	6.35	2.38	0.2	2.8	0.03~0.13	0.06~1.70		
For finishing		16T304-HFP	○		●								●					9.0	6.35	2.38	0.4	2.8	0.07~0.26	0.10~1.70		
TCMT-HMP	TCMT	090204-HMP			●					●								14.5	9.52	3.97	0.4	2.5	0.06~0.17	0.20~2.30	STACR/L STFCR/L STGCR/L STTCR/L	B85 B86 B104
For medium cutting		090208-HMP			○				○	●								8.6	5.56	2.38	0.8	2.5	0.08~0.23	0.40~2.30		
		110202-HMP		●	●	●	●	●		●								10.5	6.35	2.38	0.2	2.8	0.03~0.15	0.10~1.50		
		110204-HMP	●		○				○			●	●	●				10.0	6.35	2.38	0.4	2.8	0.06~0.19	0.20~2.50		
		110208-HMP	●	●	●	●			○	●								9.0	6.35	2.38	0.8	2.8	0.09~0.26	0.40~2.50		
		16T304-HMP	●	●	●	●	●	●	●	●	●	●	●	●				15.5	9.52	3.97	0.4	4.4	0.08~0.23	0.30~3.00		
		16T308-HMP	●	●	●	●	●		●	●	●							14.5	9.5	3.97	0.8	4.4	0.10~0.30	0.50~3.00		

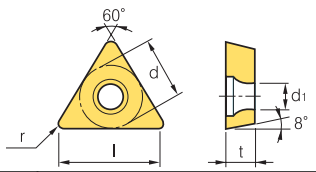
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

TO○○ Triangular 60° Positive

Relief Angle : 8°

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									Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3030	NC3120	NC500H	PC8010	NC9020	PC9030	NC305K	NC6110	NC315K	CT10	CN2000	CN20	ST10	H01	G10	l	d	t	r	d1	fn	ap		
TOEH	TOEH	060102L														●		●	6.4	3.97	1.59	0.2	2.15	0.05~0.17	0.10~1.50	FZ unit	-
For medium to finishing		090204L														●		●	8.6	5.56	2.383.	0.4	2.8	0.05~0.20	0.30~2.50		
		140304L											●					●	13.1	8.2	0	0.4	3.8	0.05~0.25	0.30~2.50		

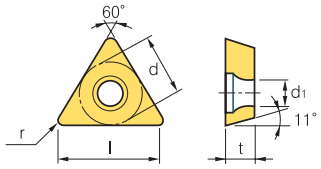
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

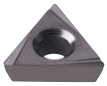
TP○○ Triangular 60° Positive

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		Coated							Cermet				Uncoated				Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	CT10	CN2000	CN20	CN30	ST20	ST20A	H01	G10	l	d	t	r	d1	fn	ap		
TPGH  For medium to finishing	TPGH	080202L									●								7.72	4.76	2.38	0.2	2.3	0.01~0.12	0.06~1.70	-	-
		080204L									●								7.2	4.76	2.38	0.4	2.3	0.01~0.15	0.08~1.70		
TPGN For medium to finishing	TPGN	090204																	8.59	5.56	2.38	0.4	2.5	0.07~0.20	0.70~2.00	-	-
		110302																	10.47	6.35	3.18	0.2	2.8	0.05~0.15	0.50~2.00		
		110304		●	●	●										●	●	●	10.0	6.35	3.18	0.4	-	0.07~0.20	0.70~3.00		
		110308				●											●		9.0	6.35	3.18	0.8	-	0.10~0.25	1.00~3.00		
		160302																	16.0	9.52	3.18	0.2	-	0.05~0.18	1.00~5.00		
		160304		●	●	●								●		●	●	●	15.5	9.52	3.18	0.4	-	0.07~0.20	1.00~5.00		
		160308	●	●	●	●									●		●	●	14.5	9.52	3.18	0.8	-	0.10~0.25	1.00~5.00		
		160310																	13.38	9.525	3.18	1.2	-	0.10~0.25	1.00~5.00		
		160312				●										●			13.5	9.52	3.18	1.2	-	0.15~0.30	1.00~5.00		
		160316				●									●	●		●	12.5	9.52	3.18	1.6	-	0.15~0.30	1.00~5.00		
		160404																	15.5	9.525	4.76	0.4	-	0.07~0.20	1.00~5.00		
		220404				●										●		●	21.0	12.7	4.76	0.4	-	0.07~0.20	1.50~7.00		
		220408				●										●		●	20.0	12.7	4.76	0.8	-	0.10~0.25	1.50~7.00		
		220412				●													19.0	12.7	4.76	1.2	-	0.15~0.30	1.50~7.00		
		220430																●	14.2	12.7	4.76	3.0	-	0.30~0.45	1.50~7.00		
		220440																	11.6	12.7	4.76	4.0	-	0.30~0.50	1.50~7.00		
		270408																	25.41	15.875	4.76	0.8	-	0.15~0.25	3.00~8.00		
		270608																	25.41	15.875	6.35	0.8	-	0.15~0.25	3.00~8.00		
TPGR-F For finishing	TPGR	110302-F																	10.5	6.35	3.18	0.2	-	0.05~0.15	0.10~1.50	CTFPR/L CTGPR/L	B68 B96
		110304-F																	10.0	6.35	3.18	0.4	-	0.05~0.20	0.30~1.50		
		160304-F																	15.5	9.52	3.18	0.4	-	0.08~0.25	0.50~2.00		
TPGR-M For medium cutting	TPGR	110308-M																	9.0	6.35	3.18	0.8	-	0.13~0.30	1.00~3.00	CTFPR/L CTGPR/L	B68 B96
		160308-M																	14.5	9.52	3.18	0.8	-	0.13~0.30	1.00~5.00		
TPGT For medium to finishing	TPGT	080202R																	7.7	4.76	2.38	0.2	2.3	0.05~0.20	0.30~1.50	STFPR/L (Boring bar) STUPR/L (Compact mini)	B105 B107
		110302R																	10.5	6.35	3.18	0.2	3.4	0.05~0.20	0.30~1.50		
		110304R									●								10.0	6.35	3.18	0.4	3.4	0.05~0.20	0.50~2.00		
		110308R																	9.0	6.35	3.18	0.8	3.4	0.07~0.25	0.50~2.00		
		160404R									●								15.5	9.52	4.76	0.4	4.4	0.05~0.20	0.70~3.00		
		160408R																	14.5	9.52	4.76	0.8	4.4	0.05~0.20	0.70~3.00		
		080202L							●		○						●		7.7	4.76	2.38	0.2	2.3	0.05~0.20	0.30~1.50		
		110302L									○								10.5	6.35	3.18	0.2	3.4	0.05~0.20	0.30~1.50		
		110304L									●		●						10.0	6.35	3.18	0.4	3.4	0.05~0.20	0.50~2.00		
		110308L									○								9.0	6.35	3.18	0.8	3.4	0.07~0.25	0.50~2.00		
		160404L									●		●						15.5	9.52	4.76	0.4	4.4	0.05~0.20	0.70~3.00		
		160408L									○								14.5	9.52	4.76	0.8	4.4	0.05~0.20	0.70~3.00		
TPGT-C05 For finishing	TPGT	110304-C05									●								10.0	6.35	3.18	0.4	3.4	0.05~0.30	0.50~2.00	STFPR/L (Boring bar)	B105
		160404-C05																	15.5	9.52	43.76	0.4	4.4	0.05~0.30	0.80~2.00		
TPGT-HFP For finishing	TPGT	110304-HFP																	10.0	6.35	3.18	0.4	3.4	0.05~0.25	0.30~1.50	STFPR/L (Boring bar)	B105
		160308-HFP																	14.5	9.52	3.18	0.8	4.4	0.05~0.25	0.30~1.50		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

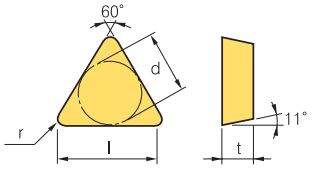
● : Stock item ○ : Under preparing for stock

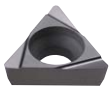
TP○○ Triangular 60° Positive

Relief Angle : 11°

Workpiece			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	NC6010	CT10	CN20	ST30A	ST20	ST30N	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		Coated / Cermet / Uncoated	Dimensions (mm)					Cutting Condition		Available toolholders	Page
				l	d	t	r	d_1	fn	ap		
TPGX  For medium to finishing	TPGX	090202L	CN20 ●	9.11	5.56	2.38	0.2	-	0.10~0.20	0.30~1.00	-	-
		090204L	CN20 ●	8.59	5.56	2.38	0.4	-	0.10~0.25	0.50~1.00		
		090208L	CN20 ●	7.55	5.56	2.38	0.8	-	0.10~0.30	1.00~1.00		
		110304L	CN20 ●	9.96	6.35	3.18	0.4	-	0.10~0.25	0.50~1.20		
TPMR-F For finishing	TPMR	090202-F		9.1	5.56	2.38	0.2	-	0.05~0.15	0.10~1.00	CTFPR/L CTGPR/L	B68 B96
		090204-F		8.6	5.56	2.38	0.4	-	0.05~0.15	0.10~1.00		
		110302-F		10.5	6.35	3.18	0.2	-	0.05~0.15	0.10~1.50		
		110304-F	NC3010 ● NC3020 ● NC3120 ● NC3030 ● NC9020 ● PC9030 ● NC6110 ●	10.0	6.35	3.18	0.4	-	0.05~0.20	0.30~1.50		
		110308-F		9.0	6.35	3.18	0.8	-	0.05~0.25	0.30~1.50		
		160304-F	NC3010 ● NC3020 ● NC3120 ● NC3030 ● NC9020 ● PC9030 ● NC6110 ● NC6010 ●	15.5	9.52	3.18	0.4	-	0.08~0.25	0.50~2.00		
		160308-F	NC3120 ● NC9020 ●	14.5	9.52	3.18	0.8	-	0.08~0.25	0.50~3.00		
TPMR-M For medium cutting	TPMR	110304-M		10.0	6.35	3.18	0.4	-	0.10~0.25	0.70~3.00	CTFPR/L CTGPR/L	B68 B96
		110308-M	NC3010 ● NC3020 ● NC3120 ● NC3030 ●	9.0	6.35	3.18	0.8	-	0.13~0.30	1.00~3.00		
		160304-M	NC3030 ●	15.5	9.52	3.18	0.4	-	0.10~0.25	1.00~5.00		
		160308-M	NC3010 ● NC3020 ● NC3120 ● NC3030 ● PC8010 ● NC9020 ● NC6110 ● NC6010 ● G10 ●	14.5	9.52	3.18	0.8	-	0.13~0.30	1.00~5.00		
		160312-M	NC3030 ●	13.5	9.52	3.18	1.2	-	0.15~0.35	1.00~5.00		
		220408-M	NC3020 ● NC3120 ● NC6110 ●	20.0	12.7	4.76	0.8	-	0.13~0.30	1.50~7.00		
TPUN For medium to finishing	TPUN	090308		7.55	5.56	3.18	0.8	-	0.10~0.30	0.50~2.00	-	-
		110208	ST30A ●	9.0	6.35	2.38	0.8	-	0.15~0.40	1.00~3.00		
		110304	ST30A ●	10.0	6.35	3.18	0.4	-	0.10~0.30	1.00~3.00		
		110308	ST30A ●	9.0	6.35	3.18	0.8	-	0.15~0.40	1.00~3.00		
		160304	NC3010 ● NC3020 ● NC3120 ● NC3030 ● ST30A ● G10 ●	15.5	9.525	3.18	0.4	-	0.10~0.30	1.00~5.00		
		160308	NC3020 ● NC3120 ● NC3030 ● ST30A ● ST20 ● G10 ●	14.5	9.525	3.18	0.8	-	0.15~0.40	1.00~5.00		
		160312	NC3020 ● NC3120 ● NC3030 ● ST30A ●	13.5	9.525	3.18	1.2	-	0.20~0.50	1.50~5.00		
		220404	ST30A ●	21.0	12.7	4.76	0.4	-	0.10~0.30	1.50~7.00		
		220408	NC3020 ● NC3120 ● NC3030 ● ST30A ●	20.0	12.7	4.76	0.4	-	0.15~0.40	1.50~7.00		
		220412	ST30A ●	19.0	12.7	4.76	1.2	-	0.20~0.50	1.50~7.00		
		330620		27.79	19.05	6.35	2.0	-	0.30~0.70	3.00~10.00		
		160308TN	G10 ●	14.5	9.525	3.18	0.8	-	0.15~0.40	1.00~5.00		
		160312TN	G10 ●	13.5	9.525	3.18	1.2	-	0.20~0.50	1.50~5.00		
		220412TN		19.0	12.7	4.76	1.2	-	0.20~0.50	1.50~7.00		

• Cutting edge geometry : **A06 ~ A09** • Recommended chip breaker : **B12 ~ B17** • Code system : **B18 ~ B19**

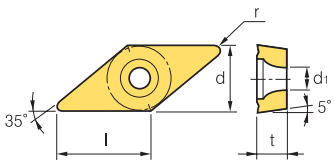
● : Stock item ○ : Under preparing for stock

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

VB○○ Rhombic 35° Positive Relief Angle : 5°

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

Machining types
● Continuous cutting
ᴗ General cutting
✚ Interrupted cutting



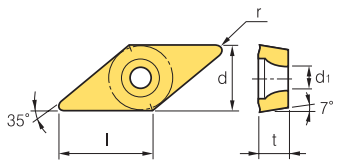
Inserts	Designation		Coated										Cermet			Uncoated		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	NC6010	NC315K	CN1000	CT10	CN2000	H01	G10	l	d	t	r	d1	fn	ap		
VBGT	VBGT	160404																15.6	9.52	3.18	0.4	4.4	0.07~0.20	0.50~1.50	SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L	B86 B87 B105 B106
For medium to finishing		160408																14.6	9.52	4.76	0.8	4.4	0.15~0.25	0.70~2.00		
VBGT-HFP	VBGT	110301-HFP																11.0	6.35	3.18	0.1	2.8	0.07~0.20	0.50~1.50	SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L	B86 B87 B105 B106
New		160408-HFP																14.6	9.52	4.76	0.8	4.4	0.15~0.25	0.70~2.00		
For finishing																										
VBGT-KF	VBGT	1103003R-KF																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJBR/L	B118
New		110301R-KF							○					○				11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302R-KF							○					○				11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70		
For finishing (Auto Tool)		1103003L-KF																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJBR/L	B118
		110301L-KF							○					○				11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302L-KF							○					○				11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70		
VBGT-KM	VBGT	1103003R-KM																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJBR/L	B118
New		110301R-KM							○					○				11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302R-KM							○					○				11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70		
For medium to finishing (Auto Tool)		1103003L-KM																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJBR/L	B118
		110301L-KM							○					○				11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302L-KM							○					○				11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70		
VBMT	VBMT	160404	●	●	●	●		●	●	●	●	●		●	●			15.6	9.52	4.76	0.4	4.4	0.07~0.20	0.50~1.50	SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L	B86 B87 B105 B106
For medium to finishing		160408	●	●	●	●		●	●	●	●	●		●	●			14.6	9.52	4.76	0.8	4.4	0.15~0.25	0.70~2.00		
VBMT-HMP	VBMT	110204-HMP		●	●													10.0	6.35	2.38	0.4	2.8	0.03~0.20	0.15~2.50	SVABR/L SVHBR/L SVJBR/L SVVBN SVQBR/L SVUBR/L	B86 B87 B105 B106
New		110208-HMP																9.0	6.35	2.38	0.4	2.8	0.03~0.25	0.15~2.50		
		110304-HMP	●	●	●													10.0	6.35	3.18	0.4	3.4	0.03~0.20	0.15~2.70		
		110308-HMP																9.0	6.35	3.18	0.8	3.4	0.05~0.25	0.40~2.70		
For medium cutting		160404-HMP	●	●	●	●	●	●		●	●		●					15.6	9.52	4.76	0.4	4.4	0.07~0.20	0.20~2.70		
		160408-HMP	●	●	●	●	●		●		●		●					14.6	9.52	4.76	0.8	4.4	0.09~0.27	0.50~2.70		
New		160412-HMP																13.48	9.525	4.76	1.2	4.4	0.11~0.32	0.50~2.70		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

VC○○ Rhombic 35° 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



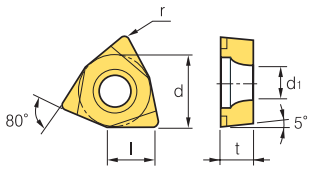
Inserts	Designation		Coated: NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	NC6010	Cermet: CT10	CN2000	CN20	Uncoated: U20	H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders	Page
VCGT-HFP	VCGT	110302-HFP										●						10.5	6.35	3.18	0.2	3.4	0.02~0.18	0.10~1.00	SVJCR/L SVVCN SVQCR/L SVUCR/L	B87 B88 B105 B106
For finishing		110304-HFP		●	●													10.0	6.35	3.18	0.4	3.4	0.03~0.18	0.15~1.20		
		110308-HFP																9.0	6.35	3.18	0.8	3.4	0.04~0.23	0.20~1.20		
		160404-HFP		●	●													15.6	9.52	4.76	0.4	4.4	0.04~0.20	0.15~1.50		
		160408-HFP		●	●													14.6	9.52	4.76	0.8	4.4	0.05~0.25	0.20~1.50		
VCGT-KF New	VCGT	1103003R-KF																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJCR/L	B118
For finishing (Auto Tool)		110301R-KF							○			○						11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302R-KF							○			○						11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70		
		1103003L-KF																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJCR/L	B118
		110301L-KF							○			○						11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302L-KF							○			○						11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70		
VCGT-KM New	VCGT	1103003R-KM																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJCR/L	B118
For medium to finishing (Auto Tool)		110301R-KM							○			○						11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302R-KM							○			○						11.0	6.35	3.18	0.2	2.8	0.03~0.13	0.06~1.70		
		1103003L-KM																11.0	6.35	3.18	0.03	2.8	0.01~0.06	0.04~1.30	SVJCR/L	B118
		110301L-KM							○			○						11.0	6.35	3.18	0.1	2.8	0.02~0.08	0.05~1.50		
		110302L-KM							○			○						11.0	6.35	3.18	0.2	2.8	0.03 ~0.13	0.06~1.70		
VCMT-HFP	VCMT	110302-HFP																10.5	6.35	3.18	0.2	3.4	0.02~0.18	0.10~1.00	SVJCR/L SVVCN SVQCR/L SVUCR/L	B87 B88 B105 B106
For finishing		110304-HFP																10.0	6.35	3.18	0.4	3.4	0.03~0.18	0.15~1.20		
		110308-HFP			○													9.0	6.35	3.18	0.8	3.4	0.04~0.23	0.20~1.20		
		160404-HFP			●													15.6	9.52	4.76	0.4	4.4	0.04~0.20	0.15~1.50		
		160408-HFP																14.6	9.52	4.76	0.8	4.4	0.05~0.25	0.20~1.50		
VCMT-HMP	VCMT	160404-HMP	●	●	●	●		●			●							15.6	9.52	4.76	0.4	4.4	0.10~0.25	0.30~2.60	SVJCR/L SVVCN SVQCR/L SVUCR/L	B87 B88 B105 B106
For medium cutting		160408-HMP		●	●	●		●			●							14.3	9.52	4.76	0.8	4.4	0.13~0.33	0.60~2.60		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

WB○○ Trigon 80° Positive Relief Angle : 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: NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	NC6010	Cermet: CT10	CN2000	Uncoated: U2	H01	G10	Dimensions (mm): l	d	t	r	d1	Cutting Condition: fn	ap	Available toolholders	Page
WBGT	WBGT	020102R New															2.6	3.97	1.59	0.2	2.2	0.01~0.05	0.10~0.30	SWUBR/L (Compact mini)	B108
For medium to finishing		020102L							●			●			●		3.1	4.76	2.38	0.2	2.3	0.01~0.08	0.10~0.40		
		S30202L							●			●			○		3.0	4.76	2.38	0.4	2.3	0.01~0.08	0.10~0.40		
		S30204L							○			○			○							0.01~0.10	0.10~0.50		

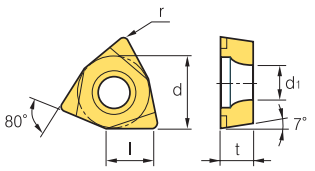
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜
Note)"WBGT" Designation comparision : WBGT020100 → WBGT060100
WBGTS30200 → WBGT080200

WC○○ Trigon 80° Positive Relief Angle : 7°

Workpiece			Inserts	Designation	Coated									Cermet			Uncoated			Dimensions (mm)					Cutting Condition		Available toolholders	Page
					NC3010	NC3020	NC3120	NC3030	PC8010	NC9020	PC9030	NC6110	NC6010	CT10	CN2000	CN20	U20	H01	G10	l	d	t	r	d_1	fn	ap		
	Steel	P	WCGT-C05	WCGT 080408-C05	○		●													8.3	12.7	4.76	0.8	-	0.08~0.30	0.20~2.70	SWACR/L SWLCR/L	B88 B106
	Stainless steel	M																									
	Cast iron	K																									
	Non-ferrous metal	N																									
	Heat resistant alloy, Titanium alloy	S																									
	Hardened steel	H																									

For finishing

Machining types
- ● Continuous cutting
- ◕ General cutting
- ✚ Interrupted cutting

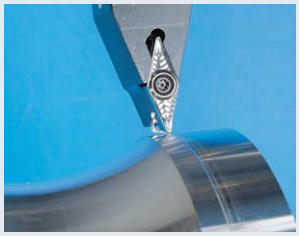


• Cutting edge geometry : **A06** ~ **A09** • Recommended chip breaker : **B12** ~ **B17** • Code system : **B18** ~ **B19**
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

● : Stock item ○ : Under preparing for stock

Technical Information for Aluminum

■ AK special chip breaker for aluminum



Features

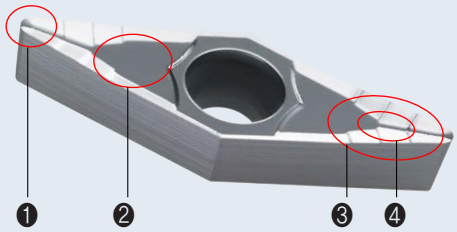
- Unique and 3-dimensional rake angle controls chip breaking and chip flow ensuring longer tool life and reducing cutting load.
- High rake angle at cutting edge part reduces cutting load to increase tool life.
- Buffed on top face controls chip flow reducing built-up edge.

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

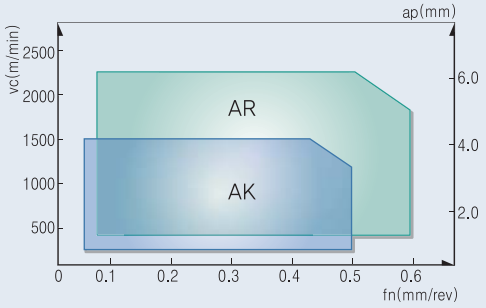
Features

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

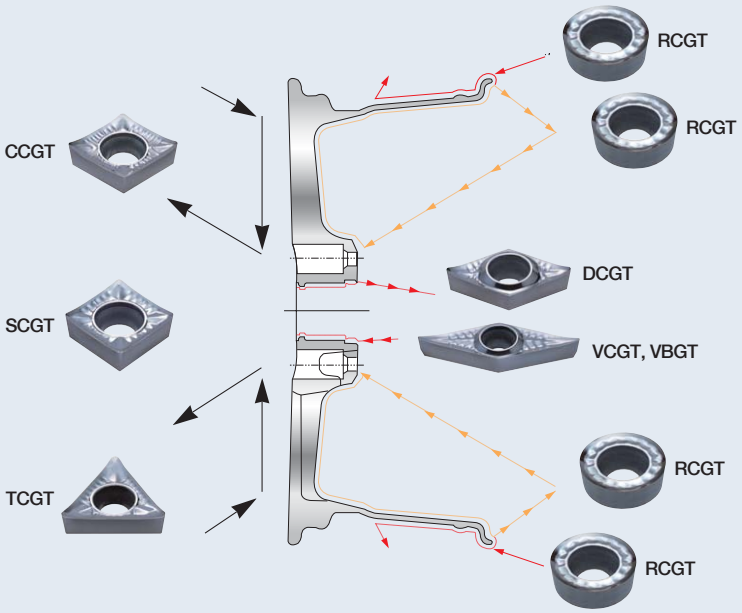


① Flat corner cutting edge improved productivity at high feed machining and ensures good surface roughness and reliability owing to strong cutting edge
② Specially buffed on top face controls chip flow reducing built-up edge
③ KORLOY' s own technology applied for cutting edge and corner shape controlling 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=0.1~6.0㎜ fn=0.05~0.6㎜/rev	H01(Uncoated cemented carbides K10~K20) ND1000(Diamond coating) PD1000(DLC coating)



■ Features of H01

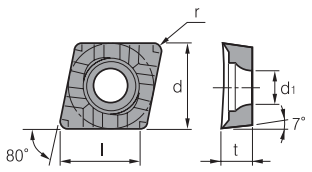
- Useful for aluminum and alloyed steel machining
- Buffed on top face reduced built-up edge
- 3-dimensional design reduced cutting load and shows good performance at high feed and speed machining.

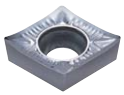
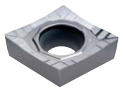
Workpiece		Hardness(HB)	kc(Mpa)	vc(m/min)	fn(mm/rev)
Aluminum alloy(forged)	before heat treatment	50 ~ 70	500 ~ 600	1000 ~ 2500	0.1 ~ 0.6
	after heat treatment	90 ~ 110	700 ~ 900	300 ~ 1000	0.1 ~ 0.5
Aluminum alloy (cast)	before heat treatment	70 ~ 80	700 ~ 800	300 ~ 1000	0.1 ~ 0.6
	after heat treatment	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°

Workpiece			Coated			Uncoated	
			PC130	PC230	PD1000	H01	H10
	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



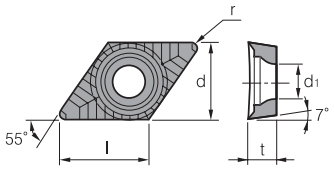
Inserts	Designation	PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap	Available toolholders	Page
							Dimensions (mm)					Cutting Condition			
CCGT-AK 	CCGT 060202-AK		●		●		6.2	6.35	2.38	0.2	2.8	0.01~0.12	0.05~3.00	SCACR/L SCLCR/L	B82 B101
	060204-AK		●		●	●	6.0	6.35	2.38	0.4	2.8	0.02~0.15	0.10~3.00		
	060208-AK				●		5.6	6.35	2.38	0.8	2.8	0.02~0.20	0.10~4.00		
	09T302-AK		●		●		9.4	9.52	3.97	0.2	4.4	0.02~0.20	0.05~3.00		
	09T304-AK	●	●		●		9.2	9.52	3.97	0.4	4.4	0.02~0.30	0.10~5.00		
	09T308-AK		●		●		8.8	9.52	3.97	0.8	4.4	0.03~0.50	0.10~5.00		
	120402-AK				●		12.6	12.7	4.76	0.2	5.5	0.02~0.30	0.05~4.00		
	120404-AK	●	●		●	●	12.4	12.7	4.76	0.4	5.5	0.03~0.50	0.10~5.00		
	120408-AK	●	●		●		12.0	12.7	4.76	0.8	5.5	0.04~0.80	0.10~5.50		
CCGT-AR 	CCGT 060202-AR						6.2	6.35	2.38	0.2	2.8	0.02~0.30	0.30~4.00	SCACR/L SCLCR/L	B82 B101
	060204-AR				●		6.0	6.35	2.38	0.4	2.8	0.03~0.35	0.50~4.50		
	060208-AR				●		5.6	6.35	2.38	0.8	2.8	0.04~0.50	0.50~4.50		
	09T302-AR				●		9.4	9.52	3.97	0.2	4.4	0.03~0.45	0.30~4.00		
	09T304-AR				●		9.2	9.52	3.97	0.4	4.4	0.04~0.50	0.50~4.50		
	09T308-AR				●		8.8	9.52	3.97	0.8	4.4	0.05~0.60	0.50~6.00		
	120402-AR				●		12.6	12.7	4.76	0.2	5.5	0.04~0.50	0.30~5.00		
	120404-AR				●		12.4	12.7	4.76	0.4	5.5	0.05~0.60	0.50~6.00		
	120408-AR				●		12.0	12.7	4.76	0.8	5.5	0.06~0.65	0.50~6.00		
	120412-AR				●		11.6	12.7	4.76	1.2	5.5	0.08~0.70	0.50~6.50		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

DC○○ Rhombic 55° Positive Relief Angle : 7°

Workpiece			Coated			Uncoated	
			PC130	PC230	PD1000	H01	H10
	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	PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap	Available toolholders	Page
							Dimensions (mm)					Cutting Condition			
DCGT-AK	DCGT 070202-AK		●		●		7.5	6.35	2.38	0.2	2.8	0.01~0.20	0.05~3.00	SDACR/L	B82
	070204-AK	●			●		7.3	6.35	2.38	0.1	2.8	0.02~0.30	0.10~4.00	SDJCR/L	B83
	070208-AK				●		6.8	6.35	2.38	0.8	2.8	0.03~0.40	0.10~4.00	SDNCN	B102
	11T302-AK		●		●		11.4	9.52	3.97	0.2	4.4	0.02~0.30	0.05~4.00	SDQCR/L	B103
	11T304-AK	●	●	●	●		11.2	9.52	3.97	0.4	4.4	0.03~0.50	0.10~5.00	SDUCR/L	
	11T308-AK		●		●		10.8	9.52	3.97	0.8	4.4	0.03~0.50	0.10~5.00	SDZCR/L	
	11T312-AK				●		10.4	9.52	3.97	1.2	4.4	0.04~0.60	0.15~5.00		
DCGT-AR	DCGT 070202-AR				●		7.5	6.35	2.38	0.2	2.8	0.02~0.30	0.30~4.00	SDACR/L	B82
	070204-AR				●		7.3	6.35	2.38	0.4	2.8	0.03~0.40	0.50~5.00	SDJCR/L	B83
	070208-AR				●		6.8	6.35	2.38	0.8	2.8	0.04~0.50	0.50~5.00	SDNCN	B102
	11T302-AR				●		11.4	9.52	3.97	0.2	4.4	0.03~0.45	0.30~6.00	SDQCR/L	B103
	11T304-AR				●		11.2	9.52	3.97	0.4	4.4	0.04~0.50	0.50~6.00	SDUCR/L	
	11T308-AR				●		10.8	9.52	3.97	0.8	4.4	0.05~0.60	0.50~6.00	SDZCR/L	
	11T312-AR				●		10.4	9.52	3.97	1.2	4.4	0.08~0.65	0.50~6.50		

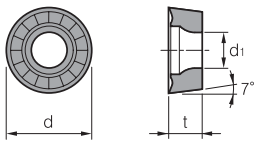
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

RC○○ Round 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		Coated PC130	Coated PC230	Coated PD1000	Uncoated H01	Uncoated H10	Dimensions (mm) d	t	d1	Cutting Condition fn	ap	Available toolholders	Page
RCGT-AK	RCGT	0602M0-AK					●	6.0	2.38	2.2	0.05~0.20	0.50~2.00	SRDCN	B83
		0803M0-AK					●	8.0	3.18	3.35	0.05~0.25	0.50~2.50	SRGCR/L	B84
		1003M0-AK					●	10.0	3.18	4.0	0.10~0.30	1.00~3.00		
		10T3M0-AK						10.0	3.97	4.4	0.10~0.30	1.00~3.00		
		1204M0-AK					●	12.0	4.76	4.4	0.10~0.35	1.00~3.50		
RCGT-AR	RCGT	0602M0-AR					●	6.0	2.38	2.2	0.05~0.20	0.50~2.00	SRDCN	B83
		0803M0-AR					●	8.0	3.18	3.35	0.05~0.25	0.50~2.50	SRGCR/L	B84
		1003M0-AR					●	10.0	3.18	4.0	0.10~0.30	1.00~3.00		
		10T3M0-AR						10.0	3.97	4.4	0.10~0.30	1.00~3.00		
		1204M0-AR					●	12.0	4.76	4.4	0.10~0.35	1.00~3.50		

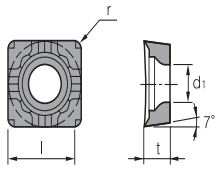
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

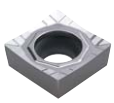
SC○○ Square 90° Positive

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		Coated PC130	Coated PC230	Coated PD1000	Uncoated H01	Uncoated H10	Dimensions (mm) l	d	t	r	d1	Cutting Condition fn	ap	Available toolholders	Page
SCGT-AK	SCGT	09T304-AK				●		9.3	9.52	3.97	0.2	4.4	0.02~0.30	0.10~4.00	SSBCR/L	B84
		09T308-AK				●		9.1	9.52	3.97	0.4	4.4	0.04~0.40	0.10~5.00	SSDCN	B85
		120404-AK				●		8.7	9.52	3.97	0.8	4.4	0.03~0.40	0.10~5.00	SSKCR/L	B103
		120408-AK				●		12.3	12.7	4.76	0.4	5.5	0.03~0.50	0.10~5.00	SSSCR/L	
		120416-AK						11.9	12.7	4.76	0.8	5.5	0.04~0.60	0.15~5.50		
SCGT-AR	SCGT	09T304-AR				●		9.1	9.52	3.97	0.4	4.4	0.03~0.40	0.50~5.00	SSBCR/L	B84
		09T308-AR				●		8.7	9.52	3.97	0.8	4.4	0.04~0.50	0.50~6.00	SSDCN	B85
		120404-AR				●		12.3	12.7	4.76	0.4	5.5	0.04~0.50	0.50~6.50	SSKCR/L	B103
		120408-AR				●		11.9	12.7	4.76	0.8	5.5	0.05~0.60	0.50~6.50	SSSCR/L	
		120416-AR						11.1	12.7	4.76	1.6	5.5	0.05~0.60	0.50~7.00		

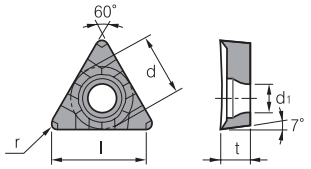
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

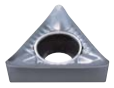
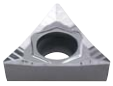
TC○○ Triangular 60° Positive

Relief Angle : 7°

Workpiece			Coated			Uncoated	
			PC130	PC230	PD1000	H01	H10
	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		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap		
TCGT-AK 	TCGT	090202-AK				●		9.1	5.56	2.38	0.2	2.5	0.01~0.12	0.05~3.00	STACR/L	B85 B86 B104
		090204-AK				●		8.6	5.56	2.38	0.4	2.5	0.02~0.15	0.10~4.00	STFCR/L	
		110202-AK				●		10.5	6.35	2.38	0.2	2.8	0.02~0.20	0.05~4.00	STGCR/L	
		110204-AK				●		10.0	6.35	2.38	0.4	2.8	0.03~0.30	0.10~4.00	STTCR/L	
		110208-AK				●		9.0	6.35	2.38	0.8	2.8	0.03~0.40	0.10~5.00		
		16T302-AK				●		15.0	9.52	3.97	0.2	4.4	0.02~0.30	0.05~5.00		
		16T304-AK	●			●		15.5	9.52	3.97	0.4	4.4	0.03~0.40	0.10~5.50		
		16T308-AK				●		14.5	9.52	3.97	0.8	4.4	0.03~0.50	0.10~5.50		
		16T312-AK				●		13.5	9.52	3.97	1.2	4.4	0.04~0.60	0.15~5.50		
		16T316-AK				●		12.5	9.52	3.97	1.6	4.4	0.05~0.80	0.15~5.50		
		16T325-AK						10.0	9.525	3.76	2.5	4.4	0.06~0.90	0.20~7.00		
TCGT-AR 	TCGT	090202-AR						9.1	5.56	2.38	0.2	2.5	0.02~0.18	0.30~3.00	STACR/L	B85 B86 B104
		090204-AR				●		8.6	5.56	2.38	0.4	2.5	0.02~0.25	0.30~5.00	STFCR/L	
		110202-AR				●		10.5	6.35	2.38	0.2	2.8	0.02~0.30	0.30~4.00	STGCR/L	
		110204-AR				●		10.0	6.35	2.38	0.4	2.8	0.03~0.40	0.30~5.00	STTCR/L	
		110208-AR				●		9.0	6.35	2.38	0.8	2.8	0.04~0.45	0.50~6.00		
		16T302-AR				●		15.0	9.52	3.97	0.2	4.4	0.03~0.45	0.30~5.00		
		16T304-AR				●		15.5	9.52	3.97	0.4	4.4	0.04~0.50	0.50~6.00		
		16T308-AR				●		14.5	9.52	3.97	0.8	4.4	0.05~0.60	0.50~6.00		
		16T312-AR				●		13.5	9.52	3.97	1.2	4.4	0.06~0.65	0.50~6.00		
		16T316-AR				●		12.5	9.52	3.97	1.6	4.4	0.08~0.70	0.50~6.50		
		16T325-AR						10.0	9.525	3.97	2.5	4.4	0.10~0.10	0.80~7.00		

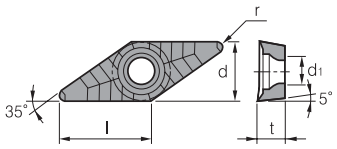
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

VB○○ Rhombic 35° Positive

Relief Angle : 5°

Workpiece			Coated			Uncoated	
			PC130	PC230	PD1000	H01	H10
	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		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap		
VBGT-AK	VBGT	110302-AK				●		10.5	6.35	3.18	0.2	2.8	0.02~0.15	0.05~3.00	SVABR/L	B86 B87 B105 B106
		110304-AK				●		10.0	6.35	3.18	0.4	2.8	0.02~0.15	0.10~4.00	SVJBR/L	
		110308-AK						9.0	6.35	3.18	0.8	2.8	0.03~0.18	0.10~5.00	SVVBN	
		160402-AK						16.1	9.52	4.76	0.2	4.4	0.03~0.30	0.05~4.00	SVQBR/L	
		160404-AK				●		15.6	9.52	4.76	0.4	4.4	0.03~0.40	0.10~5.00	SVUBR/L	
		160408-AK				●		14.6	9.52	4.76	0.8	4.4	0.03~0.50	0.10~5.00		
		160412-AK						13.6	9.52	4.76	1.2	4.4	0.05~0.60	0.10~5.50		
VBGT-AR	VBGT	110302-AR				●		10.5	6.35	3.18	0.2	2.8	0.02~0.35	0.30~3.00	SVABR/L	B86 B87 B105 B106
		110304-AR				●		10.0	6.35	3.18	0.4	2.8	0.03~0.45	0.30~4.00	SVJBR/L	
		110308-AR						9.0	6.35	3.18	0.8	2.8	0.03~0.50	0.50~6.00	SVVBN	
		160402-AR						16.1	9.52	4.76	0.2	4.4	0.04~0.45	0.30~5.00	SVQBR/L	
		160404-AR				●		15.6	9.52	4.76	0.4	4.4	0.04~0.50	0.50~6.00	SVUBR/L	
		160408-AR				●		14.6	9.52	4.76	0.8	4.4	0.05~0.60	0.50~6.00		
		160412-AR						13.6	9.52	4.76	1.2	4.4	0.05~0.70	0.50~6.50		

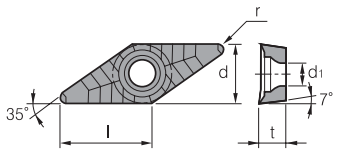
• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock
Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

VC○○ Rhombic 35° Positive

Relief Angle : 7°

Workpiece			Coated			Uncoated	
			PC130	PC230	PD1000	H01	H10
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		Dimensions (mm)					Cutting Condition		Available toolholders	Page
			PC130	PC230	PD1000	H01	H10	l	d	t	r	d1	fn	ap		
VCGT-AK	VCGT	110301-AK						10.2	6.35	3.18	0.1	2.8	0.02~0.15	0.05~3.00	SVJCR/L SVVCN SVQCR/L SVUCR/L	B87 B88 B105 B106
		110302-AK				●		10.5	6.35	3.18	0.2	2.8	0.02~0.20	0.05~3.00		
		110304-AK	●	●		●		10.0	6.35	3.18	0.4	2.8	0.02~0.25	0.10~4.00		
		110308-AK				●		9.0	6.35	3.18	0.8	2.8	0.03~0.30	0.10~5.00		
		130302-AK				●		10.5	7.94	3.18	0.2	3.4	0.02~0.35	0.10~5.00		
		130304-AK				●		10.0	7.94	3.18	0.4	3.4	0.03~0.35	0.10~5.00		
		130308-AK						9.0	7.94	3.18	0.8	3.4	0.04~0.40	0.10~5.00		
		160402-AK		●		●		16.1	9.52	4.76	0.2	4.4	0.02~0.30	0.05~5.00		
		160404-AK		●	●	●		15.6	9.52	4.76	0.4	4.4	0.03~0.40	0.10~5.00		
		160408-AK		●	●	●		14.0	9.52	4.76	0.8	4.4	0.03~0.50	0.10~5.00		
		160412-AK				●		13.6	9.52	4.76	1.2	4.4	0.03~0.50	0.10~5.00		
		220516-AK						18.0	12.7	5.56	1.6	5.6	0.03~0.60	0.10~7.00		
		220525-AK						15.6	12.7	5.56	2.5	5.6	0.05~0.70	0.10~7.00		
		220530-AK				●		14.3	12.7	5.56	3.0	5.6	0.08~1.00	0.10~7.00		
VCGT-AR	VCGT	110301-AR						10.2	6.35	3.18	0.1	2.8	0.02~0.20	0.10~3.00	SVJCR/L SVVCN SVQCR/L SVUCR/L	B87 B88 B105 B106
		110302-AR				●		10.5	6.35	3.18	0.2	2.8	0.02~0.25	0.30~3.00		
		110304-AR				●		10.0	6.35	3.18	0.4	2.8	0.03~0.35	0.30~4.00		
		110308-AR				●		9.0	6.35	3.18	0.8	2.8	0.04~0.45	0.50~6.00		
		130302-AR				●		10.5	7.94	3.18	0.2	3.4	0.02~0.40	0.50~3.00		
		130304-AR				●		10.0	7.94	3.18	0.4	3.4	0.03~0.45	0.50~4.00		
		130308-AR				●		9.0	7.94	3.18	0.8	3.4	0.04~0.50	0.50~5.00		
		160402-AR				●		16.1	9.52	4.76	0.2	4.4	0.03~0.40	0.30~5.00		
		160404-AR				●		15.6	9.52	4.76	0.4	4.4	0.04~0.50	0.50~6.00		
		160408-AR				●		14.6	9.52	4.76	0.8	4.4	0.05~0.60	0.50~6.00		
		160412-AR				●		13.6	9.52	4.76	1.2	4.4	0.06~0.65	0.50~6.50		
		220516-AR						18.0	12.7	5.56	1.6	5.6	0.10~0.65	0.80~6.50		
		220525-AR				●		15.6	12.7	5.56	2.5	5.6	0.10~0.70	0.80~7.00		
		220530-AR				●		14.3	12.7	5.56	3.0	5.6	0.12~0.75	1.00~7.00		

• Cutting edge geometry : A06 ~ A09 • Recommended chip breaker : B12 ~ B17 • Code system : B18 ~ B19 ● : Stock item ○ : Under preparing for stock

Note)Unit : Feed(fn) = ㎜/rev Depth of cut(ap) = ㎜

Technical information for cBN Insert

• Features of cBN Grade

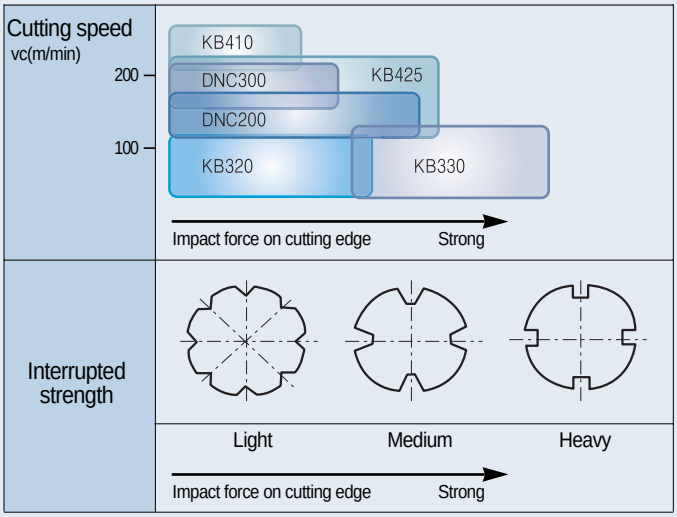
Grade	Applications	Features
KB410	High speed continuous cutting of hardened steel	Best wear resistance grade and suitable for high speed continuous cutting
KB420	High efficiency cutting of hardened steel	Binder with high heat resistance improve tool life during high speed machining
KB425	High speed interrupted cutting of hardened steel	Superior fracture resistance and suitable for high speed interrupted hard turning
KB320	Continuous cutting and interrupted cutting of hardened steel	Micro grain cBN with ceramic binder improve fracture resistance and wear resistance
KB330	Heavy interrupted cutting of hardened steel	Micro grain cBN with higher fracture resistance and wear resistance
DNC200	High speed continuous and medium interrupted cutting of hardened steel	Excellent wear resistance and cost effective by using multi cutting edge insert
DNC300	High speed continuous and light interrupted cutting of hardened steel	Excellent wear resistance and suitable for high efficiency machining with multi cutting edge
KB350	High speed precision machining of cast iron (GC/GCD)	High fracture resistance and wear resistance
KB370	High speed machining of cast iron and difficult-to-cut material	The highest hardness and toughness acquire good performance for difficult-to-cut material and cast iron

■ For general hardened steel machining

• Recommended cutting condition

Grade	Cutting Speed, vc(m/min)	feed fn(m/rev) / D.O.C ap(mm)	
	50 100 (120) 150 200 250 300	0 0.1 0.2 0.3 / 0 0.1 0.2 0.3 0.4 0.5	
KB410	150 – 200	fn	0.03 – 0.13
		ap	0.03 – 0.2
KB420	120 – 150	fn	0.03 – 0.3
		ap	0.03 – 0.5
KB425	150 – 200	fn	0.03 – 0.3
		ap	0.03 – 0.5
KB320	80 – 120	fn	0.03 – 0.2
		ap	0.03 – 0.3
KB330	80 – 110	fn	0.03 – 0.2
		ap	0.03 – 0.3
DNC200	130 – 170	fn	0.05 – 0.3
		ap	0.05 – 0.3
DNC300	140 – 200	fn	0.05 – 0.5
		ap	0.05 – 0.3

• Application range

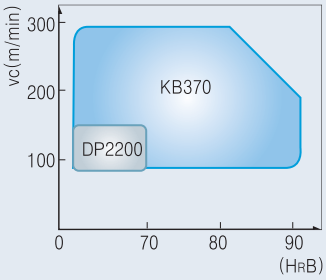


■ For valve seat ring (VSR)

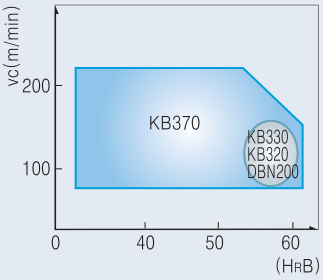
	Gasoline VSR material	Diesel VSR material
Plunge machining	KB370 KB330	KB370 KB330
Traverse machining	KB370 KB350	KB370 KB350
Hardness(HV)	Low ⬅ HV300 ➡ High	Low ⬅ HV300 ➡ High

■ For sintered component machining

• General sintered alloy



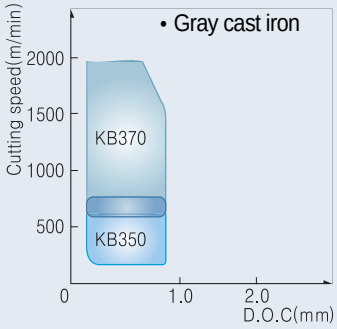
• High density/ Hardened sintered alloy



■ For cast iron machining

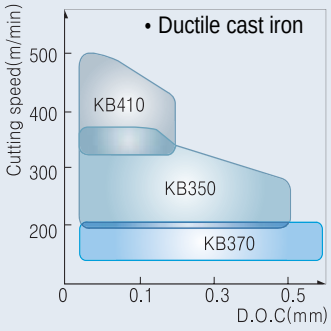
Grade	Applications	Features
KB350	For cast iron machining(GC.GCD), High hardened VSR(Traverse machining)	Suitable for cast iron machining with a good balance of wear and fracture resistance
KB370	High speed machining for cast iron Cast iron milling Iron based products High hardness roll machining Heat resistant alloy	Lesser burs when machining sintered material due to excellent edge sharpness

• Application range

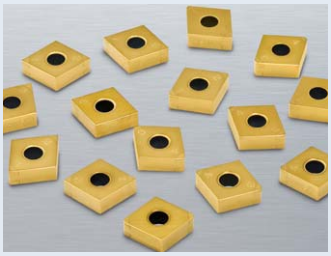
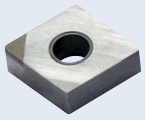
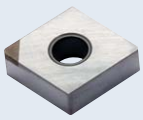
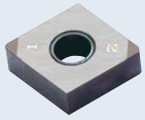


• Recommended cutting condition

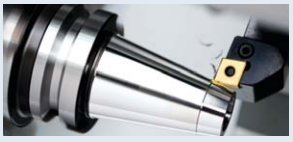
Type	Workpiece		Cutting speed, vc(m/min) 100 1000 2000	fn (mm/rev)	ap (mm)
	Material	Grade			
Turning	Gray cast iron	KB370	500 — 2000	0.1~0.5	≦1.0
		KB350	200 — 700	0.1~0.5	≦1.0
	Alloyed cast iron	KB370	200 — 800	0.1~0.4	≦0.5
	Ductile cast iron	KB370	80 — 200	0.1~0.4	≦0.6
		KB350	100 — 350	0.1~0.4	≦0.5
		KB410	250 — 500	0.1~0.4	≦0.5
Milling	Gray cast iron	KB370	800 — 2000	0.1~0.5	≦0.5



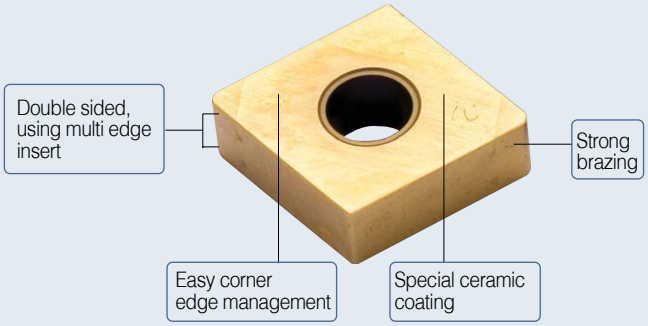
• Type of cBN insert

Regrinding type	One use type	Multi edge type	Wiper type
			
• Long tool life.. • Excellent wear resistance, High hardness. • Saved tool cost due to the regrinding insert 3~4 times.  CNMA120408	• Economical price. • Cost down. • Simple tool management. • Various line-up. • Stable machining and long tool life due to strong brazing technology.  NU CNMA120408	• Insert with several brazed cBN. • Price per edge is more reasonable compare to normal single cornered, one-used type. • Wide application of continuous to interrupted machining.  2NU-CNGA120408	• One-used wiper insert for hardened steel. • Excellent surface roughness. • High efficiency machining. • Grade : DNC200, DNC300.

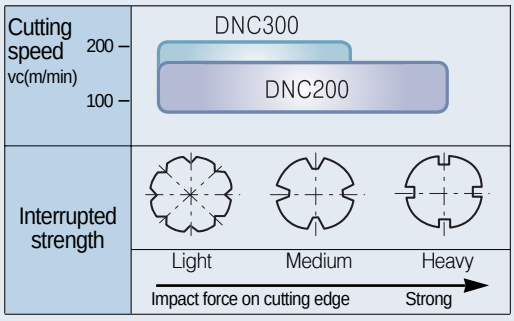
■ Coated multi edge cBN insert - High efficiency cutting of hardened steel



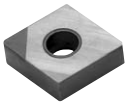
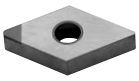
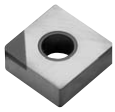
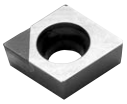
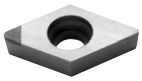
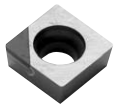
- Stable and long tool life
- Cost effective by double sided, multi edge insert
- Improved stability in surface roughness and chip control in high speed cutting



• Application range

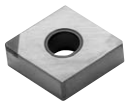
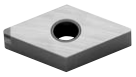
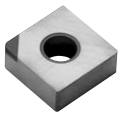
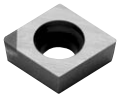
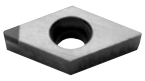


cBN Regrinding (Negative / Positive)

	Figure	Designation	Grades	Dimensions(mm)				Available toolholders	Page
			KB320	Inscribed circle	Thickness	Nose R	Hole size		
CN○○ 80° Nega		CNMA 120404	●	12.7	4.76	04	5.16	DCBNR/L DCLNR/L	AD02
		120408	●	12.7	4.76	08	5.16	MCKNR/L MCLNR/L	B69
								MCMNN PCBNR/L	B76
								PCLNR/L	B97
									B99
DN○○ 55° Nega		DNMA 150404	●	12.7	4.76	04	5.16	DDJNR/L MDJNR/L	AD02
		150408	●	12.7	4.76	08	5.16	MDNNN MDQNR/L	B70
								PDJNR/L PDNNR/L	B71
								MDUNR/L PDSNR/L	B77
								PDUNR/L	B97
									B99
SN○○ 90° Nega		SNMA 120404	●	12.7	4.76	04	5.16	DSBNR/L MSBNR/L	AD02, B97
		120408	●	12.7	4.76	08	5.16	MSDNN MSKNR/L	B71, B100
								MSRNR/L MSSNR/L	B72
								PSBNR/L PSDNN	B78
								PSKNR/L	B79
									B80
TN○○ 60° Nega		TNMA 160404	●	9.525	4.76	04	3.81	MTENNS MTFNR/L	B73, B100
		160408	●	9.525	4.76	08	3.81	MTGNR/L MTJNR/L	B74
								PTFNR/L PTGNR/L	B80
								PTTNR/L WTENN	B81
								WTJNR/L WTXNR/L	B89
									B98
VN○○ 35° Nega		VNMA 160404	●	9.525	4.76	04	3.81	MVJNR/L	B74
		160408	●	9.525	4.76	08	3.81	MVQNR/L	B75
								MVVNN	B98
								MVUNR/L	
CC○○ 80° Posi		CCMW 060204		6.35	2.38	04	2.8	SCACR/L	B82
		060208		6.35	2.38	08	2.8	SCLCR/L	B101
		09T304	●	9.525	3.97	04	4.4	SCLCR/L	
		09T308		9.525	3.97	08	4.4		
DC○○ 55° Posi		DCMW 070204		6.35	2.38	04	2.8	SDACR/L	B82
		11T304		9.525	3.97	04	4.4	SDJCR/L	B83
		11T308		9.525	3.97	08	4.4	SDNCN	B102
		11T312		9.525	3.97	12	4.4	SDQCR/L	B103
								SDUCR/L	
								SDZCR/L	
SC○○ 90° Posi		SCMW 09T304		9.525	3.97	04	4.4	SSBCR/L	B84
		09T308		9.525	3.97	08	4.4	SSDCN	B85
								SSKCR/L	B103
								SSSCR/L	
								SSKCR/L	
TC○○ TP○○ 60° Posi		TCMW 110204		6.35	2.38	04	2.8	STACR/L	B85
		TPGB 110304	●	6.35	3.18	04	3.4	STFCR/L	B86
		110308	●	6.35	3.18	08	3.4	STFPR/L	B104
								STGCR/L	B105
								STTCR/L	B113
VB○○ 35° Posi		VBMW 160404	●	9.525	4.76	04	4.4	SVABR/L	B86
		160408		9.525	4.76	08	4.4	SVHBR/L	B87
								SVJBR/L	B105
								SVQBR/L	B106
								SVUBR/L	

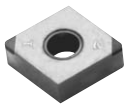
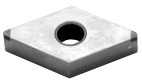
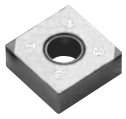
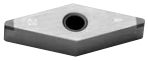
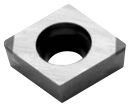
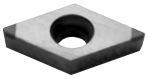
● : Stock item

cBN One-Use Type (Negative / Positive)

	Figure	Designation	Grades	Dimensions(mm)				Available toolholders	Page
			KB320	Inscribed circle	Thickness	Nose R	Hole size		
CN○○ 80° Nega		NU-CNMA 120404	●	12.7	4.76	04	5.16	DCBNR/L DCLNR/L	AD02
		120408	●	12.7	4.76	08	5.16	MCKNR/L MCLNR/L	B69
								MCMNN PCBNR/L	B76
								PCLNR/L	B97
									B99
DN○○ 55° Nega		NU-DNMA 150404		12.7	4.76	04	5.16	DDJNR/L MDJNR/L	AD02
		150408		12.7	4.76	08	5.16	MDNNN MDQNR/L	B70
								PDJNR/L PDNNR/L	B71
								MDUNR/L PDSNR/L	B77
								PDUNR/L	B97
									B99
SN○○ 90° Nega		NU-SNMA 120404		12.7	4.76	04	5.16	DSBNR/L MSBNR/L	AD02, B97
		120408		12.7	4.76	08	5.16	MSDNN MSKNR/L	B71, B100
								MSRNR/L MSSNR/L	B72,
								PSBNR/L PSDNN	B78,
								PSKNR/L	B79
									B80
TN○○ 60° Nega		NU-TNMA 160404		9.525	4.76	04	3.81	MTENNS MTFNR/L	B73, B100
		160408		9.525	4.76	08	3.81	MTGNR/L MTJNR/L	B74
								PTFNR/L PTGNR/L	B80
								PTTNR/L WTENN	B81
								WTJNR/L WTXNR/L	B89
									B98
VN○○ 35° Nega		NU-VNMA 160404		9.525	4.76	04	3.81	MVJNR/L	B74
		160408		9.525	4.76	08	3.81	MVQNR/L	B75
								MVVNN	B98
								MVUNR/L	
CC○○ 80° Posi		NU-CCMW 060204		6.35	2.38	02	2.8	SCACR/L	B82
		060208		6.35	2.38	04	2.8	SCLCR/L	B101
		09T302		9.525	3.97	02	4.4	SCLCR/L	
		09T304		9.525	3.97	04	4.4		
		09T308		9.525	3.97	08	4.4		
DC○○ 55° Posi		NU-DCMW 070202		6.35	2.38	02	2.8	SDACR/L	B82
		070204		6.35	2.38	04	2.8	SDJCR/L	B83
		11T302		9.525	3.97	02	4.4	SDNCN	B102
		11T304		9.525	3.97	04	4.4	SDQCR/L	B103
		11T308		9.525	3.97	08	4.4	SDUCR/L	
								SDZCR/L	
TP○○ 60° Posi		NU-TPGW 080204		4.76	2.38	04	2.8	STFPR/L	B105
		110304		6.35	3.18	04	3.4	STUPR/L	B107
VB○○ 35° Posi		NU-VBMW 160404		9.525	4.76	04	4.4	SVABR/L	B86
		160408		9.525	4.76	08	4.4	SVHBR/L	B87
								SVJBR/L	B105
								SVQBR/L	B106
								SVUBR/L	

● : Stock item

cBN Multi-Corner Type (Negative / Positive)

	Figure	Designation	Grades	Dimensions(mm)				Available toolholders	Page
			KB320	Inscribed circle	Thickness	Nose R	Hole size		
CN○○ 80° Nega		2NU-CNGA 120404	●	12.7	4.76	04	5.16	DCBNR/L DCLNR/L	AD02
		120408	●	12.7	4.76	08	5.16	MCKNR/L MCLNR/L	B69
								MCMNN PCBNR/L	B76
								PCLNR/L	B97
									B99
DN○○ 55° Nega		2NU-DNGA 150404	●	12.7	4.76	04	5.16	DDJNR/L MDJNR/L	AD02 B99
		150408	●	12.7	4.76	08	5.16	MDNNN MDQNR/L	B70
								PDJNR/L PDNNR/L	B71
								MDUNR/L PDSNR/L	B77
								PDUNR/L	B97
SN○○ 90° Nega		2NU-SNGA 120404	●	12.7	4.76	04	5.16	DSBNR/L MSBNR/L	AD02, B80
		120408	●	12.7	4.76	08	5.16	MSDNN MSKNR/L	B71, B97
								MSRNR/L MSSNR/L	B72, B100
								PSBNR/L PSDNN	B78
								PSKNR/L	B79
TN○○ 60° Nega		3NU-TNGA 160404	●	9.525	4.76	04	3.81	MTENNS MTFNR/L	B73, B98
		160408	●	9.525	4.76	08	3.81	MTGNR/L MTJNR/L	B74, B100
								PTFNR/L PTGNR/L	B80
								PTTNR/L WTENN	B81
								WTJNR/L WTXNR/L	B89
VN○○ 35° Nega		2NU-VNGA 160404	●	9.525	4.76	04	3.81	MVJNR/L	B74
		160408	●	9.525	4.76	08	3.81	MVQNR/L	B75
								MVVNN	B98
								MVUNR/L	
CC○○ 80° Posi		2NU-CCGW 09T304	●	9.525	3.97	04	4.4	SCACR/L	B82
		09T308	●	9.525	3.97	08	4.4	SCLCR/L	B101
								SCLCR/L	
DC○○ 55° Posi		2NU-DCGW 11T304	●	9.525	3.97	04	4.4	SDACR/L SDJCR/L	BB82
		11T308	●	9.525	3.97	08	4.4	SDNCN SDQCR/L	B83
								SDUCR/L SDZCR/L	B102
									B103
TP○○ 60° Posi		3NU-TPGB 110304	●	6.35	3.18	04	3.4	STFPR/L	B105
		110308	●	6.35	3.18	08	3.4		
VB○○ 35° Posi		2NU-VBGW 160404	●	9.525	4.76	04	3.81	SVABR/L	B86
		160408	●	9.525	4.76	08	3.81	SVHBR/L	B87
								SVJBR/L	B105
								SVQBR/L	B106
								SVUBR/L	

● : Stock item

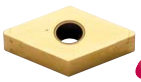
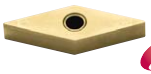
cBN Wiper Type (Negative)

	Figure	Designation	Grades	Dimensions(mm)				Available toolholders	Page
			DNC200	Inscribed circle	Thickness	Nose R	Hole size		
CN○○ 80° Nega		4NU-CNGA 120404W	●	12.7	4.76	04	5.16	DCBNR/L DCLNR/L	AD02
		120408W	●	12.7	4.76	08	5.16	MCKNR/L MCLNR/L	B69
		120412W	●	12.7	4.76	12	5.16	MCMNN PCBNR/L	B76
								PCLNR/L	B97
									B99

New

● : Stock item

cBN General Type (Negative)

	Figure	Designation	Grades	Dimensions(mm)				Available toolholders		Page
			DNC200	Inscribed circle	Thickness	Nose R	Hole size			
CN○○ 80° Nega		4NU-CNGA 120404	●	12.7	4.76	04	5.16	DCBNR/L	DCLNR/L	AD02
		120408	●	12.7	4.76	08	5.16	MCKNR/L	MCLNR/L	B69
								MCMNN	PCBNR/L	B76
								PCLNR/L		B97
										B99
DN○○ 55° Nega		4NU-DNGA 150404	●	12.7	4.76	04	5.16	DDJNR/L	MDJNR/L	AD02, B99
		150408	●	12.7	4.76	08	5.16	MDNNN	MDQNR/L	B70
								PDJNR/L	PDNNR/L	B71
								MDUNR/L	PDSNR/L	B77
								PDUNR/L		B97
VN○○ 35° Nega		4NU-VNGA 160404		12.7	4.76	04	5.16	MVJNR/L		B74
		160404		12.7	4.76	08	5.16	MVQNR/L		B75
								MVVNN		B98
								MVUNR/L		
SN○○ 90° Nega		4NU-SNGA 120404		12.7	4.76	04	3.81	DSBNR/L	MSBNR/L	AD02, B80
		120408		12.7	4.76	08	3.81	MSDNN	MSKNR/L	B71, B97
								MSRNR/L	MSSNR/L	B72, B100
								PSBNR/L	PSDNN	B78
								PSKNR/L		B79
TN○○ 60° Nega		4NU-TNGA 160404		9.525	4.76	04	3.81	MTENNS	MTFNR/L	B73, B98
		160408		9.525	4.76	08	3.81	MTGNR/L	MTJNR/L	B74, B100
								PTFNR/L	PTGNR/L	B80
								PTTNR/L	WTENN	B81
								WTJNR/L	WTXNR/L	B89

● : Stock item

PCD Insert

Technical information for PCD insert

Features

KORLOY PCD products are manufactured by using high quality PCD tip which is made under ultra high temperature and pressure. The PCD tip has been welded on the qualified carbide insert of KORLOY.
Since KORLOY supplies high quality PCD products for turning, milling and endmills, it is possible to meet the needs of variety of application.

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

PCD Grade

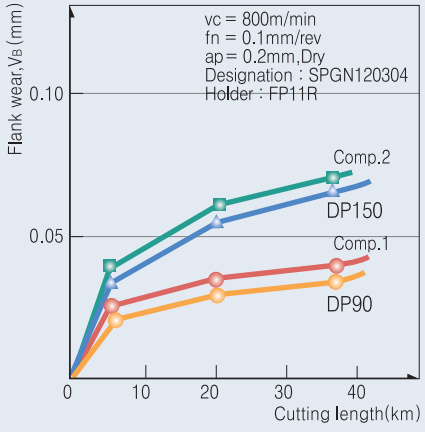
Grade	Features	Application	Grain size(㎛)	Hardness(Hv)	TRS(kgf/㎟)
DP90	Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy.	Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone	50	10,000~ 12,000	110
DP150	By use 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

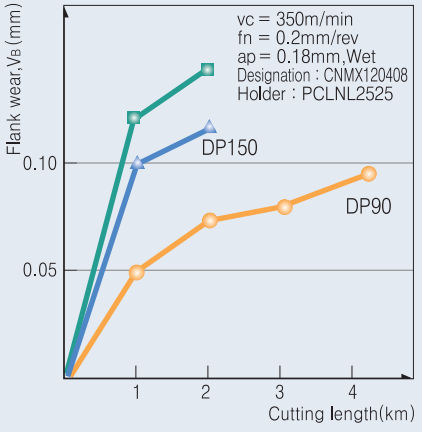
Workpiece	Cutting speed (m/min)	Feed (mm/rev)	Depth of cut (mm)	Recommended grade	
				1st	2nd
Aluminum alloy (4%~8% Si)	1000 ~ 3000	0.1 ~ 0.6	~ 3	DP150	DP200
Aluminum alloy (9%~14% Si)	600 ~ 2500	0.1 ~ 0.5	~ 3	DP150	DP200
Aluminum alloy (15%~18% Si)	300 ~ 700	0.1 ~ 0.4	~ 3	DP150	DP200
Copper, Bronze 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

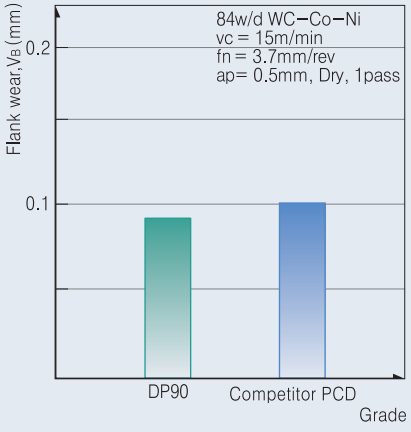
• Continuous cutting test(Workpiece:Al-25%Si)



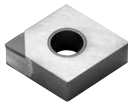
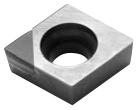
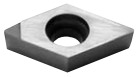
• Interrupted cutting test(Workpiece:Al-20%Si)



• Cutting test of cemented carbide



PCD Insert (Negative / Positive)

	Figure	Designation	Grades	Dimensions(mm)				Available toolholders	Page
			DP150	Inscribed circle	Thickness	Nose R	Hole size		
CN○○ 80° Nega		CNMM 120404	●	12.9	4.76	04	5.16	DCBNR/L DCLNR/L	AD02
		120408	●	12.9	4.76	08	5.16	MCKNR/L MCLNR/L	B69
		CNMX 120404		12.9	4.76	04	5.16	MCMNN PCBNR/L	B76
		120408		12.9	4.76	08	5.16	PCLNR/L	B97
									B99
CC○○ 80° Posi		CCMT 060202		6.35	2.38	02	2.8	SCACR/L	B82
		060204		6.35	2.38	04	2.8	SCLCR/L	B101
		09T304	●	9.525	3.97	04	4.4	SCLCR/L	
		09T308		9.525	3.97	08	4.4		
DC○○ 55° Nega		DCMT 11T304		9.525	3.97	04	4.4	SDACR/L SDJCR/L	B82
		11T308		9.525	3.97	08	4.4	SDNCN SDQCR/L	B83
								SDUCR/L SDZCR/L	B102
									B103
TB○○ TP○○ 60° Posi		TBGW 060102		3.97	1.59	02	2.2	STFPR/L	B105
		060104		3.97	1.59	02	2.2	STUBR/L	B107
		TPGT 080204		4.76	2.38	04	2.4	STUPR/L	
		110304		6.35	3.18	04	3.4		
		TPGW 080204		4.76	2.38	04	2.2		
		TPGB 080204		4.76	2.38	04	2.4		
		110304		6.35	3.18	04	3.4		
VB○○ VC○○ 35° Posi		VBMW 160408		9.525	4.76	08	4.4	SVABR/L	B86
		VCMT 110304		6.35	3.18	04	3.4	SVHBR/L	B87
		160408		9.525	4.76	08	4.4	SVJBR/L	B88
		160412		9.525	4.76	12	4.4	SVQBR/L	B105
								SVUBR/L	B106
								SVVCN	

● : Stock item

External tool Holder Code System(ISO)

P	S	K	N	R	25	25	–	M	12
1	2	3	4	5	6	7		8	9

1 P S K N R 25 25 – M 12
Clamping Method of Inserts

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 P S K N R 25 25 – M 12
Insert Shape

80°	55°	75°	55°
C	D	E	K
L	R	S	T
35°	80°		
V	W		

3 P S K N R 25 25 – M 12
Holder Style

75°	45°	60°	90°	90°	93°	75°
B	D	E	F	G	J	K
95° 95°	63°	75°	45°	60°	72.5°	85°
L	N	R	S	T	V	Y

4 P S K N R 25 25 – M 12
Clearance Angle of Inserts

5°	7°	15°	20°
B	C	D	E
25°	0°	11°	
F	N	P	

5 P S K N R 25 25 – M 12
Hand of Tool

L	N	R

6 P S K N R 25 25 – M 12
Height of Shank

H

7 P S K N R 25 25 – M 12
Width of Shank

W

8 P S K N R 25 25 – M 12
Length of Holder

l

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	

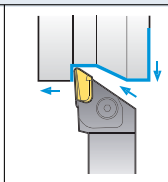
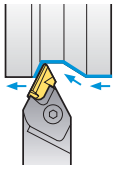
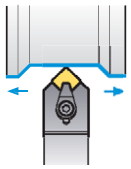
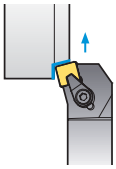
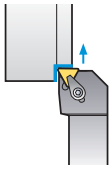
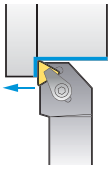
9 P S K N R 25 25 – M 12
Length of Insert Cutting Edge

A.B.K l | C.D.E M.V l | H l | L l

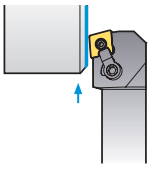
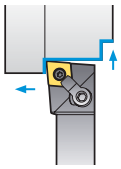
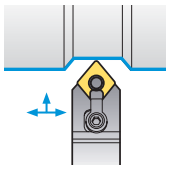
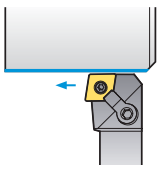
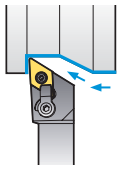
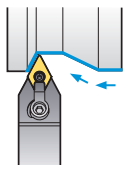
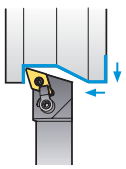
O l | P l | R l

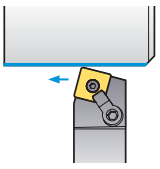
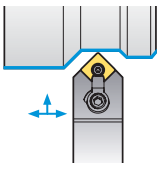
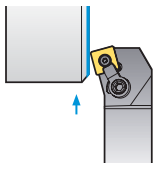
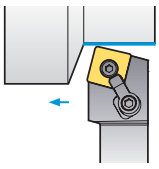
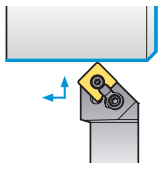
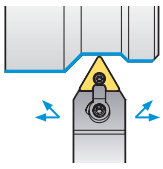
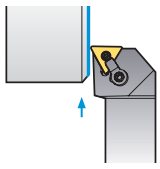
S l | T l | W l

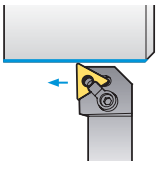
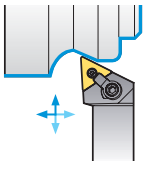
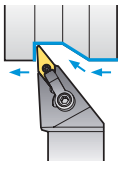
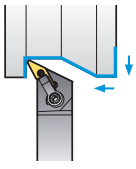
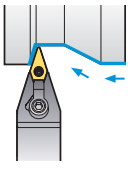
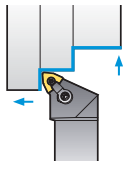
■ Clamp on System

Cutting Shape							
Designation	CKJNR/L	CKNNR/L	CSDPN	CSKPR/L	CTFPR/L	CTGPR/L	
Approach angle	93°	63°	45°	75°	90°	90°	
Page	B67	B67	B67	B68	B68	B68	
Turning	●	●	●			●	
Copying	●	●					
Facing				●	●		
Chamfering							
Back turning	●						

■ Multi Lock System

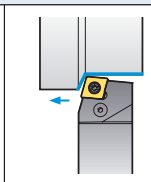
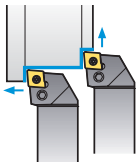
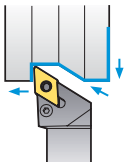
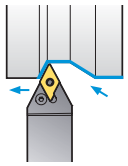
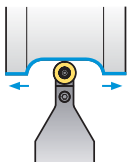
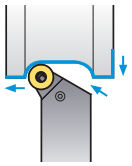
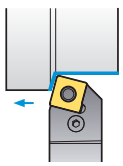
Cutting Shape							
Designation	MCKNR/L	MCLNR/L	MCMNN	MCRNR/L	MDJNR/L	MDNNN	MDQNR/L
Approach angle	95°	95°	50°	75°	93°	62.5°	107.5°
Page	B69	B69	B69	B70	B70	B70	B71
Turning		●	●	●	●	●	●
Copying					●	●	●
Facing	●	●					
Chamfering							
Back turning		●			●		●

Cutting Shape							
Designation	MSBNR/L	MSDNN	MSKNR/L	MSRNR/L	MSSNR/L	MTENNS	MTFNR/L
Approach angle	75°	45°	75°	75°	45°	60°	90°
Page	B71	B71	B72	B72	B72	B73	B73
Turning	●	●		●	●	●	
Copying						●	
Facing			●		●		●
Chamfering							
Back turning							

Cutting Shape							
Designation	MTGNR/L	MTJNR/L	MVJNR/L	MVQNR/L	MVVNN	MWLNR/L	
Approach angle	90°	93°	93°	117.5°	72.5°	95°	
Page	B73	B74	B74	B74	B75	B75	
Turning	●	●	●	●	●	●	
Copying		●	●	●	●		
Facing		●				●	
Chamfering							
Back turning		●	●	●		●	

Index for External Holder

■ Lever Lock System

Cutting Shape							
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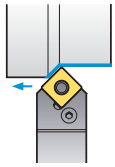
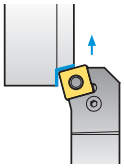
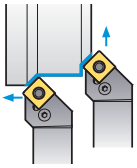
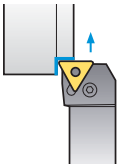
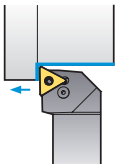
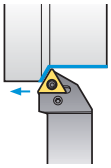
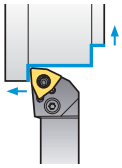
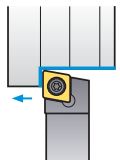
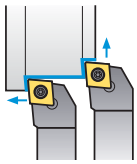
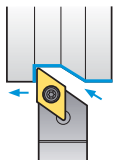
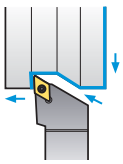
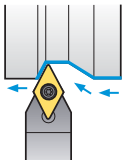
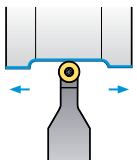
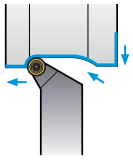
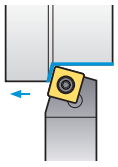
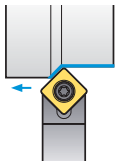
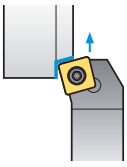
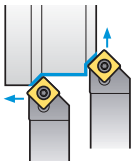
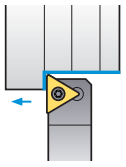
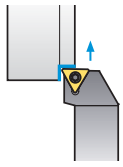
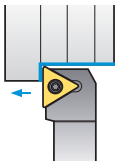
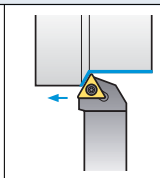
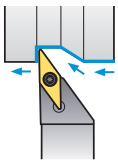
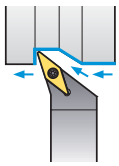
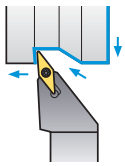
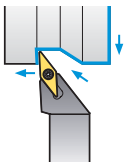
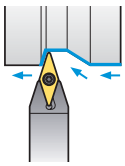
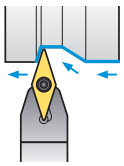
Approach angle	75°	95°	93°	63°	-	-	75°
Page	B76	B76	B77	B77	B77	B78	B78
Turning	●	●	●	●	●	●	●
Copying			●	●	●	●	
Facing		●					
Chamfering							
Back turning		●	●				

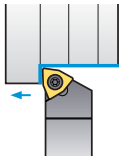
Cutting Shape							
Designation	PSDNN	PSKNR/L	PSSNR/L	PTFNR/L	PTGNR/L	PTTNR/L	PWLNR/L
Approach angle	45°	75°	45°	90°	90°	60°	95°
Page	B79	B79	B80	B80	B80	B81	B81
Turning	●		●		●	●	●
Copying							
Facing		●	●	●			●
Chamfering						●	
Back turning							●

■ Screw on System

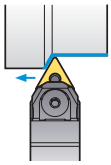
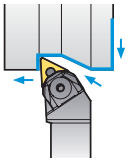
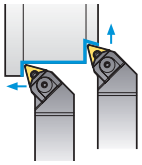
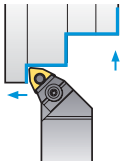
Cutting Shape							
Designation	SCACR/L	SCLCR/L	SDACR/L	SDJCR/L	SDNCN	SRDCN	SRGCR/L
Approach angle	90°	95°	90°	93°	63°	-	-
Page	B82	B82	B82	B83	B83	B83	B84
Turning	●	●	●	●	●	●	●
Copying			●	●	●	●	●
Facing		●					
Chamfering							
Back turning		●		●			

Cutting Shape							
Designation	SSBCR/L	SSDCN	SSKCR/L	SSSCR/L	STACR/L	STFCR/L	STGCR/L
Approach angle	75°	45°	75°	45°	90°	90°	90°
Page	B84	B84	B85	B85	B85	B85	B86
Turning	●	●		●	●		●
Copying							
Facing			●	●		●	
Chamfering							
Back turning							

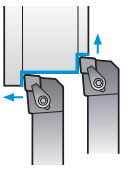
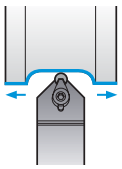
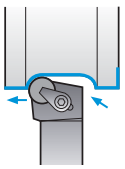
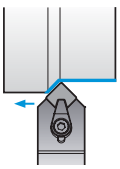
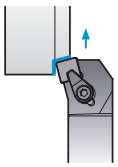
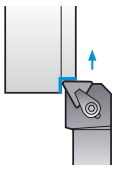
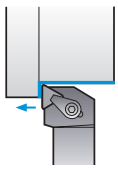
Cutting Shape							
Designation	STTCR/L	SVABR/L	SVHBR/L	SVJBR/L	SVJCR/L	SVVBN	SVVCN
Approach angle	60°	90°	107.5°	93°	93°	72.5°	72.5°
Page	B86	B86	B86	B87	B87	B87	B88
Turning	●	●	●	●	●	●	●
Copying		●	●	●	●	●	●
Facing							
Chamfering							
Back turning		●	●	●	●		

Cutting Shape	
Designation	SWACR/L
Approach angle	90°
Page	B88
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	B89	B89	B89	B89
Turning	●	●	●	●
Copying	●	●	●	
Facing				●
Chamfering				
Back turning		●	●	●

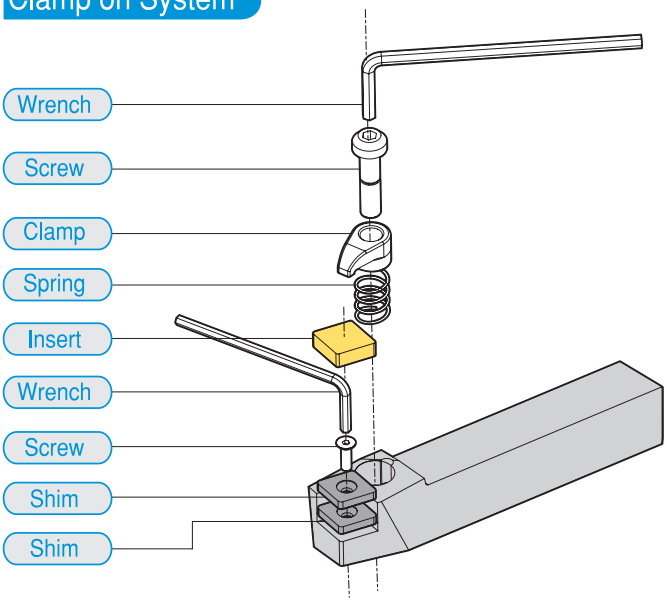
■ Ceramic Holder

Cutting Shape							
Designation	CCNLR/L	CRDNN	CRGNR/L	CSDNN	CSKNR/L	CTFNR/L	CTGNR/L
Approach angle	95°	-	-	45°	75°	90°	90°
Page	B90	B90	B90	B90	B91	B91	B91
Turning	●	●	●	●			●
Copying			●				
Facing	●				●	●	
Chamfering							
Back turning	●						

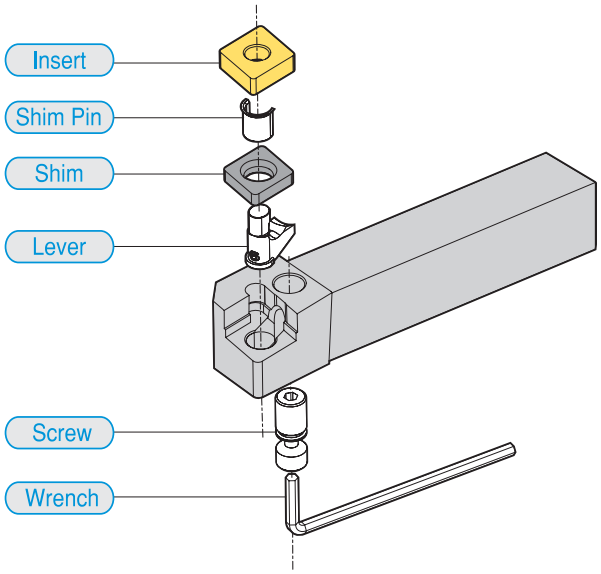
Instruction of External Holder

Instructions of Holder assembly

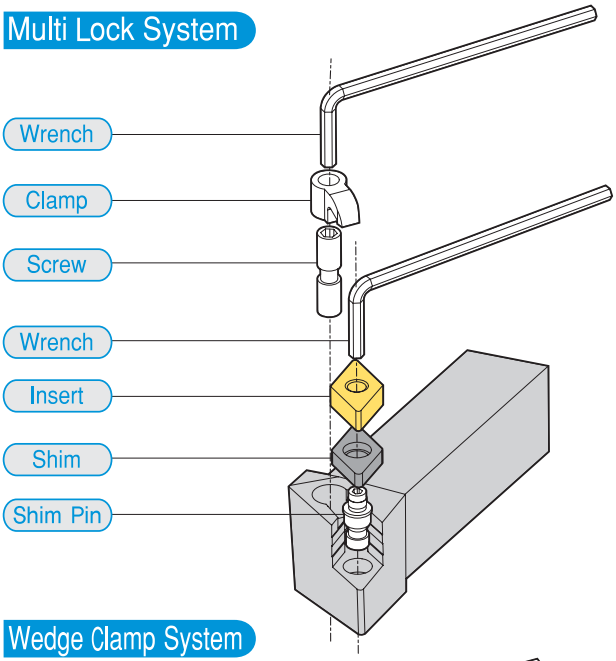
Clamp on System



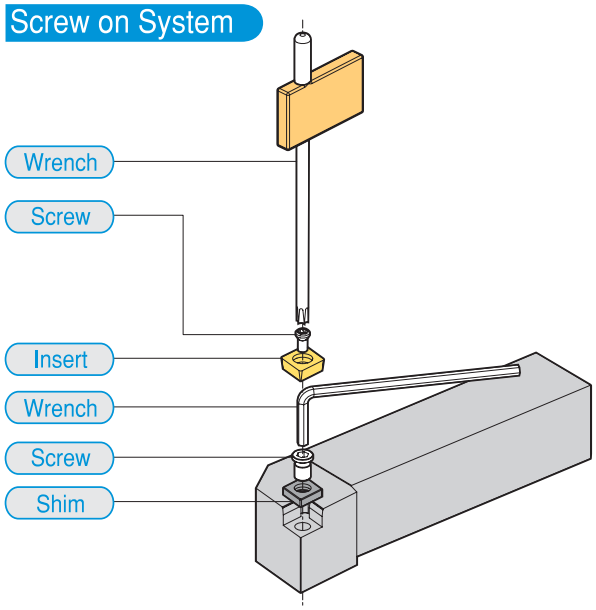
Lever Lock System



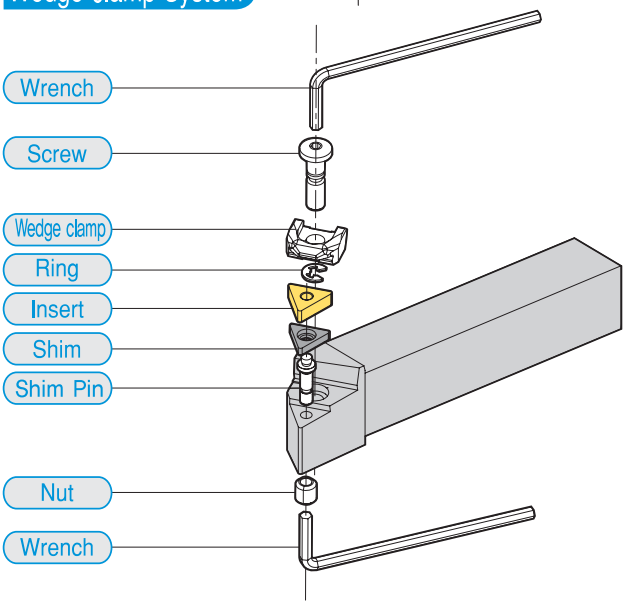
Multi Lock System



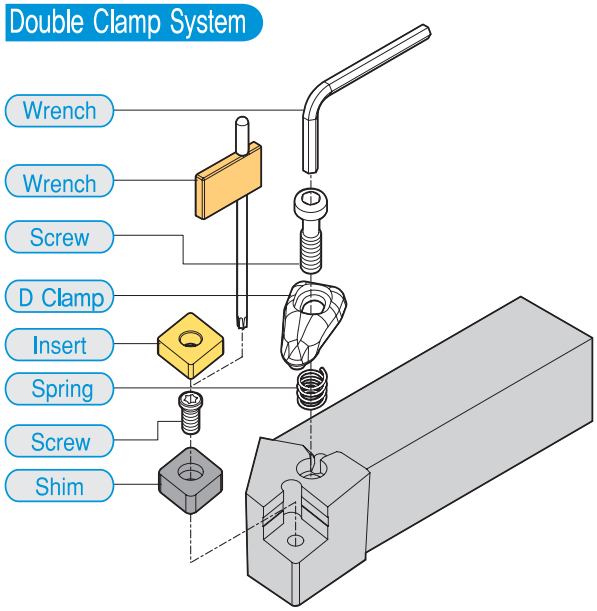
Screw on System



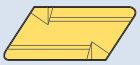
Wedge Clamp System



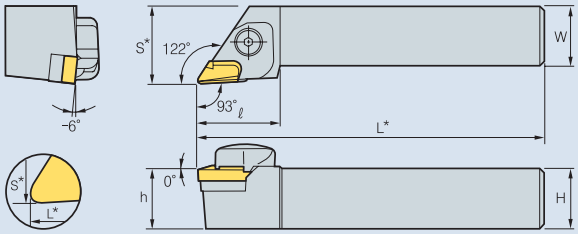
Double Clamp System



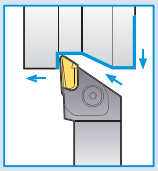
CKJNR/L



KN□□



93°



• R type insert

(mm)

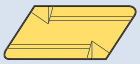
Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin	Shim Screw	Wrench
CKJNR	2020-K16	●		20	20	125	25	20	32	KN□□ 1604□□R	CTH6R1	CHX0625	SR3 SR4	SK33C	PN0515	SHX0310	HW20L HW40L
	2525-M16	●		25	25	150	32	25	32								
	3225-M16	○		32	25	150	32	32	32								
	3225-P16	●		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 SR4	SK33CL	PN0515	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, see pages **B25**

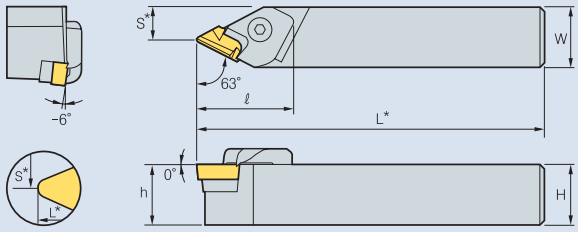
* r=0.5

● : Stock item ○ : Under preparing for stock

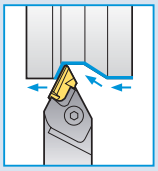
CKNNR/L



KN□□



63°



• R type insert

(mm)

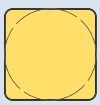
Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin	Shim Screw	Wrench
CKNNR	2525-M16	●		25	25	150	14.3	25	37	KN□□ 1604□□R	CTH6R1	CHX0625	SR3 SR4	SK33L	PN0515	SHX0310	HW20L HW40L
	3232-P16	●		32	32	170	16.8	32	37								
CKNNL	2525-M16			25	25	150	14.3	25	37	KN□□ 1604□□L	CTH6L1	CHX0625	SR3 SR4	SK33CL	PN0515	SHX0310	HW20L HW40L
	3232-P16	○	●	32	32	170	16.8	32	37								

• Applicable inserts, see pages **B25**

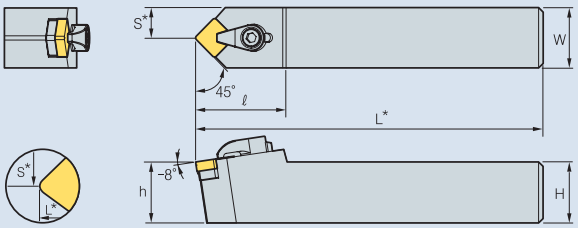
* r=0.5

● : Stock item ○ : Under preparing for stock

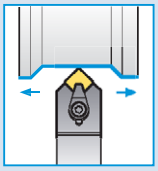
CSDPN



SP□R



45°



(mm)

Designation		Stock	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□R 0903□□	CH53R1	CH0515C	SS32C	SP3C	CR03C	HW25L
	2525-M12	●	25	25	150	12.5	25	35	SP□R 1203□□	CH6R5	CHX0622C	SS42C	SP3C	CR04C	HW30L

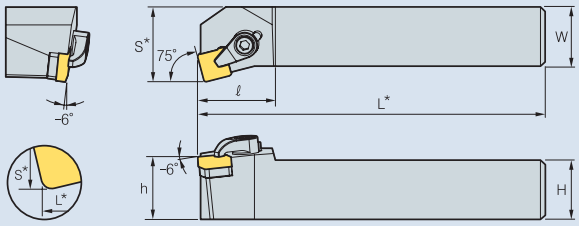
• Applicable inserts, see pages **B41, B42**

* r=0.8

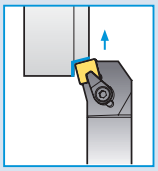
● : Stock item ○ : Under preparing for stock

CSKPR/L

SP□R



75°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-ring	Wrench
CSKPR/L 2525-M12	●		25	25	150	32	20	32	SP□R 1203□□	CH6R5	CHX0622C	SS42C	SP3C	CR04C	HW30L

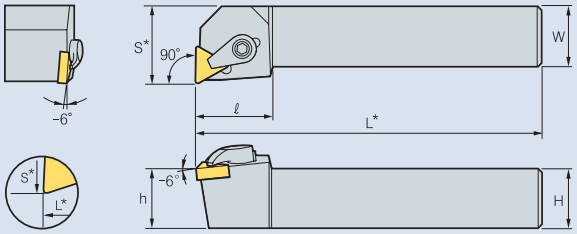
• Applicable inserts, see pages **B41, B42**

*r=0.8

● : Stock item ○ : Under preparing for stock

CTFPR/L

TP□R



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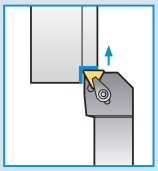


• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-ring	Wrench
CTFPR/L 2020-K16			20	20	125	25	20	32	TP□R 1603□□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
2525-M16	●		25	25	150	32	25	32							

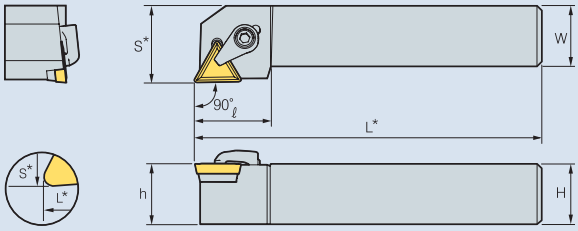
• Applicable inserts, see pages **B44, B45**

*r=0.8

● : Stock item ○ : Under preparing for stock

CTGPR/L

TP□R



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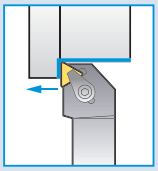


• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Clamp Screw	Shim	Shim Pin	C-ring	Wrench
CTGPR/L 1212-F11	●		12	12	80	16	12	20	TP□R 1103□□	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	0	25	TP□R 1603□□	CH6R5	CHX0622C	ST32C	SP3C	CR04C	HW30L
2525-M16	●	●	25	25	150	32	0	25							
2525-M22	●		25	25	150	32	25	32	TP□R 2204□□	CH83R1	CHX0823C	ST43C	SP4C	CR05C	HW40L
3232-P22			32	32	170	40	32	32							

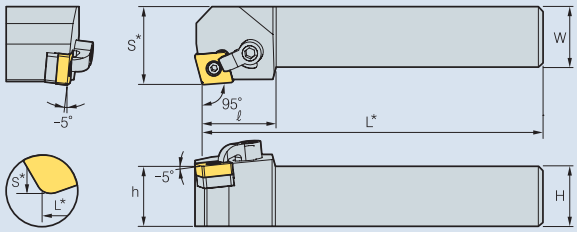
• Applicable inserts, see pages **B44, B45**

*r=0.8

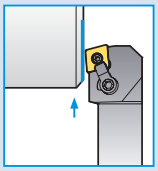
● : Stock item ○ : Under preparing for stock

MCKNR/L

CN□□



95°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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						

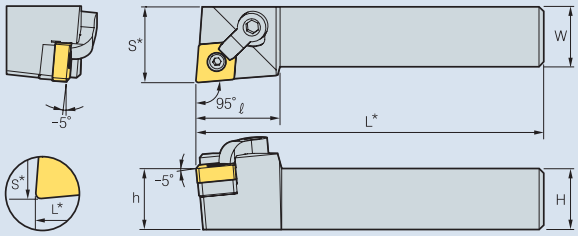
• Applicable inserts, see pages **AD05, B20~B22, B56~B59, B61**

* r=0.8

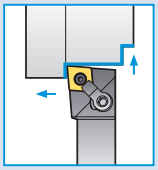
● : Stock item ○ : Under preparing for stock

MCLNR/L

CN□□



95°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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	32	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

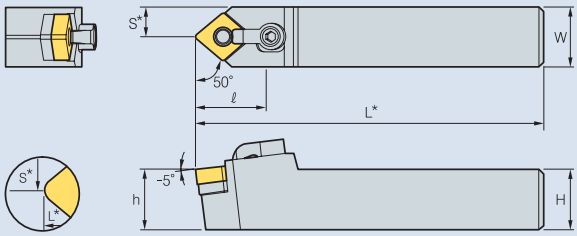
• Applicable inserts, see pages **AD05, B20~B22, B56~B59, B61**

* r=0.8(l=12) r=1.2(l=16, 19) r=2.4(l=25)

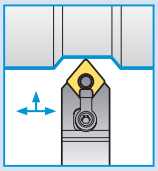
● : Stock item ○ : Under preparing for stock

MCMNN

CN□□



50°



(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCMNN	2020-K12		20	20	125	10.0	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	16.0	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	16.0	32	40						
	3232-P19		32	32	170	16.0	32	40	CN□□ 1906□□	CDH8N	DHA5/16-32	SD63D	SP6D	HW39.7L HW35.7L
	4040-S19		40	40	250	20.0	40	32						

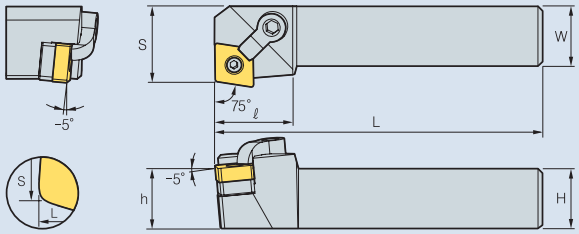
• Applicable inserts, see pages **AD05, B20~B22, B56~B59, B61**

* r=0.8

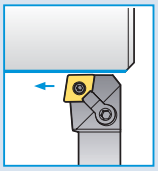
● : Stock item ○ : Under preparing for stock

MCRNR/L

CN□□



75°



• R type insert

(mm)

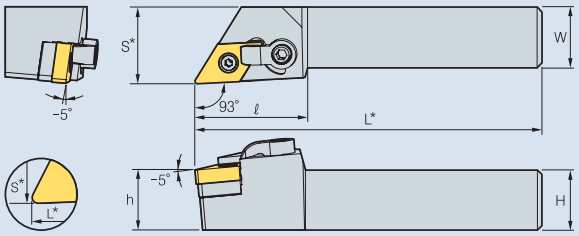
Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MCRNR/L	2020-K12			20	20	125	22.0	20	32	CN□□ 1204□□	CDH8N1	DHA5/16-32	SC43D	SP4D	HW39.7L HW23.8L
	2525-M12			25	25	150	27.0	25	32						
	2525-M16			25	25	150	27.0	25	33	CN□□ 1606□□	CDH8N1	DHA5/16-32	SC53D	SP5D	HW39.7L HW31.8L
	3232-P16			32	32	170	35.0	32	33						
	3232-P19			32	32	170	35.0	32	38	CN□□ 1906□□	CDH8N1	DHA5/16-32	SC63D	SP6D	HW39.7L HW35.7L
	4040-S19			40	40	250	43.0	40	38						

• Applicable inserts, see pages **AD05, B20~B22, B56~B59, B61**

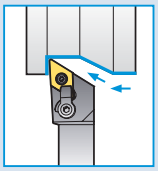
● : Stock item ○ : Under preparing for stock

MDJNR/L

DN□□



93°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MDJNR/L	2020-K11			20	20	125	25	20	32	DN□□ 1104□□	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						

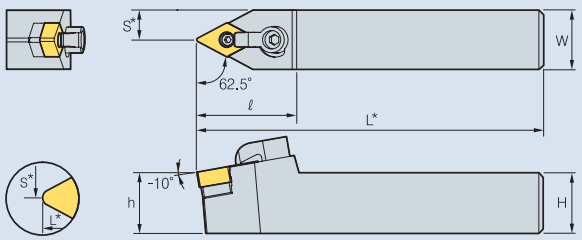
• Applicable inserts, see pages **B23, B24, B56~B59**

* r=0.8

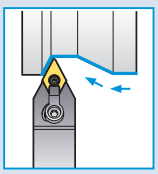
● : Stock item ○ : Under preparing for stock

MDNNN

DN□□



62.5°



(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: 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

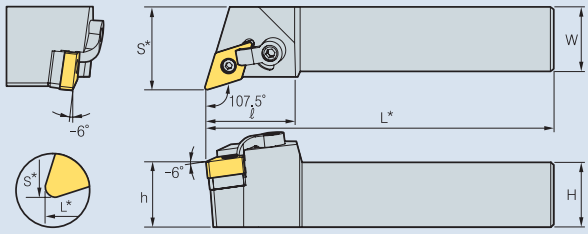
• Applicable inserts, see pages **B23, B24, B56~B59**

* r=0.8

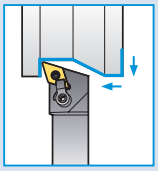
● : Stock item ○ : Under preparing for stock

MDQNR/L

DN□□



107.5°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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
3232-P15-3			32	32	170	40	32	36						HW23.8L
2525-M15	●	●	25	25	150	32	25	36	DN□□ 1506□□	CDH6N	DHA1/4-25	SD43D	SP4DL	HW31.8L
3232-M15			32	32	170	40	32	36						HW23.8L

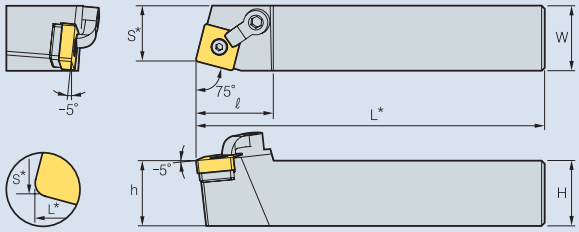
• Applicable inserts, see pages **B23, B24, B56~B59**

* r=0.8

● : Stock item ○ : Under preparing for stock

MSBNR/L

SN□□



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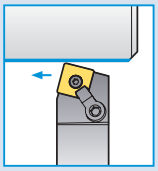


• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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
2525-M12			25	25	150	22.0	25	32						HW23.8L
2525-M15			25	25	150	22.0	25	35	SN□□ 1506□□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L
3232-P15			32	32	170	22.0	32	35						HW31.8L
3232-P19			32	32	170	27.0	32	40	SN□□ 1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
4040-S19			40	40	250	35.0	40	40						HW35.7L

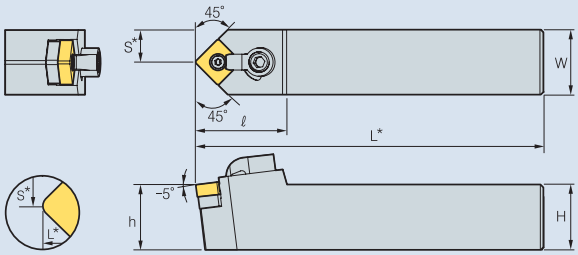
• Applicable inserts, see pages **AD05, B26~B29, B56~B59**

* r=0.8

● : Stock item ○ : Under preparing for stock

MSDNN

SN□□



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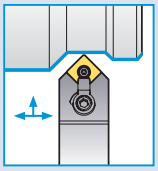


(mm)

Designation	Stock	H	W	L*	S*	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSDNN 1616-H09		16	16	100	8.0	16	28	SN□□ 0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
2020-K09		20	20	125	10.0	20	28						HW23.8L
2020-K12		20	20	125	10.0	20	32	SN□□ 1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
2525-M12		25	25	150	12.5	25	32						HW23.8L
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
3225-P15		32	25	170	12.5	32	35						HW31.8L
3232-P15		32	32	170	16.0	32	35						
4040-S15		40	40	250	20.0	40	35						
3232-P19		32	32	170	16.0	32	42	SN□□ 1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
4040-S19		40	40	250	20.0	40	42						HW35.7L

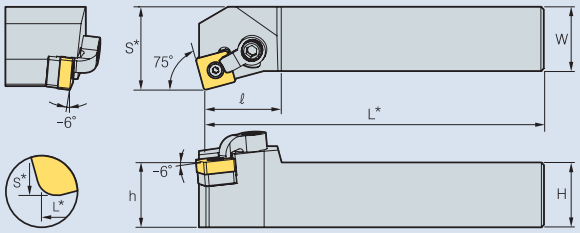
• Applicable inserts, see pages **AD05, B26~B29, B56~B59**

* r=0.8

● : Stock item ○ : Under preparing for stock

MSKNR/L

SN□□



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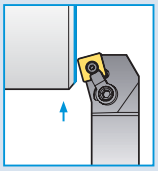


• R type insert

(mm)

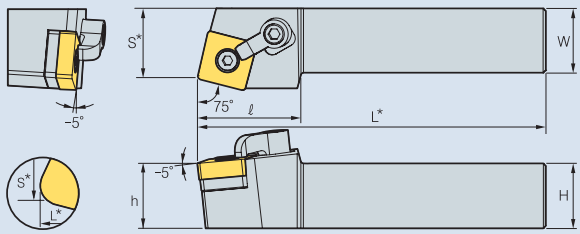
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSKNR/L 1616-H09			16	16	100	20.0	16	28	SN□□ 0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
2020-K09			20	20	125	22.0	20	28						HW23.8L
2020-K12			20	20	125	25.0	20	32	SN□□ 1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
2525-M12			25	25	150	32.0	25	32						HW23.8L
3225-P12			32	25	170	32.0	32	32						
2525-M15			25	25	150	32.0	25	35	SN□□ 1506□□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L
3232-P15			32	32	170	40.0	32	35						HW31.8L
3232-P19			32	32	170	40.0	32	40	SN□□ 1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
4040-S19			40	40	250	50.0	40	40						HW35.7L
4040-S25			40	40	250	50.0	40	40	SN□□ 2507□□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L
														HW39.7L

• Applicable inserts, see pages AD05, B26~B29, B56~B59 *r=0.8

● : Stock item ○ : Under preparing for stock

MSRNR/L

SN□□



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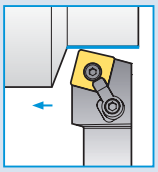


• R type insert

(mm)

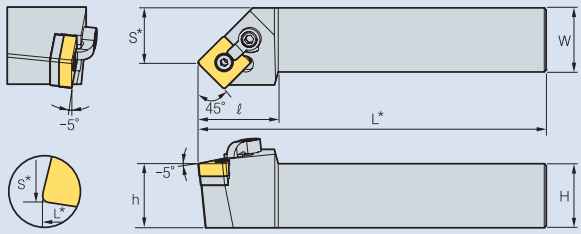
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSRNR/L 1616-H09			16	16	100	17.0	16	28	SN□□ 0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
2020-K09			20	20	125	22.0	20	28						HW23.8L
2020-K12			20	20	125	22.0	20	32	SN□□ 1204□□	CDH8N1	DHA5/16-32	SS43D	SP4D	HW39.7L
2525-M12			25	25	150	27.0	25	32						HW23.8L
2525-M15			25	25	150	27.0	25	35	SN□□ 1506□□	CDH8N	DHA5/16-32	SS53D	SP5D	HW39.7L
3232-P15			32	32	170	35.0	32	35						HW31.8L
3225-P19			32	25	170	27.0	32	40	SN□□ 1906□□	CDH8N	DHA5/16-32	SS63D	SP6D	HW39.7L
3232-P19			32	32	170	35.0	32	40						HW35.7L
4040-S19			40	40	250	43.0	40	40						
4040-S25			40	40	250	43.0	40	40	SN□□ 2507□□	CDH8N3	DHA3/8-35	SS84D	SP8D	HW47.6L/ HW39.7L

• Applicable inserts, see pages AD05, B26~B29, B56~B59 *r=0.8

● : Stock item ○ : Under preparing for stock

MSSNR/L

SN□□



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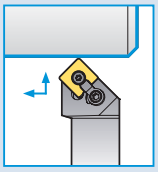


• R type insert

(mm)

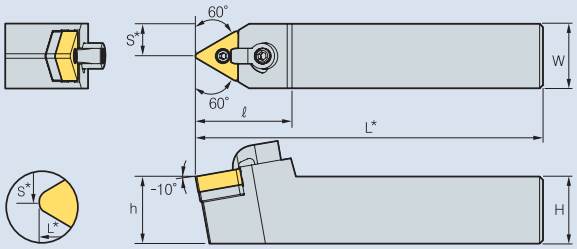
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MSSNR/L 1616-H09			16	16	100	20.0	16	28	SN□□ 0903□□	CDH7N	DHA10-32-19	SS32D	SP3DS	HW19.8L
2020-K09			20	20	125	25.0	20	28						HW23.8L
2020-K12			20	20	125	25.0	20	32	SN□□ 1204□□	CDH8N1	DHA5/16-28	SS43D	SP4D	HW39.7L
2525-M12			25	25	150	32.0	25	32						HW23.8L
2525-M15			25	25	150	32.0	25	35	SN□□ 1506□□	CDH8N1	DHA5/16-32	SS53D	SP5D	HW39.7L
3232-P15			32	32	170	40.0	32	35						HW31.8L
3232-P19			32	32	170	40.0	32	40	SN□□ 1906□□	CDH8N1	DHA5/16-32	SS63D	SP6D	HW39.7L
4040-S19			40	40	250	50.0	40	40						HW35.7L

• Applicable inserts, see pages AD05, B26~B29, B56~B59 *r=0.8

● : Stock item ○ : Under preparing for stock

MTENNS

TN□□



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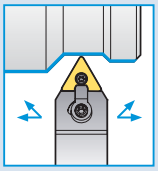


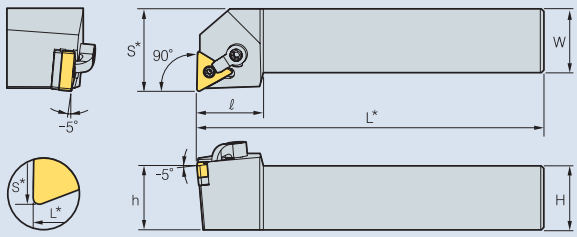
(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTENNS	2020-K16		20	20	125	10.0	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	DHA5/16-28	ST43D	SP4D	HW39.7L/HW23.8L
	3232-P27		32	32	170	16.0	32	35	TN□□ 2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L/HW31.8L
	4040-S33		40	40	250	20.0	40	40	TN□□ 3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L/HW35.7L

• Applicable inserts, see pages B30~B33, B56~B59 ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

MTFNR/L

TN□□



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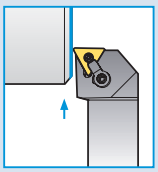


• R type insert

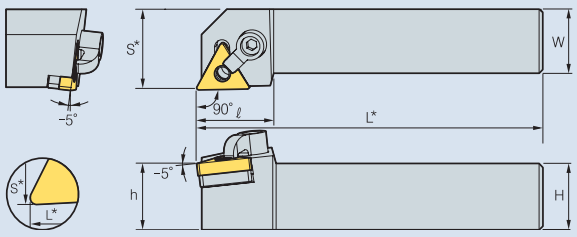
(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTFNR/L	1616-H16			16	16	100	20.0	16	32	TN□□ 1604□□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	2020-K16			20	20	125	25.0	20	32						
	2525-M16			25	25	150	32.0	25	32						
	2525-M22			25	25	150	32.0	25	32	TN□□ 2204□□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	3232-P22			32	32	170	40.0	32	32						
	4040-S22			40	40	250	50.0	40	32						
	3232-P27			32	32	170	40.0	32	35	TN□□ 2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	4040-S27			40	40	250	50.0	40	35						
	4040-S33			40	40	250	50.0	40	40	TN□□ 3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

• Applicable inserts, see pages B30~B33, B56~B59 ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

MTGNR/L

TN□□



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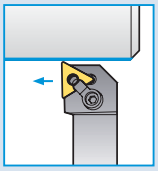


• R type insert

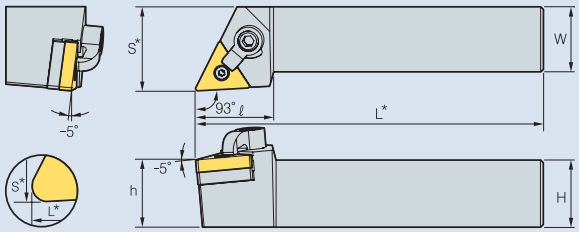
(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTGNR/L	1616-H16			16	16	100	20.0	16	32	TN□□ 1604□□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
	2020-K16			20	20	125	25.0	20	32						
	2525-M16			25	25	150	32.0	25	32						
	2525-M22			25	25	150	32.0	25	32	TN□□ 2204□□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
	3232-P22			32	32	170	40.0	32	32						
	3232-P27			32	32	170	40.0	32	35	TN□□ 2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
	4040-S27			40	40	250	50.0	40	35						
	4040-S33			40	40	250	50.0	40	40	TN□□ 3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

• Applicable inserts, see pages B30~B33, B56~B59 ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

MTJNR/L

TN□□



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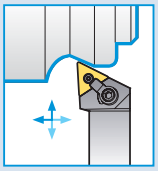


• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
MTJNR/L 2020-K16			20	20	125	25.0	20	32	TN□□ 1604□□	CDH7N	DHA10-32-19	ST32D	SP3D	HW23.8L HW19.8L
2525-M16			25	25	150	32.0	25	32						
2525-M22			25	25	150	32.0	25	32	TN□□ 2204□□	CDH8N1	DHA5/16-32	ST43D	SP4D	HW39.7L HW23.8L
3232-P22			32	32	170	40.0	32	32						
3232-P27			32	32	170	40.0	32	35	TN□□ 2706□□	CDH8N1	DHA5/16-32	ST53D	SP5D	HW39.7L HW31.8L
4040-S27			40	40	250	50.0	40	35						
4040-S33			40	40	250	50.0	40	40	TN□□ 3307□□	CDH8N	DHA5/16-32	ST63D	SP6DL	HW39.7L HW35.7L

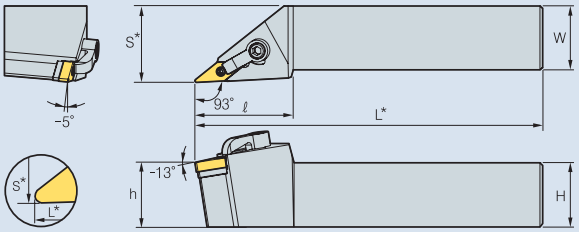
• Applicable inserts, see pages B30~B33, B56~B59

*r=0.8

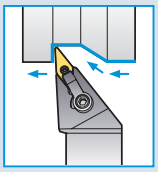
● : Stock item ○ : Under preparing for stock

MVJNR/L

VN□□



93°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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						

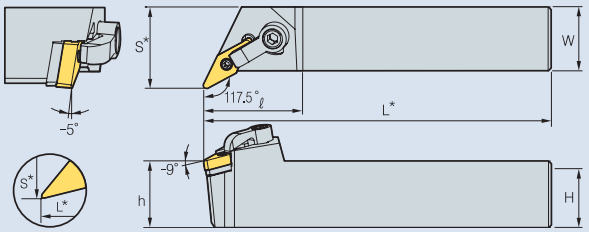
• Applicable inserts, see pages B34, B56~B59

*r=0.8

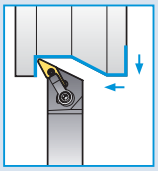
● : Stock item ○ : Under preparing for stock

MVQNR/L

VN□□



117.5°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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						

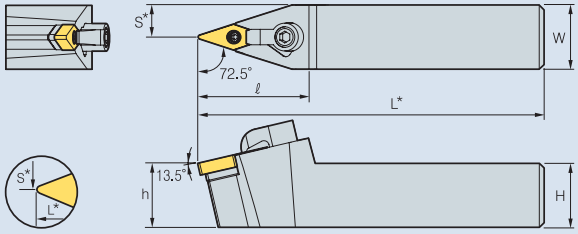
• Applicable inserts, see pages B34, B56~B59

*r=0.8

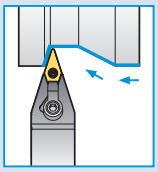
● : Stock item ○ : Under preparing for stock

MVVNN

VN□□



72.5°



(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts / 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
	2525-M16	●	25	25	150	32	25	42						HW19.8L

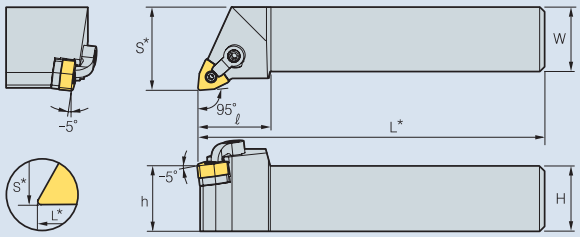
• Applicable inserts, see pages **B34, B56~B59**

* r=0.8

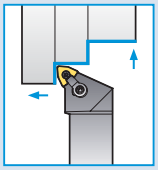
● : Stock item ○ : Under preparing for stock

MWLNR/L

WN□□



95°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / 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
	2525-M06			25	25	150	32	25	32						HW23.8L
	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
	2525-M08	●	●	25	25	150	32	25	32						HW23.8L
	3232-P08			32	32	170	40	32	32						

• Applicable inserts, see pages **B35, B36**

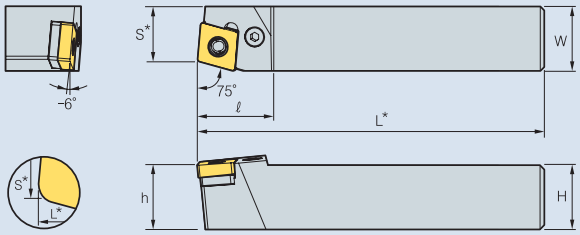
* r=0.8

● : Stock item ○ : Under preparing for stock

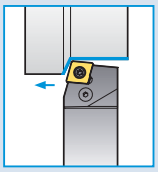
Lever Lock System

PCBNR/L

CN□□



75°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PCBNR/L	2020-K12	●	●	20	20	125	17	20	27	CN□□ 1204□□	LV4	VHX0821	SC42	SP4	HW30L	LSPS8
	2525-M12	●	●	25	25	150	22	25	27							
	3225-P12	●	●	32	32	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							

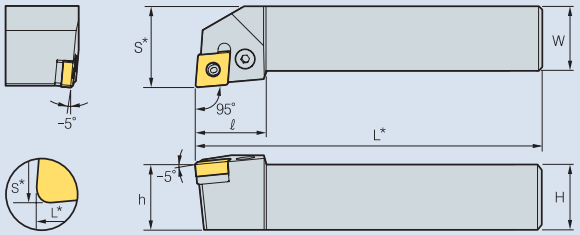
• Applicable inserts, see pages B20~B22, B56~B59, B61

* r=0.8(l=12) r=1.2(l=16, 19) r=2.4(l=25)

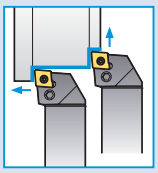
● : Stock item ○ : Under preparing for stock

PCLNR/L

CN□□



95°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PCLNR/L	1616-H09	●		16	16	100	20	16	20	CN□□ 0903□□	LV3	VHX0617	SC32	SP10	HW25L	-
	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	VHX0812	SC42	SP4	HW30L	-
	2020-K12	●	●	20	20	125	25	20	28							
	2525-M12	●		25	25	150	32	25	28							
	3225-P12	●	●	32	32	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	-
	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	250	50	40	36							
	4040-S19	●	●	40	40	170	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							

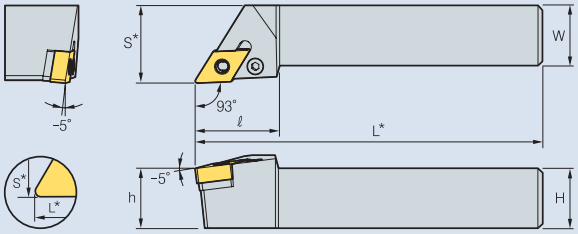
• Applicable inserts, see pages B20~B22, B56~B59, B61

* r=0.8(l=12) r=1.2(l=16, 19) r=2.4(l=25)

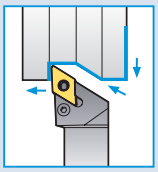
● : Stock item ○ : Under preparing for stock

PDJNR/L

DN□□



93°



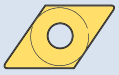
• R type insert

(mm)

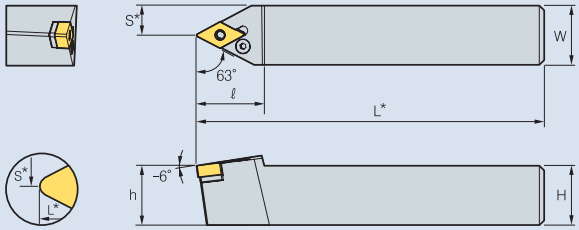
Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench
PDJNR/L	1616-H11	●	●	16	16	100	20	16	25	DN□□ 1104□□	LV3	VHX0617	SD317	SP3	HW25L
	2020-K11	●	●	20	20	125	25	20	25						
	2525-M11	●	●	25	25	150	32	25	30						
	2020-K15	●	●	20	20	125	25	20	35	DN□□ 1506□□	LV4B	VHX0821	SD42	SP4	HW30L
	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
	2525-M15-3	●	●	25	25	150	32	25	35						
	3232-P15-3			32	32	170	40	32	35						

• Applicable inserts, see pages **B23, B24, B56~B59** * r=0.8 ● : Stock item ○ : Under preparing for stock

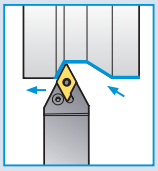
PDNNR/L



DN□□



63°



• R type insert

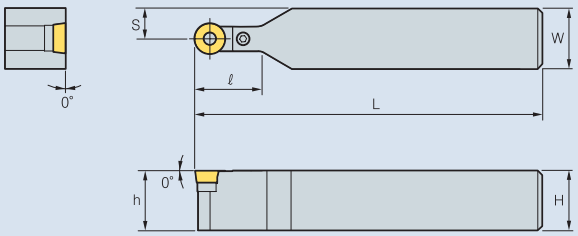
(mm)

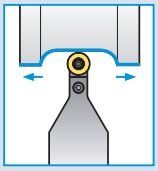
Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench
PDNNR/L	2020-K15	●		20	20	125	8	20	37	DN□□ 1506□□	LV4B	VHX0521	SD42	SP4	HW30L
	2525-M15	●	●	25	25	150	12.5	25	37						
	3232-P15	●		30	32	150	16	25	37						
	4025-M15			40	25	170	12.5	32	37						
	2525-M15-3	●		25	25	150	12.5	25	37	DN□□ 1504□□	LV4	VHX0821	SD42	SP4	HW30L
	4025-M15-3			40	25	150	12.5	25	37						

• Applicable inserts, see pages **B23, B24, B56~B59** * r=0.8 ● : Stock item ○ : Under preparing for stock

PRDCN

RCMX





(mm)

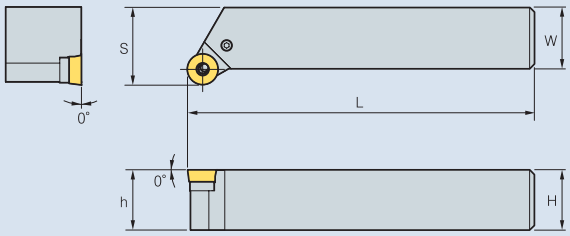
Designation		Stock	H	W	L	S	h	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PRDCN	2020-M10	●	20	20	150	15	20	24	RCMX 1003M0	LR10	VHX0514	SR10	SP10	HW20L	-
	2525-M10	●	25	25	150	17.5	25	24							
	2525-M12	●	25	25	150	18.5	25	24	RCMX 1204M0	LR12	VHX0617	SR12	SP10	HW25L	-
	2020-K12	●	20	20	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	VHX06221	SR16	SP4	HW25L	-
	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	SP5-1	HW30L	-
	4040-S25	●	40	40	250	32.5	40	42	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LPSP6
	4040-T25	●	40	40	300	32.5	40	42							
	5050-U32	●	50	50	350	41	50	52	RCMX 3209M0	LR32	VHX1236	SR32	SP8N	HW50L	LPSP8

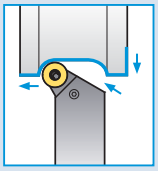
• Applicable inserts, see pages **B40** ● : Stock item ○ : Under preparing for stock

Lever Lock System

PRGCR/L

RCMX





• R type insert

(mm)

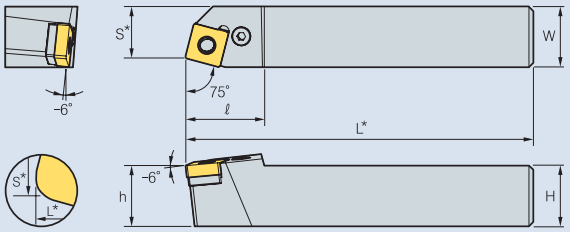
Designation		Stock R	Stock L	H	W	L	S	h	Parts / Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PRGCR/L	2020-K10	●	●	20	20	125	25	20	RCMX 1003M0	LR10	VHX0514	SR10	SP10	HW20L	-
	2525-M10	●	●	25	25	150	32	25							
	2020-K12	●	●	20	20	125	25	20	RCMX 1204M0	LR12	VHX0617	SR12	SP10	HW25L	-
	2525-M12	●	●	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	-
	3225-P16	●	●	32	25	170	32	32							
	3232-P20	●	●	32	32	170	40	32	RCMX 2006M0	LR20	VHX0823	SR20	SP5-1	HW30L	-
	4040-S25	●	●	40	40	250	50	40	RCMX 2507M0	LR25	VHX1030	SR25	SP6N	HW40L	LSPS6

• Applicable inserts, see pages **B40**

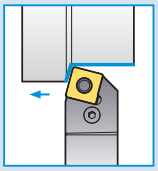
● : Stock item ○ : Under preparing for stock

PSBNR/L

SN□□



75°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PSBNR/L	1616-H09		●	16	16	100	13	16	21	SN□□ 0903□□	LV3	VHX0617	SS32	SP10	HW25L	-
	2020-K09	●		20	20	125	17	20	23							
	2020-K12	●	●	20	20	125	17	20	28	SN□□ 1204□□	LV4	VHX0821	SS42	SP4	HW30L	-
	2525-M12	●	●	25	25	150	22	25	28							
	3225-P12	●	●	32	32	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	-
	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

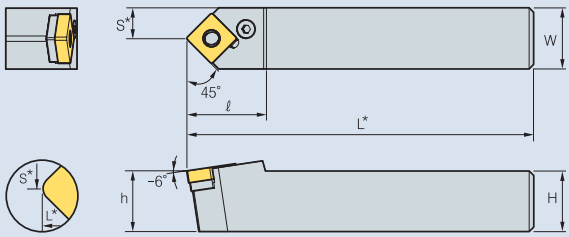
• Applicable inserts, see pages **B26~B29, B56~B59**

* r=0.8(l=12) r=1.2(l=15, 19) r=2.4(l=25)

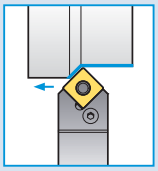
● : Stock item ○ : Under preparing for stock

PSDNN

SN□□



45°



(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts / Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PSDNN	1616-H09	●	16	16	100	8	16	23	SN□□ 0903□□	LV3	VHX0617	SS32	SP10	HW25L	-
	2020-K12	●	20	20	125	10	20	30	SN□□ 1204□□	LV4	VHX0821	SS42	SP4	HW30L	-
	2525-M12	●	25	25	150	12.5	25	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	-
	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							

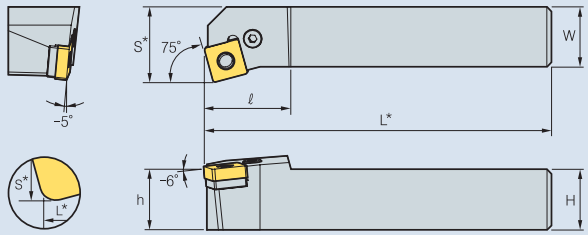
• Applicable inserts, see pages **B26~B29, B56~B59**

* r=0.8(l=12) r=1.2(l=15, 19) r=2.4(l=25)

● : Stock item ○ : Under preparing for stock

PSKNR/L

SN□□



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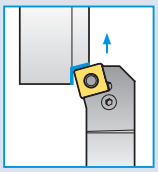


• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PSKNR/L	1616-H09			16	16	100	20	16	17	SN□□ 0903□□	LV3	VHX0617	SS32	SP10	HW25L	-
	2020-K09	●		20	20	125	25	20	20							
	2020-K12	●	●	20	20	125	25	20	26	SN□□ 1204□□	LV4	VHX0821	SS42	SP4	HW30L	-
	2525-M12	●	●	25	25	150	32	25	26							
	3232-P12			32	32	170	40	32	26							
	2525-M15			25	25	150	32	25	32	SN□□ 1506□□	LV5	VHX0825	SS63	SP5	HW30L	-
	3232-P15	●	●	32	32	170	40	32	32							
	3232-P19	●	●	32	32	170	40	32	41.5	SN□□ 1906□□	LV6N	VHX1027N	SS84N	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

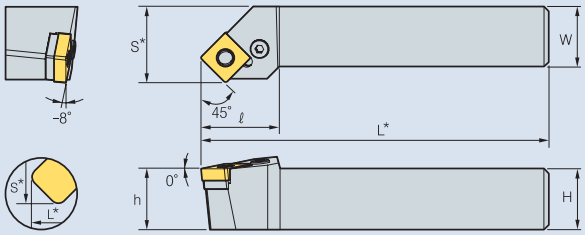
• Applicable inserts, see pages **B26~B29, B56~B59**

* r=0.8(l=12) r=1.2(l=15, 19) r=2.4(l=25)

● : Stock item ○ : Under preparing for stock

PSSNR/L

SN□□



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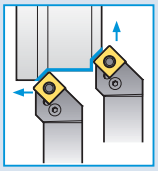


• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts Insert	Lever	Screw	Shim	Shim Pin	Wrench	Pin Punch
PSSNR/L	1616-H09	●		16	16	100	20	16	25	SN□□ 0903□□	LV3	VHX0617	SS32	SP10	HW25L	-
	2020-K12	●	●	20	20	125	25	20	30	SN□□ 1204□□	LV4	VHX0821	SS42	SP4	HW30L	-
	2525-M12	●	●	25	25	150	32	25	36							
	3232-P12			32	32	170	40	32	40							
	2525-M15	●	●	25	25	150	32	25	36	SN□□ 1506□□	LV5	VHX0825	SS53	SP5	HW30L	-
	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	250	50	40	41.5							
	4040-S19	●	●	40	40	200	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

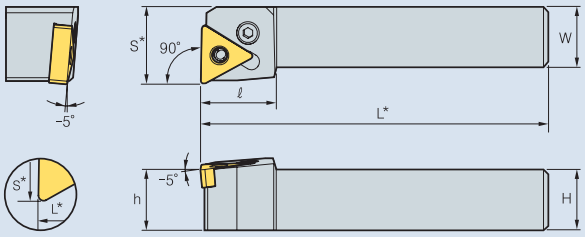
• Applicable inserts, see pages **B26~B29, B56~B59**

* r=0.8(l=12) r=1.2(l=15, 19) r=2.4(l=25)

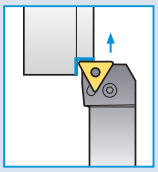
● : Stock item ○ : Under preparing for stock

PTFNR/L

TN□□



90°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts Insert	Lever	Screw	Shim	Shim Pin	Wrench
PTFNR/L	1616-H16	●	●	16	16	100	20	16	20	TN□□ 1604□□	LV3	VHX0617	ST317	SP3	HW25L
	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
	3232-P22	●		32	32	170	40	32	25						
	3232-P27			32	32	170	40	32	34	TN□□ 2706□□	LV5	VHX0825	ST53	SP5	HW30L
	4040-S27			40	40	250	50	40	34						

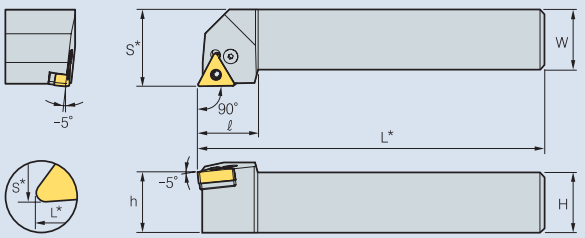
• Applicable inserts, see pages **B30~B33, B56~B59**

* r=0.8(l=16, 22) r=1.2(l=27)

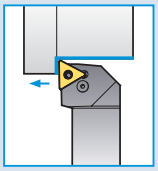
● : Stock item ○ : Under preparing for stock

PTGNR/L

TN□□



90°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts Insert	Lever	Screw	Shim	Shim Pin	Wrench
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
	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
	3232-P22	●	●	32	32	170	40	32	28						
	3232-P27	●		32	32	170	40	32	33	TN□□ 2706□□	LV5	VHX0825	T53	SP5	HW30L
	4040-S27			40	40	250	50	40	33						

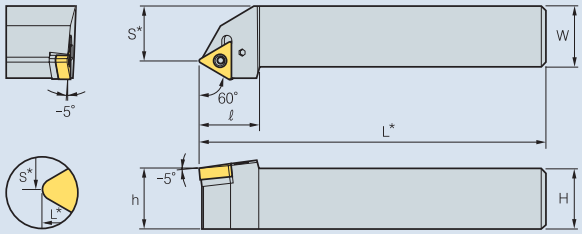
• Applicable inserts, see pages **B30~B33, B56~B59**

* r=0.8(l=16, 22) r=0.4(l=11) r=1.2(l=27)

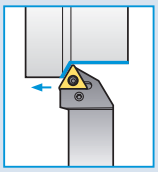
● : Stock item ○ : Under preparing for stock

PTTNR/L

TN□□



60°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench
PTTNR/L	1616-H16			16	16	100	13	16	25	TN□□ 1604□□	LV3	VHX0617	ST317	SP3	HW25L
	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

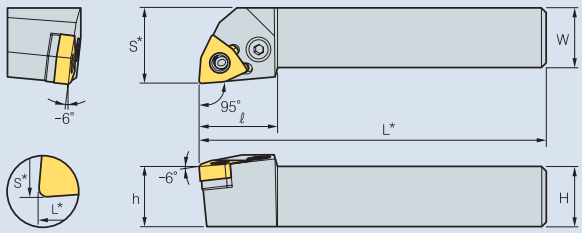
• Applicable inserts, see pages **B30~B33, B56~B59**

*r=0.8(l=16, 22)

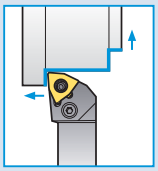
● : Stock item ○ : Under preparing for stock

PWLNR/L

WN□□



95°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench
PWLNR/L	1616-H06	●	●	16	16	100	20	16	20	WN□□ 0604□□	LV3	VHX0617	SW317	SP3	HW25L
	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
	2525-M08	●	●	25	25	150	32	25	26						

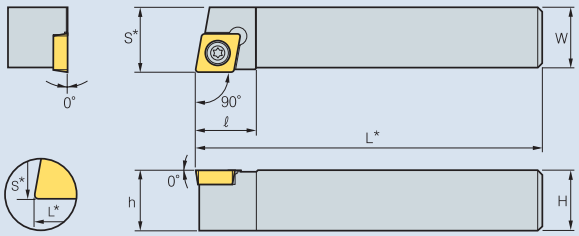
• Applicable inserts, see pages **B35, B36**

* r=0.8

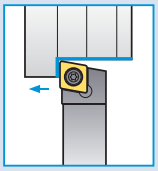
● : Stock item ○ : Under preparing for stock

SCACR/L

CC□□



90°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SCACR/L 1010-E06	○	●	10	10	70	10.5	10	10	CC□□ 0602□□	FTKA02565	-	-	TW07P
1212-F09			12	12	80	12.5	12	16	CC□□ 09T3□□	FTKA03508	-	-	TW15P

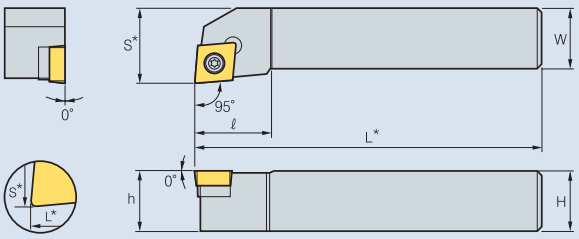
• Applicable inserts, see pages B37, B38, B50, B56~B58, B61

* r=0.8(l=09) r=0.4(l=06)

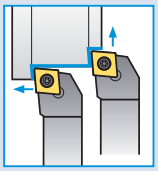
● : Stock item ○ : Under preparing for stock

SCLCR/L

CC□□



95°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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□□	FTGA03508	-	-	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-M12	●	●	25	25	150	32	25	26					HW40L

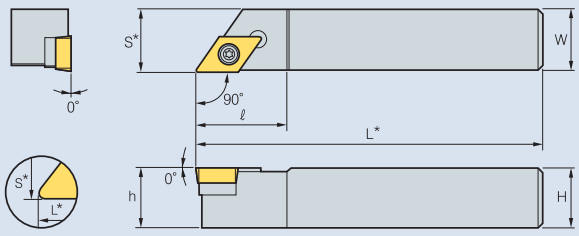
• Applicable inserts, see pages B37, B38, B50, B56~B58, B61

* r=0.8(l=06) r=0.8(l=09, 12)

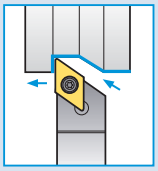
● : Stock item ○ : Under preparing for stock

SDACR/L

DC□□



90°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SDACR/L 1010-E07			10	10	70	10.5	10	15	DC□□ 0702□□	FTKA02565	-	-	TW07P
1212-F11	●		12	12	80	12.5	12	15	DC□□ 11T3□□	FTKA03508	-	-	TW15P
1616-H11	●		16	16	100	16.5	16	24		FTKA03512	SD32S	SHXN0509F	TW15P, HW35L

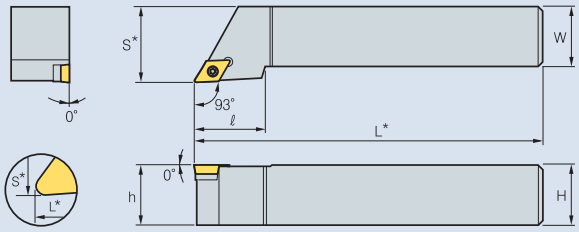
• Applicable inserts, see pages B39, B50, B56~B58, B61

* r=0.4(l=07) r=0.8(l=11)

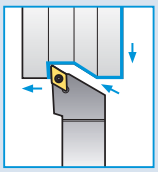
● : Stock item ○ : Under preparing for stock

SDJCR/L

DC□□



93°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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	SD32S	SHXN0509F	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					

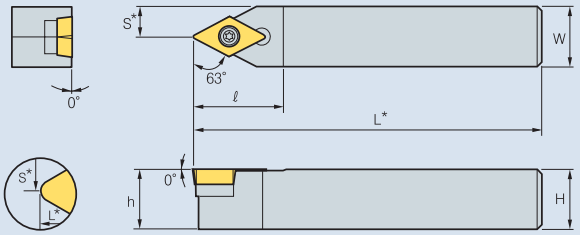
• Applicable inserts, see pages **B39, B50, B56~B58, B61**

* r=0.4(l=04) r=0.8(l=11)

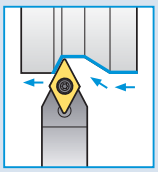
● : Stock item ○ : Under preparing for stock

SDNCN

DC□□



63°



(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SDNCN	1010-E07	●	10	10	70	5	10	20	DC□□ 0702□□	FTKA02565	-	-	TW07P
	1212-F07	●	12	12	80	6	12	20					
	1212-H11	●	12	12	100	6	12	30	DC□□ 11T3□□	FTGA03508	-	-	TW15P
	1616-H11	●	16	16	100	8	16	30	DC□□ 11T3□□	FTGA03512	SD32S	SHXN0509F	TW15P, HW35L
	2020-K11	●	20	20	125	10	20	30					

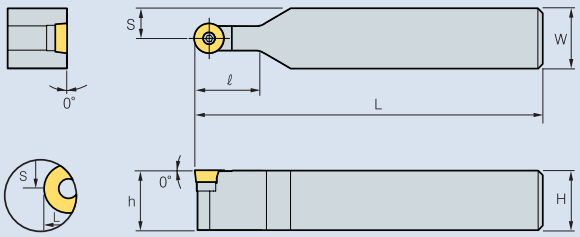
• Applicable inserts, see pages **B39, B50, B56~B58, B61**

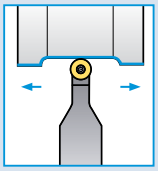
* r=0.4(l=04) r=0.8(l=11)

● : Stock item ○ : Under preparing for stock

SRDCN

RCGT





(mm)

Designation		Stock	H	W	L	S	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SRDCN	1010-E06		10	10	70	5	10	10	RCGT 0602MO	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	RCGT 0803MO	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	RCGT 1003MO	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	RCGT 1204MO	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	2525-M12	●	25	25	150	12.5	25	28					

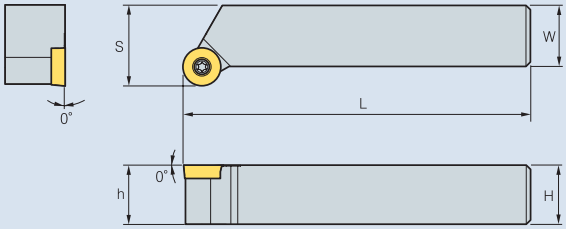
• Applicable inserts, see pages **B51**

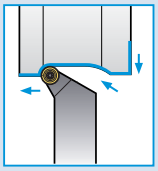
● : Stock item ○ : Under preparing for stock

Screw on System

SRGCR/L

RCGT





• R type insert

(mm)

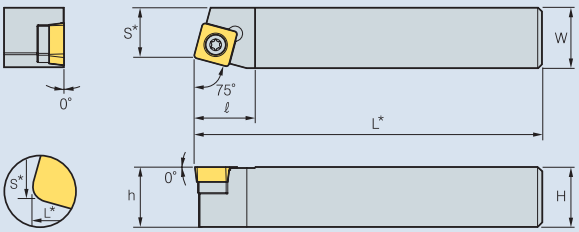
Designation		Stock R	Stock L	H	W	L	S	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SRGCR/L	1010-E06			10	10	70	12	10	-	RCGT 0602MO	FTKA02565	-	-	TW07P
	1212-F06	●		12	12	80	16	12	-					
	1616-H06			16	16	100	20	16	-					
	1616-H08	●		16	16	100	20	16	-	RCGT 0803MO	FTNA0307	-	-	TW09P
	2020-K08			20	20	125	25	20	-					
	2525-M08			25	25	150	32	25	-					
	1616-H10			16	16	100	20	16	-	RCGT 1003MO	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	-	RCGT 1204MO	FTGA03512	SR12S	SHXN0509F	TW15P HW35L
	2525-M12	●	●	25	25	150	32	25	-					

• Applicable inserts, see pages **B51**

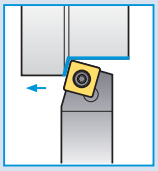
● : Stock item ○ : Under preparing for stock

SSBCR/L

SC□□



75°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SSBCR/L	1212-F09			12	12	80	11	12	16	SC□□ 09T3□□	FTGA03508	-	-	TW15P
	1616-H09	●		16	16	100	13	16	16		FTGA03512	S32S	SHXN0509F	TW15P, HW35L
	2020-K12			20	20	125	17	20	25	SC□□ 1204□□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L

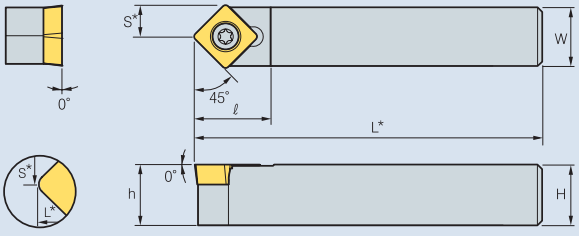
• Applicable inserts, see pages **B40, B51**

*r=0.8

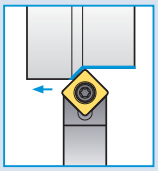
● : Stock item ○ : Under preparing for stock

SSDCN

SC□□



45°



(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SSDCN	1212-F09	●	12	12	80	6	12	15.5	SC□□ 09T3□□	FTGA03508	-	-	TW15P
	1616-H09	●	16	16	100	8	16	15.5		FTGA03512	SS32S	SHXN0509F	TW15P,HW35L

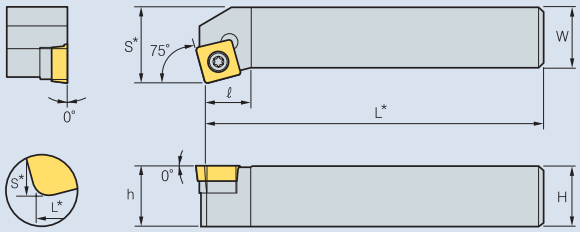
• Applicable inserts, see pages **B40, B51**

*r=0.8

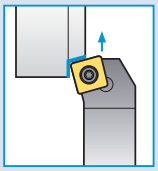
● : Stock item ○ : Under preparing for stock

SSKCR/L

SC□□



75°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SSKCR/L 1616-H09			16	16	100	20	16	13	SC□□ 09T3□□	FTGA03512	SS32S	SHXN0509F	TW15P, HW35L

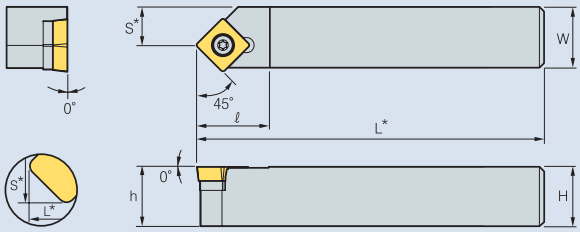
• Applicable inserts, see pages **B40, B51**

* r=0.8

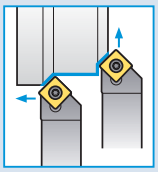
● : Stock item ○ : Under preparing for stock

SSSCR/L

SC□□



45°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SSSCR/L 1616-H09	●		16	16	100	17	16	15.5	SC□□ 09T3□□	FTGA03512	-	-	TW15P
2020-K12	●	●	20	20	125	21	20	24	SC□□ 1204□□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L

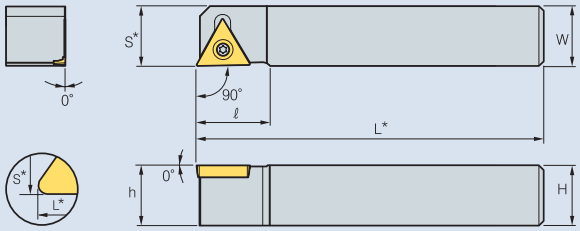
• Applicable inserts, see pages **B40, B51**

* r=0.8

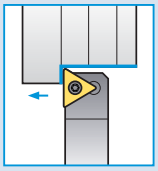
● : Stock item ○ : Under preparing for stock

STACR/L

TC□□



90°



• R type insert

(mm)

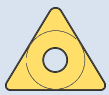
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
STACR/L 1010-E09			10	10	70	10.5	10	10	TC□□ 0902□□	FTKA02206	-	-	TW06P
1212-F11	●		12	12	80	12.5	12	14	TC□□ 1102□□	FTKA02565	-	-	TW07P

• Applicable inserts, see pages **B43, B52, B56**

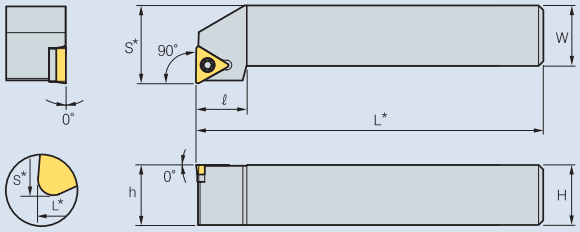
* r=0.4(l=09) r=0.8(l=11)

● : Stock item ○ : Under preparing for stock

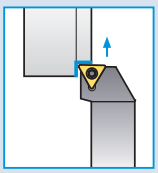
STFCR/L



TC□□



90°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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	-	-	W07P
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					

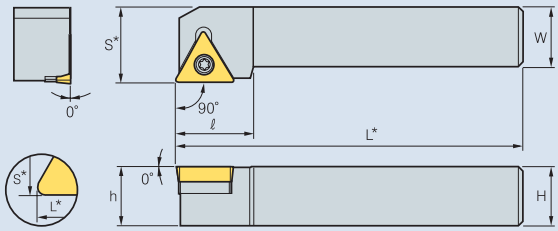
• Applicable inserts, see pages **B43, B52, B56**

* r=0.4(l=09) r=0.8(l=11, 16)

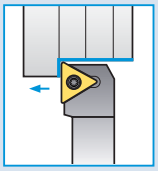
● : Stock item ○ : Under preparing for stock

STGCR/L

TC□□



90°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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					
2020-K16	●	●	20	20	125	25	20	21	TC□□ 16T3□□	FTKA03512	ST32S	SHXN0509F	TW15P, HW35L
2525-M16	●	●	25	25	150	32	25	21					

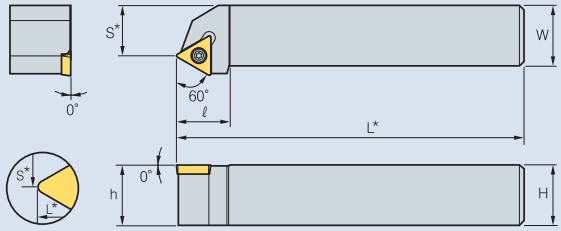
• Applicable inserts, see pages **B43, B52, B56**

* r=0.4(I=09) r=0.8(11, 16)

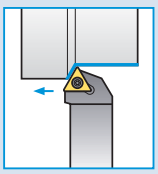
● : Stock item ○ : Under preparing for stock

STTCR/L

TC□□



60°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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					
2020-K16			20	20	125	17	20	19	TC□□ 16T3□□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L

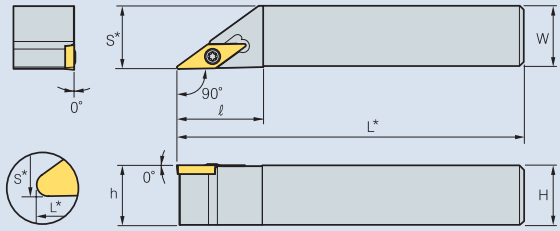
• Applicable inserts, see pages **B43, B52, B56**

* r=0.8

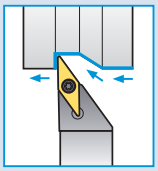
● : Stock item ○ : Under preparing for stock

SVABR/L

VB□□



90°



• R type insert

(mm)

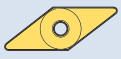
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SVABR/L 1616-H16			16	16	100	16.5	16	28	VB□□ 1604□□	FTG03512	SV32S	SHXN0509F	TW15P, HW35L
2020-K16			20	20	125	20.5	20	28					

• Applicable inserts, see pages **B46, B52, B56~B58, B61**

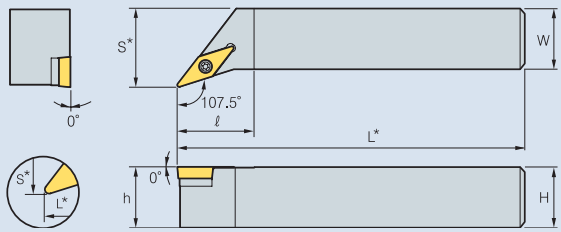
* r=0.8

● : Stock item ○ : Under preparing for stock

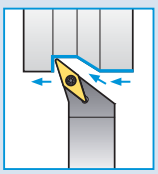
SVHBR/L



VB□□



107.5°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SVHBR/L 2525-M16	●	●	25	25	150	32	25	31.5	VB□□ 1604□□	FTG03512	SV32S	SHXN0509F	TW15P HW35L
3225-P16	●	●	32	25	170	32	32	31.5					

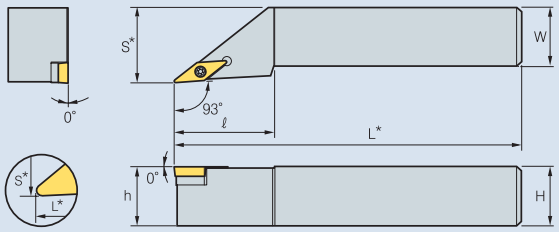
• Applicable inserts, see pages **B46, B52, B56~B58, B61**

* r=0.8

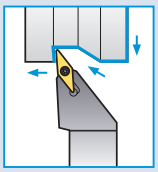
● : Stock item ○ : Under preparing for stock

SVJBR/L

VB□□



93°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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□□ 1103□□	FTKA02565	-	-	TW07P
	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					

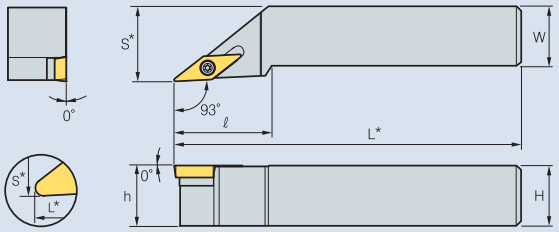
• Applicable inserts, see pages B46, B52, B56~B58, B61

* r=0.4(l=11) r=0.8(l=16)

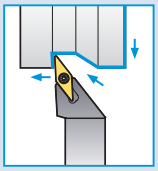
● : Stock item ○ : Under preparing for stock

SVJCR/L

VC□□



93°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SVJCR/L	1212-F11	●		12	12	80	16	12	25	VC□□ 1102□□	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					

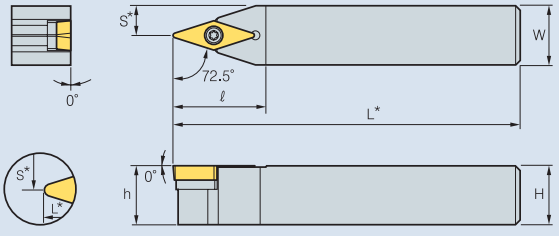
• Applicable inserts, see pages B47, B53, B61

* r=0.4(l=11) r=0.8(l=16)

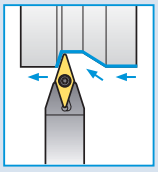
● : Stock item ○ : Under preparing for stock

SVVBN

VB□□



72.5°



(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SVVBN	1212-F11	●		12	12	80	6	12	27	VB□□ 1102□□	FTKA02565	-	-	TW07P
	1616-H11			16	16	100	8	16	27					
	2020-K11	●		20	20	125	10	20	27					
	1616-H16	●		16	16	100	8	16	32	VB□□ 1604□□	FTGA03512	SV32S	SHXN0509F	TW15P, HW35L
	2020-K16	●		20	20	125	10	20	32					
	2525-M16	●		25	25	150	12.5	25	32					
	3225-P16	●		32	25	170	12.5	32	32					

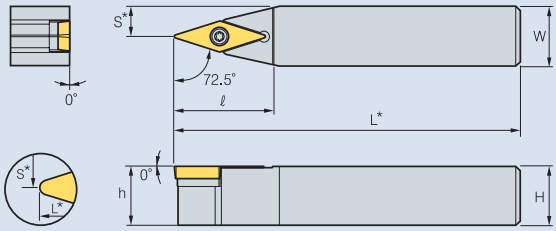
• Applicable inserts, see pages B46, B52, B56~B58, B61

* r=0.4(l=11) r=0.8(l=16)

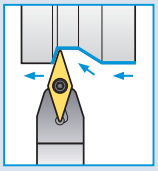
● : Stock item ○ : Under preparing for stock

SVVCN

VC□□



72.5°



(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
SVVCN	1212-F11	●	12	12	80	6	12	25	VC□□ 1103□□	FTKA02565	-	-	TW07P
	1616-H11		16	16	100	8	16	25					
	2020-K11	●	20	20	125	10	20	25					
	1212-F13		12	12	80	6	12	32	VC□□ 1303□□	FTNA0307	-	-	TW09P
	1616-H13		16	16	100	8	16	32					
	2020-K13	●	20	20	125	10	20	32					
	1616-H16		16	16	100	8	16	40	VC□□ 1604□□	FTGA03512	SV32S	SHXN0509F	TW15P HW35L
	2020-K16	●	20	20	125	10	20	40					
	2525-M16	●	25	25	150	12.5	25	40					

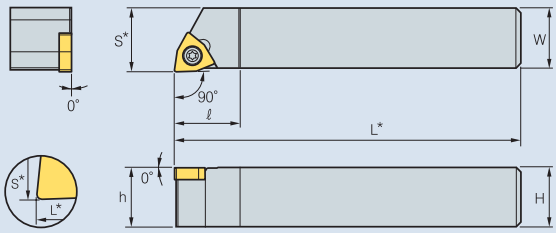
• Applicable inserts, see pages **B47, B53, B61**

* r=0.4(l=04) r=0.8(l=06, 08)

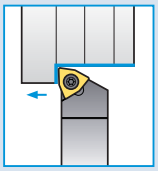
● : Stock item ○ : Under preparing for stock

SWACR/L

WC□□



90°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Wrench
SWACR/L1010-E04				10	10	70	10.1	10	10	WC□□ 0402□□	FTKA02565	TW07P
	1212-F04			12	12	80	12.1	12	14			
	1616-H06			16	16	100	16.1	16	20	WC□□ 06T3□□	FTGA03508	TW15P
	2020-K08	○		20	20	125	20.1	20	24	WC□□ 0804□□	FTGA0411F	TW15P

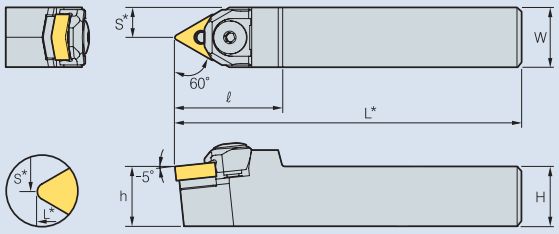
• Applicable inserts, see pages **B48**

* r=0.4(l=04, 06) r=0.8(l=08)

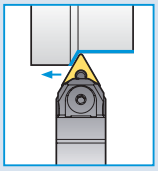
● : Stock item ○ : Under preparing for stock

WTENN

TN□□



60°



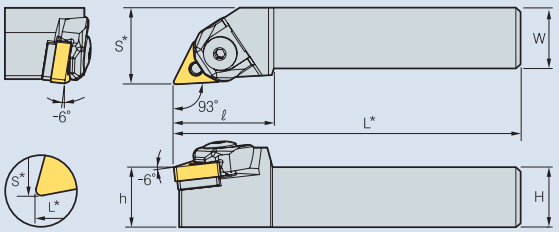
(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: 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	N0407	HW30L
	2525-M16	●	25	25	150	12.5	25	36						SP3M		
	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								

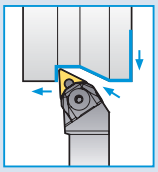
• Applicable inserts, see pages **B30~B33, B56~B59** ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

WTJNR/L

TN□□



93°



• R type insert

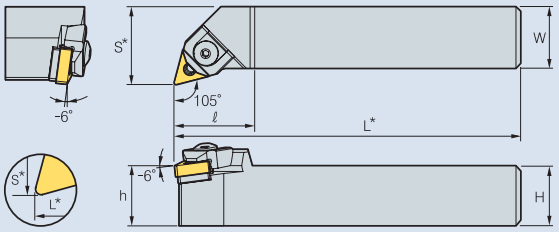
(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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	N0407	HW30L
	2525-M16	●	●	25	25	150	32	25	33						SP3M		
	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								

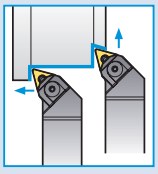
• Applicable inserts, see pages **B30~B33, B56~B59** ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

WTXNR/L

TN□□



105°



• R type insert

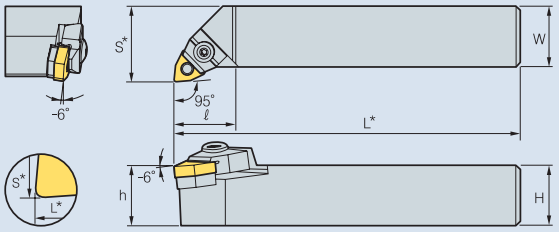
(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: 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	N0407	HW25L
	2525-M16	●	●	25	25	150	32	25	33						SP3M		HW30L
	3232-P16			32	32	170	40	32	33								

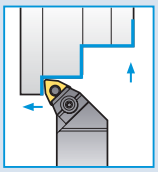
• Applicable inserts, see pages **B30~B33, B56~B59** ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

WWLNR/L

WN□□



95°



• R type insert

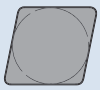
(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Wedge Clamp	Screw	C-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				SP4M		

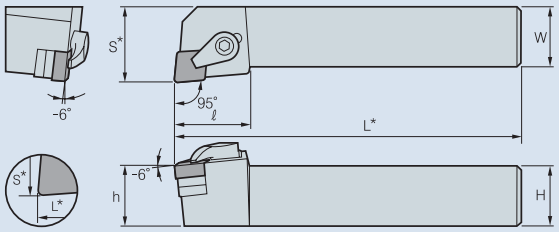
• Applicable inserts, see pages **B35, B36** ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

Holder for Ceramic

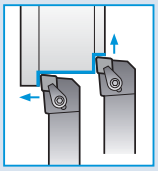
CCLNR/L



CN□N



95°



• R type insert

(mm)

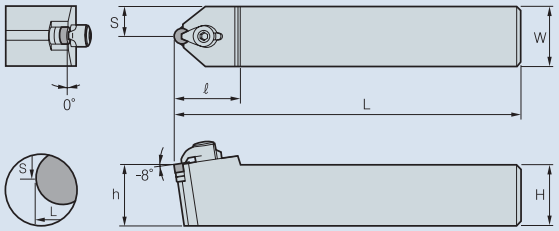
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Spring	Screw	Shim	Wrench
CCLNR/L 2525-M12C			25	25	150	32	25	32	CN□N 1204□□ 1207□□	CH6R3	SR3	MHX0630 SHX0310	SC42CC	HW40L HW20L

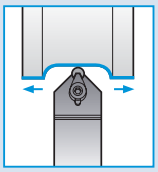
*r=0.8

● : Stock item ○ : Under preparing for stock

CRDNN

RN□N





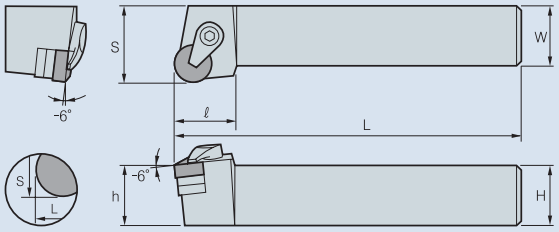
(mm)

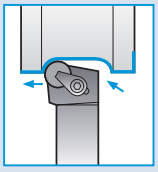
Designation	Stock	H	W	L	S	h	ℓ	Parts / Insert	Clamp	Spring	Screw	Shim	Wrench
CRDNN 2525-M12C	●	25	25	150	12.5	25	35	RN□N 1204□□ 1207□□	CH6R3	SR3	MHX0630 SHX0310	SR42CC	HW40L HW20L

● : Stock item ○ : Under preparing for stock

CRGNR/L

RN□N





• R type insert

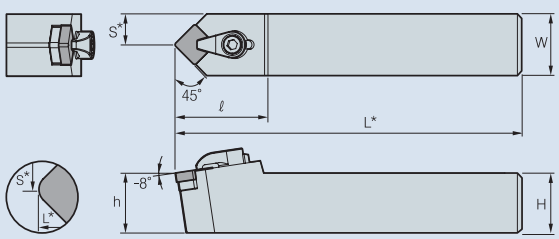
(mm)

Designation	Stock R	Stock L	H	W	L	S	h	ℓ	Parts / Insert	Clamp	Spring	Screw	Shim	Wrench
CRGNR/L 2525-M12C	●		25	25	150	32	25	32	RN□N 1204□□ 1207□□	CH6R3	SR3	MHX0630 SHX0310	SR42CC	HW40L HW20L

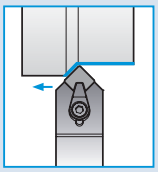
● : Stock item ○ : Under preparing for stock

CSDNN

SN□N



45°



(mm)

Designation	Stock	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Spring	Screw	Shim	Wrench
CSDNN 2525-M12C	●	25	25	125	12.5	25	35	SN□N 1204□□ 1207□□	CH6R3	SR3	MHX0630 SHX0310	SR42CC	HW40L HW20L

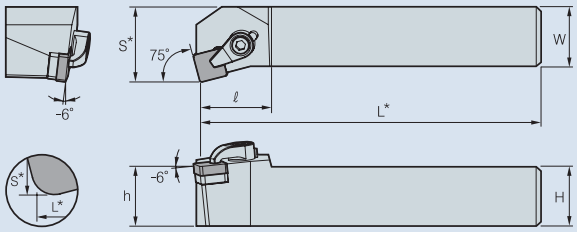
• Applicable inserts, see pages **B29**

*r=0.8

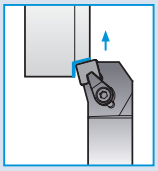
● : Stock item ○ : Under preparing for stock

CSKNR/L

SN□N



75°



• R type insert

(mm)

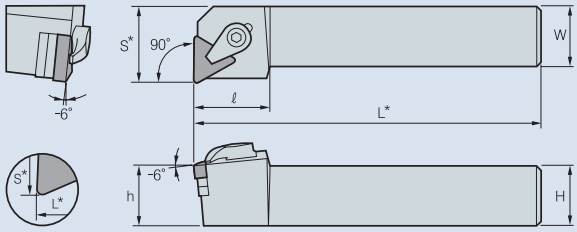
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Spring	Screw	Shim	Wrench
CSKNR/L 2525-M12C	●		25	25	150	32	25	28	SN□N 1204□□ 1207□□	CH6R3	SR3	MHX0630 SHX0310	SR42CC	HW40L HW20L

* r=0.8

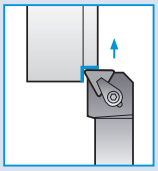
● : Stock item ○ : Under preparing for stock

CTFNR/L

TN□N



90°



• R type insert

(mm)

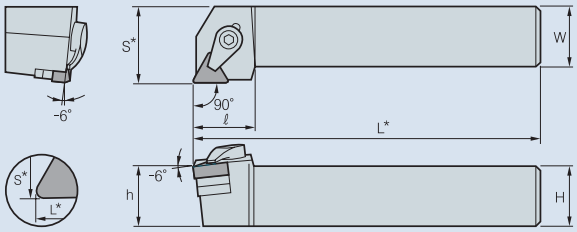
Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Spring	Screw	Shim	Wrench
CTFNR/L 2525-M16C	●		25	25	150	32	25	32	TN□N 1604□□ 1607□□	CH6R3	SR3	MHX0630 SHX0310	ST32CC	HW40L HW20L

* r=0.8

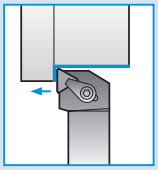
● : Stock item ○ : Under preparing for stock

CTGNR/L

TN□N



90°



• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts / Insert	Clamp	Spring	Screw	Shim	Wrench
CTGNR/L 2525-M16C	●		25	25	150	32	25	25	TN□N 1604□□ 1607□□	CH6R3	SR3	MHX0630 SHX0310	ST32CC	HW40L HW20L

* r=0.8

● : Stock item ○ : Under preparing for stock

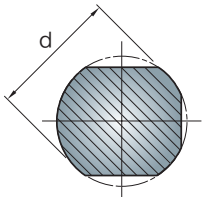
Boring Bar Code System(ISO)

S	12	M	–	S	T	F	P	R	–	11
1	2	3		4	5	6	7	8		9

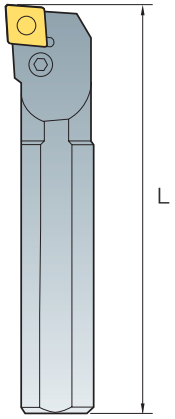
1 S 12 M - S T F P R - 11
Type of Bar

"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 S 12 M - S T F P R - 11
Bar Diameter

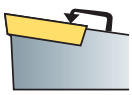


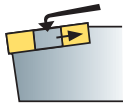
3 S 12 M - S T F P R - 11
Bar Length



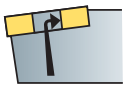
length(L)	(mm)
H	100
J	110
K	125
M	150
N	160
Q	180
R	200
S	250
T	300
U	350
V	400
W	450
T	500

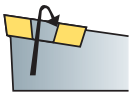
4 S 12 M - S T F P R - 11
Method of Mounting Insert


Top clamping
C

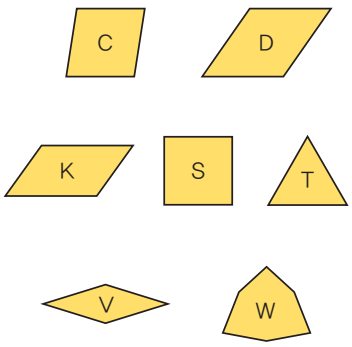

Top and hole claming
D

Top and hole claming
M

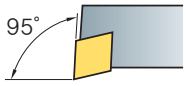

Hole clamping
P


Screw on
S

5 S 12 M - S T F P R - 11
Insert Shape



6 S 12 M - S T F P R - 11
Lead Angle of Boring Bar



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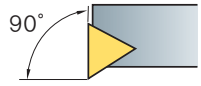

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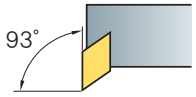

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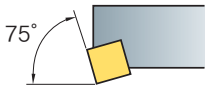

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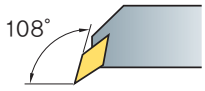

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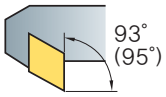
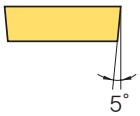


Z

7 S 12 M - S T F P R - 11
Relief Angle of Insert



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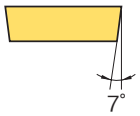

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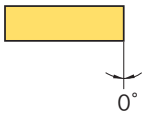

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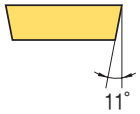
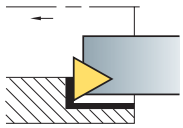


P

8 S 12 M - S T F P R - 11
Hand of Bar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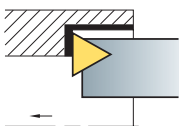
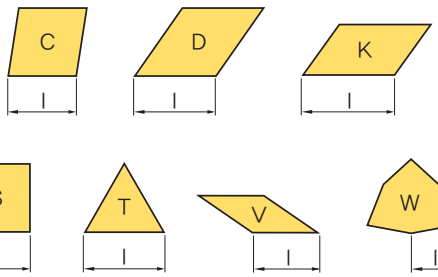
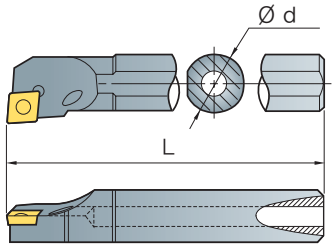

L

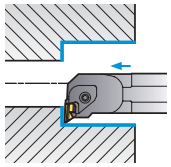
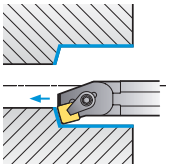
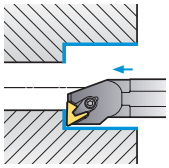
9 S 12 M - S T F P R - 11
Length of Cutting Edge



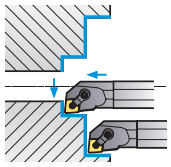
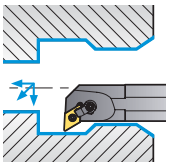
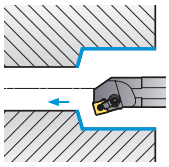
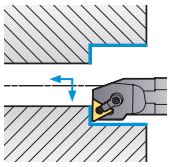
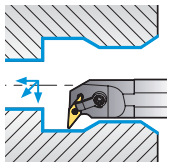
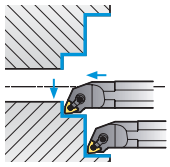
Boring Bar with Coolant Hole



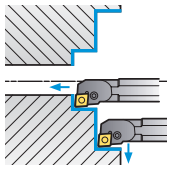
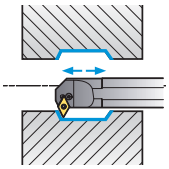
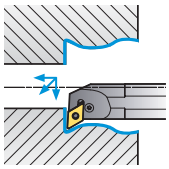
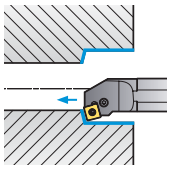
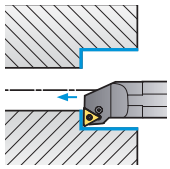
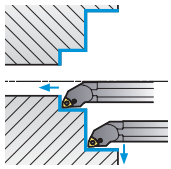
■ Clamp on System

Cutting Shape							
Designation	CKUNR/L	CSKPR/L	CTFPR/L				
Approach angle	93°	75°	90°				
Page	B96	B96	B96				
Copying							
Facing							
Back turning	●						
Turning	●	●	●				

■ Multi Lock System

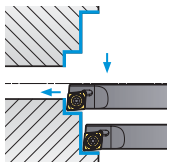
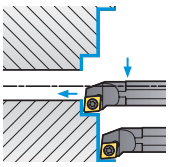
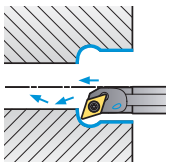
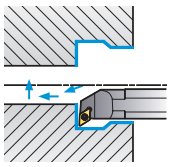
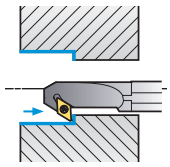
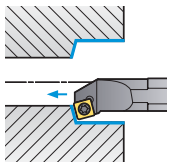
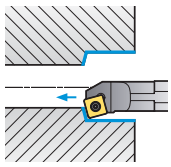
Cutting Shape							
Designation	MCLNR/L	MDUNR/L	MSKNR/L	MTFNR/L	MVUNR/L	MWLNR/L	
Approach angle	95°	93°	75°	90°	93°	95°	
Page	B97	B97	B97	B98	B98	B98	
Copying		●			●		
Facing	●					●	
Back turning	●	●			●	●	
Turning	●	●	●	●	●	●	

■ 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	B99	B99	B99	B100	B100	B100	
Copying		●	●				
Facing	●					●	
Back turning	●		●			●	
Turning	●	●	●	●	●	●	

Index for Boring Bar

■ Screw on System

Cutting Shape							
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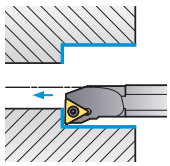
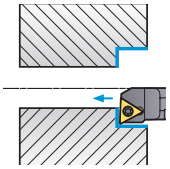
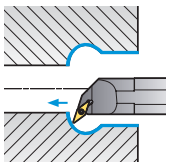
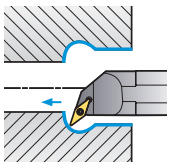
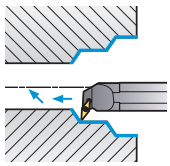
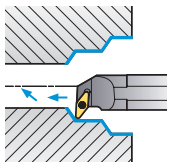
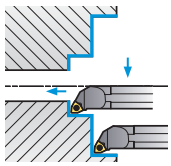
Approach angle	95°	95°	107.5°	93°	3°	75°	75°
Page	B101	B102	B102	B103	B103	B103	B104
Copying			●	●			
Facing	●	●					
Back turning	●	●	●	●	●		
Turning	●	●	●	●	●	●	●

Cutting Shape							
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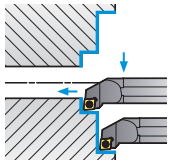
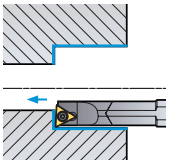
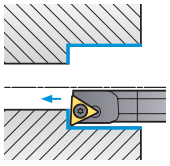
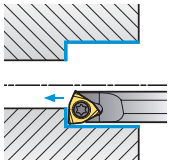
Approach angle	90°	90°	108°	108°	93°	93°	95°
Page	B104	B105	B105	B105	B106	B106	B106
Copying			●	●	●	●	
Facing							●
Back turning			●	●	●	●	●
Turning	●	●	●	●	●	●	●

■ Compact Mini

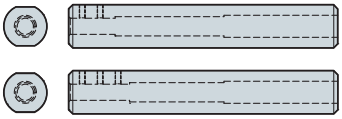
Cutting Shape							
Designation	SCLCR/L	STUBR/L	STUPR/L	SWUBR/L			
Approach angle	95°	93°	93°	93°			
Page	B107	B107	B107	B108			
Copying							
Facing	●	●					
Back turning	●	●	●				
Turning	●	●	●	●			

■ Carbide Shank Boring Bar

Designation	SCLCR/L	SCLPR/L	SDQCR/L	SDUCR/L	STFCR/L
Approach angle	95°	95°	107.5°	93°	91°
Page	B122	B123	B123	B124	B125

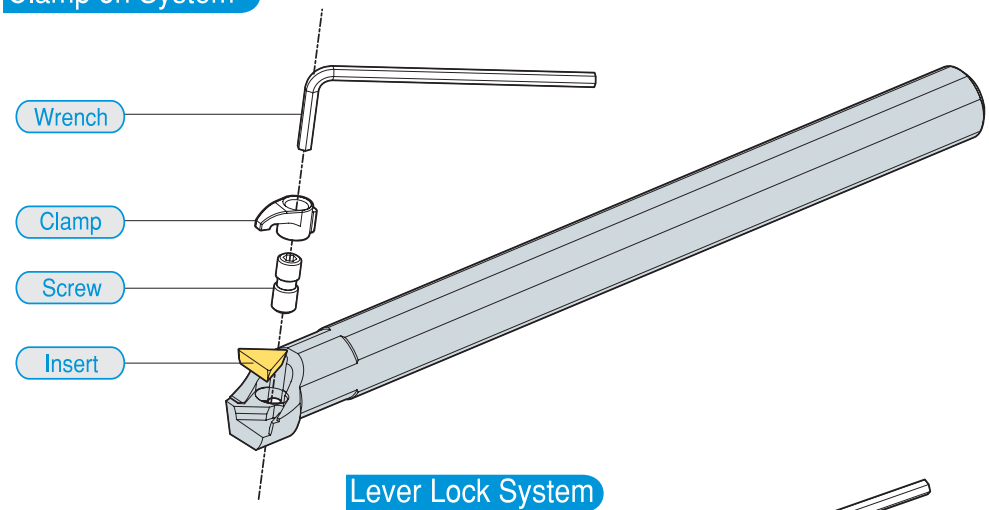
Designation	STFPR/L	STUBR/L	STUPR/L	SWUBR/L	-
Approach angle	90°	93°	93°	93°	-
Page	B126	B126	B127	B127	-

■ Sleeve

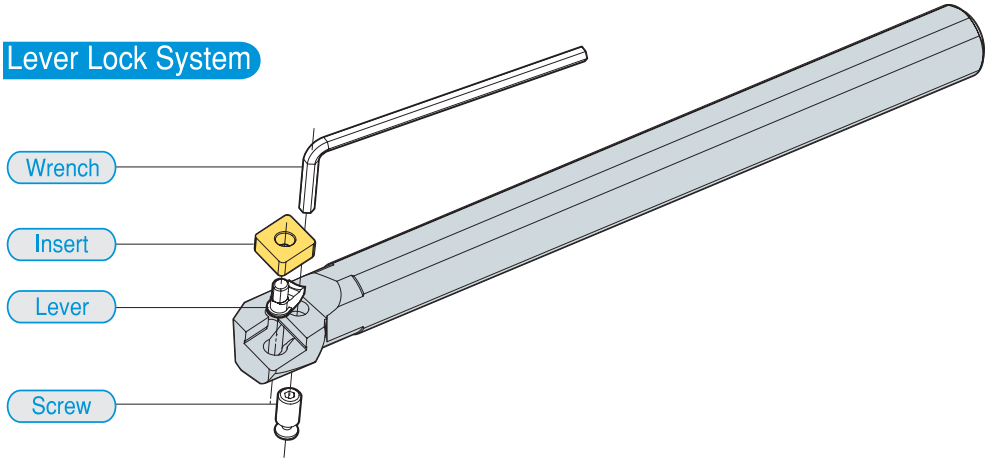
Cutting Shape	
Designation	SL
Page	B128

Instructions of Boring Bar assembly

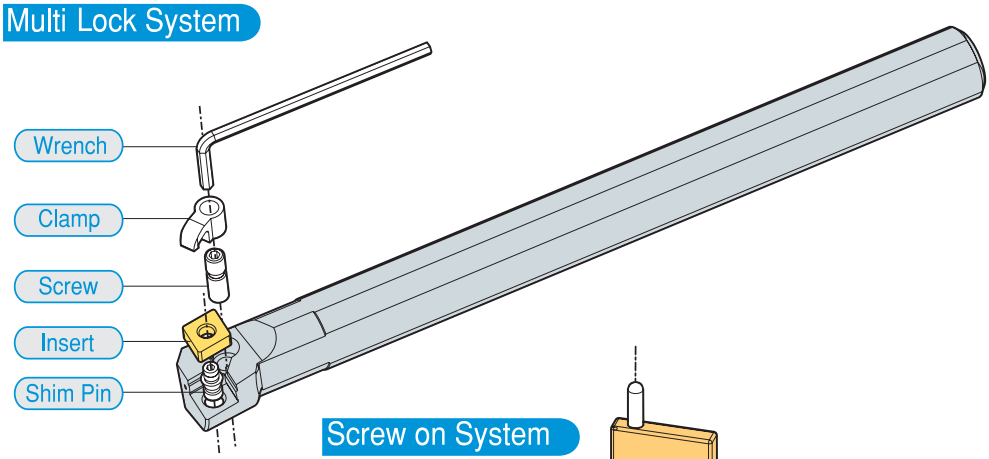
Clamp on System



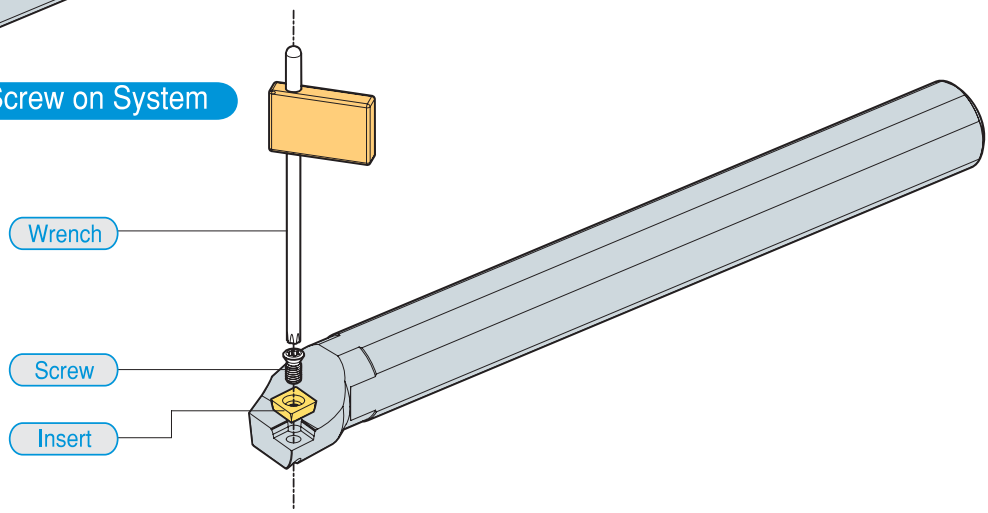
Lever Lock System



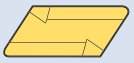
Multi Lock System



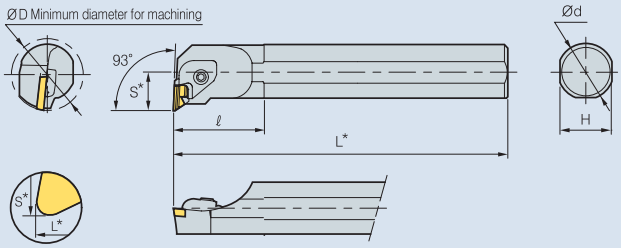
Screw on System



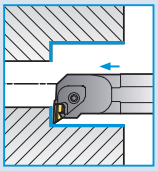
CKUNR/L



KN□□



93°



• R type insert

(mm)

Designation	Stock R	Stock L	øD	Ød	H	L*	S*	ℓ	Insert	Clamp	Clamp Screw	Spring	Shim	Pin	Shim Screw	Wrench
S32U-CKUNR/L-16	●		40	32	30	350	22	70	KN□□ 1604□□R/L	CTH6RC CTH6LC	CHX0625C	SR3C SR4C	SK33CC SK33CCL	PN0515C	SHX0310C	HW40L
S40V-CKUNR/L-16	●		50	40	37	400	27	60								
S50W-CKUNR/L-16	●		63	50	43	450	35	55								

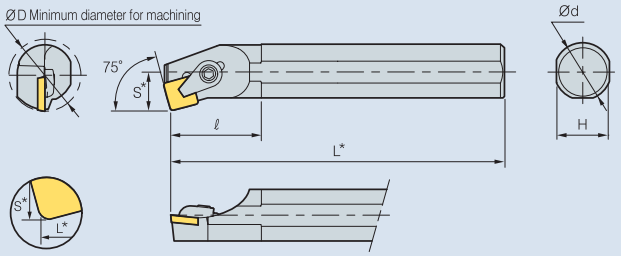
• Applicable inserts, see pages **B25**

* r=0.8

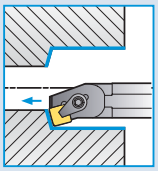
● : Stock item ○ : Under preparing for stock

CSKPR/L

SP□□



75°



• R type insert

(mm)

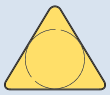
Designation	Stock R	Stock L	øD	Ød	H	L*	S*	ℓ	Insert	Clamp	Clamp Screw	C-Ring	Wrench
S16R-CSKPR/L-09	●		20	16	15	200	11	30	SP□□ 0903□□	CH4R1C	CHX0414	CR02C	HW25L
S20S-CSKPR/L-09	●		25	20	18	250	13	36					
S20S-CSKPR/L-12	●		25	20	18	250	13	28	SP□□ 1203□□	CH5R5C CH6R5	CHX0519C CH0616	CR03C CR04C	HW30L
S25T-CSKPR/L-12	●		25	20	23	300	17	40					

• Applicable inserts, see pages **B41, B42**

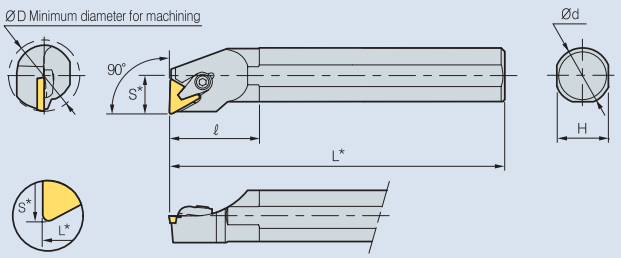
* r=0.8

● : Stock item ○ : Under preparing for stock

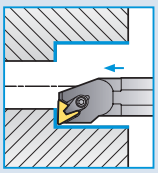
CTFPR/L



TP□□



90°



• R type insert

(mm)

Designation	Stock R	Stock L	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□□	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□□	CH5R5C	CHX0519C	CR03C	-	-	HW30L
S20S-CTFPR/L-16	●	●	25	20	18	250	13	40							
S25T-CTFPR/L-16	●	●	32	25	23	300	17	40		CH6R5	CHX0622C	CR04C	ST32C	SP3C	
S32U-CTFPR/L-16	●		40	32	30	350	22	45							
S40V-CTFPR/L-16			50	40	37	400	27	60							
S40V-CTFPR/L-22	●		50	40	37	400	27	60	TP□□ 2204□□	CH83R1	CH0823C	CR05C	ST43C	SP4C	HW40L

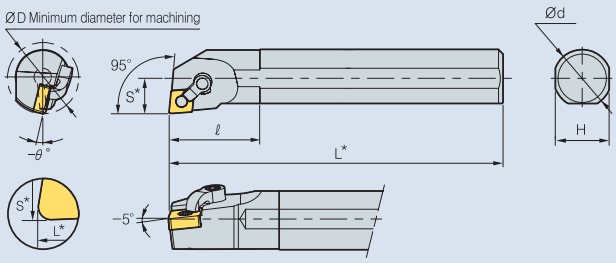
• Applicable inserts, see pages **B44, B45**

* r=0.4(l=11) r=0.8(l=16, 22)

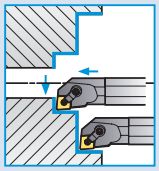
● : Stock item ○ : Under preparing for stock

MCLNR/L

CN□□



95°



• R type insert

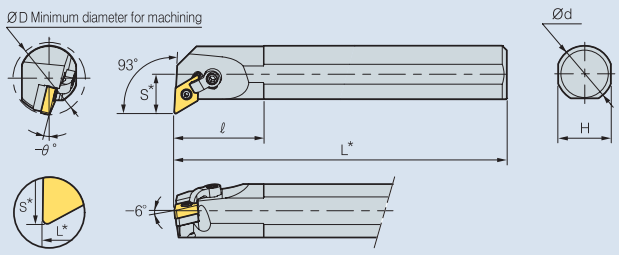
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
S20S-MCLNR/L-09			25	20	18	250	13	-12°	36	CN□□ 0903□□	CDH7N	DHA10-32-19	-	SP3D3	HW19.8L HW23.8L
S25T-MCLNR/L-09			32	25	23	300	17	-11°	36						
S25T-MCLNR/L-12	●		32	25	23	300	17	-13°	36	CN□□ 1204□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L
S32U-MCLNR/L-12	●		40	32	30	350	22	-15°	50				SC43D	SP4D	
S40V-MCLNR/L-12			50	40	37	400	27	-15°	60						
※ A25R-MCLNR/L-12			32	25	23	200	17	-14°	40	CN□□ 1204□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L HW23.8L
※ A32S-MCLNR/L-12			40	32	30	250	22	-15°	50				SC43D	SP4D	

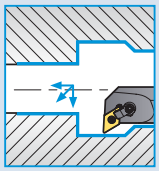
• Applicable inserts, see pages **AD05, B20~B22, B56~B59, B61** ⋆ r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

MDUNR/L

DN□□



93°



• R type insert

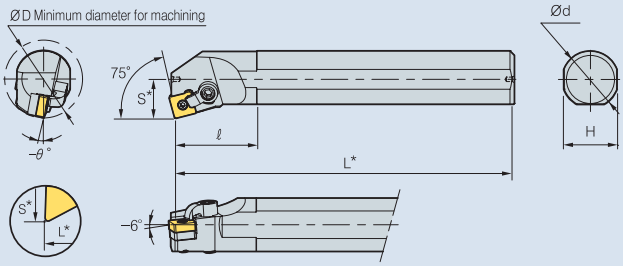
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
S32U-MDUNR/L-15-3			40	32	30	350	22.0	-13°	50	DN□□ 1504□□	CDH6N	DHA1/4-21	SD43D	SP4D	HW31.8L HW23.8L
S40V-MDUNR/L-15-3			50	40	37	400	27.0	-11°	60						
A32S-MDUNR/L-15-3			40	32	30	250	22.0	-13°	50						

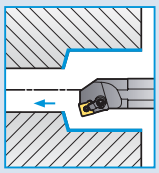
• Applicable inserts, see pages **B23, B24, B56~B59** ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

MSKNR/L

SN□□



75°



• R type insert

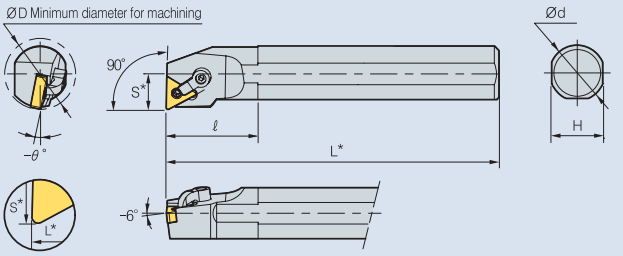
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
S25T-MSKNR/L-12			32	25	23	300	17.0	-12°	36	SN□□ 1204□□	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L HW23.8L
S32U-MSKNR/L-12			40	32	30	350	22.0	-10°	50				SS43D	SP4D	
S40V-MSKNR/L-12			50	40	37	400	27.0	-10°	60						
A25R-MSKNR/L-12			32	25	23	200	17.0	-12°	40	SN□□ 1204□□	CDH8N1	DHA5/16-28	-	SP4DS	HW39.7L HW23.8L
A32S-MSKNR/L-12			40	32	30	250	22.0	-10°	50				SS43D	SP4D	
A40T-MSKNR/L-12			50	40	37	300	27.0	-10°	60						

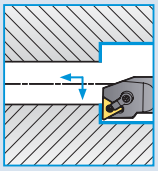
• Applicable inserts, see pages **AD05, B26~B29, B56~B59** ⋆ r=0.8 ● : Stock item ○ : Under preparing for stock

MTFNR/L

TN□□



90°



• R type insert

(mm)

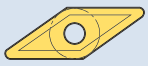
Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
S25T-MTFNR/L-16			32	25	23	300	17.0	-13°	36	TN□□ 1604□□	CDH7N1	DHA10-32-19	–	SP3D3	HW23.8L
S32U-MTFNR/L-16			40	32	30	350	22.0	-11°	50				ST32D	SP3D	HW19.8L
S40U-MTFNR/L-16			50	40	37	350	27.0	-11°	60						
A25R-MTFNR/L-16			32	25	23	200	17.0	-13°	40	TN□□ 1604□□	CDH7N1	DHA10-32-19	–	SP3D3	HW23.8L
A32S-MTFNR/L-16			40	32	30	250	22.0	-11°	50				ST32D	SP3D	HW19.8L

• Applicable inserts, see pages **B30~B33, B56~B59**

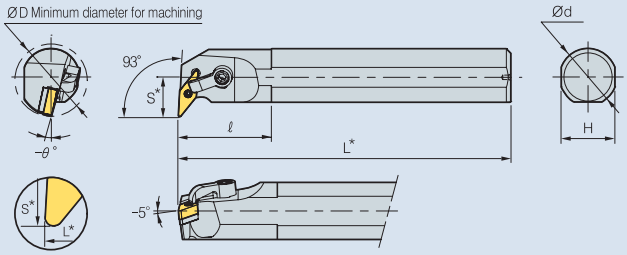
*r=0.8

● : Stock item ○ : Under preparing for stock

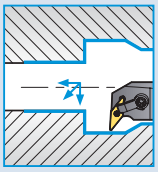
MVUNR/L



VN□□



93°



• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
S32U-MVUNR/L-16			40	32	30	350	22.0	-12°	50	VN□□ 1604□□	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L
S40V-MVUNR/L-16			50	40	37	400	27.0	-12°	60						HW19.8L
A32U-MVUNR/L-16			40	32	30	250	22.0	-12°	50	VN□□ 1604□□	CDH8N2	DHA5/16-28	SV32D	SP3D	HW39.7L
A40T-MVUNR/L-16			50	40	37	300	27.0	-12°	60						HW19.8L

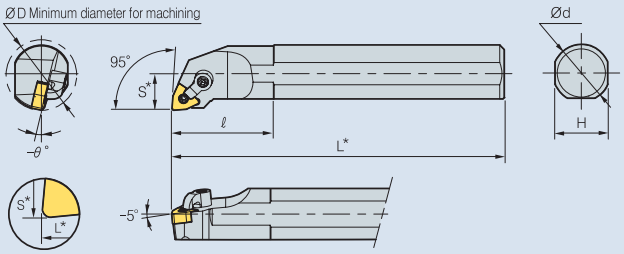
• Applicable inserts, see pages **B34, B56~B59**

*r=0.8

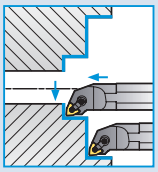
● : Stock item ○ : Under preparing for stock

MWLNR/L

WN□□



95°



• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Clamp	Clamp Screw	Shim	Shim Pin	Wrench
S25T-MWLNR/L-06	●		32	25	23	300	17.0	-12°	36	WN□□ 0604□□	CDH7N	DHA10/32-19	-	SP3D3	HW23.8L
S32U-MWLNR/L-06			40	32	30	350	22.0	-14°	50				SW32D	SP3D	HW19.8L
S40V-MWLNR/L-06			50	40	37	400	27.0	-14°	60						
S25T-MWLNR/L-08	●	●	32	25	23	300	17.0	-12°	36	WN□□ 0804□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L
S32U-MWLNR/L-08	●		40	32	30	350	22.0	-14°	50				SW43D	SP4D	HW23.8L
S40V-MWLNR/L-08	●		50	40	37	400	27.0	-14°	60						
A25R-MWLNR/L-06			32	25	23	200	17.0	-14°	40	WN□□ 0604□□	CDH7N	DHA10/32-19	-	SP3D3	HW31.8L
A32S-MWLNR/L-06			40	32	30	250	22.0	-14°	50				SW32D	SP3D	HW19.8L
A25R-MWLNR/L-08			32	25	23	200	17.0	-12°	40	WN□□ 0804□□	CDH6N	DHA1/4-21	-	SP4DS	HW31.8L
A32S-MWLNR/L-08			40	32	30	250	22.0	-14°	50				SW43D	SP4D	HW23.8L

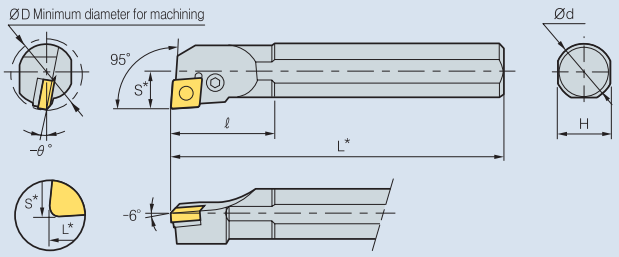
• Applicable inserts, see pages **B35, B36**

*r=0.8

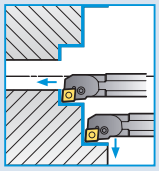
● : Stock item ○ : Under preparing for stock

PCLNR/L

CN□□



95°



• R type insert

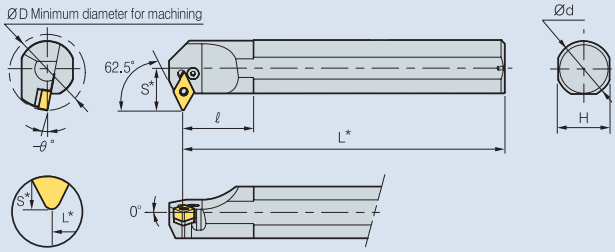
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench
S16R-PCLNR/L-09	●	●	20	16	15	200	11	-12°	28	CN□□ 0903□□	LV3C	VHX0509B	-	-	HW20L
S20S-PCLNR/L-09	●	●	25	20	18	250	13	-11°	32						
S25T-PCLNR/L-09	●		32	25	23	300	17	-10°	36						
S25T-PCLNR/L-12	●	●	32	25	23	300	14	-12°	40	CN□□ 1204□□	LV4A	VHX0613A	-	-	HW25L
S32U-PCLNR/L-12	●	●	40	32	30	350	22	-11°	50		LV4	VHX0821	SC42B	SP4	HW30L
S40V-PCLNR/L-12	●	●	50	40	37	400	27	-10°	55						
S50W-PCLNR/L-12	●	●	63	50	47	450	35	-10°	55						
S50W-PCLNR/L-19	●	●	70	50	47	450	35	-10°	63	CN□□ 1906□□	LV6	VHX1027	SC63	SP6	HW40L
※ A25R-PCLNR/L-12	●	●	32	25	24	200	17	-12°	40	CN□□ 1204□□	LV4A	VHX0613A	-	-	HW25L
※ A32S-PCLNR/L-12	●	●	44	32	31	250	22	-10°	50		LV4	VHX0821	SC42B	SP4	HW30L
※ A40T-PCLNR/L-12	●		50	40	47	300	27	-10°	60						

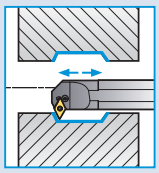
• Applicable inserts, see pages **AD05, B20~B22, B56~B59, B61**
⋆ r=0.8(12) r=1.2(19) ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

PDSNR/L

DN□□



62.5°



• R type insert

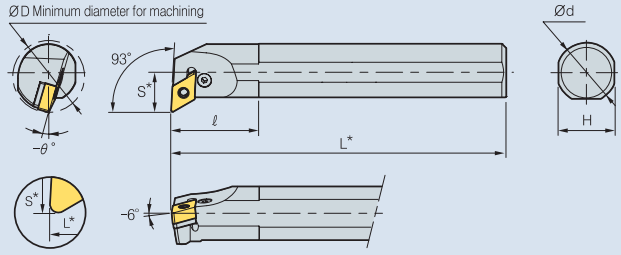
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench
S32U-PDSNR/L-15	●	●	40	32	30	350	22	-11°	45	DN□□ 1506□□	LV4B	VHX0821	SD42	SP4	HW30L
S40V-PDSNR/L-15	●	●	50	40	37	400	27	-11°	43						
S32U-PDSNR/L-15-3			40	32	30	350	22	-11°	45	DN□□ 1504□□	LV4	VHX0821	SD42	SP4	HW30L
S40V-PDSNR/L-15-3			50	40	37	400	27	-11°	43						
※ A32S-PDSNR/L-15			40	32	31	250	22	-12°	45	DN□□ 1506□□	LV4B	VHX0821	SD42	SP4	HW30L
※ A32S-PDSNR/L-15-3			40	32	31	250	22	-12°	45	DN□□ 1504□□	LV4	VHX0821	SD42	SP4	HW30L

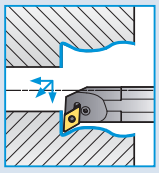
• Applicable inserts, see pages **B23, B24, B56~B59**
⋆ r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

PDUNR/L

DN□□



93°



• R type insert

(mm)

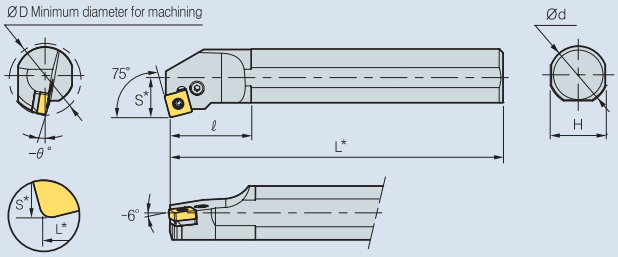
Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Lever	Screw	Shim	Shim Pin	Wrench
S20S-PDUNR/L-11	●		25	20	18	250	13	-16°	30	DN□□ 1104□□	LV3D	VHX0512B	-	-	HW20L
S25T-PDUNR/L-11	●	●	32	25	23	300	17	-13°	35						
S32U-PDUNR/L-11			40	32	30	350	22	-16°	40		LV3	VHX0617	SD317	SP3	HW25L
S32U-PDUNR/L-15	●	●	40	32	30	350	22	-16°	50	DN□□ 1506□□	LV4B	VHX0821	SD42	SP4	HW30L
S40V-PDUNR/L-15	●	●	50	40	37	400	27	-11°	50						
S50W-PDUNR/L-15	●	○	63	50	47	450	35	-11°	63						
S32U-PDUNR/L-15-3			40	32	30	350	22	-16°	50	DN□□ 1504□□	LV4	VHX0821	SD42	SP4	HW30L
S40V-PDUNR/L-15-3			50	40	37	400	27	-11°	50						
※ A32S-PDUNR/L-15			40	32	31	250	22	-16°	50	DN□□ 1506□□	LV4B	VHX0821	SD42	SP4	HW30L
※ A32S-PDUNR/L-15-3			40	32	31	250	22	-16°	50	DN□□ 1504□□	LV4	VHX0821	SD42	SP4	HW30L

• Applicable inserts, see pages **B23, B24, B56~B59**
⋆ r=0.4(l=11) r=0.8(15) ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

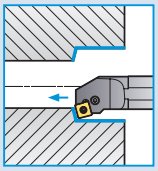
Lever Lock System

PSKNR/L

SN□□



75°



• R type insert

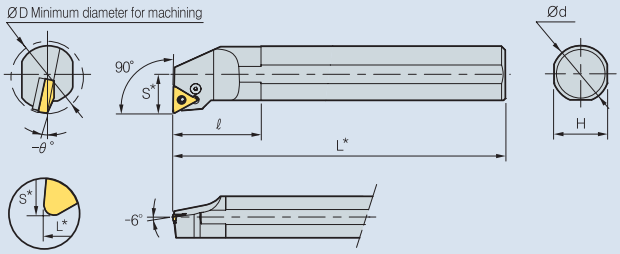
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench
S25T-PSKNR/L-12	●	●	32	25	23	300	17	-12°	42	SN□□ 1204□□	LV4A	VHX0613A	-	-	HW25L
S32U-PSKNR/L-12	●	○	40	32	30	350	22	-12°	45		LV4	VHX0821	SS42B	SP4	HW30L
S40V-PSKNR/L-12	●	○	50	40	37	400	27	-12°	50						
※ A25R-PSKNR/L-12			32	25	24	200	17	-12°	42		LV4A	VHX0613A	-	-	HW25L
※ A32S-PSKNR/L-12			40	32	31	250	22	-12°	50		LV4	VHX0821	SS42B	SP4	HW30L

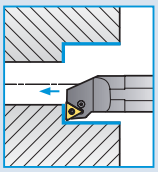
• Applicable inserts, see pages **AD05, B26~B29, B56~B59**
⋆r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

PTFNR/L

TN□□



90°



• R type insert

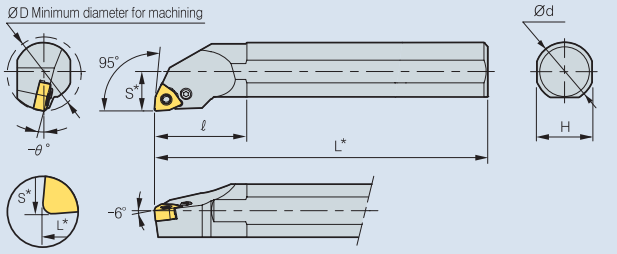
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench
S16R-PTFNR/L-11	●		20	16	15	200	11	-14°	28	TN□□ 1103□□	LV2	VHX0509B	-	-	HW25L
S20S-PTFNR/L-11	●		25	20	18	250	13	-12°	33						
S25T-PTFNR/L-11	●		32	25	23	300	17	-12°	36						
S25T-PTFNR/L-16	●	●	32	25	23	300	17	-12°	42	TN□□ 1604□□	LV3B	VHX0512B	-	-	HW20L
S32U-PTFNR/L-16	●	●	44	32	30	350	22	-10°	50		LV3	VHX0617	ST317B	SP3	HW25L
S40V-PTFNR/L-16	●	○	54	40	37	400	27	-10°	55						
※ A25R-PTFNR/L-16			32	25	24	200	17	-12°	40		LV3	VHX0617	ST317B	SP3	HW25L
※ A32S-PTFNR/L-16			40	32	31	250	22	-12°	50		LV3	VHX0617	ST317B	SP3	HW25L

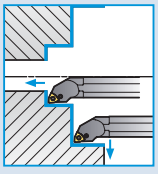
• Applicable inserts, see pages **B30~B33, B56~B59**
⋆r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

PWLNR/L

WN□□



95°



• R type insert

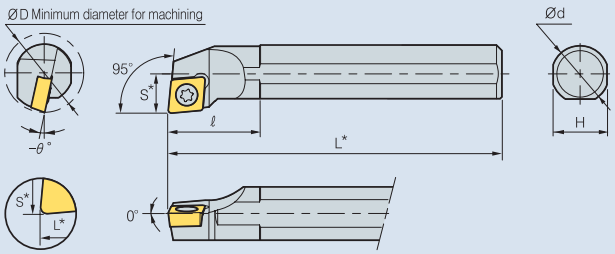
(mm)

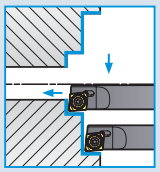
Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Insert	Lever	Screw	Shim	Shim Pin	Wrench
S20S-PWLNR/L-06	●	●	25	20	18	250	13	-12°	40	WN□□ 0604□□	LV3B	VHX0512B	-	-	HW20L
S25T-PWLNR/L-06	●		32	25	23	300	17	-12°	40						
S32U-PWLNR/L-06	●		44	32	30	350	22	-10°	45		LV3B	VHX0613B	SW317	SP3	HW25L
S25T-PWLNR/L-08	●	●	32	25	23	300	17	-12°	45	WN□□ 0804□□	LV4A	VHX0613A	–	–	HW25L
S32U-PWLNR/L-08	●	●	44	32	30	350	22	-10°	50		LV4	VHX0821	SW42	SP4	HW30L

• Applicable inserts, see pages **B35, B36**
⋆r=0.8 ● : Stock item ○ : Under preparing for stock

SCLCR/L

CC□□





• R type insert

(mm)

Designation	Stock R	Stock L	øD	ød	H	L*	S*	θ°	ℓ	Parts: Insert	Parts: Screw	Parts: Shim	Parts: Shim Screw	Parts: Wrench
S08K-SCLCR/L-06	●	●	10	8	7	125	5	-15°	14	CC□□ 0602□□	FTKA02555	-	-	TW07P
S10K-SCLCR/L-06	●		12	10	9	125	6	-13°	14		FTKA02565			
S10M-SCLCR/L-06	●	●	12	10	9	150	6	-13°	14					
S12M-SCLCR/L-06	●	●	16	12	11	150	9	-10°	25					
S16R-SCLCR/L-06			20	16	15	200	11	-8°	32					
S12M-SCLCR/L-09	●	●	16	12	11	150	9	-10°	25	CC□□ 09T3□□	FTGA03508	-	-	TW15P
S16R-SCLCR/L-09	●	●	20	16	15	200	11	-12°	32.5					
S20S-SCLCR/L-09	●	●	25	20	18	250	13	-5°	38					
S25T-SCLCR/L-09	●	●	32	25	23	300	17	-6°	45		FTGA03510			
S25T-SCLCR/L-12	●	●	32	25	23	300	17	-6°	45	CC□□ 1204□□	FTGQ0411F	-	-	TW15P
S32U-SCLCR/L-12	●	●	40	32	30	350	22	-10°	50			SC42S	SHXN0610F	HW40L, TW15P
S40V-SCLCR/L-12	●	●	50	40	37	400	27	-8°	60					
※ A08F-SCLCR/L-06			10	8	7.5	80	5	-15°	14	CC□□ 0602□□	FTKA02555	-	-	TW07P
※ A10H-SCLCR/L-06			12	10	9.5	100	6	-13°	14		FTKA02565			
※ A12K-SCLCR/L-06			16	12	11	125	9	-10°	25					
※ A12K-SCLCR/L-09			16	12	11	125	9	-10°	25	CC□□ 09T3□□	FTGA03508	-	-	TW15P
※ A16M-SCLCR/L-09			20	16	15	150	11	-12°	32.5					
※ A20Q-SCLCR/L-09	●		25	20	19	180	12	-8°	38					
※ A25R-SCLCR/L-09			32	25	24	200	17	-6°	45		FTGA03510			
※ A25R-SCLCR/L-12			32	25	24	200	17	-6°	45	CC□□ 1204□□	FTGA0411F	-	-	TW15P
※ A32S-SCLCR/L-12			40	32	31	250	32	-10°	50			SC42S	SHXN0610F	HW40L, TW15P

• Applicable inserts, see pages **B37, B38, B50, B56~B58, B61**
• Carbide shank boring bar, see pages **B122~B128**

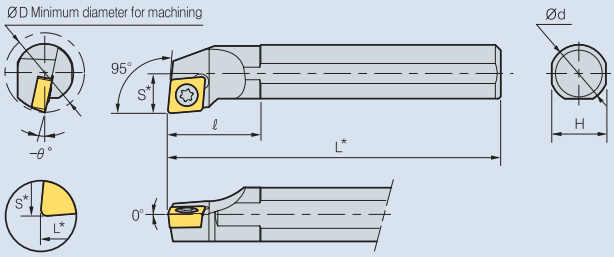
⋆ r=0.4(l=0., 0.9 06 09) r=0.8(l=12)
※ Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

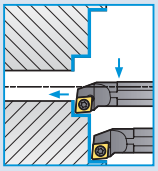
Screw on System

SCLPR/L

CP□□



95°



• R type insert

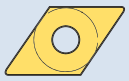
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Wrench
S10M-SCLPR/L-08	●		12	10	9	150	6	-5°	-	CP□□ 0802□□	FTNA0305	TW09P
S12M-SCLPR/L-08	●		16	12	11	150	8	-2°	15		FTNA0307	
S16N-SCLPR/L-09	●		20	16	15	160	10	-2°	15	CP□□ 0903□□	FTNA0408	TW15P
S16R-SCLPR/L-09	●		20	16	15	200	10	-2°	15			
S20N-SCLPR/L-09	●		25	20	18	160	12.5	0°	20			
S20S-SCLPR/L-09	●		25	20	15	250	12.5	0°	20			
※ A10H-SCLPR/L-08			12	10	9.5	100	9	-5°	-	CP□□ 0802□□	FTNA0305	TW09P
※ A12K-SCLPR/L-08			16	12	11	125	8	-2°	20		FTNA0307	
※ A16M-SCLPR/L-09			20	16	15	150	10	-2°	15	CP□□ 0903□□	FTNA0408	TW15P
※ A20Q-SCLPR/L-09			25	20	19	180	12.5	0°	28			

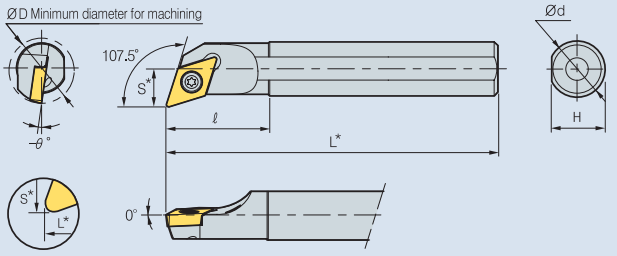
• Applicable inserts, see pages **B38**
• Carbide shank boring bar, see pages **B122~B128**

* r=0.4(l=11) r=0.8(15) ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

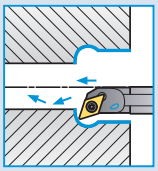
SDQCR/L



DC□□



107.5°



• R type insert

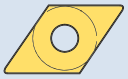
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	f	Parts: Insert	Screw	Wrench
S10M-SDQCR/L-07	●	●	13	10	9	150	7	-8°	20	2.5	DC□□ 0702□□	FTKA02555	TW07P
S12M-SDQCR/L-07	●	●	16	12	11	150	9	-8°	22	3.5		FTKA02565	
S16R-SDQCR/L-07	●	●	20	16	15	200	11	-6°	27	4			
S16R-SDQCR/L-11	●	●	20	16	15	200	11	-6°	32	4	DC□□ 11T3□□	FTGA03508	TW15P
S20S-SDQCR/L-11	●	●	25	20	18	250	13	-6°	32	4.5			
S25T-SDQCR/L-11	●	●	32	25	23	300	17	-6°	32	7		FTGA03510	
※ A10H-SDQCR/L-07			13	10	9.5	100	7	-8°	20	2	DC□□ 0702□□	FTKA02555	TW07P
※ A12K-SDQCR/L-07			16	12	11	125	9	-8°	22	3		FTKA02565	
※ A16M-SDQCR/L-11			20	16	15	150	11	-6°	27	3	DC□□ 11T3□□	FTGA03508	TW15P
※ A20Q-SDQCR/L-11			25	20	19	180	13	-6°	32	3			
※ A25R-SDQCR/L-11			32	25	24	200	17	-6°	32	4		FTGA03510	

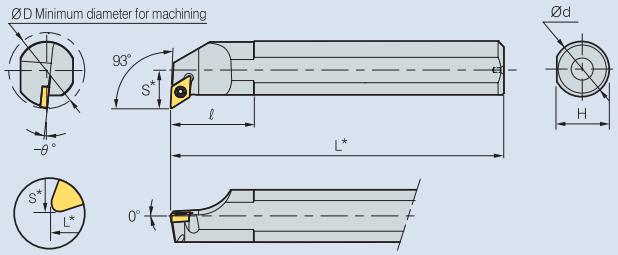
• Applicable inserts, see pages **B39, B50, B56~B58, B61**
• Carbide shank boring bar, see pages **B122~B128**

* r=0.4(l=07) r=0.8(l=11) ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

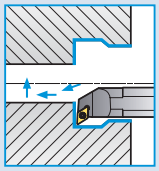
SDUCR/L



DC□□



93°



• R type insert

(mm)

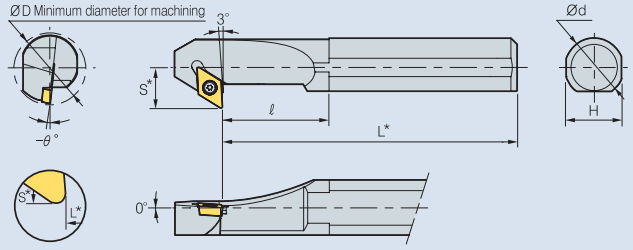
Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	f	Parts: Insert	Screw	Wrench
S10M-SDUCR/L-07	●	●	13	10	9	150	7	-8°	0	2.5	DC□□ 0702□□	FTKA02555	TW07P
S12M-SDUCR/L-07	●	●	16	12	11	150	9	-8°	22	3.5		FTKA02565	
S16R-SDUCR/L-07	●	●	20	16	15	200	11	-6°	27	4			
S16R-SDUCR/L-11	●	●	20	16	15	200	11	-8°	27	4	DC□□ 11T3□□	FTGA03508	TW15P
S20S-SDUCR/L-11	●	●	25	20	18	250	13	-6°	40	4.3			
S25T-SDUCR/L-11	●	●	32	25	23	300	17	-6°	46	6.8		FTGA03510	
S32U-SDUCR/L-11	●	●	40	32	30	350	22	-6°	50	8.4			
※ A10H-SDUCR/L-07			13	10	9.5	100	7	-8°	0	2	DC□□ 0702□□	FTKA02555	TW07P
※ A12K-SDUCR/L-07			16	12	11	125	9	-8°	22	3		FTKA02565	
※ A16M-SDUCR/L-07			20	16	15	150	11	-6°	27	3			
※ A20Q-SDUCR/L-11	●		25	20	19	180	13	-6°	35	3	DC□□ 11T3□□	FTGA03508	TW15P
※ A25R-SDUCR/L-11			32	25	24	200	17	-6°	46	4.5		FTGA03510	

• Applicable inserts, see pages **B39, B50, B56~B58, B61**
• Carbide shank boring bar, see pages **B122~B128**

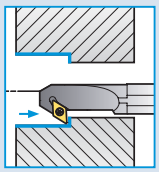
⋆ r=0.4(l=07) r=0.8(l=11) ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

SDZCR/L

DC□□



3°



• R type insert

(mm)

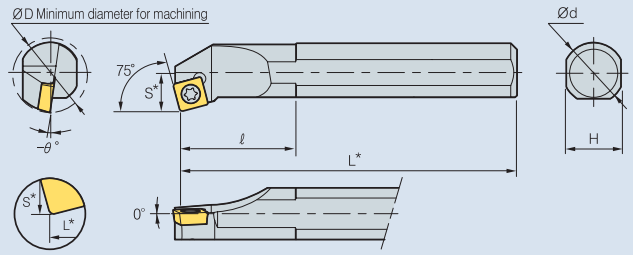
Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	f	Parts: Insert	Screw	Shim	Shim Screw	Wrench
S16R-SDZCR/L-07	●		20	16	15	200	11	-6°	20	4	DC□□ 0702□□	FTGA02565	-	-	TW07P
S20S-SDZCR/L-07	●		25	20	18	250	13	-6°	25	4.5					
S25T-SDZCR/L-11	●		32	25	23	300	17	-6°	30	6.9	DC□□ 11T3□□	FTGA03510	-	-	TW15P
S32U-SDZCR/L-11	●		40	32	30	350	22	-6°	39	8.4		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L
S40V-SDZCR/L-11	○		50	40	37	400	27	-4°	47	9.4					
※ A25R-SDZCR/L-11			32	25	24	200	17	-6°	30	4.5		FTGA03510	-	-	TW15P
※ A32S-SDZCR/L-11			40	32	31	250	22	-6°	39	6		FTGA03512	SD32S	SHXN0509F	TW15P, HW35L

• Applicable inserts, see pages **B39, B50, B56~B58, B61**

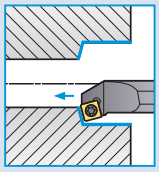
⋆ r=0.4(l=07) r=0.8(l=11) ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

SSKCR/L

SC□□



75°



• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
S12M-SSKCR/L-09	●		16	20	11	150	9	-10°	26	SC□□ 09T3□□	FTGA03507	-	-	TW15P
S16R-SSKCR/L-09	●	○	20	16	15	200	11	-11°	32		FTGA03508			
S20S-SSKCR/L-09	●		25	20	18	250	13	-8°	34					
S25T-SSKCR/L-12	●	●	32	25	23	300	17	-8°	36	SC□□ 1204□□	FTGA0411F	SS42S	SHXN0610F	TW15P, HW40L
S32U-SSKCR/L-12	●		40	32	30	350	22	-10°	43					
※ A12K-SSKCR/L-09			16	12	11	125	9	-10°	26	SC□□ 09T3□□	FTGA03507	-	-	TW15P
※ A16M-SSKCR/L-09			20	16	15	150	11	-11°	32		FTGA03508			
※ A20Q-SSKCR/L-09			25	20	19	180	12	-6°	34					
※ A25R-SSKCR/L-12			32	25	24	200	17	-8°	36	SC□□ 1204□□	FTGA0411F	SS42S	SFXN0610F	TW15P
※ A32S-SSKCR/L-12			40	32	31	250	22	-10°	43					TW15P, HW40L

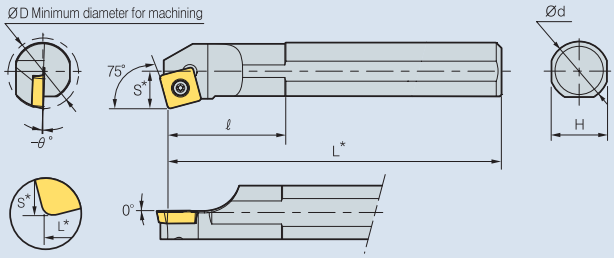
• Applicable inserts, see pages **B40, B51**

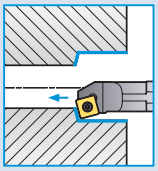
⋆ r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

Screw on System

SSKPR/L

SP□□





• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Wrench
S12M-SSKPR/L-09	●	●	16	12	11	150	8	-4°	18	SP□□ 0903□□	FTNA0307	TW09P
S16N-SSKPR/L-09	●	●	20	16	15	160	10	-2°	30			
S16R-SSKPR/L-09	●		20	16	15	200	10	-2°	32			
S20N-SSKPR/L-09	●	●	25	20	18	160	12.5	0°	32			
S20S-SSKPR/L-09	●		25	20	18	250	12.5	0°	35			
X12M-SSKPR/L-09			16	12	11	150	8	-4°	18	SP□□ 0903□□C05	FTGA03508	TW15P
X16N-SSKPR/L-09			20	16	15	160	10	-2°	30			
X16R-SSKPR/L-09			20	16	15	200	10	-2°	32			
X20N-SSKPR/L-09			25	20	18	160	12.5	0°	32			
X20S-SSKPR/L-09			25	20	18	250	12.5	0°	32			
※ A12K-SSKPR/L-09			16	12	11	125	8	-4°	21	SP□□ 0903□□R/L	FTNA0305	TW09P
※ A16M-SSKPR/L-09			20	16	15	150	10	-2°	30		FTNA0307	
※ A20Q-SSKPR/L-09			25	20	19	180	12.5	0°	32			

• Applicable inserts, see pages **B41**

* r=0.8

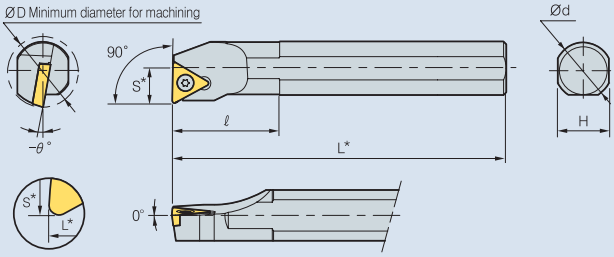
• Holder is opposed to hand of insert

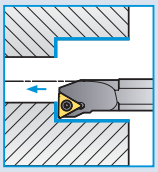
● : Stock item ○ : Under preparing for stock

※Boring bar with Oil hole

STFCR/L

TC□□





• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
S10M-STFCR/L-09	●	●	13	10	9	150	7	-13°	23	TC□□ 0902□□	FTKA02206	-	-	TW06P
S12M-STFCR/L-09	●		16	12	11	150	9	-10°	28					
S12M-STFCR/L-11	●	●	16	12	11	150	9	-10°	30	TC□□ 1102□□	FTKA02565	-	-	TW07P
S16R-STFCR/L-11	●	●	20	16	15	200	11	-6°	35					
S20S-STFCR/L-11	●	●	25	20	18	250	13	-3°	36					
S20S-STFCR/L-16	●		25	20	18	250	13	-10°	40	TC□□ 16T3□□	FTGA03510	-	-	TW15P
S25T-STFCR/L-16	●	●	32	25	23	300	17	-6°	49					
S32U-STFCR/L-16	●		40	32	30	350	22	-10°	50	TC□□ 16T3□□	FTGA03512	ST32S	SHXN0509F	TW15P, HW35L
S40V-STFCR/L-16	●		50	40	37	400	27	-8°	60					
※ A10H-STFCR/L-09			13	10	9.5	100	7	-13°	23	TC□□ 0902□□	FTKA02206	-	-	TW06P
※ A12K-STFCR/L-09			16	12	11	125	9	-10°	23					
※ A12K-STFCR/L-11			16	12	11	125	9	-10°	30					
※ A16M-STFCR/L-11	●		20	16	15	150	11	-6°	35	TC□□ 1102□□	FTKA02565	-	-	TW07P
※ A20Q-STFCR/L-11			25	20	19	180	13	-3°	36					
※ A25R-STFCR/L-16			32	25	24	200	17	-6°	49	TC□□ 16T3□□	FTKA03510	-	-	TW15P
※ A32S-STFCR/L-16			40	32	31	250	22	-10°	50		FTGA03512	ST32S	SHXN0509F	TW15P, HW35L

• Applicable inserts, see pages **B43, B52, B56**

• Carbide shank boring bar, see pages **B122~B128**

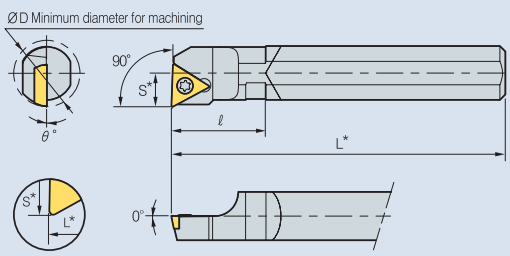
* r=0.4(l=09, 11) r=0.8(l=16)

※Boring bar with Oil hole

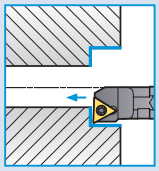
● : Stock item ○ : Under preparing for stock

STFPR/L

TP□□



90°



• R type insert

(mm)

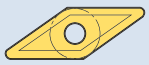
Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Wrench
S10M-STFPR/L-11	●		12	10	9	150	6	-5°	-	TP□□ 1103□□R/L	FTNA0305	TW09P
S12M-STFPR/L-11	●		16	12	11	150	8	-4°	10			
S16N-STFPR/L-11	●		20	16	15	160	10	-2°	12		FTNA0307	TW09P
S16R-STFPR/L-11	●	●	20	16	15	200	10	-2°	12			
S20N-STFPR/L-16	●		25	20	18	160	12.5	0°	14	TP□□ 1604□□R/L	FTNA0408	TW15P
S20S-STFPR/L-16	●		25	20	18	250	12.5	0°	14			
※ A10H-STFPR/L-11			12	10	9.5	100	6	-5°	-	TP□□ 1103□□R/L	FTNA0305	TW09P
※ A12K-STFPR/L-11			16	12	11	125	8	-4°	10		FTNA0307	TW09P
※ A16M-STFPR/L-11			20	16	15	150	10	-2°	12			
※ A20Q-STFPR/L-16			25	20	19	180	12.5	0°	14	TP□□ 1604□□R/L	FTNA0408	TW15P

• Applicable inserts, see pages **B44, B56~B58, B61**
• Carbide shank boring bar, see pages **B122~B128**

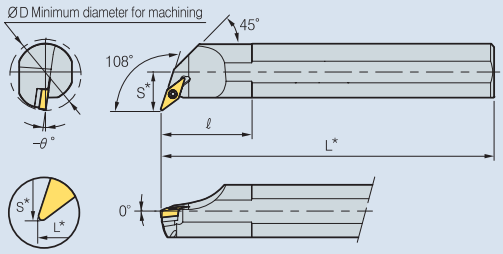
∗r=0.8 • Holder is opposed to hand of insert ● : Stock item ○ : Under preparing for stock

※Boring bar with Oil hole

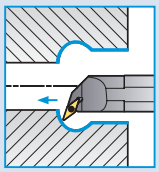
SVQBR/L



VB□□



108°



• R type insert

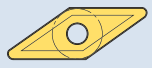
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
S32U-SVQBR/L-16	●	●	40	32	30	350	22	-8°	56	VB□□ 1604□□	FTGA03515	SV32S	SHXN0509F	TW15P, HW35L
S40V-SVQBR/L-16	●	○	50	40	37	400	27	-8°	64					
※ A32S-SVQBR/L-16			40	32	31	250	22	-8°	56					

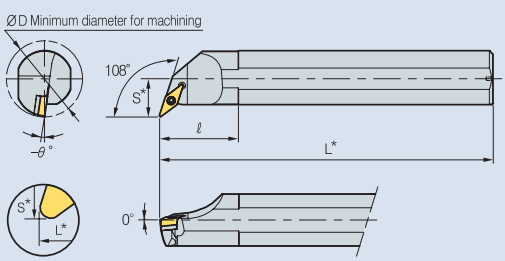
• Applicable inserts, see pages **B46, B52, B56, B61**

∗r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

SVQCR/L



VC□□



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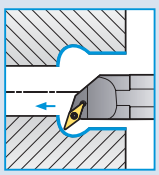


• R type insert

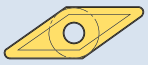
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Shim	Shim Screw	Wrench
S16R-SVQCR/L-11	●		20	16	15	200	11	-7°	35	VC□□ 1103□□	FTKA02565	-	-	TW07P
S20S-SVQCR/L-11			25	20	18	250	13	-6°	38					
S25T-SVQCR/L-11			32	25	23	300	17	-6°	42					
S20S-SVQCR/L-13	●		25	20	18	250	13	-6°	42	VC□□ 1303□□	FTKA0307	-	-	TW07P
S25T-SVQCR/L-13			32	25	23	300	17	-6°	45					
S25T-SVQCR/L-16	●	●	32	25	23	300	17	-6°	50	VC□□ 1604□□	FTGA03510	-	-	TW15P
S32U-SVQCR/L-16	●	○	40	32	30	350	22	-8°	56		FTGA03512	SV32S	SHXN0509F	TW15P
S40V-SVQCR/L-16	○	○	50	40	37	400	27	-8°	64					HW35L

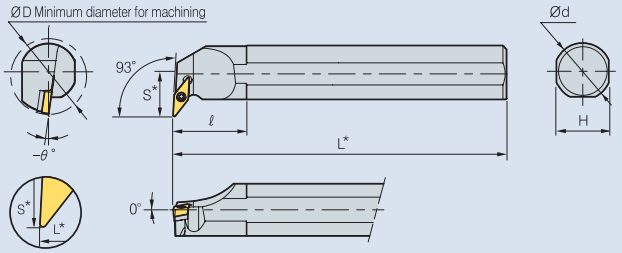
• Applicable inserts, see pages **B47, B53, B61**

∗r=0.4(l=11, 13) r=0.8(l=16) ● : Stock item ○ : Under preparing for stock

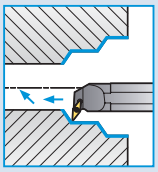
SVUBR/L



VB□□



93°



• R type insert

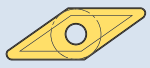
(mm)

Designation	Stock R	Stock L	øD	ød	H	L*	S*	θ°	ℓ	Parts Insert	Screw	Shim	Shim Screw	Wrench
S32U-SVUBR/L-16	●	●	40	32	30	350	22	-8°	49	VB□□ 1604□□	FTGA0351	SV32S	SHXN0509F	TW15P, HW35L
S40V-SVUBR/L-16	●	○	50	40	37	400	27	-8°	56					
※ A32S-SVUBR/L-16			40	32	31	250	22	-8°	49					

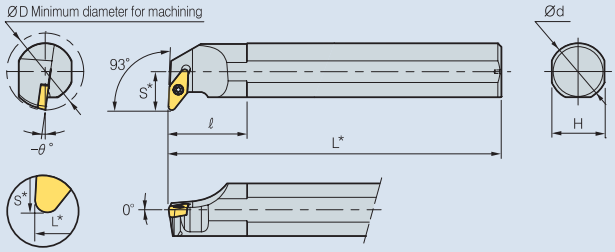
• Applicable inserts, see pages B46, B52, B56~B58, B61

* r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

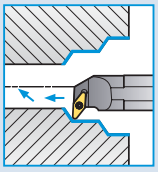
SVUCR/L



VC□□



93°



• R type insert

(mm)

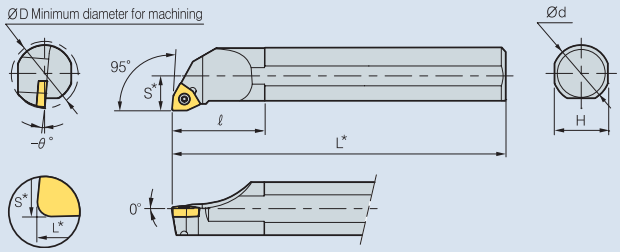
Designation	Stock R	Stock L	øD	ød	H	L*	S*	θ°	ℓ	Parts Insert	Screw	Shim	Shim Screw	Wrench
S16R-SVUCR/L-11	●		20	16	15	200	11	-7°	30	VC□□ 1103□□	FTKA02565	-	-	TW07P
S20S-SVUCR/L-11			25	20	18	250	13	-5°	33					
S25T-SVUCR/L-11			32	25	23	300	17	-3°	38					
S20S-SVUCR/L-13	●		28	20	18	250	16	-5°	35	VC□□ 1303□□	FTKA0307	-	-	TW09P
S25T-SVUCR/L-13			32	25	23	300	17	-3°	40					
S25T-SVUCR/L-16	●	●	32	25	23	300	19	-6°	50	VC□□ 1604□□	FTGA03510	-	-	TW15P
S32U-SVUCR/L-16	●		40	32	30	350	22	-8°	56		FTGA03512	SV32S	SHXN0509F	TW15P
S40V-SVUCR/L-16	○	○	50	40	37	400	27	-8°	64					HW35L

• Applicable inserts, see pages B47, B53, B61

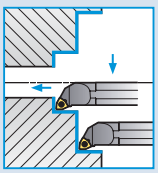
* r=0.4(l=11, 13) r=0.8(l=16) ● : Stock item ○ : Under preparing for stock

SWLCR/L

WC□□



95°



• R type insert

(mm)

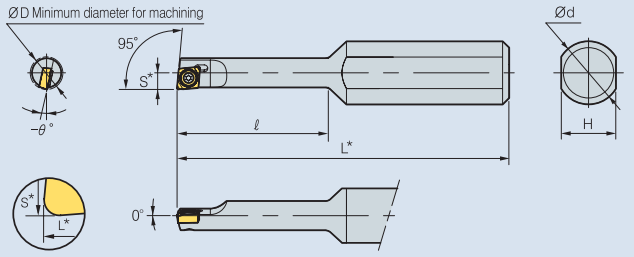
Designation	Stock R	Stock L	øD	ød	H	L*	S*	θ°	ℓ	Parts Insert	Screw	Wrench
S25T-SWLCR/L-08	●		32	25	23	300	17	-7°	46	WC□□ 0804□□	FTGA0411F	TW15P
S32U-SWLCR/L-08	●		40	32	30	350	22	-5°	51			
※ A25R-SWLCR/L-08			32	25	24	200	17	-7°	46	WC□□ 0804□□	FTGA0411F	TW15P
※ A32S-SWLCR/L-08			40	32	31	250	22	-5°	51			

• Applicable inserts, see pages B48

* r=0.8 ※Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

SCLCR/L

CCET



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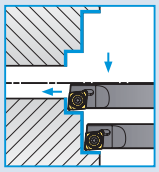


• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts Insert	Screw	Shim	Shim Screw	Wrench
S10H-SCLCR/L-0305	●		5	10	9	100	2.5	-15°	25	CCET 0301□□	FTNA01633	-	-	TW06P
S10H-SCLCR/L-0306	●		6	10	9	100	3.0	-13°	25					
S10J-SCLCR/L-0407	●		7	10	9	110	3.5	-13°	30	CCET 0401□□	FTNA0238	-	-	TW06P
S10J-SCLCR/L-0408	●		8	10	9	110	4.0	-11°	30					

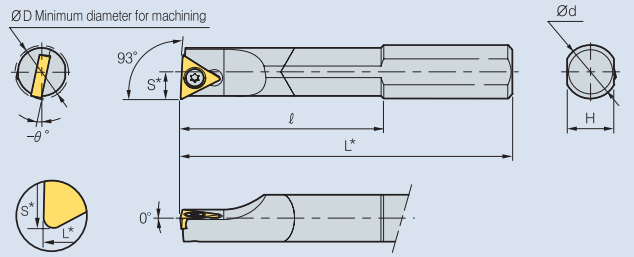
• Applicable inserts, see pages **B37**
• Carbide shank boring bar, see pages **B122~B128**

∗r=0.2

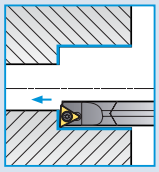
● : Stock item ○ : Under preparing for stock

STUBR/L

TB□□



93°



• R type insert

(mm)

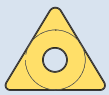
Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts Insert	Screw	Wrench
S08K-STUBR/L-06	●		8	8	7	125	4	-12°	30	TB□□ 0601□□	FTNA0204	TW06P
※ A08F-STUBR/L-06			8	8	7.5	80	4	-12°	30			

• Applicable inserts, see pages **B42**
• Carbide shank boring bar, see pages **B122~B128**

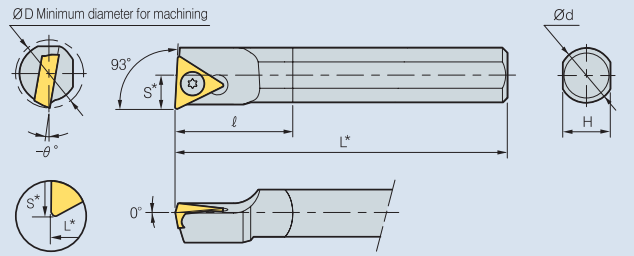
∗r=0.8 • Holder is opposed to hand of insert
※Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

STUPR/L



TP□□



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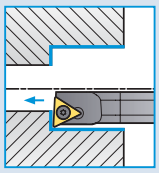


• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts Insert	Screw	Wrench
S08K-STUPR/L-08	●		10	8	7	125	5	-10°	18	TP□□ 0802□□	FTNA02205	TW06P
※ A08F-STUPR/L-08			10	8	7.5	80	5	-10°	18			

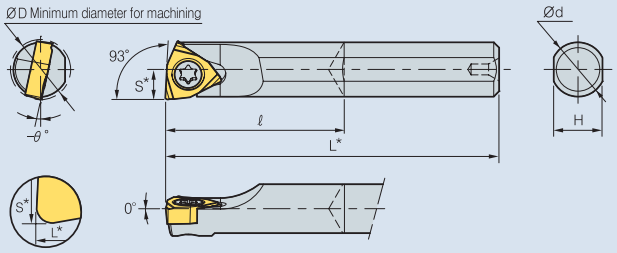
• Applicable inserts, see pages **B44, B57, B61**
• Carbide shank boring bar, see pages **B122~B128**

∗r=0.2 • Holder is opposed to hand of insert
※Boring bar with Oil hole

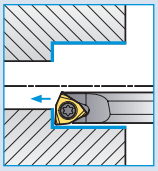
● : Stock item ○ : Under preparing for stock

SWUBR/L

WBGT



93°



• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L*	S*	θ°	ℓ	Parts: Insert	Screw	Wrench
S05H-SWUBR/L-02	●		5.5	5	4.5	100	2.75	-12°	-	WBGT 0201□□R/L	FTNA0203	TW06P
S08K-SWUBR/L-02	●		8	8	7	125	4	-10°	30		FTNA02033	
S08K-SWUBR/L-S3	○		10	8	7	125	5	-13°	18	WBGT S302□□R/L	FTNA02205	TW06P
※ A08F-SWUBR/L-02			8	8	7.5	80	4	-10°	30	WBGT 0201□□R/L	FTNA0203	TW06P
※ A08F-SWUBR/L-S3			10	8	7.5	80	5	-13°	16	WBGT S302□□R/L	FTNA02205	TW06P

• Applicable inserts, see pages **B47**
• Carbide shank boring bar, see pages **B122~B128**

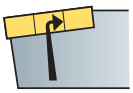
⋆r=0.2 • Holder is opposed to hand of insert

※Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

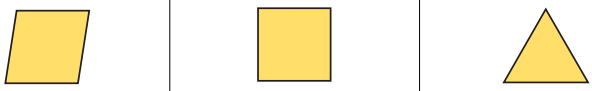
S	T	F	C	R	12	C	A	–	16
1	2	3	4	5	6	7	8		9

1 S T F C R 12 C A – 16
Method of Mounting Insert



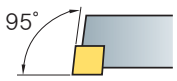
Top Clamping	Hole clamping	Screw on
C	P	S

2 S T F C R 12 C A – 16
Insert Shape

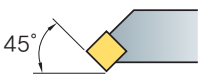


C	S	T

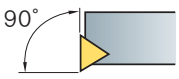
3 S T F C R 12 C A – 16
Holder Style



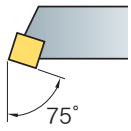
L



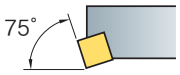
S



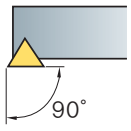
F



R



K



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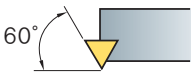
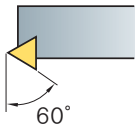
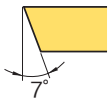


W

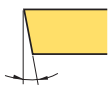


T

4 S T F C R 12 C A – 16
Relief Angle of Insert



C



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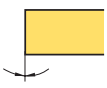
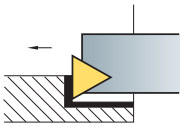


N

5 S T F C R 12 C A – 16
Hand of Tool



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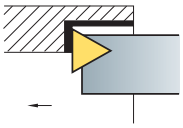
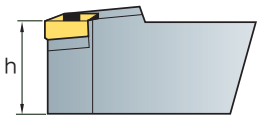


L

6 S T F C R 12 C A – 16
Height of Cutting Edge



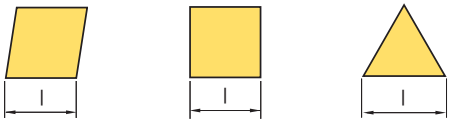
7 S T F C R 12 C A – 16
Cartrige Code

C
(Cartridge)

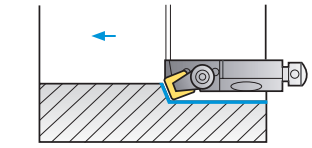
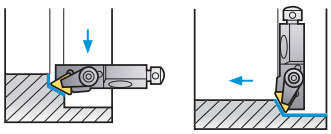
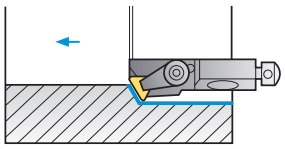
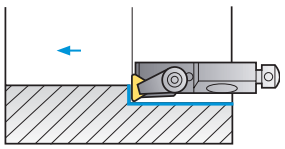
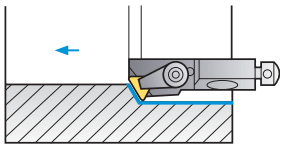
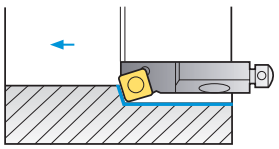
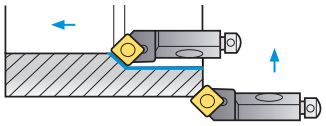
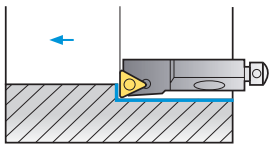
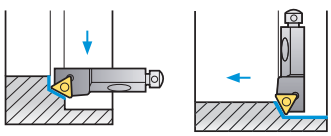
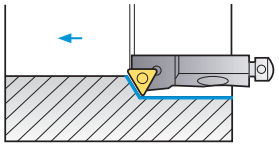
8 S T F C R 12 C A – 16
Type of Cartridge

A
(ISO5611)

9 S T F C R 12 C A – 16
Length of Cutting Edge

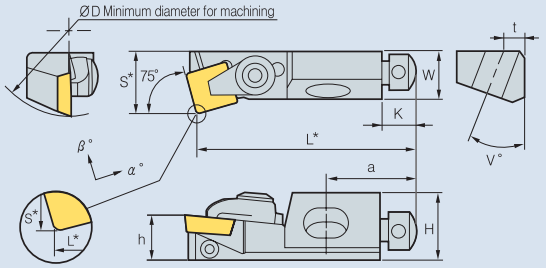


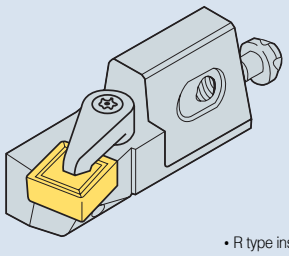
Index for Cartridge

	Cutting Shape		Designation	Turning	Copying	Facing	Chamfering	Applicable inserts	Page
Clamp on System	CSKPR/L		10CA-09 12CA-12	●				SP□R 0903□□ 1203□□	B111
	CTTPR/L		10CA-11 12CA-16	●				TP□R 1103□□ 1603□□	B112
	CTWPR/L		10CA-11 12CA-16	●				TP□R 1103□□ 1603□□	B112
	CTFPR/L		10CA-11 12CA-16	●		●		TP□R 1103□□ 1603□□	B111
	CTSPR/L		10CA-11 12CA-16	●				TP□R 1103□□ 1603□□	B111
Screw on System	SSKCR/L		10CA-09 12CA-12	●				SC□T 09T3□□ 1204□□	B113
	SSSCR/L		10CA-09 12CA-12	●			●	SC□T 09T3□□ 1204□□	B113
	STFCR/L		10CA-11 12CA-16	●		●		TC□T 1102□□ 16T3□□	B113
	STTCR/L		10CA-11 12CA-16	●		●		TC□T 1102□□ 16T3□□	B114
	STWCR/L		10CA-11 12CA-16	●				TC□T 1102□□ 16T3□□	B114

CSKPR/L

SP□R





• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	ØD	Insert
CSKPR/L 10CA-09	○		15	11	50	14	10	8	6	0	20	5	20	40	SP□R 0903□□
12CA-12	●		20	15	55	20	12	8	6	0	20	6	20	50	SP□R 1203□□

• Applicable inserts, see pages B41, B42

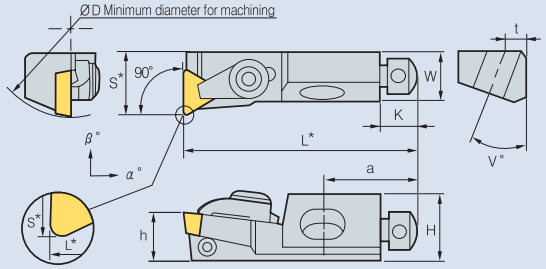
* r=0.8

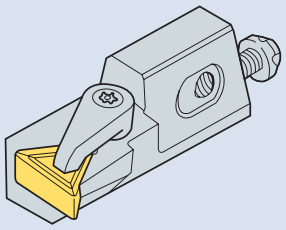
● : Stock item ○ : Under preparing for stock

Parts	Clamp	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
CSKPR/L 10CA-09	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	TW15L	HW20L
12CA-12	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	TW15L	HW20L

CTFPR/L

TP□R





• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	ØD	Insert
CTFPR/L 10CA-11	●		15	11	50	14	10	8	6	0	20	5	20	40	TP□R 1103□□
12CA-16	○		20	16	55	20	12	8	6	0	20	6	20	50	TP□R 1603□□

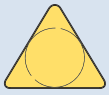
• Applicable inserts, see pages B44, B45

* r=0.4(l=11) r=0.8(l=16)

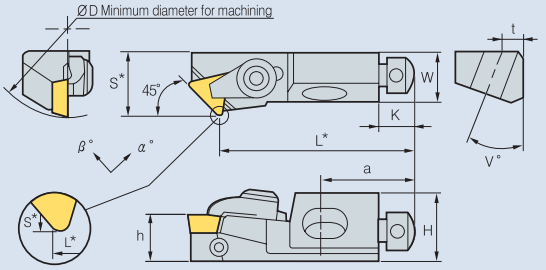
● : Stock item ○ : Under preparing for stock

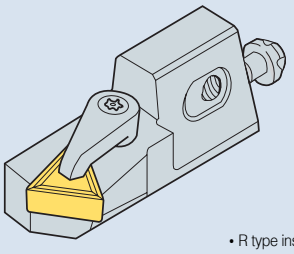
Parts	Clamp	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
CTFPR/L 10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	HW25L	HW20L
12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	HW30L	HW20L

CTSPR/L



TP□R





• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	ØD	Insert
CTSPR/L 10CA-11	●		15	11	44	14	10	8	4	0	20	5	20	40	TP□R 1103□□
12CA-16	●		20	16	47	20	12	8	5	0	20	6	20	50	TP□R 1603□□

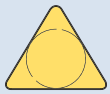
• Applicable inserts, see pages B44, B45

* r=0.4(l=11) r=0.8(l=16)

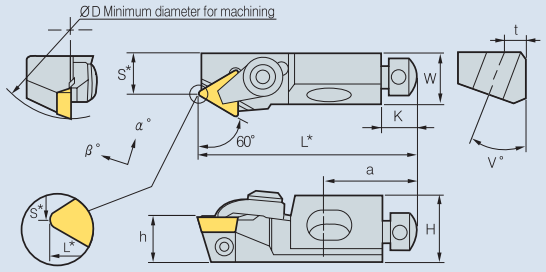
● : Stock item ○ : Under preparing for stock

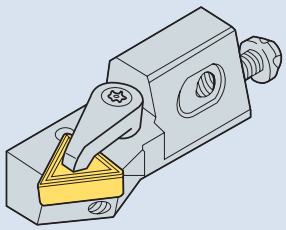
Parts	Clamp	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
CTSPR/L 10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	HW25L	HW20L
12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	HW30L	HW20L

CTTPR/L



TP□R





• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	øD	Insert
CTTPR/L	10CA-11	●		15	11	50	9	10	8	5	0	20	5	20	40	TP□R 1103□□
	12CA-16	●		20	15	55	20	12	8	5	0	20	6	20	50	TP□R 1603□□

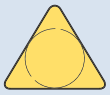
• Applicable inserts, see pages B44, B45

*r=0.8

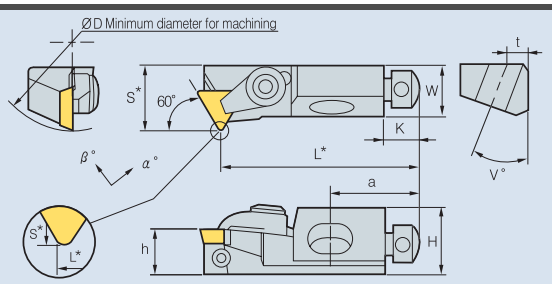
● : Stock item ○ : Under preparing for stock

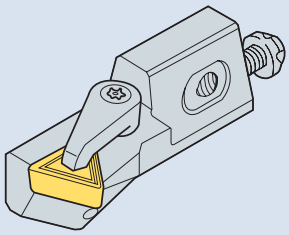
Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
CTTPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	HW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	HW30L	HW20L

CTWPR/L



TP□R





• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	øD	Insert
CTWPR/L	10CA-11	●		15	11	44	14	10	8	6	0	20	5	20	40	TP□R 1103□□
	12CA-16	●		20	16	47	20	12	8	6	0	20	6	20	50	TP□R 1603□□

• Applicable inserts, see pages B44, B45

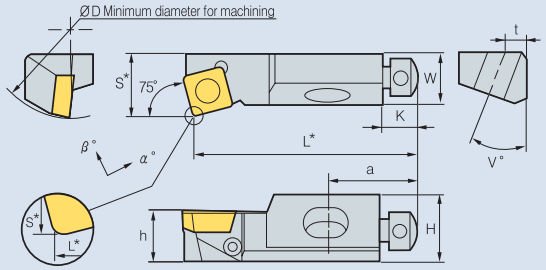
*r=0.4(l=11) r=0.8(l=16)

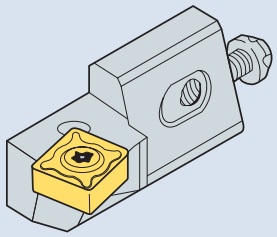
● : Stock item ○ : Under preparing for stock

Parts		Clamp	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
CTWPR/L	10CA-11	CA05R	AZ0508F	KHA0408	RHA0620	WA0602	HW25L	HW20L
	12CA-16	CA06R	AZ0508F	KHA0412	RHA0625	WA0602	HW30L	HW20L

SSKCR/L

SC□□





• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	ØD	Insert
SSKCR/L 10CA-09	○		15	11	50	14	10	8	0	-4°	20	5	20	40	SC□□ 09T3□□
12CA-12	○		20	15	55	20	12	8	0	-4°	20	6	20	50	SC□□ 1204□□

• Applicable inserts, see pages B40

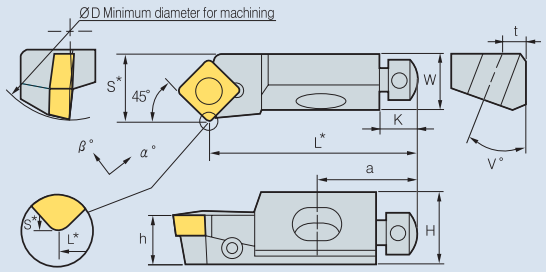
* r=0.8

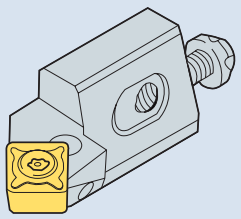
● : Stock item ○ : Under preparing for stock

Parts	Screw	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
SSKCR/L 10CA-09	FTGA03508	AZ0508F	KHA0408	RHA0602	WA0602	TW 15P	HW20L
12CA-12	FTGA0411F	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

SSSCR/L

SC□□





• R type insert

(mm)

Designation	Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	ØD	Insert
SSSCR/L 10CA-09	○		15	11	44	14	10	8	-5°	0	20	5	20	40	SC□□ 09T3□□
12CA-12	○		20	15	47	20	12	8	-5°	0	20	6	20	50	SC□□ 1204□□

• Applicable inserts, see pages B40

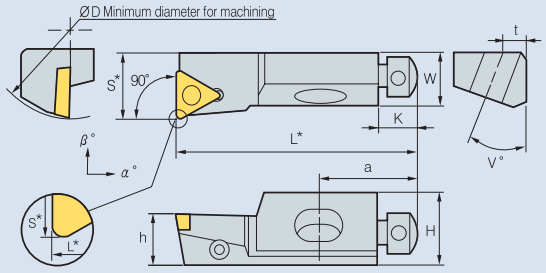
* r=0.8

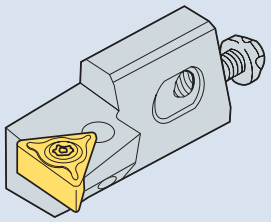
● : Stock item ○ : Under preparing for stock

Parts	Screw	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	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	Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	ØD	Insert
STFCR/L 10CA-11	○		15	11	50	14	10	8	0	-3°	20	5	20	40	TC□□ 1102□□
12CA-16	○		20	15	55	20	12	8	0	-3°	20	6	20	50	TC□□ 16T3□□

• Applicable inserts, see pages B43

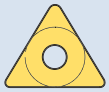
* r=0.4(l=11) r=0.8(l=16)

● : Stock item ○ : Under preparing for stock

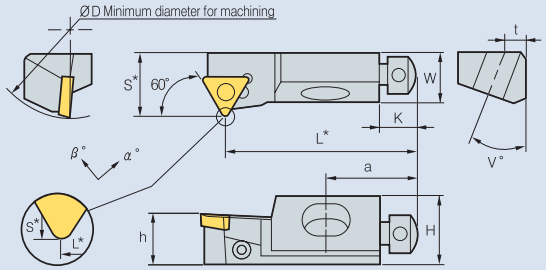
Parts	Screw	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
STFCR/L 10CA-11	FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

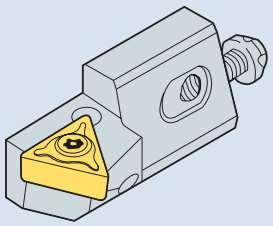
Screw on System

STTCR/L



TC□□





• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	øD	Insert
STTCR/L	10CA-11	○		15	11	50	9	10	8	-5°	0	20	5	20	40	TC□□ 1102□□
	12CA-16	○		20	15	47	20	12	8	-3°	0	20	6	20	50	TC□□ 16T3□□

• Applicable inserts, see pages **B43**

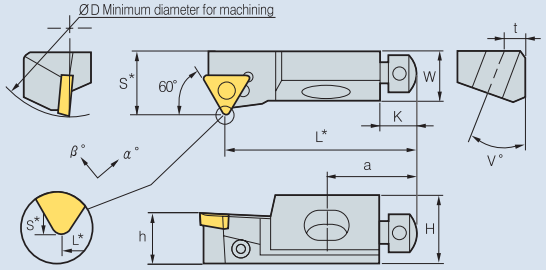
* r=0.4(l=11) r=0.8(l=16)

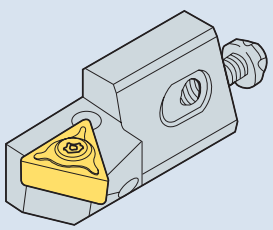
● : Stock item ○ : Under preparing for stock

Parts		Screw	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	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		Stock R	Stock L	H	W	L*	S*	h	K	α°	β°	a	t	v°	øD	Insert
STWCR/L10CA-11		○		15	11	44	14	10	8	0	-4°	20	5	20	40	TC□□ 1102□□
	12CA-16	○		20	15	47	20	12	8	-5°	0	20	6	20	50	TC□□ 16T3□□

• Applicable inserts, see pages **B43**

* r=0.4(l=11) r=0.8(1=16)

● : Stock item ○ : Under preparing for stock

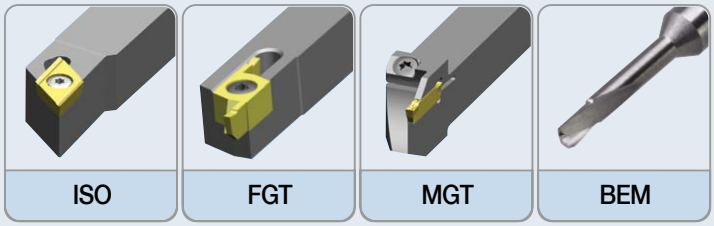
Parts		Screw	Axial Adjust Screw	Radial Adjust Screw	Mounting Screw	Washer	Wrench	Wrench
STWCR/L10CA-11		FTKA02565	AZ0508F	KHA0408	RHA0620	WA0602	TW 15P	HW20L
	12CA-16	FTKA03508	AZ0508F	KHA0412	RHA0625	WA0602	TW 15P	HW20L

Technical Information

■ Features

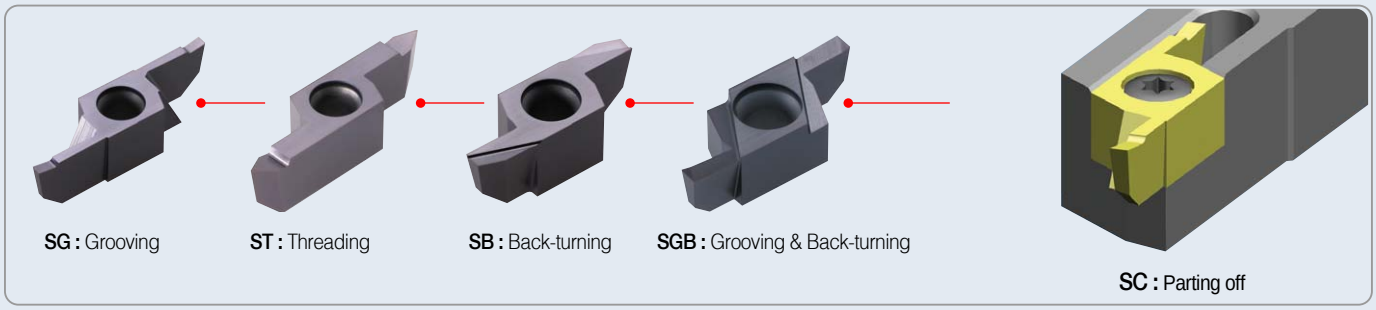
- Excellent for precision machining
- Excellent for complicated machining
- Excellent for small part machining
- Available for various types of machining
- Whole inserts can be clamped on only one FGT holders
- ISO whole holders Offset "0"

■ Type

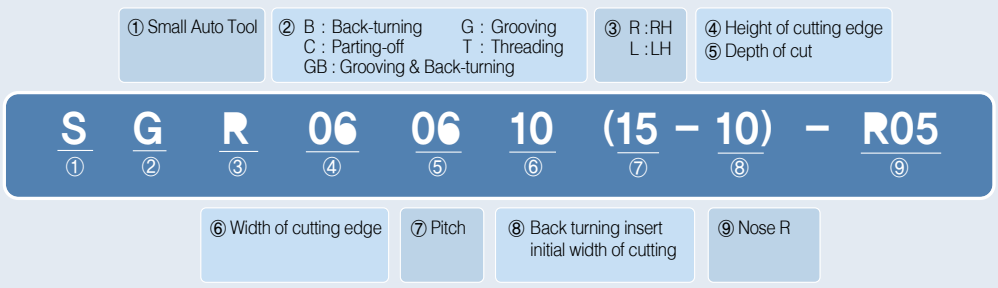


■ Multi functional auto tool(FGT)

Possible to clamp on only one holder (Ex : 06 size whole inserts - Clamping on the 06 size holder)



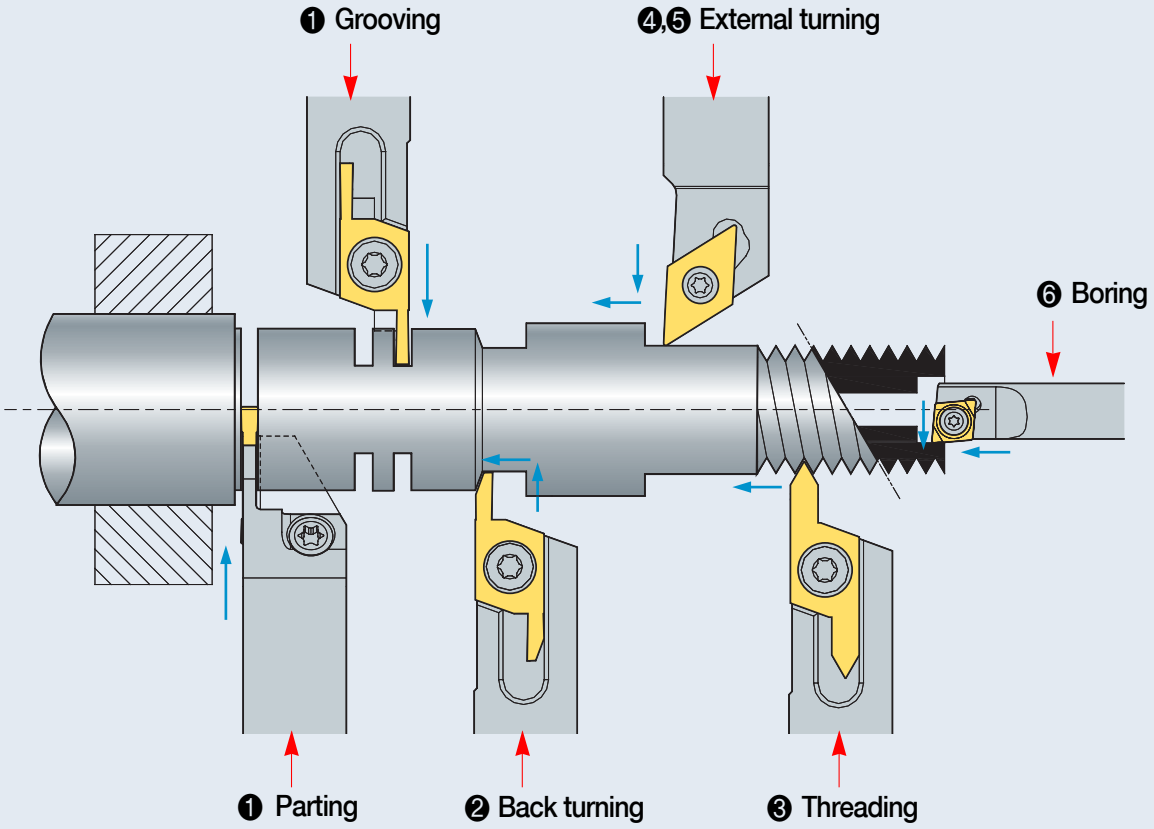
■ Insert code system



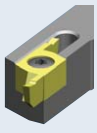
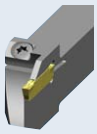
■ Recommended cutting condition

	Turning		Grooving		Parting off		Back-turning	
Workpiece	Cutting Speed(m/min)	Feed(mm/rev)	Cutting Speed(m/min)	Feed(mm/rev)	Cutting Speed(m/min)	Feed(mm/rev)	Cutting Speed(m/min)	Feed(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

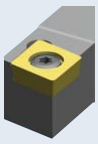
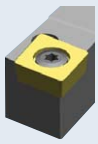
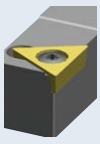
Application Example



Index

	① Parting and Grooving			② Back turning		③ Threading
Holder	SXGNR/L	SXGNR/L	MGEHR/L	SXGNR/L	SXGNR/L	SXGNR/L
Insert	SG	SC	MGMN	SB	SGB	ST
Holder size	10 ~ 20mm	10 ~ 20mm	10 ~ 16mm	10 ~ 20mm	10 ~ 20mm	10 ~ 20mm
Insert shape						
Cutting width	1 ~ 3mm	1 ~ 3mm	1.5~2.5mm	2 ~ 4mm	2 ~ 3mm	Pitch ranges
ØDmax	Ø18	Ø18	Ø32	Tmax8	Tmax8.5	0.5~1.5/1.5~3.0
Page	B119	B119	B121	B119	B119	B119

	④ External turning and Copy machining			
Holder	SDJCR/L	SDNCN	SVJBR/L	SVJCR/L
Insert	DC□T	DC□T	VB□T	VC□T
Holder size	8 ~ 16mm	8 ~ 16mm	10 ~ 16mm	10 ~ 16mm
Insert shape				
Feature	Offset "0"			
Page	B117	B118	B118	B118

	⑤ External turning and Facing		
Holder	SCACR/L	SCLCR/L	STACR/L
Insert	CC□T	CC□T	TC□T
Holder size	8 ~ 16mm	8 ~ 16mm	8 ~ 10mm
Insert shape			
Feature	Offset "0"		
Page	B117	B117	B118

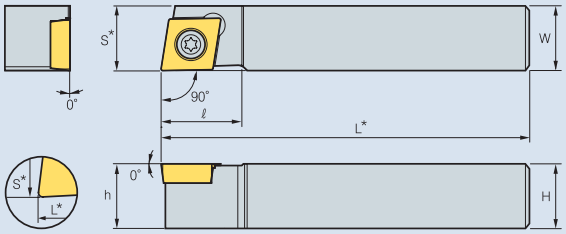
	⑥ Boring				
Holder	SCLCR/L	STUBR/L	STUPR/L	SWUBR/L	BEM
Insert	CC□T	TB□T	TP□T	WB□T	-
Shank diameter	Ø4~10	Ø8	Ø8	Ø5~Ø8	Ø4~Ø6
Insert shape					
ØDmin	Ø5	Ø8	Ø10	Ø5.5	Ø2.2
Page	B117	B107	B107	B108	B121

SCACR/L

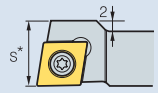
New

offset "0"

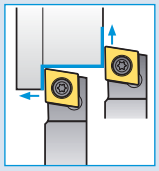
CCGT



90°



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



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Wrench
SCACR/L	0808-X06A	○		8	8	120	8	8	10	CCGT 0602□□	FTKA02565	TW 07P
	1010-X06A	○		10	10	120	10	10	10			
	1010-X09A	○		10	10	120	12	10	13	CCGT 09T3□□	FTKA0410	TW 15P
	1212-X09A	○		12	12	120	12	12	16			
	1616-X09A	○		16	16	120	16	16	16			

• Applicable inserts, see pages **B37**

* r=0.2(l=09) r=0.1(l=06)

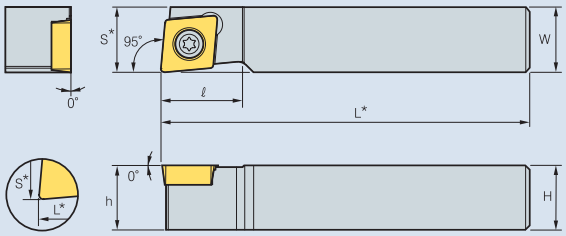
● : Stock item ○ : Under preparing for stock

SCLCR/L

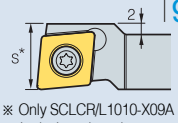
New

offset "0"

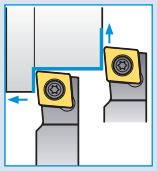
CCGT



95°



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



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Wrench
SCLCR/L	0808-X06A	○		8	8	120	8	8	10	CCGT 0602□□	FTKA02565	TW 07P
	1010-X06A	○		10	10	120	10	10	10			
	1010-X09A	○		10	10	120	12	10	13	CCGT 09T3□□	FTKA0410	TW 15P
	1212-X09A	○		12	12	120	12	12	16			
	1616-X09A	○		16	16	120	16	16	16			

• Applicable inserts, see pages **B37**

* r=0.2(l=09) r=0.1(l=06)

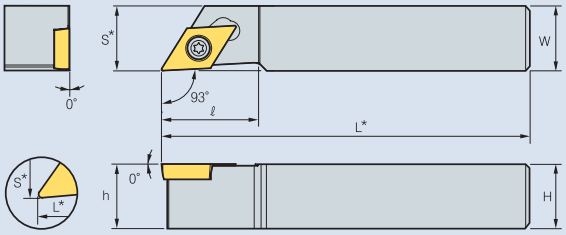
● : Stock item ○ : Under preparing for stock

SDJCR/L

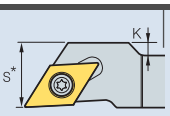
New

offset "0"

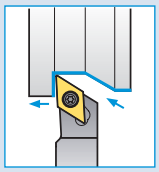
DCGT



93°



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



• R type insert

(mm)

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

• Applicable inserts, see pages **B39**

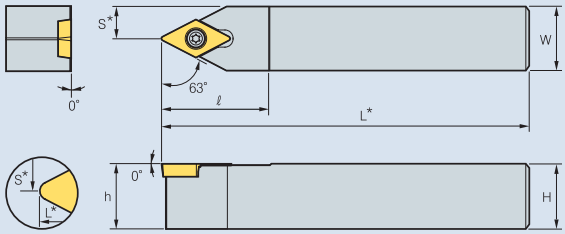
* r=0.2(l=11) r=0.1(l=07)

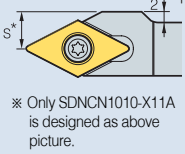
● : Stock item ○ : Under preparing for stock

SDNCN

New

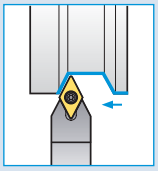
DCGT





※ Only SDNCN1010-X11A is designed as above picture.

63°



• R type insert

(mm)

Designation		Stock	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Wrench
SDNCN	0808-X07A	○	8	8	120	4	8	20	DCGT 0702□□	FTKA02565	TW 07P
	1010-X07A	○	10	10	120	5	10	20			
	1010-X11A	○	10	10	120	7	10	24	DCGT 11T3□□	FTKA0410	TW 15P
	1212-X11A	○	12	12	120	6	12	30			
	1616-X11A	○	16	16	120	8	16	30			

• Applicable inserts, see pages B39

*r=0.2(l=11) r=0.1(l=07)

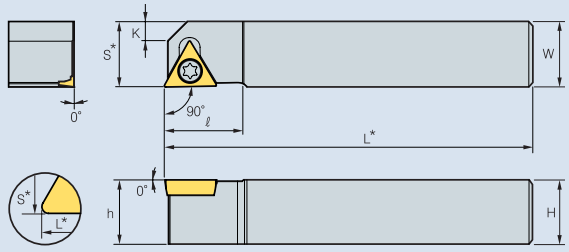
● : Stock item ○ : Under preparing for stock

STACR/L

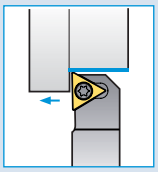
New

TCGT

offset "0"



90°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	K	Parts: Insert	Screw	Wrench
STACR/L	0808-X08A	○		8	8	120	8	8	12	1	TCGT 0802□□	FTNA 0206	TW 06P
	1010-X08A	○		10	10	120	10	10	12	3			

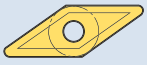
• Applicable inserts, see pages B43

*r=0.1(l=08)

● : Stock item ○ : Under preparing for stock

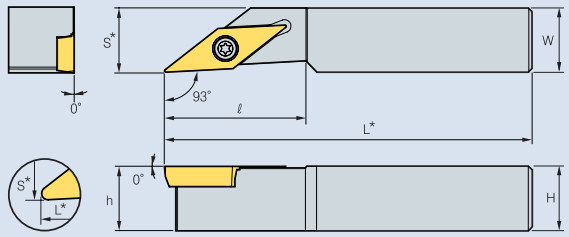
SVJBR/L

New

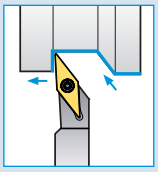


VBGT

offset "0"



93°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Wrench
SVJBR/L	1010-X11A	○		10	10	120	10	8	22	VBGT 1103□□	FTKA 02565	TW 07P
	1212-X11A	○		12	12	120	12	12	22			
	1616-X11A	○		16	16	120	16	16	24			

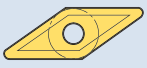
• Applicable inserts, see pages B46

*r=0.2(l=11)

● : Stock item ○ : Under preparing for stock

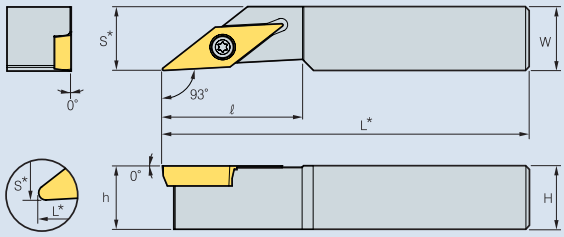
SVJCR/L

New

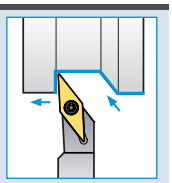


VCGT

offset "0"



93°



• R type insert

(mm)

Designation		Stock R	Stock L	H	W	L*	S*	h	ℓ	Parts: Insert	Screw	Wrench
SVJCR/L	1010-X11A	○		10	10	120	10	8	22	VCGT 1103□□	FTKA 02565	TW 07P
	1212-X11A	○		12	12	120	12	12	22			
	1616-X11A	○		16	16	120	16	16	24			

• Applicable inserts, see pages B47

*r=0.2(l=11)

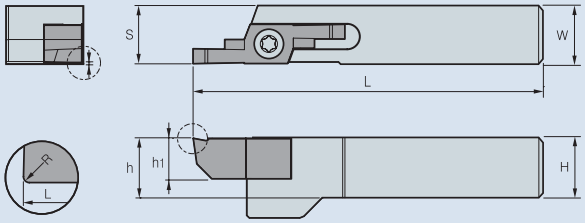
● : Stock item ○ : Under preparing for stock

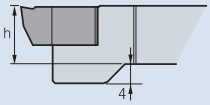
SXGNR/L

New

SBR, SGBR
SCR, STR
SGR

Offset "0"





※ Only SXGNR/L1212-X08A is designed as above picture.

• R type insert

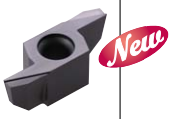
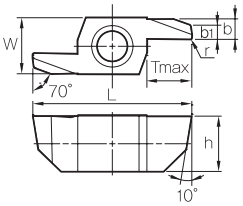
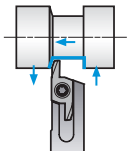
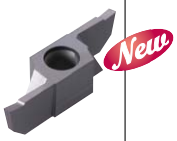
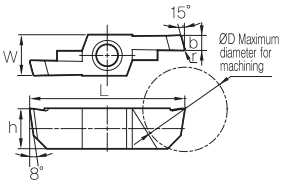
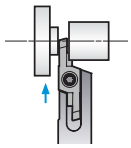
(mm)

Designation	Stock R	Stock L	H	W	L	S	h	h_1	Parts: Insert	Screw	Wrench
SXGNR/L 1010-X06A	○		10	10	125	10	10	6	S□R/L 06	FTNA 0409	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			

• Applicable inserts, see pages **B119**, **B120**

● : Stock item ○ : Under preparing for stock

Available Inserts

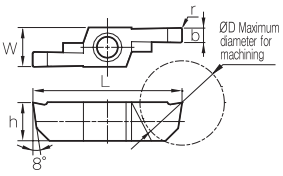
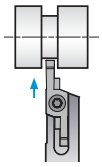
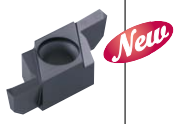
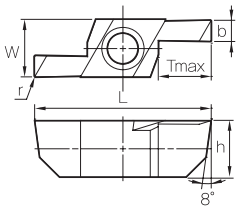
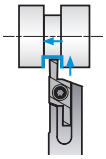
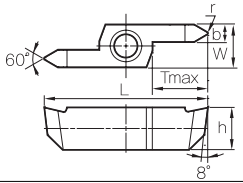
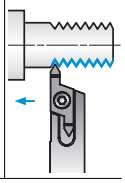
Application	Picture	Designation	Coated PC9030	b_1	b	W	L	r	h	T-max	Ø D	Configuration	Feed Direction
Back Turning	SBR/L  New	SBR/L 060520-10-R00	○	1	2	8	22	0	6	5.5	-		
		060520-10-R05	○	1	2	8	22	0.05	6	5.5	-		
		060520-10-R10	○	1	2	8	22	0.1	6	5.5	-		
		060630-20-R00	○	2	3	8	24	0	6	6.5	-		
		060630-20-R05	○	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	-		
		080640-20-R00	○	2	4	8	27	0	8	8.5	-		
		080640-20-R05	○	2	4	8	27	0.05	8	8.5	-		
		080640-20-R10	○	2	4	8	27	0.1	8	8.5	-		
Parting off	SCR/L  New	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		

• Applicable holders, see pages **B119**

● : Stock item ○ : Under preparing for stock

Auto Tools - FGT Type

Available Inserts

Application	Picture	Designation	Coated	Dimensions (mm)								Configuration	Feed Direction
			PC9030	b	W	L	r	h	T-max	Ø D	Pitch		
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 & Back Turning	SGBR/L 	SGBR/L 0604520-R00	○	2	8	22	0	6	5.5	-	-		
		0604520-R05	○	2	8	22	0.05	6	5.5	-	-		
		0604520-R10	○	2	8	22	0.1	6	5.5	-	-		
		0604525-R00	○	2.5	8	22	0	6	5.5	-	-		
		0604525-R05	○	2.5	8	22	0.05	6	5.5	-	-		
		0604525-R10	○	2.5	8	22	0.1	6	5.5	-	-		
		0605530-R00	○	3	8	24	0	6	6.5	-	-		
		0605530-R05	○	3	8	24	0.05	6	6.5	-	-		
		0605530-R10	○	3	8	24	0.1	6	6.5	-	-		
		0805525-R00	○	2.5	8	24	0	8	7	-	-		
		0805525-R05	○	2.5	8	24	0.05	8	7	-	-		
		0805525-R10	○	2.5	8	24	0.1	8	7	-	-		
		0806530-R00	○	3	8	26	0	8	8	-	-		
		0806530-R05	○	3	8	26	0.05	8	8	-	-		
		0806530-R10	○	3	8	26	0.1	8	8	-	-		
Threading	STR/L	STR/L 6073215	○	3.2	8	25	0.06	6	7	-	0.5-1.5		
		6073230	○	3.2	8	25	0.19	6	7	-	1.5-3.0		
		8103215	○	3.2	8	31	0.06	8	10.5	-	0.5-1.5		
		8103230	○	3.2	8	31	0.19	8	10.5	-	1.5-3.0		

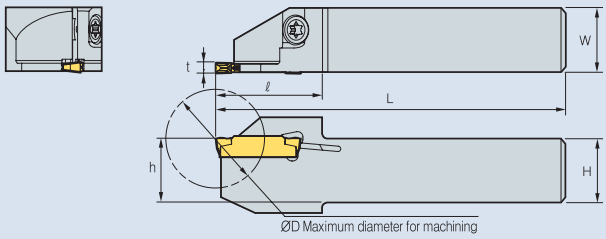
• Applicable holders, see pages **B119**

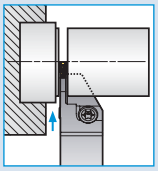
● : Stock item ○ : Under preparing for stock

MGEHR/L

New

MGMN





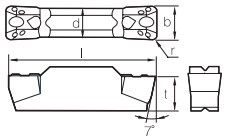
• R type insert

(mm)

Designation	Stock R	Stock L	Ø D	H=h	W	L	ℓ	t	Parts: 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			

● : Stock item ○ : Under preparing for stock

Available Inserts

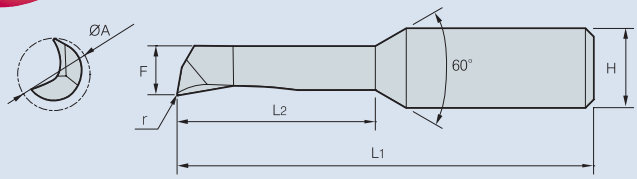
Application	Picture	Designation		Coated NC3020	Coated NC3120	Coated NC3030	Coated PC3525	Coated PC3535	Coated PC9030	Cermet CT10	Cermet CN20	Uncoated H01	Uncoated G10	Uncoated U20	Dimensions (mm) b	r	l	d	t	Configuration
Grooving · Parting off	MGMN	MGMN	150-G	●	●			●							1.5	0.15	16	1.2	3.5	
			200-G	●	●				●						2	0.2	16	1.6	3.5	
			200-M	●	●				●						2	0.2	16	1.6	3.5	
			250-G		●				●						2.5	0.2	18.5	2	3.85	
			250-M	●	●				●						2.5	0.2	18.5	2	3.85	

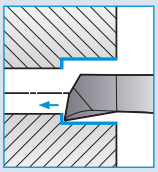
● : Stock item ○ : Under preparing for stock

Auto Tools - BEM

BEM(For Boring)

New





• R type insert

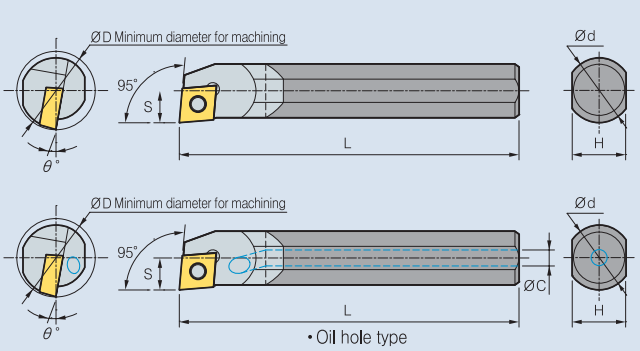
(mm)

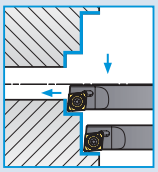
Designation		Ø A	H	L_1	L_2	F	r
BEM	Ø2.2-Ø4	Ø2.2	Ø4	40	12	2.08	0.2
	Ø3.2-Ø4	Ø3.2	Ø4	40	12	3.02	0.2
	Ø4.2-Ø6	Ø4.2	Ø6	40	15	3.98	0.2
	Ø5.2-Ø6	Ø5.2	Ø6	40	15	4.92	0.2

Carbide Shank Boring Bar

SCLCR/L

CC□□





• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L	S	θ°	ØC	Parts: Insert	Screw	Wrench	Flg.
C04G-SCLCR/L-03	●	○	5	4	3.8	90	2.5	-15°	-	CC□T0301□□	FTNA01633	TW06P	1
C05H-SCLCR/L-03	●	○	6	5	4.4	100	3	-15°	-	CC□T0301□□	FTNA01633	TW06P	1
C06H-SCLCR/L-04	●	○	7	6	5.4	100	3.5	-15°	-	CC□T0401□□	FTNA0238	TW06P	1
C07K-SCLCR/L-04	●	○	8	7	6.4	125	4	-12°	-	CC□T0401□□	FTNA0238	TW06P	1
C08K-SCLCR/L-06	●	○	10	8	7	125	5	-12°	-	CC□T0602□□	FTKA02555	TW07P	2
C10K-SCLCR/L-06	●	○	12	10	9	125	6	-12°	-	CC□T0602□□	FTKA02565	TW07P	2
C10M-SCLCR/L-06	●	○	12	10	9	150	6	-12°	-	CC□T0602□□	FTKA02565	TW07P	2
C12M-SCLCR/L-06	●	○	14	12	11	150	7	-12°	-	CC□T0602□□	FTKA02565	TW07P	2
C12Q-SCLCR/L-06	●	○	14	12	11	180	7	-12°	-	CC□T0602□□	FTKA02565	TW07P	2
C12M-SCLCR/L-09	●	○	15	12	11	150	8	-12°	-	CC□T09T3□□	FTGA03508	TW15P	2
C12Q-SCLCR/L-09	●	○	15	12	11	180	8	-12°	-	CC□T09T3□□	FTGA03508	TW15P	2
C16R-SCLCR/L-09	●	○	20	16	15	250	10	-12°	-	CC□T09T3□□	FTGA03508	TW15P	2
C16S-SCLCR/L-09	●	○	20	16	15	250	10	-12°	-	CC□T09T3□□	FTGA03508	TW15P	2
C20R-SCLCR/L-09	●	○	25	20	18	200	13	-8°	-	CC□T09T3□□	FTGA03508	TW15P	2
C20S-SCLCR/L-09	●	○	25	20	18	250	13	-8°	-	CC□T09T3□□	FTGA03508	TW15P	2
C25T-SCLCR/L-12	●	○	32	25	23	300	17	-6°	-	CC□T1204□□	FTGA0411F	TW15P	2
※ E06H-SCLCR/L-04	●	○	7	6	5.4	100	3.5	-15°	2	CC□T0401□□	FTNA0238	TW06P	1
※ E07K-SCLCR/L-04	●	○	8	7	6.4	125	4	-12°	2	CC□T0401□□	FTNA0238	TW06P	1
※ E08K-SCLCR/L-06	●	○	10	8	7	125	5	-12°	3	CC□T0602□□	FTKA02555	TW07P	2
※ E10K-SCLCR/L-06	●	○	12	10	9	125	6	-12°	3	CC□T0602□□	FTKA02565	TW07P	2
※ E10M-SCLCR/L-06	●	○	12	10	9	150	6	-12°	3	CC□T0602□□	FTKA02565	TW07P	2
※ E12M-SCLCR/L-06	●	○	14	12	11	150	7	-12°	3.5	CC□T0602□□	FTKA02565	TW07P	2
※ E12Q-SCLCR/L-06	●	○	14	12	11	180	7	-12°	3.5	CC□T0602□□	FTKA02565	TW07P	2
※ E12M-SCLCR/L-09	●	○	15	12	11	150	8	-12°	3.5	CC□T09T3□□	FTGA03508	TW15P	2
※ E12Q-SCLCR/L-09	●	○	15	12	11	180	8	-12°	3.5	CC□T09T3□□	FTGA03508	TW15P	2
※ E16R-SCLCR/L-09	●	○	20	16	15	250	10	-12°	3.5	CC□T09T3□□	FTGA03508	TW15P	2
※ E16S-SCLCR/L-09	●	○	20	16	15	250	10	-12°	3.5	CC□T09T3□□	FTGA03508	TW15P	2
※ E20R-SCLCR/L-09	●	○	25	20	18	200	13	-8°	3.5	CC□T09T3□□	FTGA03508	TW15P	2
※ E20S-SCLCR/L-09	●	○	25	20	18	250	13	-8°	3.5	CC□T09T3□□	FTGA03508	TW15P	2
※ E25T-SCLCR/L-12	●	○	32	25	23	300	17	-6°	4	CC□T1204□□	FTGA0411F	TW15P	2

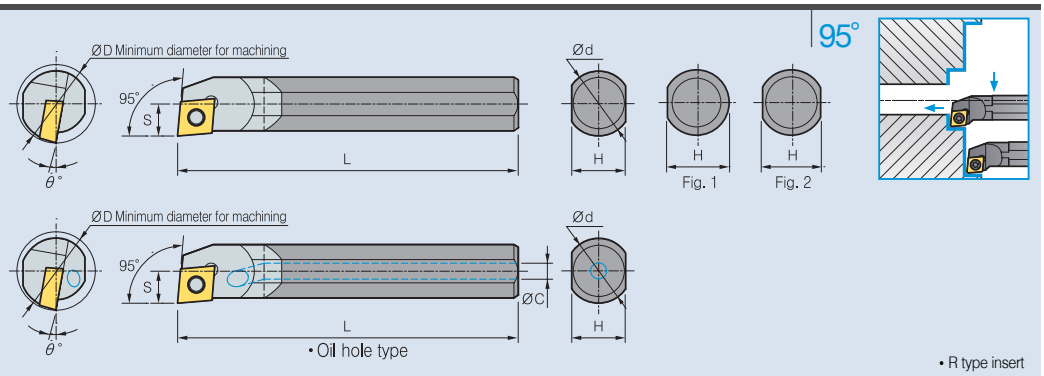
• Applicable inserts, see pages **B37, B38, B50, B56~B58, B61**

※ Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

SCLPR/L

CP□□



• R type insert

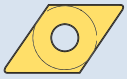
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L	S	θ°	ØC	Parts / Insert	Screw	Wrench	Flg.
C10K-SCLPR/L-08	●	○	12	10	9	125	6	-5°	-	CP□T0802□□	FTNA0305	TW09P	2
C10M-SCLPR/L-08	●	○	12	10	9	150	6	-5°	-	CP□T0802□□	FTNA0305	TW09P	2
C12M-SCLPR/L-08	●	○	15	12	11	150	7.5	-2°	-	CP□T0802□□	FTNA0307	TW09P	2
C12Q-SCLPR/L-08	●	○	15	12	11	180	7.5	-2°	-	CP□T0802□□	FTNA0307	TW09P	2
C12M-SCLPR/L-09	●	○	15	12	11	150	8	-2°	-	CP□T0903□□	FTNA0408	TW15P	2
C12Q-SCLPR/L-09	●	○	15	12	11	180	8	-2°	-	CP□T0903□□	FTNA0408	TW15P	2
C16R-SCLPR/L-09	●	○	20	16	15	200	10	-2°	-	CP□T0903□□	FTNA0408	TW15P	2
C16S-SCLPR/L-09	●	○	20	16	15	250	10	-2°	-	CP□T0903□□	FTNA0408	TW15P	2
C20R-SCLPR/L-09	●	○	25	20	18	200	13	-2°	-	CP□T0903□□	FTNA0408	TW15P	2
C20S-SCLPR/L-09	●	○	25	20	18	250	13	-2°	-	CP□T0903□□	FTNA0408	TW15P	2
※ E10K-SCLPR/L-08	●	○	12	10	9	125	6	-5°	3	CP□T0802□□	FTNA0305	TW09P	2
※ E10M-SCLPR/L-08	●	○	12	10	9	150	6	-5°	3	CP□T0802□□	FTNA0305	TW09P	2
※ E12M-SCLPR/L-08	●	○	15	12	11	150	7.5	-2°	3.5	CP□T0802□□	FTNA0307	TW09P	2
※ E12Q-SCLPR/L-08	●	○	15	12	11	180	7.5	-2°	3.5	CP□T0802□□	FTNA0307	TW09P	2
※ E12M-SCLPR/L-09	●	○	15	12	11	150	8	-2°	3.5	CP□T0903□□	FTNA0408	TW15P	2
※ E12Q-SCLPR/L-09	●	○	15	12	11	180	8	-2°	3.5	CP□T0903□□	FTNA0408	TW15P	2
※ E16R-SCLPR/L-09	●	○	20	16	15	200	10	-2°	3.5	CP□T0903□□	FTNA0408	TW15P	2
※ E16S-SCLPR/L-09	●	○	20	16	15	250	10	-2°	3.5	CP□T0903□□	FTNA0408	TW15P	2
※ E20R-SCLPR/L-09	●	○	25	20	18	200	13	-2°	3.5	CP□T0903□□	FTNA0408	TW15P	2
※ E20S-SCLPR/L-09	●	○	25	20	18	250	13	-2°	3.5	CP□T0903□□	FTNA0408	TW15P	2

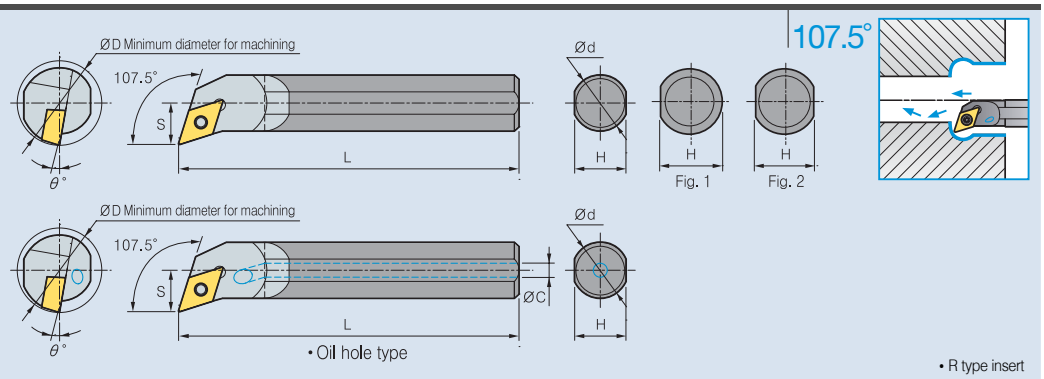
• Applicable inserts, see pages **B38**

※ Boring bar with Oil hole • Use right-hand insert for left-hand holder ● : Stock item ○ : Under preparing for stock

SDQCR/L



DC□□



• R type insert

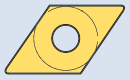
(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L	S	θ°	ØC	Parts / Insert	Screw	Wrench	Flg.
C08K-SDQCR/L-07	●	○	10	8	7	125	6	-15°	-	DC□T0702□□	FTKA02555	TW07P	2
C10K-SDQCR/L-07	●	○	13	10	9	125	7	-15°	-	DC□T0702□□	FTKA02555	TW07P	2
C12M-SDQCR/L-07	●	○	16	12	11	150	9	-10°	-	DC□T0702□□	FTKA02565	TW07P	2
C16R-SDQCR/L-07	●	○	20	16	15	200	11	-6°	-	DC□T0702□□	FTKA02565	TW07P	2
C16R-SDQCR/L-11	●	○	20	16	15	200	11	-6°	-	DC□T11T3□□	FTGA03508	TW15P	2
C20R-SDQCR/L-11	●	○	25	20	18	200	13	-6°	-	DC□T11T3□□	FTGA03508	TW15P	2
C20S-SDQCR/L-11	●	○	25	20	18	250	13	-6°	-	DC□T11T3□□	FTGA03508	TW15P	2
※ E08K-SDQCR/L-07	●	○	10	8	7	125	6	-15°	3	DC□T0702□□	FTKA02555	TW07P	2
※ E10K-SDQCR/L-07	●	○	13	10	9	125	7	-15°	3	DC□T0702□□	FTKA02555	TW07P	2
※ E12M-SDQCR/L-07	●	○	16	12	11	150	9	-10°	3.5	DC□T0702□□	FTKA02565	TW07P	2
※ E16R-SDQCR/L-07	●	○	20	16	15	200	11	-6°	3.5	DC□T0702□□	FTKA02565	TW07P	2
※ E16R-SDQCR/L-11	●	○	20	16	15	200	11	-6°	3.5	DC□T11T3□□	FTGA03508	TW15P	2
※ E20R-SDQCR/L-11	●	○	25	20	18	200	13	-6°	3.5	DC□T11T3□□	FTGA03508	TW15P	2
※ E20S-SDQCR/L-11	●	○	25	20	18	250	13	-6°	3.5	DC□T11T3□□	FTGA03508	TW15P	2

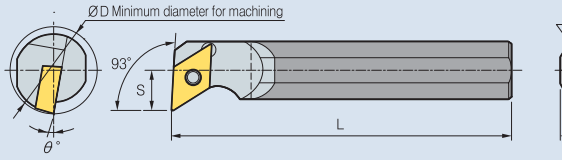
• Applicable inserts, see pages **B39, B50, B56~B58, B61**

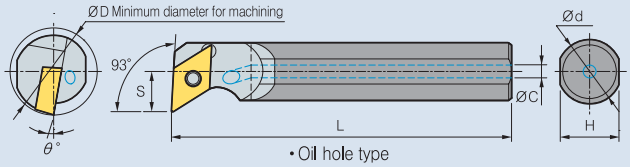
※ Boring bar with Oil hole ● : Stock item ○ : Under preparing for stock

SDUCR/L

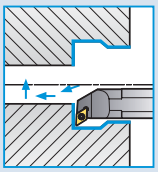


DC□□





• Oil hole type



• R type insert

(mm)

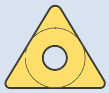
Designation	Stock R	Stock L	ØD	Ød	H	L	S	θ°	ØC	Parts Insert	Screw	Wrench	Flg.
C10K-SDUCR/L-07	●	○	13	10	9	125	7	-15°	-	DC□T0702□□	FTKA02555	TW07P	2
C10M-SDUCR/L-07	●	○	13	10	9	150	7	-15°	-	DC□T0702□□	FTKA02555	TW07P	2
C12M-SDUCR/L-07	●	○	16	12	11	150	9	-10°	-	DC□T0702□□	FTKA02565	TW07P	2
C12Q-SDUCR/L-07	●	○	16	12	11	180	9	-10°	-	DC□T0702□□	FTKA02565	TW07P	2
C16R-SDUCR/L-07	●	○	20	16	15	200	11	-6°	-	DC□T0702□□	FTKA02565	TW07P	2
C16S-SDUCR/L-07	●	○	20	16	15	250	11	-6°	-	DC□T0702□□	FTKA02565	TW07P	2
C16R-SDUCR/L-11	●	○	20	16	15	200	11	-6°	-	DC□T11T3□□	FTGA03508	TW15P	2
C16S-SDUCR/L-11	●	○	20	16	15	250	11	-6°	-	DC□T11T3□□	FTGA03508	TW15P	2
C20R-SDUCR/L-11	●	○	25	20	18	200	13	-6°	-	DC□T11T3□□	FTGA03508	TW15P	2
C20S-SDUCR/L-11	●	○	25	20	18	250	13	-6°	-	DC□T11T3□□	FTGA03508	TW15P	2
C25T-SDUCR/L-11	●	○	32	25	23	300	17	-6°	-	DC□T11T3□□	FTGA03510	TW15P	2
※ E10K-SDUCR/L-07	●	○	13	10	9	125	7	-15°	3	DC□T0702□□	FTKA02555	TW07P	2
※ E10M-SDUCR/L-07	●	○	13	10	9	150	7	-15°	3	DC□T0702□□	FTKA02555	TW07P	2
※ E12M-SDUCR/L-07	●	○	16	12	11	150	9	-10°	3.5	DC□T0702□□	FTKA02565	TW07P	2
※ E12Q-SDUCR/L-07	●	○	16	12	11	180	9	-10°	3.5	DC□T0702□□	FTKA02565	TW07P	2
※ E16R-SDUCR/L-07	●	○	20	16	15	200	11	-6°	3.5	DC□T0702□□	FTKA02565	TW07P	2
※ E16S-SDUCR/L-07	●	○	20	16	15	250	11	-6°	3.5	DC□T0702□□	FTKA02565	TW07P	2
※ E16R-SDUCR/L-11	●	○	20	16	15	200	11	-6°	3.5	DC□T11T3□□	FTGA03508	TW15P	2
※ E16S-SDUCR/L-11	●	○	20	16	15	250	11	-6°	3.5	DC□T11T3□□	FTGA03508	TW15P	2
※ E20R-SDUCR/L-11	●	○	25	20	18	200	13	-6°	3.5	DC□T11T3□□	FTGA03508	TW15P	2
※ E20S-SDUCR/L-11	●	○	25	20	18	250	13	-6°	3.5	DC□T11T3□□	FTGA03508	TW15P	2
※ E25T-SDUCR/L-11	●	○	32	25	23	300	17	-6°	4	DC□T11T3□□	FTGA03510	TW15P	2

• Applicable inserts, see pages B39, B50, B56~B58, B61

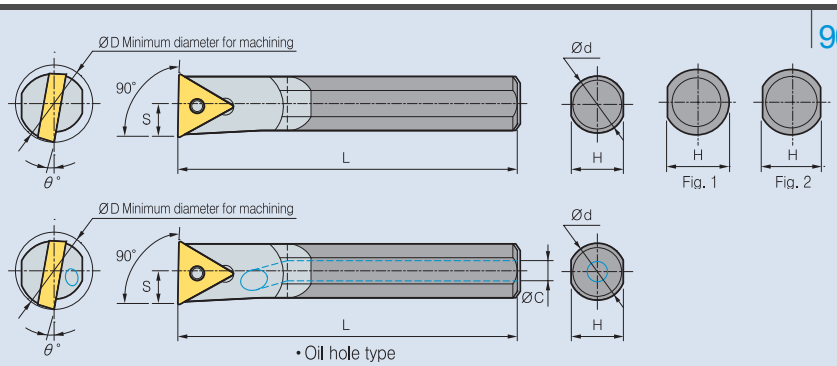
※ Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

STFCR/L



TC□□



90°

• R type insert

(mm)

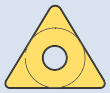
Designation	Stock R	Stock L	ØD	Ød	H	L	S	θ°	ØC	Parts / Insert	Screw	Wrench	Flg.
C08K-STFCR/L-09	●	○	10	8	7	125	5	-10°	-	TC□T0902□□	FTKA02206	TW06P	2
C10K-STFCR/L-09	●	○	12	10	9	125	6	-10°	-	TC□T0902□□	FTKA02206	TW06P	2
C10K-STFCR/L-11	●	○	12	10	9	125	6	-10°	-	TC□T1102□□	FTKA02565	TW07P	2
C12M-STFCR/L-11	●	○	15	12	11	150	8	-10°	-	TC□T1102□□	FTKA02565	TW07P	2
C16R-STFCR/L-11	●	○	20	16	15	200	10	-10°	-	TC□T1102□□	FTKA02565	TW07P	2
C20R-STFCR/L-11	●	○	25	20	18	200	13	-6°	-	TC□T1102□□	FTKA02565	TW07P	2
C20S-STFCR/L-11	●	○	25	20	18	250	13	-6°	-	TC□T1102□□	FTKA02565	TW07P	2
C20R-STFCR/L-16	●	○	25	20	18	200	13	-6°	-	TC□T16T3□□	FTGA03510	TW15P	2
C20S-STFCR/L-16	●	○	25	20	18	250	13	-6°	-	TC□T16T3□□	FTGA03510	TW15P	2
※ E08K-STFCR/L-09	●	○	10	8	7	125	5	-10°	3	TC□T0902□□	FTKA02206	TW06P	2
※ E10K-STFCR/L-09	●	○	12	10	9	125	6	-10°	3	TC□T0902□□	FTKA02206	TW06P	2
※ E10K-STFCR/L-11	●	○	12	10	9	125	6	-10°	3	TC□T1102□□	FTKA02565	TW07P	2
※ E12M-STFCR/L-11	●	○	15	12	11	150	8	-10°	3.5	TC□T1102□□	FTKA02565	TW07P	2
※ E16R-STFCR/L-11	●	○	20	16	15	200	10	-10°	3.5	TC□T1102□□	FTKA02565	TW07P	2
※ E20R-STFCR/L-11	●	○	25	20	18	200	13	-6°	3.5	TC□T1102□□	FTKA02565	TW07P	2
※ E20S-STFCR/L-11	●	○	25	20	18	250	13	-6°	3.5	TC□T1102□□	FTKA02565	TW07P	2
※ E20R-STFCR/L-16	●	○	25	20	18	200	13	-6°	3.5	TC□T16T3□□	FTGA03510	TW15P	2
※ E20S-STFCR/L-16	●	○	25	20	18	250	13	-6°	3.5	TC□T16T3□□	FTGA03510	TW15P	2

• Applicable inserts, see pages **B43, B52, B56**

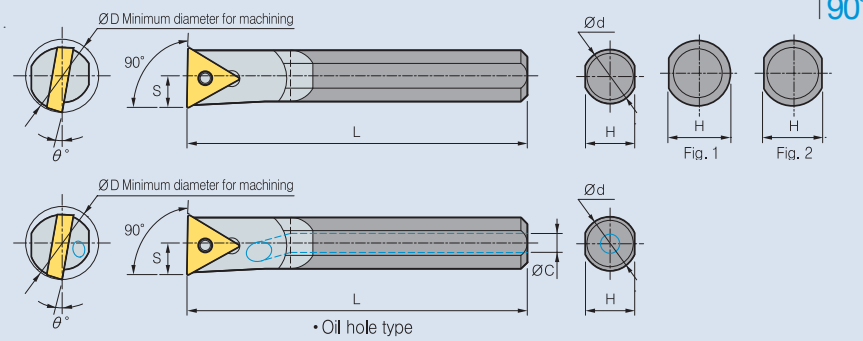
※ Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

STFPR/L



TP□□



90°

• R type insert

(mm)

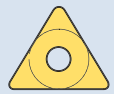
Designation	Stock R	Stock L	ØD	Ød	H	L	S	θ°	ØC	Parts Insert	Screw	Wrench	Flg.
C08K-STFPR/L-08	●	○	10	8	7	125	5	-10°	-	TP□T0802□□	FTNA02205	TW06P	2
C10K-STFPR/L-11	●	○	12	10	9	125	6	-10°	-	TP□T1103□□	FTNA0305	TW09P	2
C10M-STFPR/L-11	●	○	12	10	9	150	6	-10°	-	TP□T1103□□	FTNA0305	TW09P	2
C12M-STFPR/L-11	●	○	15	12	11	150	8	-10°	-	TP□T1103□□	FTNA0307	TW09P	2
C12Q-STFPR/L-11	●	○	15	12	11	180	8	-10°	-	TP□T1103□□	FTNA0307	TW09P	2
C16R-STFPR/L-11	●	○	20	16	15	200	10	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C16S-STFPR/L-11	●	○	20	16	15	250	10	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C20R-STFPR/L-11	●	○	25	20	18	200	13	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C20S-STFPR/L-11	●	○	25	20	18	250	13	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C20R-STFPR/L-16	●	○	25	20	18	200	13	-6°	-	TP□T1604□□	FTNA0408	TW15P	2
C20S-STFPR/L-16	●	○	25	20	18	250	13	-6°	-	TP□T1604□□	FTNA0408	TW15P	2
C25T-STFPR/L-16	●	○	32	25	23	300	17	-6°	-	TP□T1604□□	FTNA0408	TW15P	2
※ E08K-STFPR/L-08	●	○	10	8	7	125	5	-10°	3	TP□T0802□□	FTNA02205	TW06P	2
※ E10K-STFPR/L-11	●	○	12	10	9	125	6	-10°	3	TP□T1103□□	FTNA0305	TW09P	2
※ E10M-STFPR/L-11	●	○	12	10	9	150	6	-10°	3	TP□T1103□□	FTNA0305	TW09P	2
※ E12M-STFPR/L-11	●	○	15	12	11	150	8	-10°	3.5	TP□T1103□□	FTNA0307	TW09P	2
※ E12Q-STFPR/L-11	●	○	15	12	11	180	8	-10°	3.5	TP□T1103□□	FTNA0307	TW09P	2
※ E16R-STFPR/L-11	●	○	20	16	15	200	10	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
※ E16S-STFPR/L-11	●	○	20	16	15	250	10	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
※ E20R-STFPR/L-11	●	○	25	20	18	200	13	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
※ E20S-STFPR/L-11	●	○	25	20	18	250	13	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
※ E20R-STFPR/L-16	●	○	25	20	18	200	13	-6°	3.5	TP□T1604□□	FTNA0408	TW15P	2
※ E20S-STFPR/L-16	●	○	25	20	18	250	13	-6°	3.5	TP□T1604□□	FTNA0408	TW15P	2
※ E25T-STFPR/L-16	●	○	32	25	23	300	17	-6°	4	TP□T1604□□	FTNA0408	TW15P	2

• Applicable inserts, see pages **B44, B56~B58, B61**

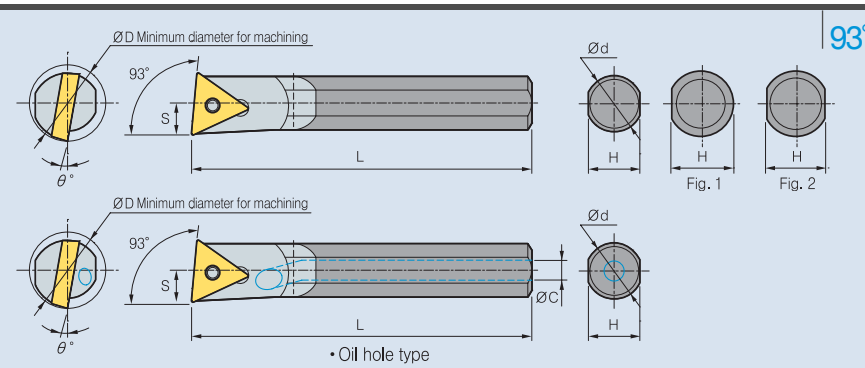
※ Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

STUBR/L



TB□□



93°

• R type insert

(mm)

Designation	Stock R	Stock L	ØD	Ød	H	L	S	θ°	ØC	Parts Insert	Screw	Wrench	Flg.
C08K-STUBR/L-06	●	○	10	8	7	125	5	-10°	-	TB□T0601□□	FTNA0204	TW06P	2
C10K-STUBR/L-06	●	○	12	10	9	125	6	-10°	-	TB□T0601□□	FTNA0204	TW06P	2
※ E08K-STUBR/L-06	●	○	10	8	7	125	5	-10°	3	TB□T0601□□	FTNA0204	TW06P	2
※ E10K-STUBR/L-06	●	○	12	10	9	125	6	-10°	3	TB□T0601□□	FTNA0204	TW06P	2

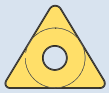
• Applicable inserts, see pages **B42**

※ Boring bar with Oil hole

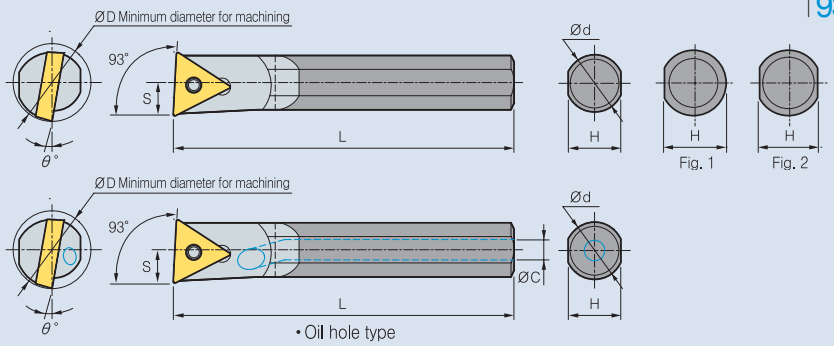
• Use right-hand insert for left-hand holder

● : Stock item ○ : Under preparing for stock

STUPR/L



TP□□



93°

• R type insert

(mm)

Designation	Stock R	Stock L	øD	ød	H	L	S	θ°	øC	Parts Insert	Screw	Wrench	Flg.
C08K-STUPR/L-08	●	○	10	8	7	125	5	-10°	-	TP□T0802□□	FTNA02205	TW06P	2
C10K-STUPR/L-11	●	○	13	10	9	125	6	-10°	-	TP□T1103□□	FTNA0305	TW09P	2
C10M-STUPR/L-11	●	○	13	10	9	150	6	-10°	-	TP□T1103□□	FTNA0305	TW09P	2
C12M-STUPR/L-11	●	○	16	12	11	150	8	-10°	-	TP□T1103□□	FTNA0307	TW09P	2
C12Q-STUPR/L-11	●	○	16	12	11	180	8	-10°	-	TP□T1103□□	FTNA0307	TW09P	2
C16R-STUPR/L-11	●	○	20	16	15	200	10	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C16S-STUPR/L-11	●	○	20	16	15	250	10	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C20R-STUPR/L-11	●	○	25	20	18	200	13	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C20S-STUPR/L-11	●	○	25	20	18	250	13	-6°	-	TP□T1103□□	FTNA0307	TW09P	2
C20R-STUPR/L-16	●	○	25	20	18	200	13	-6°	-	TP□T1604□□	FTNA0408	TW15P	2
C20S-STUPR/L-16	●	○	25	20	18	250	13	-6°	-	TP□T1604□□	FTNA0408	TW15P	2
C25T-STUPR/L-16	●	○	32	25	23	300	17	-6°	-	TP□T1604□□	FTNA0408	TW15P	2
C08K-STUPR/L-08	●	○	10	8	7	125	5	-10°	3	TP□T0802□□	FTNA02205	TW06P	2
C10K-STUPR/L-11	●	○	13	10	9	125	6	-10°	3	TP□T1103□□	FTNA0305	TW09P	2
C10M-STUPR/L-11	●	○	13	10	9	150	6	-10°	3	TP□T1103□□	FTNA0305	TW09P	2
C12M-STUPR/L-11	●	○	16	12	11	150	8	-10°	3.5	TP□T1103□□	FTNA0307	TW09P	2
C12Q-STUPR/L-11	●	○	16	12	11	180	8	-10°	3.5	TP□T1103□□	FTNA0307	TW09P	2
C16R-STUPR/L-11	●	○	20	16	15	200	10	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
C16S-STUPR/L-11	●	○	20	16	15	250	10	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
C20R-STUPR/L-11	●	○	25	20	18	200	13	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
C20S-STUPR/L-11	●	○	25	20	18	250	13	-6°	3.5	TP□T1103□□	FTNA0307	TW09P	2
C20R-STUPR/L-16	●	○	25	20	18	200	13	-6°	3.5	TP□T1604□□	FTNA0408	TW15P	2
C20S-STUPR/L-16	●	○	25	20	18	250	13	-6°	3.5	TP□T1604□□	FTNA0408	TW15P	2
C25T-STUPR/L-16	●	○	32	25	23	300	17	-6°	4	TP□T1604□□	FTNA0408	TW15P	2

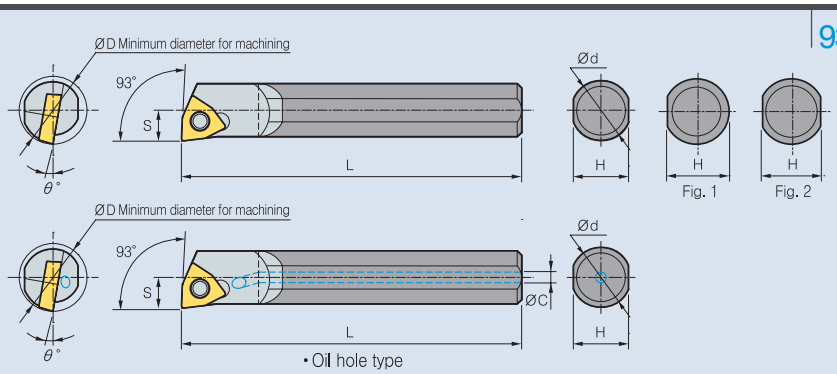
• Applicable inserts, see pages **B44**, **B57**, **B61**

※ Boring bar with Oil hole

● : Stock item ○ : Under preparing for stock

SWUBR/L

WBGT



93°

• R type insert

(mm)

Designation	Stock R	Stock L	øD	ød	H	L	S	θ°	øC	Parts Insert	Screw	Wrench	Flg.
C05H-SWUBR/L-02	●	○	6	5	4.4	100	3	-15°	-	WB□T0201□□	FTNA0203	TW06P	1
C06H-SWUBR/L-02	●	○	7	6	5.4	100	3.5	-15°	-	WB□T0201□□	FTNA0203	TW06P	1
C08K-SWUBR/L-02	●	○	9	8	7	125	4	-12°	-	WB□T0201□□	FTNA02033	TW06P	2
※ E06H-SWUBR/L-02	●	○	7	6	5.4	100	3.5	-15°	2	WB□T0201□□	FTNA0203	TW06P	1
※ E08K-SWUBR/L-02	●	○	9	8	7	125	4	-12°	3	WB□T0201□□	FTNA02033	TW06P	2

• Applicable inserts, see pages **B47**

※ Boring bar with Oil hole

• Use right-hand insert for left-hand holder

● : Stock item ○ : Under preparing for stock

SL(Sleeve)

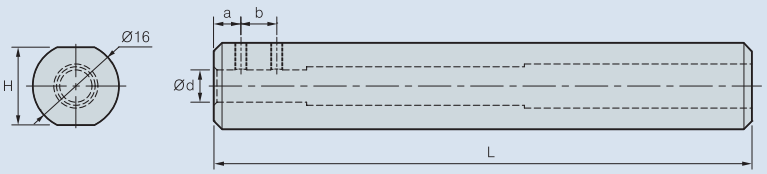


Fig.1

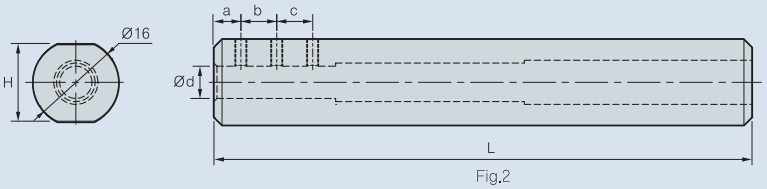


Fig.2

(mm)

Designation	Stock	ød	a	b	c	H	L	Screw	Wrench	Flg.
SL1604	●	4	5	6	-	14	100	M4-4 Bolt	HW20L	1
SL1605	●	5	5	8	-	14	100	M4-4 Bolt	HW20L	1
SL1606	●	6	5	6	6	14	100	M4-4 Bolt	HW20L	2
SL1607	●	7	5	6	8	14	100	M4-4 Bolt	HW20L	2

※ Fine tolerance and surface roughness

● : Stock item ○ : Under preparing for stock

Multi Functional tools

C

Contents

Application Example ---------- C02

MGT Series

MGT ---------- C04
MGT Face Grooving ---------- C09
MGT Aluminum Wheel ---------- C11
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Saw-man

Saw-man(Parting off) ---------- C16
Grooving & Profiling ---------- C18

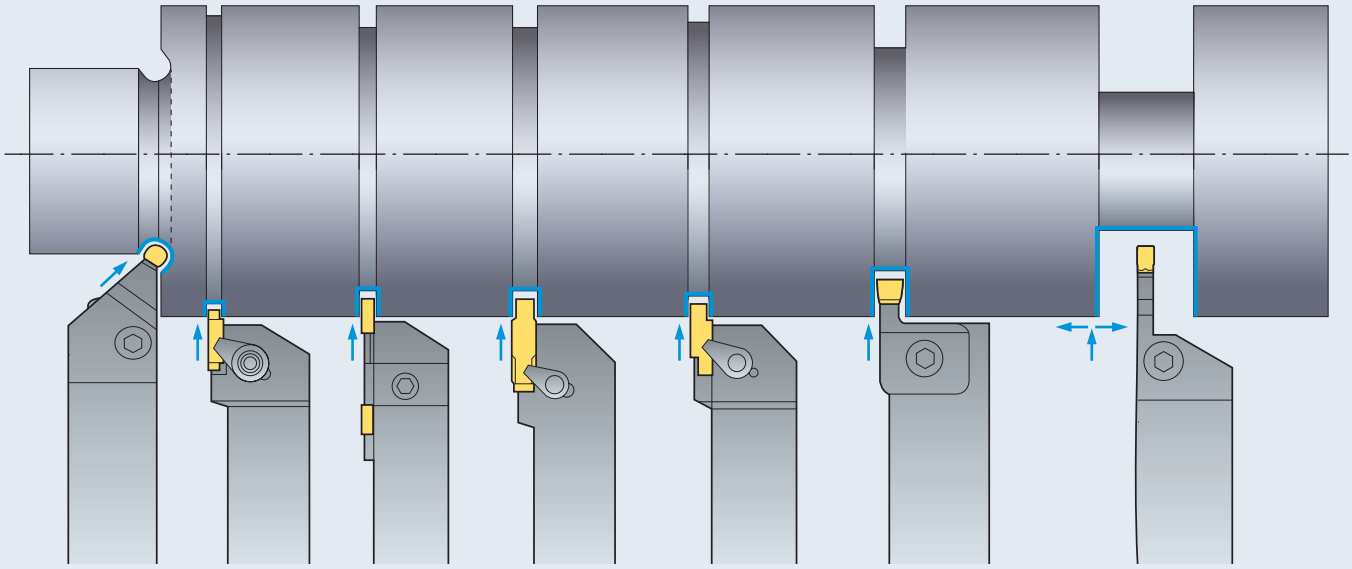
Technical Information for MGT Series C23

New Fine Tools

Technical Information for Fine Tools ---------- C30
New Fine Tools ---------- C31

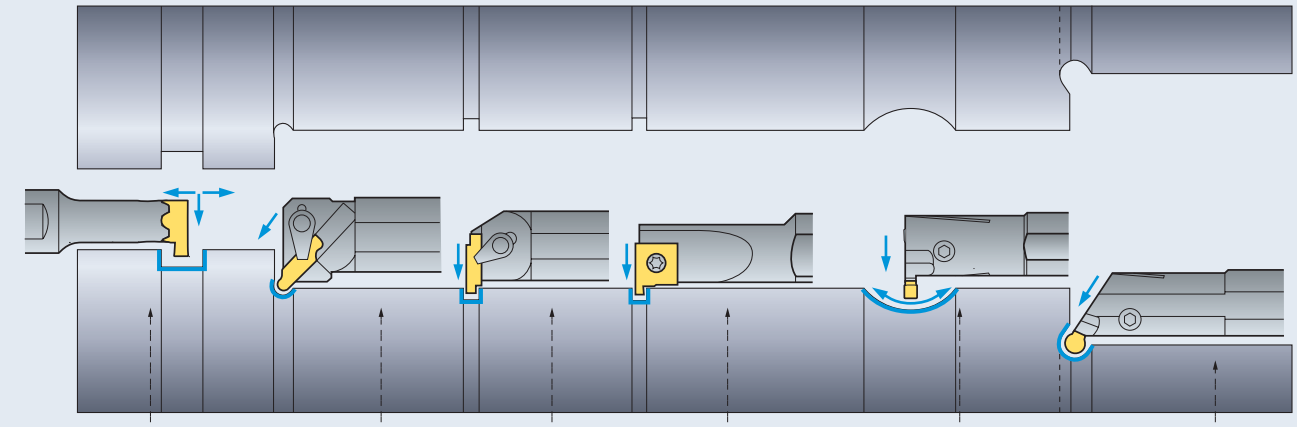
Application Example

■ For external machining



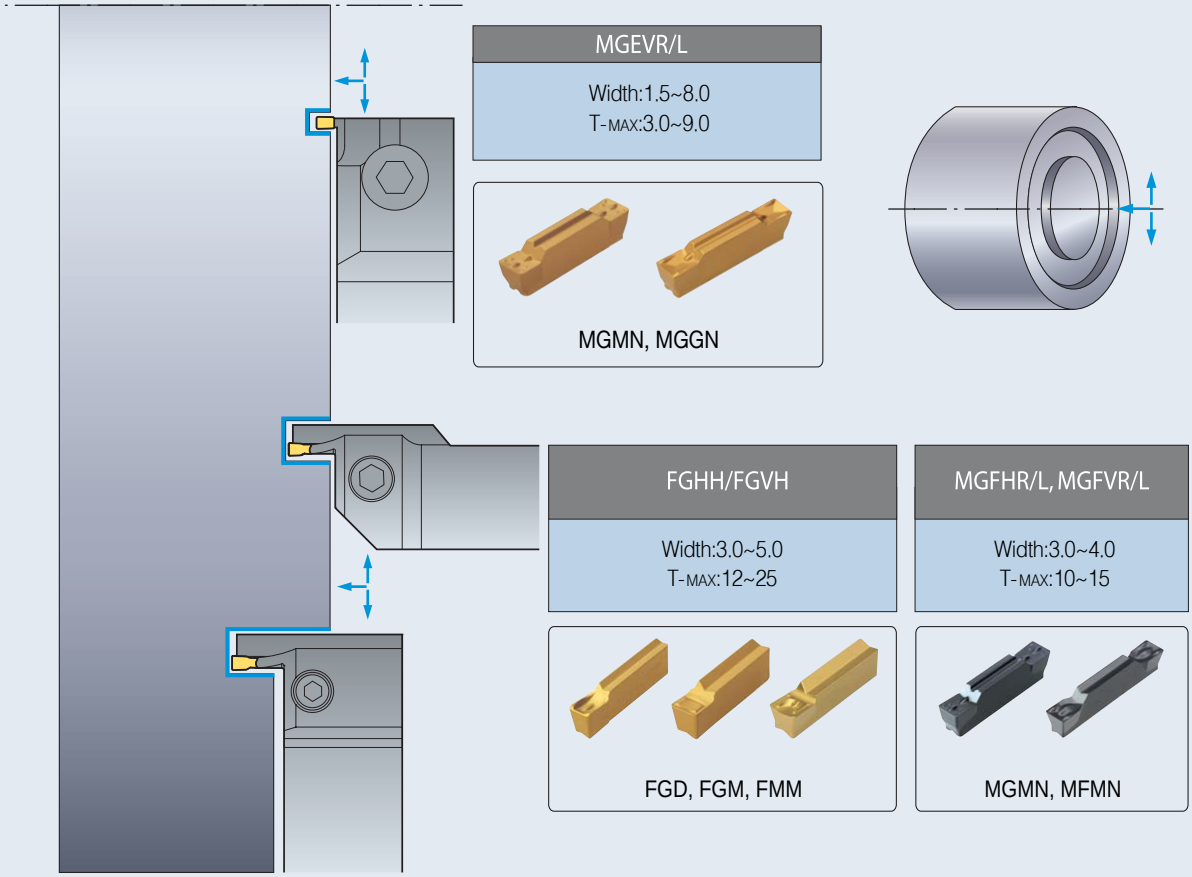
MGEUR/L	TBH	PH	GH	GFT	DBH	MGEHR/L
Width:3.0~8.0 T-MAX:3.0~5.0	Width:1.25~4.5 T-MAX:1.5~5.0	Width:3.0~5.0 Ø D-MAX:30~50	Width:1.23~4.28 T-MAX:1.5~4.0	Width:1.1~8.0 T-MAX:2.1~9.0	Width:3.0~8.0 T-MAX:14	Width:1.5~8.0 T-MAX:10~28
MRMN	TB	POB	GO, GS	GW, BF	DC, DB	MGMN, MRMN,MRGN, MGGN

■ For internal machining

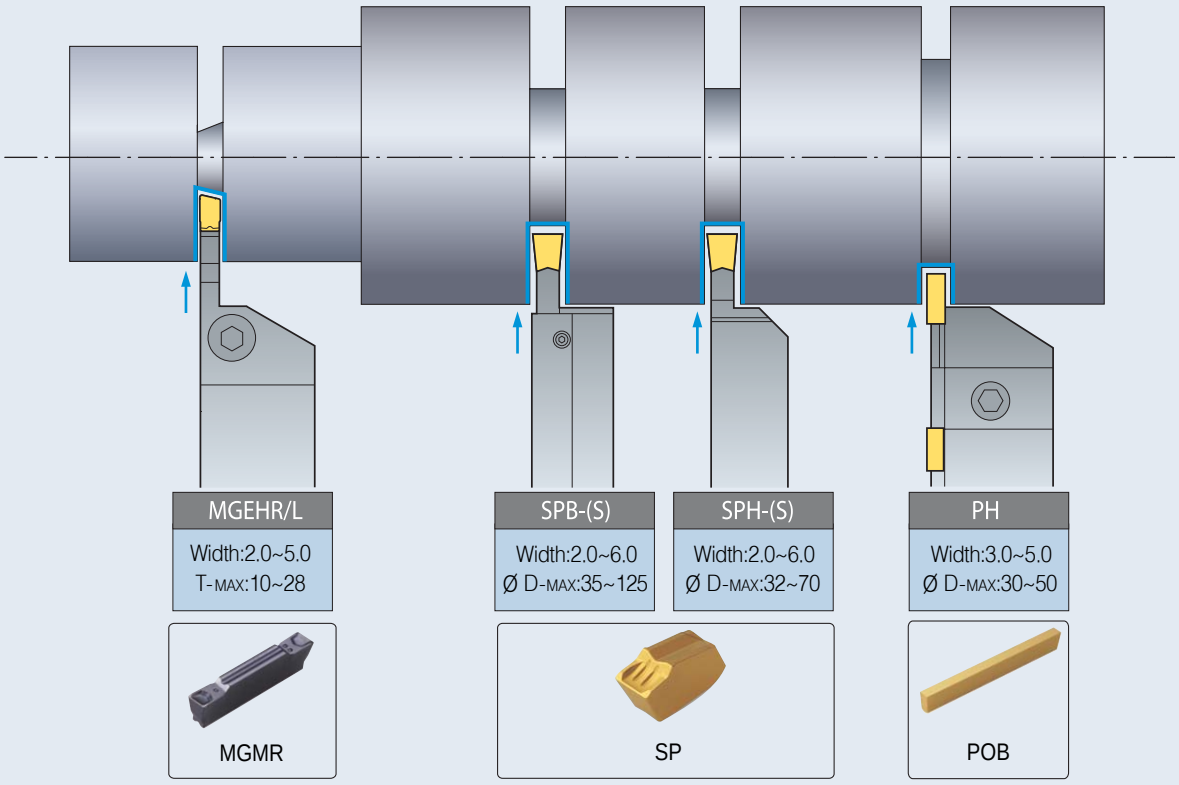


NFTIH	GFIK	GFIP	IGH	MGIVR/L	MGIUR/L
Width:0.75~4.02 T-MAX:4.8~10.2	Width:2.0~8.0 T-MAX:2.0~8.0	Width:1.1~8.0 T-MAX:2.1~9.0	Width:1.25~2.8 T-MAX:1.5~2.3	Width:1.5~8.0 T-MAX:4.0~10	Width:3.0~8.0 T-MAX:3.5~6.5
NFTG, NFTF, NFTT	GR	GW, BF	IG	MGMN, MGGN,MRMN, MRGN	MRMN

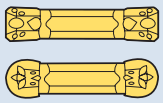
■ For face grooving



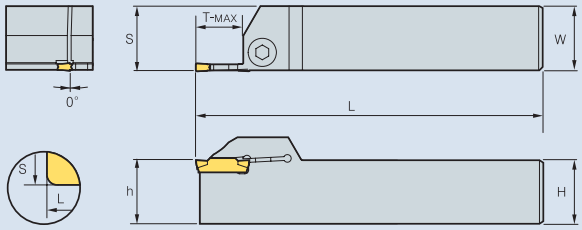
■ For parting off

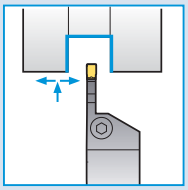


MGEHR/L For Grooving, Turning, Parting off, Reliefing, Profiling, Aluminum machining



MGMN
MGMR
MGGN
MRMN
MRGN





• R type insert

(mm)

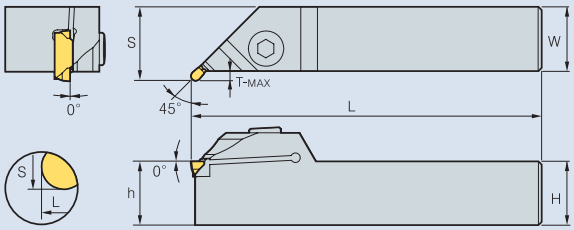
Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	Parts / Inserts	Screw	Wrench
MGEHR/L	1616-1.5	●	●	16	16	100	16.25	14.5	MGMN150-G	LTX0514	TW20L
	2020-1.5	●	●	20	20	125	20.25	14.5			
	2525-1.5	●	●	25	25	150	25.25	14.5			
	1212-2	●		12	12	100	14.25	14.5	MGMN200-G MGMN200-M MGMN200-□□	MHA0512	HW40L
	1616-2	●	●	16	16	100	16.25	14.5			
	2020-2	●	●	20	20	125	20.25	14.5			
	2525-2	●	●	25	25	150	25.25	14.5			
	1616-2.5	●	●	16	16	100	16.30	16.5	MGMN250-G MGMN250-M	MHA0512	HW40L
	2020-2.5	●	●	20	20	125	20.30	16.5			
	2525-2.5	●	●	25	25	150	25.30	16.5			
	1616-3	●	●	16	16	100	16.35	18.5	MGMN300-M MGGN300-□□M MRMN300-M MGMR300-□□	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 MGGN400-□□M MRMN400-M MGMR300-□□		
	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 MGGN500-□□M MRMN500-M MGMR500-□□		
	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		
	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			

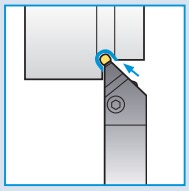
• Applicable inserts, see pages C13, C14

● : Stock item ○ : Under preparing for stock

MGEUR/L For Reliefing, Profiling, Aluminum machining

MRMN
MRGN





• R type insert

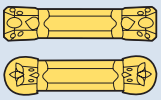
(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	Parts / 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			

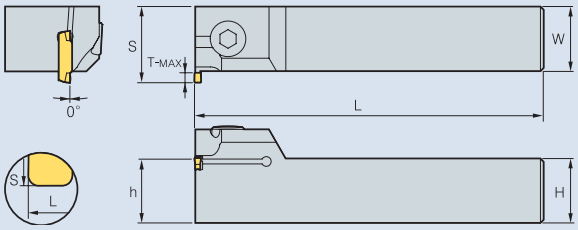
• Applicable inserts, see pages **C14**

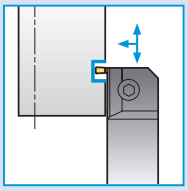
● : Stock item ○ : Under preparing for stock

MGEVR/L For Grooving, Turning, Profiling, Reliefing, Aluminum machining



MGMN
MGGN
MRMN
MRGN





• R type insert

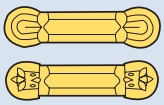
(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	Min. diameter	Parts / Inserts	Screw	Wrench
MGEVR/L	2020-1.5			20	20	125	23	3	250	MGMN150-G	LTX0514	TW20L
	2525-1.5			25	25	150	28	3	250			
	3232-1.5			32	32	170	35	3	250			
	2020-2	●		20	20	125	23.5	3.5	130	MGMN200-M MGMN200-G	BHA0616	HW50L
	2525-2			25	25	150	28.5	3.5	130			
	3232-2			32	32	170	35.5	3.5	130			
	2020-2.5			20	20	125	24	4	100	MGMN250-M MGMN250-G		
	2525-2.5			25	25	150	29	4	100			
	3232-2.5			32	32	170	36	4	100			
	2020-3	●		20	20	125	25.5	5	110	MGMN300-M		
	2525-3	●	●	25	25	150	30.5	5	110	MGGN300-□□M		
	3232-3			32	32	170	37.5	5	110	MRMN300-M		
	2020-4	●		20	20	125	25.5	5	100	MGMN400-M		
	2525-4	●		25	25	150	30.5	5	100	MGGN400-□□M		
	3232-4			32	32	170	37.5	5	100	MRMN400-M		
	2020-5			20	20	125	27	7	100	MGMN500-M		
	2525-5			25	25	15	32	7	100	MGGN500-□□M		
	3232-5			32	32	170	39	7	100	MRMN500-M		
	2020-6			20	20	125	27	7	90	MGMN600-M		
	2525-6			25	25	150	32	7	90	MGGN600-□□M		
	3232-6			32	32	170	39	7	90	MRMN600-M		
	2525-8			25	25	150	34	9	50	MRMN800-M		
	3232-8			32	32	170	41	9	50			
	2525-6A			25	25	150	32	7	90	MRGN600-A		
	3232-6A			32	32	170	39	7	90			
	2525-8A			25	25	150	34	9	50	MRGN800-A		
	3232-8A			32	32	170	41	9	50			

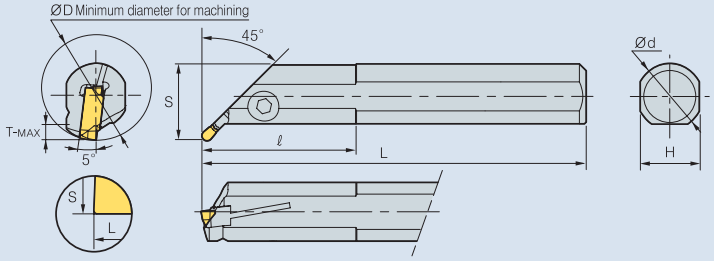
• Applicable inserts, see pages C13, C14

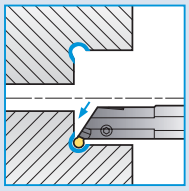
● : Stock item ○ : Under preparing for stock

MGIUR/L For Reliefing, Profiling, Aluminum machining



MRMN
MRGN





• R type insert

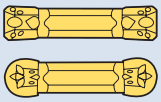
(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T-MAX	H	S	Parts: 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	HW50L
	5032-5	○		50	32	250	65	3.5	30	19		BHA0620	
	4025-6			40	25	200	45	3.5	23	19	MRMN600-M	BHA0616	
	5032-6	○		50	32	250	65	3.5	30	19		BHA0620	
	4025-8			40	25	200	45	6.5	23	15.5	MRMN800-M	BHA0616	
	5032-8	○		50	32	250	65	6.5	30	19		BHA0620	
	4025-6A			40	25	200	45	3.5	23	15.5	MRGN600-A	BHA0616	
	5032-6A			50	32	250	65	3.5	30	19		BHA0620	
	4025-8A			40	25	200	45	5.0	23	18.5	MRGN800-A	BHA0616	
	5032-8A			50	32	250	65	6.5	30	22		BHA0620	

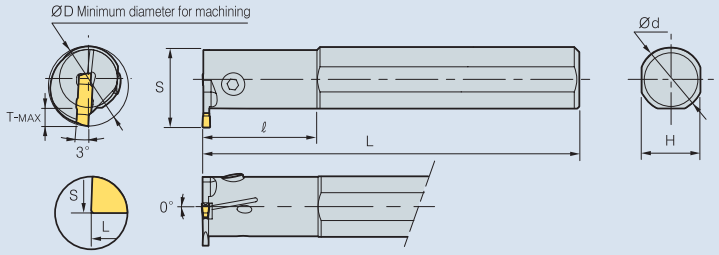
• Applicable inserts, see pages **C14**

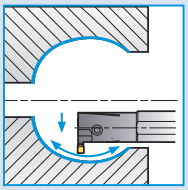
● : Stock item ○ : Under preparing for stock

MGIVR/L For Grooving, Turning, Reliefing, Profiling, Aluminum machining



MGMN
MGGN
MRMN
MRGN





• R type insert

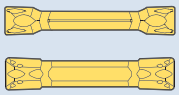
(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T-MAX	H	S	Parts / Inserts	Screw	Wrench
MGIVR/L	2016-1.5	○		20	16	125	35	4	15	11.3		MHB0310	HW25L
	2520-1.5			25	20	150	45	4	18	13.1	MGMN150-G	MHA0512	HW40L
	2925-1.5			29	25	200	45	4	23	16.2			
	2016-2	●	●	20	16	125	35	5	15	12.4	MGMN200-G	MHB0310	HW25L
	2520-2	●	●	25	20	150	45	5	18	14.0	MGMN200-M	MHA0512	HW40L
	2925-2	●	●	29	25	200	45	5	23	17.2	MRMN200-M		
	2016-2.5			20	16	125	35	6	15	12.5	MGMN250-G	MHB0310	HW25L
	2520-2.5	○		25	20	150	45	6	18	15.1	MGMN250-M	MHB0512	HW40L
	2925-2.5	○		29	25	200	45	6	23	18.2			
	2520-3	●	●	25	20	150	45	6	18	15.6	MGMN300-M/G	MHA0512	HW40L
	3125-3	●	●	31	25	200	45	6	23	18.9	MGGN300-□□M		
	3732-3	●		37	32	250	65	6	30	21.5	MRMN300-M		
	2520-4	●	●	25	20	150	45	6	18	15.6	MGMN400-M/G		
	3125-4	●		31	25	200	45	6	23	18.9	MGGN400-□□M		
	3732-4	●		37	32	250	65	6	30	21.5	MRMN400-M		
	3125-5	●		31	25	200	45	8	23	19.4	MGMN500-M/G	BHA0616	HW50L
	3732-5	●		37	32	250	65	8	30	21.5	MGGN500-□□M	BHA0620	
											MRMN500-M		
	3125-6	●	●	31	25	200	45	8	23	19.4	MGMN600-M/G	BHA0616	
	3732-6	●		37	32	250	65	8	30	21.5	MGGN600-□□M	BHA0620	
											MRMN600-M		
	3732-8	●		37	32	250	65	10	30	23.4	MRMN800-M		
	4540-8	●		45	40	300	70	10	37	27.2	MGMN800-M		
	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			

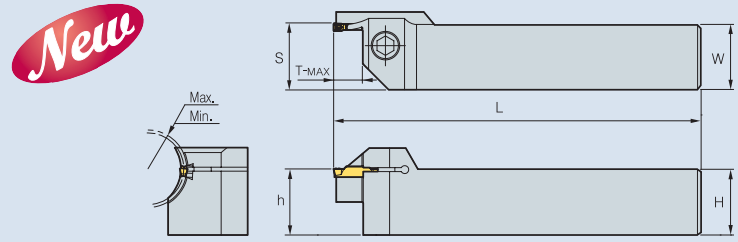
• Applicable inserts, see pages C13, C14

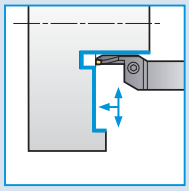
● : Stock item ○ : Under preparing for stock

MGFHR/L For Face Grooving, Turning machining



MFMN
MGMN





• R type insert

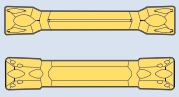
(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	Min.	Max.	Parts / Inserts	Screw	Wrench
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			
	425-62/120-T15	●		25	25	150	25.6	15	62	120	MGMN400-M		
	425-112/200-T15	●		25	25	150	25.6	15	112	200			

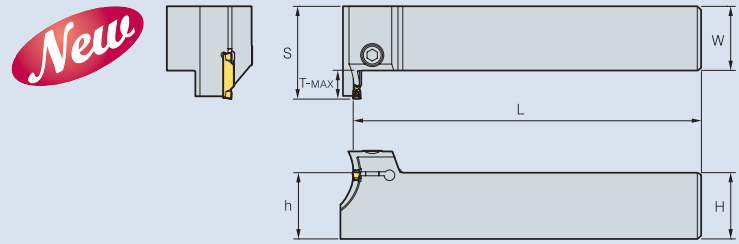
• Applicable inserts, see pages **C13**

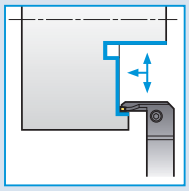
● : Stock item ○ : Under preparing for stock

MGFVR/L For Face Grooving, Turning machining



MFMN
MGMN





• R type insert

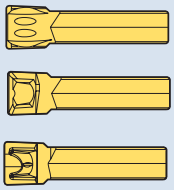
(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	Min.	Max.	Parts / Inserts	Screw	Wrench
MGFVR/L	325-24/35-T10	●		25	25	150	18	10	24	35	MFMN300	MHA0512	HW40L
	325-29/40-T10	●		25	25	150	18	10	29	40			
	325-34/50-T10	●		25	25	150	18	10	34	50			
	425-44/60-T15	●		25	25	150	25	15	44	60	MGMN400-M	BHA0616	HW50L

• Applicable inserts, see pages **C13**

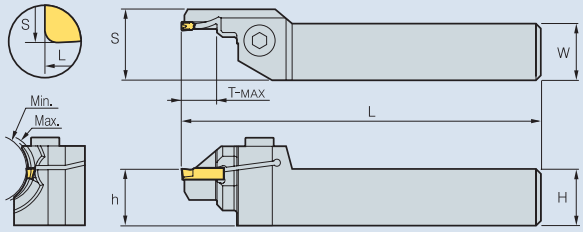
● : Stock item ○ : Under preparing for stock

FGHH/FGVH For Face Grooving, Turning machining

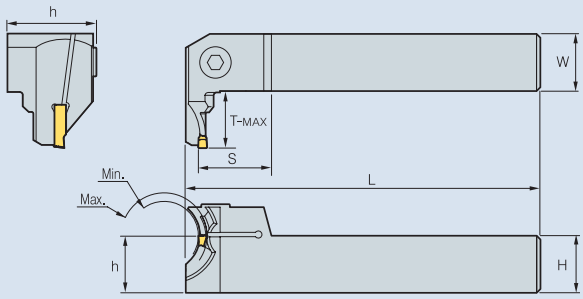


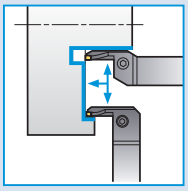
FGD
FGM
FMM

• FGHH



• FGVH





• R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	Min.	Max.	Parts / Inserts	Screw	Wrench
FGHH 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			

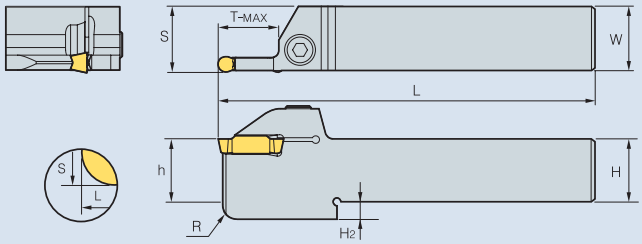
• Applicable inserts, see pages **C13**

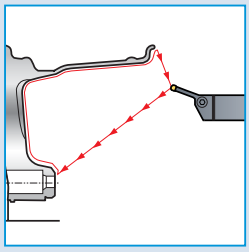
● : Stock item ○ : Under preparing for stock

MGEHR/L

New

MRGN





• R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	H2	W	L	S	R	T-MAX	Parts / Inserts	Screw	Wrench
MGEHR/L	25N-6A	○		25	7	150	25	25.55	6	23.5	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	32N-6A	○		32	8	150	32	32.55	12	27			
	25N-6A5	○	○	25	7	150	25	25.55	6	23.5	MRGN6N-A5		
	32N-6A5	○		32	8	150	32	32.55	12	27			
	25N-8A	○		25	7	150	25	25.55	6	23.5	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	32N-8A	○		32	8	150	32	32.55	12	27			
	25N-8A5	○	○	25	7	150	25	25.55	6	23.5	MRGN8N-A5		
	32N-8A5	○		32	8	150	32	3255	12	27			

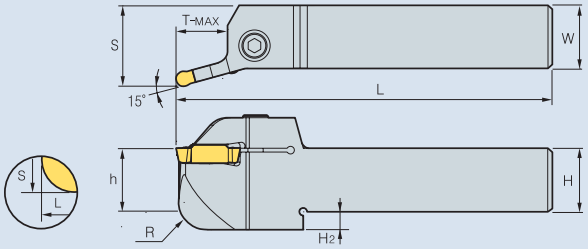
• Applicable inserts, see pages C14

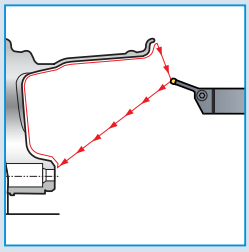
● : Stock item ○ : Under preparing for stock

MGEHR/L-15

New

MRGN





• R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	H2	W	L	S	R	T-MAX	Parts / Inserts	Screw	Wrench
MGEHR/L	25N-6A-15	○		25	7	25	150	32.2	6	20	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
	32N-6A-15	○		32	8	32	150	39.2	12	25			
	25N-6A5-15	○	○	25	7	25	150	32.2	6	20	MRGN6N-A5		
	32N-6A5-15	○		32	8	32	150	39.2	12	25			
	25N-8A-15	○		25	7	25	150	32.2	6	20	MRGN8N-A MRGN8N-AP MRGN8N-AM		
	32N-8A-15	○		32	8	32	150	39.2	12	25			
	25N-8A5-15	○	○	25	7	25	150	32.2	6	20	MRGN8N-A5		
	32N-8A5-15	○		32	8	32	150	39.2	12	25			

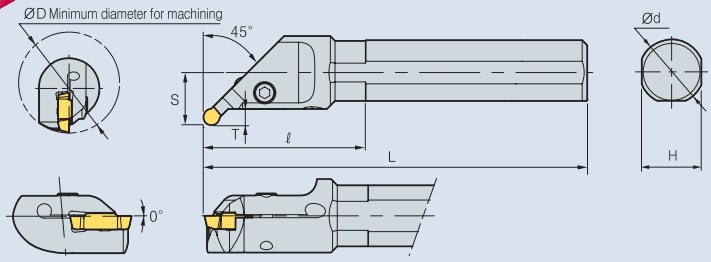
• Applicable inserts, see pages C14

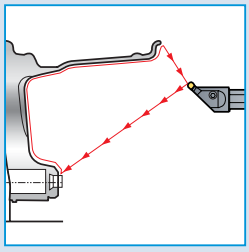
● : Stock item ○ : Under preparing for stock

MGIUR/L-MR

New

MRGN





• R type insert

(mm)

Designation		Stock R	Stock L	ØD	Ød	L	ℓ	T	H	S	Parts / Inserts	Screw	Wrench
MGIUR/L	6832-8A-MR	○		68	32	170	65	8	30	26	MRGN8N-A/AM/AP	BHA0616	HW50L
	6832-8A5-MR	○		68	32	170	65	8	30	26	MRGN8N-A5		

• Applicable inserts, see pages C14

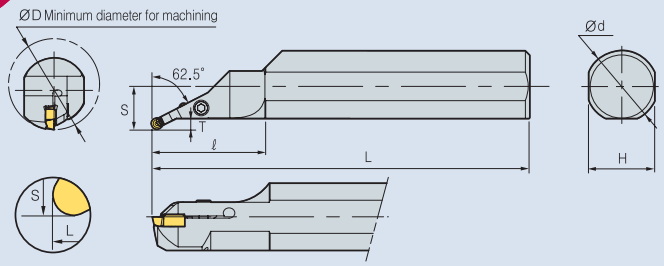
● : Stock item ○ : Under preparing for stock

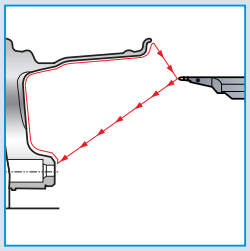
MGT Aluminum Wheel

MGIXR/L

New

MRGN





• R type insert

(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T	H	S	Parts / Inserts	Screw	Wrench
MGIXR/L	7050-8A-MR	○		70	50	350	80	7.7	46	30.2	MRGN8N-A/AM/AP	BHA0616	HW50L
	7050-8A5-MR	○		70	50	350	80	7.7	46	30.2	MRGN8N-A5		

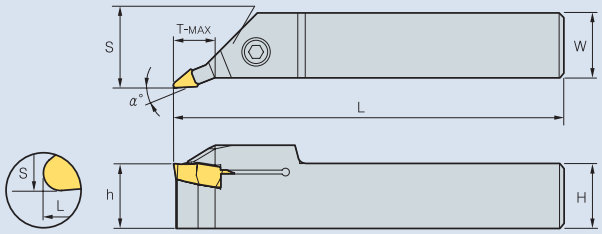
• Applicable inserts, see pages **C14**

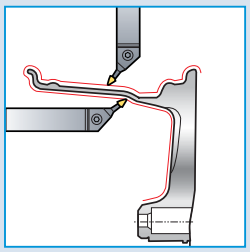
● : Stock item ○ : Under preparing for stock

MGEXR/L

New

MVGN





• R type insert

(mm)

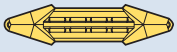
Designation		Stock R	Stock L	H=(h)	W	L	S	T-MAX	α°	Parts / Inserts	Screw	Wrench
MGEXR/L	25N-8A-5V	○	○	25	25	150	29	23.5	5	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0620	HW50L
	25N-8A-22.5V	○	○	25	25	150	35	27	22.5			

• Applicable inserts, see pages **C14**

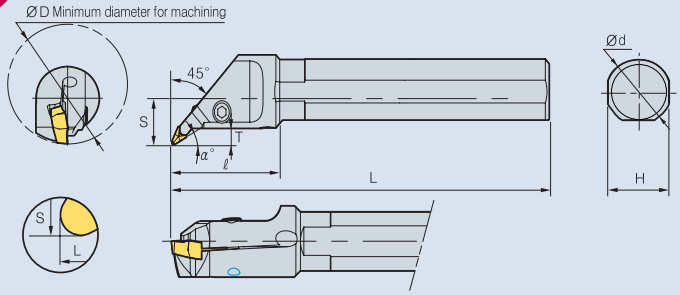
● : Stock item ○ : Under preparing for stock

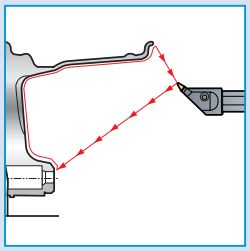
MGIUR/L-MV

New



MVGN





• R type insert

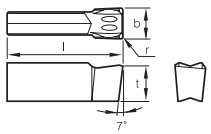
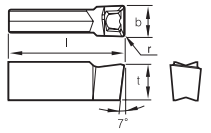
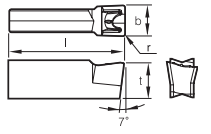
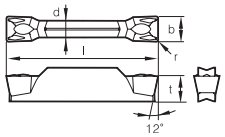
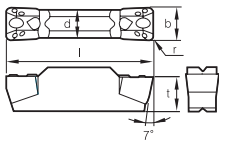
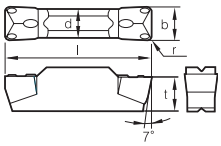
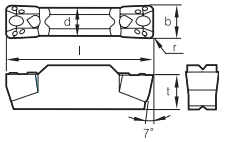
(mm)

Designation		Stock R	Stock L	øD	ød	L	ℓ	T	H	S	α°	Parts / Inserts	Screw	Wrench
MGIUR/L	6832-8A-MV	○		68	32	170	65	8.0	30	26	27.5	MVGN8N-A-R1.2 MVGN8N-A-R1.6	BHA0616	HW50L

• Applicable inserts, see pages **C14**

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation		Coated										Cermet	Dimensions (mm)					Configuration	Page
				NC3010	NC3020	NC3030	NC3120	PC215K	PC9030	PC3525	PC3535	PC6510	PC8010	PC230	CN20	b	r	l	d	t		
Face Grooving	FGD	FGD	300R-03			●		●								3.0	0.3	3.0	2.0	4.0		C10
			400R-04			●		●								4.0	0.4	4.0	3.0	4.5		
			500R-04			●		●								5.0	0.4	5.0	4.0	5.0		
Face Grooving	FGM	FGM	300R-03													3.0	0.3	3.0	2.0	4.0		C10
			400R-04													4.0	0.4	4.0	3.0	4.5		
			500R-04													5.0	0.4	5.0	4.0	5.0		
Face Grooving	FMM	FMM	300R-03			●					●		●			3.0	0.3	3.0	2.0	3.91		C10
			400R-04			●					●	●	●			4.0	0.4	4.0	3.0	3.96		
			500R-04			●					●		●			5.0	0.4	5.0	4.0	4.42		
Face Grooving	MFMN New	MFMN	300				●			●						3	0.2	18	2	3		C09
Grooving · Turning	MGGN-M	MGGN	300-02-M												●	3.0	0.2	21.0	23.5	4.8		C04 C06 C08
			300-04-M												●	3.0	0.4	21.0	23.5	4.8		
			300-08-M												○	3.0	0.8	21.0	23.5	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		C04 C06 C08
			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	0.4	21.0	2.35	4.8		
			400-G													4.0	0.4	21.0	3.3	4.8		
			500-G													5.0	0.8	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	1.2	3.5		C04 C06 C08
			250-M		●		●		●							2.5	0.2	18.5	2.0	38.5		
			300-02-M					○						○		3.0	0.2	21.0	23.5	4.8		
			300-M	○		●	●	●	●					●		3.0	0.4	21.0	23.5	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		

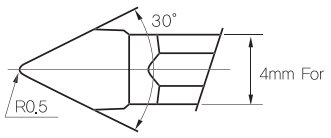
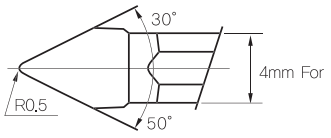
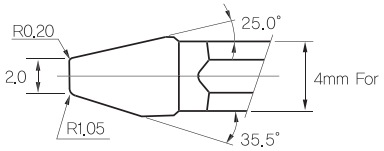
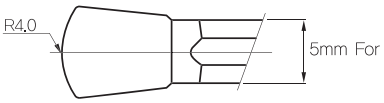
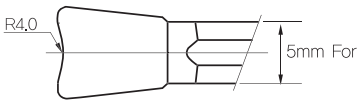
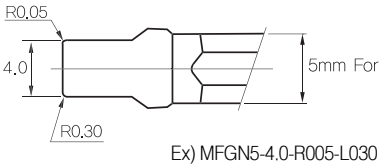
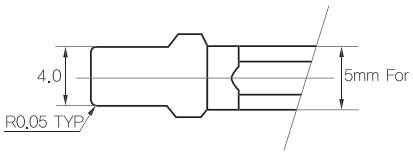
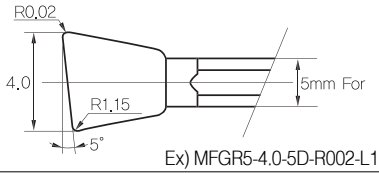
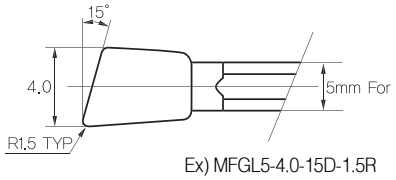
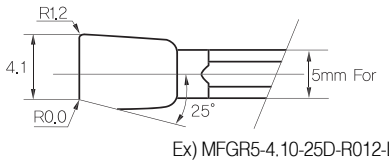
Available Insert for MGT

Available Inserts

Application	Picture	Designation		Coated NC3020	Coated NC3030	Coated NC3120	Coated PC9030	Coated PC3525	Coated PC6510	Coated PC230	Coated DP150	Uncoated H01	Uncoated G10	b	r	l	d	t	Configuration	Page
Parting off	MGMR/L-PS	MGMR/L	300-6D-PS			●	○	●						3	0.2	21	2.35	4.8		C04
			300-8D-PS			●	○	●						3	0.2	21	2.35	4.8		
			300-15D-PS			●	○	●						3	0.2	21	2.35	4.8		
			400-4D-PS			●	○	●						4	0.3	21	3.3	4.8		
			500-4D-PS			●	○	●						5	0.3	26	4.1	5.8		
Parting off	MGMR/L-PT	MGMR/L	200-6D-PT			○	○	○						2	0.2	16	1.6	3.6		C04
			300-6D-PT			●	○	●						3	0.2	21	2.35	4.8		
			300-8D-PT			●	○	●						3	0.2	21	2.35	4.8		
			300-15D-PT			●	○	●						3	0.2	21	2.35	4.8		
			400-4D-PT			●	○	●						4	0.3	21	3.3	4.8		
			500-4D-PT			●	○	●						5	0.3	26	4.1	5.8		
Aluminum	MRGN-A	MRGN	400-A									○		4.0	2.0	21.0	3.3	3.3		C04 C05 C06 C07 C08
			500-A									○		5.0	2.5	26.0	4.1	4.1		
			600-A									●		6.0	3.0	26.0	5.0	5.0		
			800-A									●		8.0	4.0	31.0	6.0	6.0		
Reliefing · Profiling	MRMN-M	MRMN	200-M	●		●								2.0	1.0	16.0	1.50	3.5		C04 C05 C06 C07 C08
			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		

Application	Picture	Designation		Coated DP150	Uncoated G10	b	r	l	d	t	Configuration	Page
For Aluminum Wheel	MVGN	MVGN	8N-A-R1.2		●	8.0	1.2	30.0	8.0	6.9		C12
			8N-A-R1.6		●	8.0	1.6	30.0	8.0	6.9		
For Aluminum Wheel	MRGN-A	MRGN	6N-A		●	6.0	3.0	26.0	7.2	5.9		C11 C12
			6N-AM		●	6.0	3.0	26.0	7.2	5.9		
			6N-AP	○	●	6.0	3.0	26.0	7.2	5.9		
			6N-A5		●	6.0	3.0	26.0	7.2	5.9		
			8N-A		●	8.0	4.0	30.0	8.0	6.5		
			8N-AM		●	8.0	4.0	30.0	8.0	6.5		
			8N-AP	○	●	8.0	4.0	30.0	8.0	6.5		
			8N-A5		●	8.0	4.0	30.0	8.0	6.5		

● : Stock item ○ : Under preparing for stock

Classification	Designation	Configuration
Fig. 1	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 : 4mm ⑥ Nose Radius : 0.5 ⑦ Degree : 30°	 Ex) MFGN4-0.5R-30D
Fig. 2	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
Fig. 3	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 : 2.0mm 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
Fig. 4	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
Fig. 5	MFGN5 - 4.0 - R 005 - L 030 ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Width of cutting edge : 4.0mm ③ Right ④ Nose Radius : 0.05 ⑤ Left ⑥ Nose Radius : 0.30	 Ex) MFGN5-4.0-R005-L030
Fig. 6	MFGN5 - 4.0 - 0.05 R ① ② ③ ① Refer to No. 1 ② Width of cutting edge: 4.0mm ③ Nose Radius: 0.05	 Ex) MFGN5-4.0-0.05R
Fig. 7	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: 5mm ④ Width of cutting edge: 4.0mm 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
Fig. 8	MFG L 5 - 4.0 - 15D - 1.5R ① ② ③ ④ ⑤ ⑥ ① Refer to No. 1 ② Left ③ Clamp part: 5mm ④ Width of cutting edge: 4.0mm ⑤ Lead angle: 15° ⑥ Right Nose Radius: 1.5	 Ex) MFGL5-4.0-15D-1.5R
Fig. 9	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: 5mm ④ Width of cutting edge: 4.1mm ⑤ Degree: 25° ⑥ Right Nose Radius: 1.2 ⑦ Left Nose Radius :0.0	 Ex) MFGR5-4.10-25D-R012-L000

SPB/SPB-S

(Stopper type)

SP

• SPB

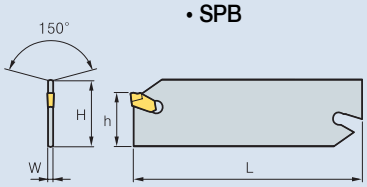


Fig. 1

• SPB-S

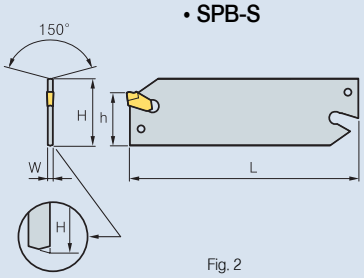
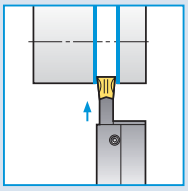


Fig. 2



• R type insert

(mm)

Designation		Stock	H	W	L	h	Parts / 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-S	226-S	●	26	1.6	110	21	SP200, 200R/L	-	SW15S	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, see pages **C17**

● : Stock item ○ : Under preparing for stock

SPH/SPH-S

(Stopper type)

SP

• SPH

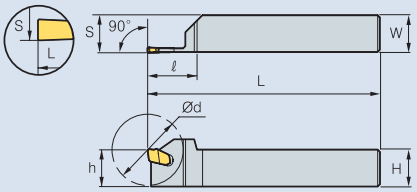


Fig.1

• SPH-S

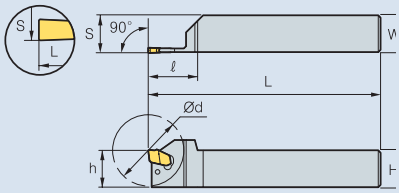
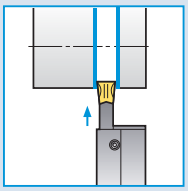


Fig. 2



• R type insert

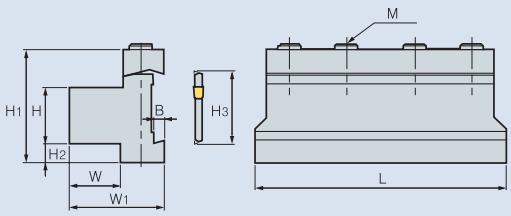
(mm)

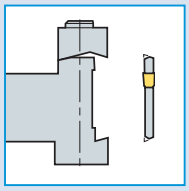
Designation		Stock R	Stock L	H=(h)	W	L	Ød	S	Parts / Inserts	Wrench		Fig.
SPH	316R/L			16	16	100	32	16.3	SP300, 300R/L	SW50L	-	1
	320R/L	●	●	20	20	120	40	20.3	SP300, 300R/L			
	420R/L	●		20	20	120	50	20.4	SP400, 400R/L			
	520R/L			20	20	120	60	20.5	SP500, 500R/L			
	325R/L	●		25	25	150	50	25.3	SP300, 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-S	316R/L-S	●		16	16	100	32	16.3	SP300, 300R/L	-	SW15S	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, see pages **C17**

● : Stock item ○ : Under preparing for stock

SMBB
(Saw-man blade block)





• R type insert

(mm)

Designation		Stock	H	W	H3	L	H1	H2	W1	B	M	Parts / Blades	Wrench
SMBB	1626		16	12	26	86	43	13	30	5.3	3-M6	SPB□26	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	
	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□26-S	
	3232	●	32	30	32	110	54	5	48	5.3	4-M6		

• Applicable blades, see pages C16

● : Stock item ○ : Under preparing for stock

Available Inserts Saw-man®

Application	Picture	Designation	Coated NC3120	NC3030	NCM325	PC230	NC500H	PC8010	PC9030	PC6510	Uncoated ST30A	Dimensions (mm) W	l	r	Configuration
Parting off	SP	SP 200	●	●	●	○		●	●	●		2.2	9.3	0.2	R type / Neutral
		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	
		300H		●								3.1	11.4	0.2	
		400	●	●	●	●		●	●	●		4.1	11.3	0.25	
		400R	●	●				●				4.1	11.3	0.25	
		400L	●	●								4.1	11.3	0.25	
		400H										4.1	11.4	0.25	
		500	●	●	●		●	●		●		5.1	11.4	0.3	L type
		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	

W = ±0.1

• Applicable holders, see pages C16

● : Stock item ○ : Under preparing for stock

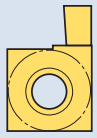
● Features of multi parting tools

- Available for various workpiece.
  - Alloy steel, Cast iron, Stainless steel, etc.
- Cutting tool life has been increased due to specially designed rake angle.
- Minimum size of Nose radius R has been employed to get rid of "Burr"
- Line-up of various lead angles for the best machining.
- Small width of chip can be acquired due to special chip breaker & cutting edge design.

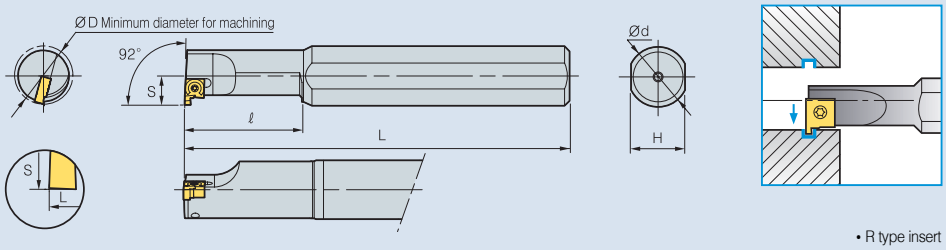
■ Recommended cutting condition

Workpiece	CVD NC3120	NC3030	NCM325	NC500H	PVD PC230	PC8010	PC9030	PC3525	PC6510	Uncoated ST30A	Cutting width (mm) 2	3	4	5	6
SM□□C	80~180				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			〃	〃	〃	〃	〃
GC/GCD									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	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

IGH For Internal grooving



IG



• R type insert

(mm)

Designation		Stock R	Stock L	ØD	Ød	H*	L*	ℓ	S	Parts: 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			

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation		Coated NC3010	Coated NC3120	Uncoated H01	Uncoated G10	Uncoated ST30A	b	g	t	d	d1	Configuration
Internal grooving	IG	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	

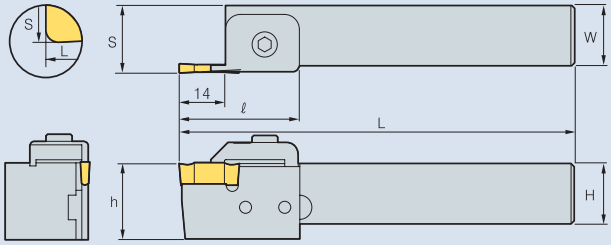
Dimensions (mm)

● : Stock item ○ : Under preparing for stock

DBH

For Deep and Wide grooving

DB
DC



• R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	ℓ	S		Parts: Inserts	Clamp	Clamp Screw	Screw	Locator	Wrench
DBH	320R/L	●		20	20	150	40	22.3*	22.8**	DB300*, 400**	CGH5R1	MHA0512	MHB0410	LD34	HW30L HW40L
	325R/L	●		25	25	150	40	27.3	27.8	DC300, 400					
	520R/L	●		20	20	150	40	24.3	24.3	DB500, 600	CGH5R2	MHA0512	MHB0410	LD56	HW30L HW40L
	525R/L	●		25	25	150	40	29.3	29.3	DC500					
	720R/L	●		20	20	150	40	26.3	26.3	DB700, 800	CGH5R3	MHA0512	MHB0410	LD78	HW30L HW40L
	725R/L	●		25	25	150	40	31.3	31.3						

• Marked "*, **" each insert dimension

● : Stock item ○ : Under preparing for stock

Available Inserts

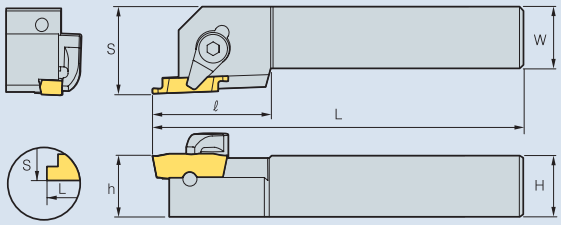
Application	Picture	Designation		Coated NC3010	Coated NC3120	Cermet CT10	Uncoated H01	Uncoated G10	b	l	t	r	Configuration
Grooving(Deep & Wide)	DB	DB	300			●			3.0	20	7.5	0.2	
			400			●			4.0	20	7.5	0.2	
			500			●			5.0	20	7.5	0.2	
			600			●			6.0	20	7.5	0.2	
			700						7.0	20	7.5	0.2	
			800						8.0	20	7.5	0.2	
	DC	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	

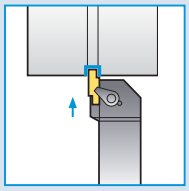
● : Stock item ○ : Under preparing for stock

GFT

For Deep and Wide grooving

GW





• R type insert

(mm)

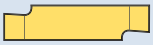
Designation		Stock R	Stock L	H=(h)	W	L	ℓ	S	Parts / Inserts	Clamp	Screw	Pin	Wrench
GFT	320R/L	●		20	20	125	23.5	25	GW110~300R/L,BF3	CS5R1	DHA0514	PN0308	HW25L
	325R/L	●	●	25	25	150	23.5	32					
	525R/L	●		25	25	150	25.5	32	GW315~500R/L,BF5	CS6R1	DHA0617	PN0312	HW30L
	825R/L	●		25	25	150	28.5	32	GW600~800R/L,BF8	CS8R1	DHA0820	PN0314	HW40L

• Use same hand of tools

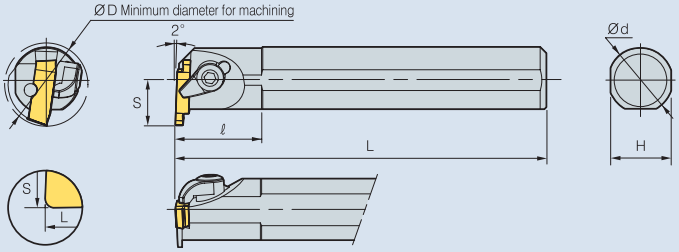
● : Stock item ○ : Under preparing for stock

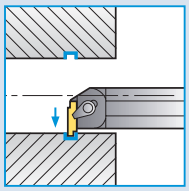
GFIP

For Deep and Wide grooving



BF
GW





• R type insert

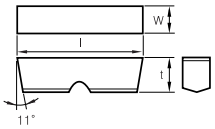
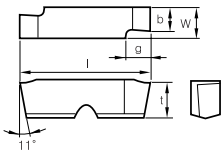
(mm)

Designation		Stock R	Stock L	øD	ød	H	L	ℓ	S	Parts / Inserts	Clamp	C-ring	Screw	Pin	Wrench
GFIP	316R	●	●	20	16	15	150	17	11	GW110L-300R/L, BF3	CS5R2	CR04	CHX0513	PN0310	HW25L
	320R	●		26	20	18	150	22	13						
	325R	●		32	25	23	200	22	17		CS6R2	CR05	CHX0616	PN0310	HW30L
	340R	●		50	40	37	300	32	27						
	525R	●		32	25	23	200	22	17	GW315L-500R/L, BF5					
	540R	●		50	40	37	300	32	27						
	840R	●		50	40	37	300	32	27	GW600L-800R/L, BF8	CS8R1	-	DHA0820	PN0314	HW40L

• Use right-hand insert for left-hand holder

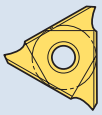
● : Stock item ○ : Under preparing for stock

Available Inserts

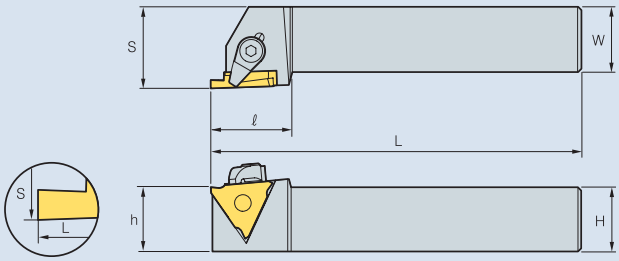
Application	Picture	Designation		Uncoated ST30A R	Uncoated ST30A L	Dimensions (mm) b	g	W	l	t	Configuration
Internal grooving	BF	BF	-3	●		-	-	3.1	16.4	5.26	
			-5	●		-	-	5.1	22.4	6.26	
			-8	●		-	-	8.1	27.4	7.26	
Grooving(Deep & Wide)	GW	GW	110R/L	●	●	1.1	2.1	3.1	16	5.0	
			130R/L	●	●	1.3	2.3	3.1	16	5.0	
			160R/L	●	●	1.6	2.6	3.1	16	5.0	
			185R/L	●	●	1.85	2.9	3.1	16	5.0	
			215R/L	●	●	2.15	3.2	3.1	16	5.0	
			265R/L	●	●	2.65	3.7	3.1	16	5.0	
			300R/L	●	●	3.0	4.0	3.1	16	5.0	
			315R/L	●	●	3.15	4.2	5.1	22	6.0	
			415R/L	●	●	4.15	5.2	5.1	22	6.0	
			500R/L	●	●	5.0	6.0	5.1	22	6.0	
			600R/L	●	●	6.0	7.1	5.1	22	7.0	
			800R/L	●	●	8.0	9.0	5.1	22	7.0	

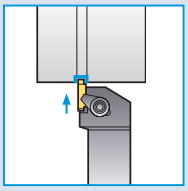
● : Stock item ○ : Under preparing for stock

TBH For Narrow grooving



TB





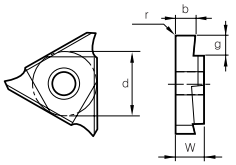
• R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	ℓ	S	Parts / Inserts	Clamp	Clamp Screw	Wrench
TBH	320-23R/L	○		20	20	125	25.5	25	TB3125-3230	CS6R1	DHA0617	HW30L
	320-33R/L	○		20	20	125	25.5	25	TB3280-3330			
	320-43R/L	○		20	20	125	25.5	25	TB3430			
	325-23R/L	●		25	25	150	25.5	30	TB3125-3230			
	325-33R/L	●		25	25	150	25.5	30	TB3280-3330			
	325-43R/L	●		25	25	150	25.5	30	TB3430			
	420-23R/L	●		20	20	125	25.5	25	TB4125-4230			
	420-33R/L	●		20	20	125	25.5	25	TB4250-4330			
	420-45R/L	●		20	20	125	25.5	25	TB4350-4450			
	425-23R/L	●		25	25	150	25.5	30	TB4125-4230			
	425-33R/L	●		25	25	150	25.5	30	TB4250-4330			
	425-45R/L	●		25	25	150	25.5	30	TB4350-4450			

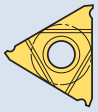
● : Stock item ○ : Under preparing for stock

Available Inserts

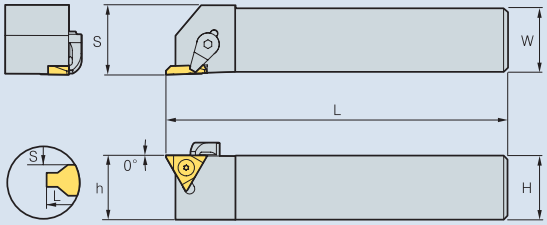
Application	Picture	Designation		Coated NC3010	Coated NC3120	Cermet CT10	Cermet CN20	Uncoated ST20	Dimensions (mm) b	g	W	r	d	Configuration
Narrow grooving	TB	TB	3125R				○		1.25	1.5	4.76	0.2	9.525	
			3145R				○		1.45	1.5	4.76	0.2	9.525	
			3175R				○		1.75	2.5	4.76	0.2	9.525	
			3185R				○		1.85	2.5	4.76	0.2	9.525	
			3200R				○		2.00	2.5	4.76	0.2	9.525	
			3230R				○	●	2.30	3.5	4.76	0.3	9.525	
			3280R				○		2.80	3.5	4.76	0.3	9.525	
			3330R				○		3.30	3.5	4.76	0.3	9.525	
			3430R				○		4.30	3.5	4.76	0.4	9.525	
			4125R				●		1.25	2.0	4.76	0.2	12.7	
			4145R				●		1.45	2.0	4.76	0.2	12.7	
			4150R				●		1.50	3.5	4.76	0.2	12.7	
			4175R				●		1.75	3.5	4.76	0.2	12.7	
			4185R				●		1.85	3.5	4.76	0.2	12.7	
			4200R			●	●		2.00	3.5	4.76	0.2	12.7	
			4215R						2.15	3.5	4.76	0.2	12.7	
			4230R				●		2.30	3.5	4.76	0.2	12.7	
			4250R				●		2.50	4.0	4.76	0.3	12.7	
			4265R						2.65	4.0	4.76	0.3	12.7	
			4280R				●		2.80	4.0	4.76	0.3	12.7	
			4300R				●		3.00	4.0	4.76	0.3	12.7	
			4330R				●		3.30	4.0	4.76	0.3	12.7	
			4350R						3.50	5.0	4.76	0.3	12.7	
			4400R						4.00	5.0	4.76	0.4	12.7	
			4430R				●		4.30	5.0	4.76	0.4	12.7	
			4450R						4.50	5.0	4.76	0.4	12.7	

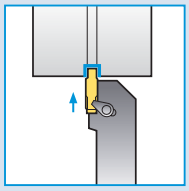
● : Stock item ○ : Under preparing for stock

GH For O-ring grooving Snap-ring grooving



GO
GS





• R type insert

(mm)

Designation		Stock R	Stock L	H=(h)	W	L	S	Parts / Inserts	Clamp	Clamp Screw	Screw	Wrench
GH	2020R/L-3	●		20	20	125	22	GS 125~280	CS6R1	DHA0617	PTMA03508	TW09P-HW30L
	2525R/L-3	●		25	25	150	27	GO 250				
	2020R/L-4	●		20	20	125	21	GS 330 / 430				
	2525R/L-4	●		25	25	150	26	GO 320 / 410				

• Use same hand of tools

● : Stock item ○ : Under preparing for stock

Available Inserts

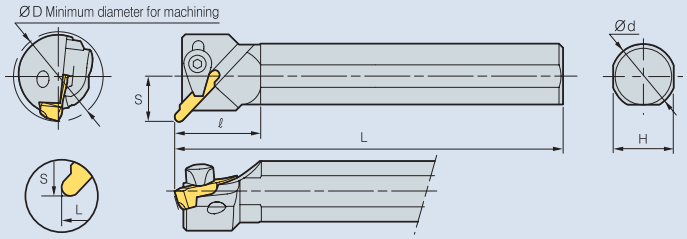
Application	Picture	Designation		Coated NC3010	Coated NC3120	Uncoated H01	Uncoated ST20	Uncoated ST30A	b	g	W	r	d	Configuration
Grooving(Narrow · O-ring · Snap-ring)	GO	GO	250				●		2.5	1.5	3.3	0.35	9.525	
			320				●		3.2	2.0	3.8	0.35	9.525	
			410						4.1	2.5	4.5	0.65	9.525	
	GS	GS	125				●		1.23	1.5	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	

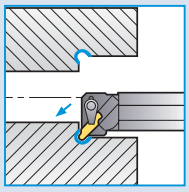
(mm)

● : Stock item ○ : Under preparing for stock

GFIK For Reliefing

GR





• R type insert

(mm)

Designation		Stock R	Stock L	ØD	Ød	H	L	ℓ	S	Parts / 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		CH5R2	CR04	CHX0513	PN0310	HW25L
	340R/L			50	40	37	300	35.4	27		CS5R1	-	CHA0514	PN0310	HW25L
	525R/L	○		32	25	23	200	27.5	17	GR5□□	CS6R1	-	CHA0617	PN0314	HW30L
	540R/L	○		50	40	37	300	39.5	27						
	840R/L	○		50	40	37	300	41.8	27	GR8□□	CS8R1	-	CHA0820	PN0314	HW40L

● : Stock item ○ : Under preparing for stock

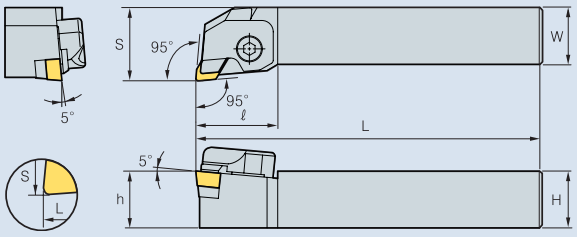
Available Inserts

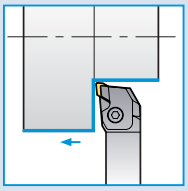
Application	Picture	Designation		Coated NC3010	Coated NC3120	Uncoated H01	Uncoated ST20	Uncoated ST30A	b	g	W	l	t	r	Configuration
Relief	GR	GR	310R						2.0	2.0	3.1	15.9	5.0	1.0	
			315R						3.0	2.9	3.1	15.9	5.0	1.5	
			520R						4.0	4.0	5.1	21.9	6.0	2.0	
			525R						5.0	5.0	5.1	21.8	6.0	2.5	
			830R						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 ○ : Under preparing for stock

EH Regrinding type insert

ESB





• R type insert

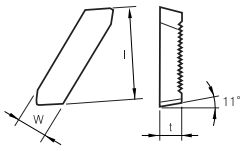
(mm)

Designation		Stock	W	H(h)	L	ℓ	S	Parts / Inserts	Clamp	Clamp Screw	Chip Breaker	Shim	Shim Screw	Wrench
EH	620R	●	20	20	125	36	27	ESB 34	CTH 6R2	BHA0616	CB20	SES33C	SHX0310	HW50L HW20L
	625R	●	25	25	150	36	32							

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Uncoated ST10	Uncoated ST20	Dimensions (mm) W	l	t	Configuration
General	ESB	ESB 34		●	9.525	30.0	6.35	

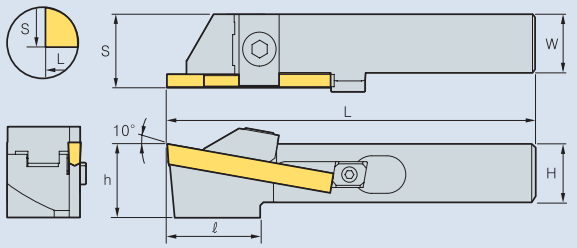


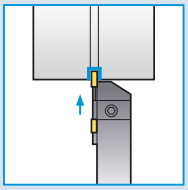
● : Stock item ○ : Under preparing for stock

PH

For Parting off Deep grooving

POB





• R type insert

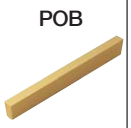
(mm)

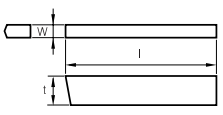
Designation		Stock R	Stock L	W	H	L	ℓ	S	h	Max. (Ø)	Parts / Inserts	Clamp	Clamp Screw	Stopper	Stopper Screw	Wrench
PH	320R/L	●		19	19	150	34	22.25	19	30	POB300	CGH6R1	BHA0616	STP5	KHD0510	HW25L-HW50L
	325R/L	●		19	25	150	34	22.25	25	40						
	420R/L	●		19	19	150	34	23.5	19	30	POB400	CGH6R2	BHA0616	STP5	KHD0510	HW25L-HW50L
	425R/L	●		19	25	150	34	23.5	25	40						
	520R/L	●		19	19	150	34	24.4	19	50	POB500	CGH6R3	BHA0616	STP5	KHD0510	HW25L-HW50L
	525R/L	●		19	25	150	34	24.4	25	50						

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Uncoated ST10	Uncoated ST20	Dimensions (mm) W	l	t	Configuration
Parting off	POB	POB 300		●	3.0	55	6.0	
		400		●	4.0	55	7.0	
		500		●	5.0	55	8.0	





● : Stock item ○ : Under preparing for stock

Features of MGT

■ Features

- 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 roughness. Even in high feed applications by using a wiper function, Korloy ensures excellent surface roughness even in roughing operation

■ Geometry of chip breaker

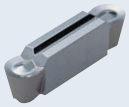
• In your description of the inserts, I recommend the following adjustments.

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.

■ Parting off (MGMN / MGMR/L)

Workpiece	Cutting Speed										Feed				
	CVD				PVD					Uncoated	Cutting width (mm)				
	NC3120	NC3030	NCM315	NC500H	PC230	PC8010	PC9030	PC3525	PC6510	ST30A	2	3	4	5	6
SM□□C	80~180				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			〃	〃	〃	〃	〃
GC/GCD									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	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							Feed		
	CVD			PVD			Uncoated	Cutting width (mm)		
	NC6110	NC3030	NC3120	PC3525	PC215K	PC8010/PC9030	H01	3	4	5
SM□□C			100~160					0.05~0.1	0.05~0.12	0.05~0.15
SCM		50~130	50~130	50~130				0.05~0.1	0.05~0.12	0.05~0.15
GC/GCD	120~150				120~150			0.05~0.1	0.05~0.12	0.05~0.15
STS						60~150		0.05~0.1	0.05~0.12	0.05~0.15
Non-ferrous metal(AL, Copper)							200~800	0.05~0.15	0.08~0.15	0.08~0.15

■ Grooving, Turning (MGMN / MRMN)

Workpiece	Cutting Speed											Feed					
	CVD			PVD				Cermet		Uncoated		Cutting width (mm)					
	NC3010	NC3120	NC3030	PC215K	PC9030	PC230	PC3525	CN20	CT10	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		80~120	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		80~160	80~180	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							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						60~100		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)				150~300						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

Turning and Grooving

■ Selection of Insert

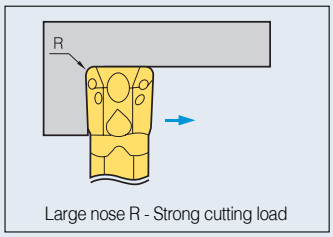
Insert edge width

- The width of the insert contributes to its strength, when possible a machinist should try to use the widest width possible.
- The width of the cutting edge will help determine the range of chip control allowed by an insert.
- The narrower the insert's edge, the better the chip control at lower feeds.
- Using the wider edge of an insert when is the optimal choice when trying to increase cutting speed.

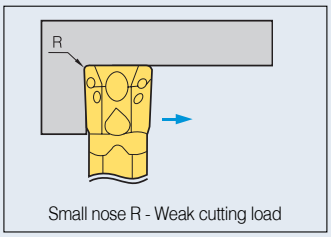
Recommendation of external turning

• Corner radius size

- A larger radius extends tool life, use the largest radius insert possible.
- In case of high cutting load pressure, you can use a smaller nose radius, lower feed rates or use a narrower insert.



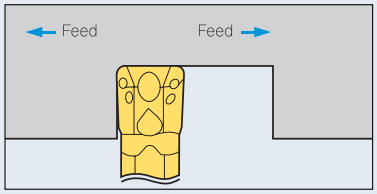
Large nose R - Strong cutting load



Small nose R - Weak cutting load

• Cutting speed

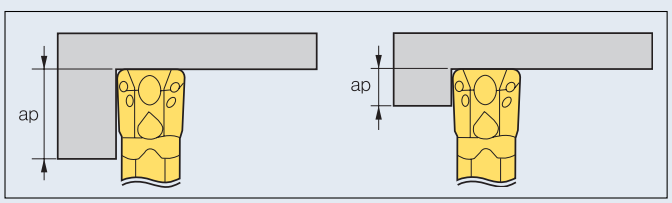
- It is always recommended that you do exceed Korloy's cutting speed recommendations.
- The insert's maximum feed rate depends on insert's characteristics as well as what a machine can accept for cutting load pressure.
- A smaller nose radius reduces an insert's tool life in high feed applications.
- The maximum feed rate should not exceed the tool's radius.
- In grooving applications, chip evacuation problems can be remedied by using step feed methods at small intervals.



Max. Feed :
Fmax = W x 0.075

• Depth of cut

- The minimum depth of cut should not exceed the insert's nose radius.
- The maximum depth of cut depends of a machine's cutting load capabilities.

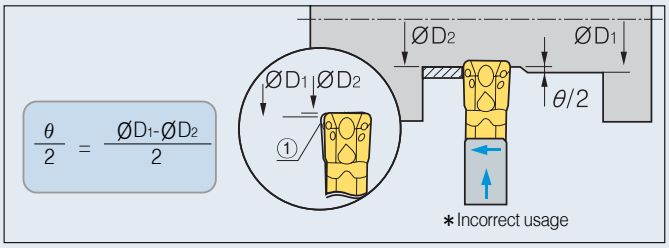


■ Notice for turning

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)

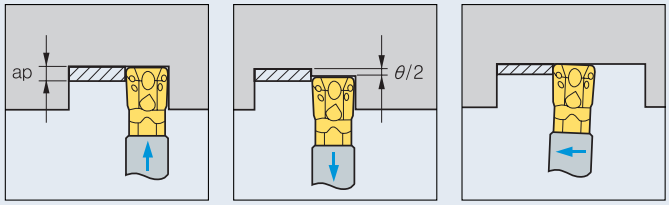
After desired diameter is grooved, continuous turning operation might cause some deflection of the workpiece. In these cases follow the given formula, offsetting these factors enables the desired diameter that you want.



To eliminate the difference in the machined diameter by utilizing the clearance angle *(which generates commonly while final turning operation)* follow the directions above when machining.

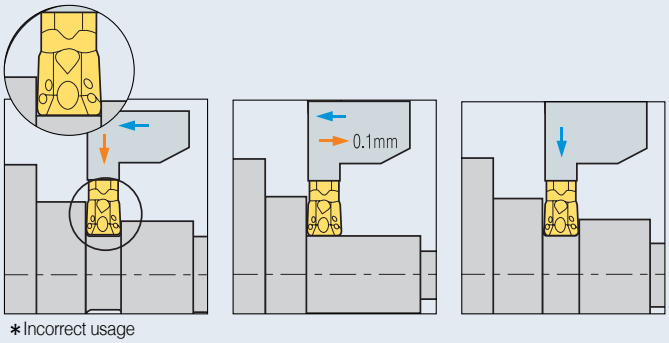
To obtain a good surface roughness without offsetting in an application follows the directions below.

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.



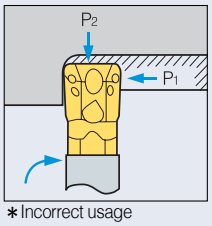
■ Notice for MGT turning applications

M.G.T 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.



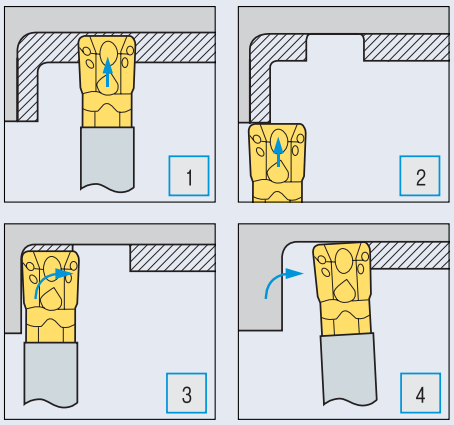
∗Incorrect usage

■ Machining workpiece with a radius smaller than the insert's corner radius



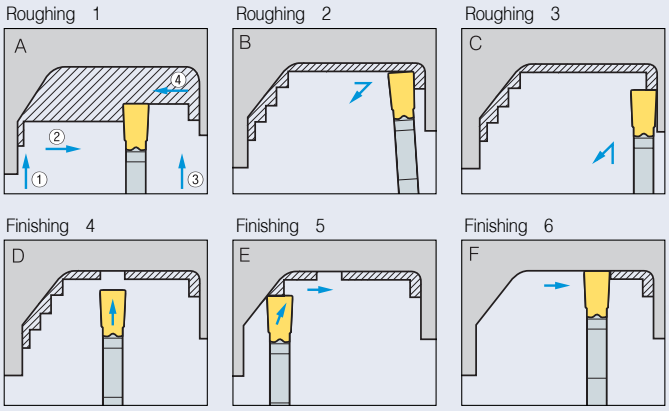
*Incorrect usage

Stabilize your tool pressure. 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.



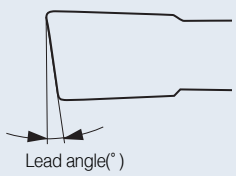
■ Notice for wide grooving

An important benefit of the MGT tool is the ability to machine between walls. Follow a line of continuous machining. When most of the material is machined pull back the tool to profile.



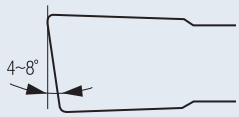
Parting off & Grooving

■ Insert

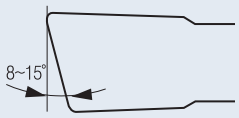


- **Lead angle applications**
  - **4°** - Pipe (Tubing and hollow bar)
  - **6°** - Pipe and solid bar
  - **8°** - Solid bar
  - **15°** - Small diameter Solid bar

Lead angle 0° (Neutral)
- Parting off on solid bar type.
- Occurring the center stub when parting off.
- Prevent to be deflected workpiece by cutting diretion during parting off.
- Availble for use deep parting depth.



Lead angle 4°~8°
- Reduce the center stub when parting off on solid bar type.
- Reduce the burr when parting off on tubing or hollow bar type.



Lead angle 8°~15°
- Parting off on small diameter and hollow bar type.
- Reduce the burr and center stub when parting off on small diameter solid bar type.

■ Selection of Insert

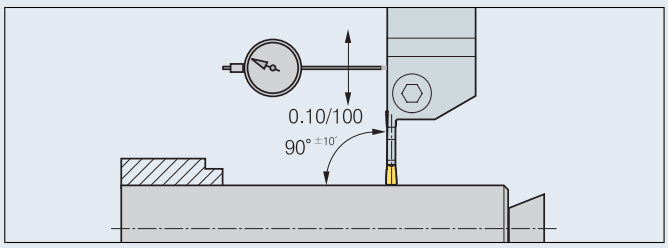
To properly match the insert and cutting condition, the following factors should be considered.
- Width of insert.
- Chip breaker.
- Grade and nose R.

• **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 decrease tool life. In the case where burrs are acceptable, we recommend using a neutral type insert.

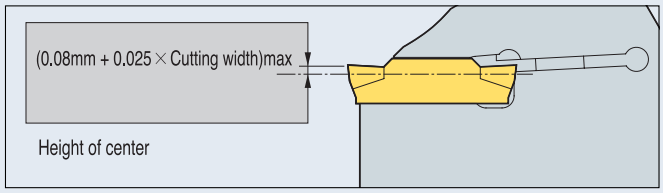
■ Setting of Holders

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 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
- Decrease 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.

■ Trouble Shooting

1. To improve surface roughness
   - Increase cutting speed
   - Use a neutral type insert.(0 degree lead angle)
   - Use the proper chip breaker for better chip control
   - Use a coated insert
   - Use proper coolant an amount
   - Reduce factors that lead to tool vibration

2. To improve straightness
   - Replace inserts that are worn or that have any chipping
   - Use neutral type insert.(0 degree lead angle)
   - Use a holder with a minimal overhang
   - Confirm a perpendicular angle (90 degrees) between the cutting edge and the machine axis
   - Tightly fixture the work piece to the machine

3. To improve chip control
   - Choose the proper chip breaker
   - Use a neutral type insert.(0 degree lead angle)
   - Replace worn insert corner to a new corner or insert.
   - Confirm a perpendicular angle (90 degree) from the cutting edge and the machine axis
   - Use proper coolant an amount
   - Increase feed rates accordingly
   - If the long chip curling is grown when grooving, step feed at small intervals

4. To minimize burrs
   - Reduce feed by 50% on approaching when approaching desired diameter.
   - Place the inserts edge height along the center line of the workpiece.
   - Use right or left handed inserts with lead angle.
   - When using a neutral insert, use an insert with a small cutting width.
   - Match the center line exactly and the supporting parts.
   - When machining hollow bars or pipes, we recommend chamfering the work piece with an internal boring bar before parting.

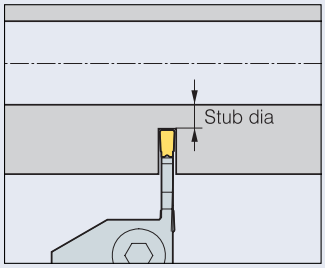


Fig.1

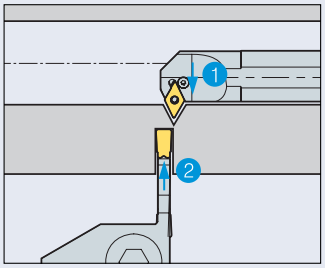


Fig.2

5. To prevent insert fracture along the cutting edge
   - Use the proper geometry and insert grade.
   - Use an insert with a larger corner radius.
   - Reduce factors that lead to tool vibration
   - Use proper coolant an amount
   - Decrease feed rates at about 50% around the surrounding center part.

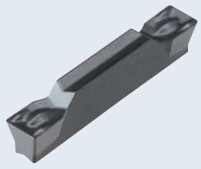
6. To reduce built-up edge
   - Use the proper geometry and insert grade
   - Increase cutting speed.
   - Use proper coolant an amount

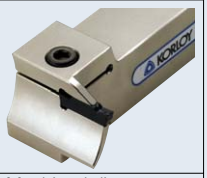
7. Parting off eccentric tube

   For tube operations, we recommend an insert with a 4 degree lead angle. However, poor machine precision and eccentric tubes may increase “feed-snap” and lead to insert damage. In these cases, we recommend an 8 degree insert with a larger lead angle.

Face grooving tools

■ For Shallow Grooving

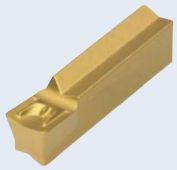
MFMN300	MGMN400-M
	
Cutting width 3mm	Cutting Width 4mm

Vertical MGFHR	Horizontal MGFVR
	
Machined diameter Ø24~200mm	Machined diameter Ø24~60mm

Features

- 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.

■ For Deep Grooving

FGD	FGM	FMM
		
Deep face grooving (G class)	Wide face grooving turning (G class)	Wide face grooving turning (M class)

Vertical FGHH	Horizontal FGVH
Machined diameter Ø25~140mm	Machined diameter Ø25~140mm

Features

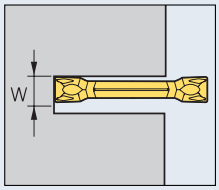
- These tools are suitable for deep grooving with a single cutting edge. (Tmax 25mm)
- A variety of chip breakers enable a machinist to apply a wide range of functions in machining.
- A variety of holders ensures multiple application ranges.

Note

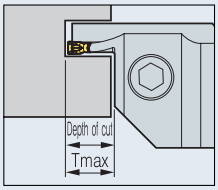
FGM and FMM have similar application rages but are NOT interchangeable with each other's holder.

■ Selection System of Holder

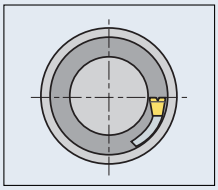
Follow these 3 simple directions to choose the right insert and holder for your application.



- Choose the insert and holder that best applies to your application according to the cutting width and workpiece shape to be machined.



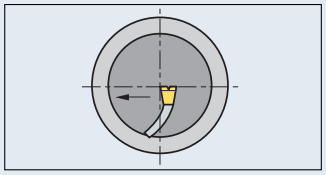
- Choose the holder with the shortest overhang that will still meet the cutting depth required



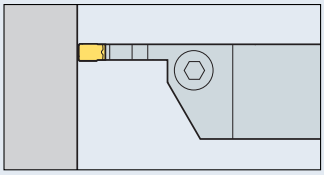
- Choose the largest size of shank depending on the initial grooving diameter required in the application.

■ Notice for Face Grooving

Before machining, check and adjust the following holder position.



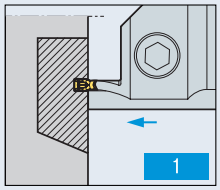
- Check the cutting edge height at the center of the workpiece.
- Machine towards the center and check for burrs.



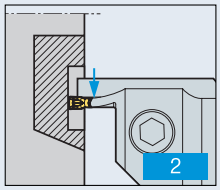
- For better surface roughness, set up the insert in order to perpendicular at center line.

■ Optimization of Face Grooving

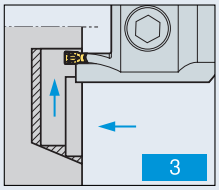
Roughing: When face grooving decrease the cutting speed 40% below a normal face turning operation.



Grooving at the initial diameter

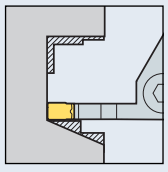


Face turning away from center

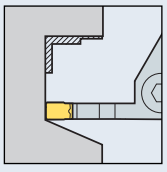


Face turning to center

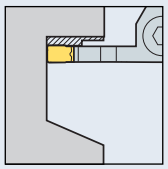
Finishing: When face grooving decrease the cutting speed 40% below a normal face turning operation.



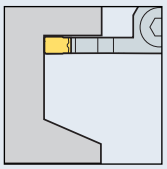
- Grooving at the initial diameter to the final cutting depth and face turning away from center.



- Radius operation toward final dimension at the bottom.



- Face turning to center.

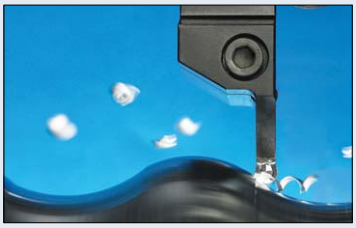


- Grooving for the right dimension you want.

MGT - Machining Al Wheels

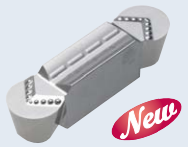
Features

- 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 insert.
- A variety of insert types for multi application functions.



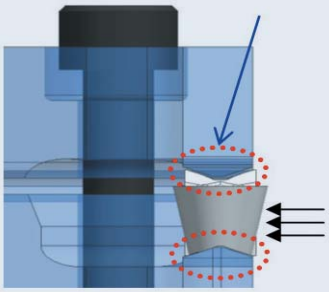
Various insert types

• 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

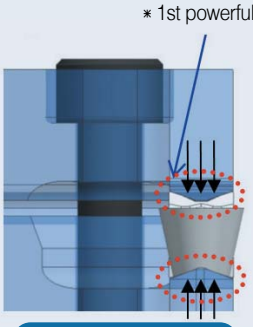
New clamping system

* Insert Centering



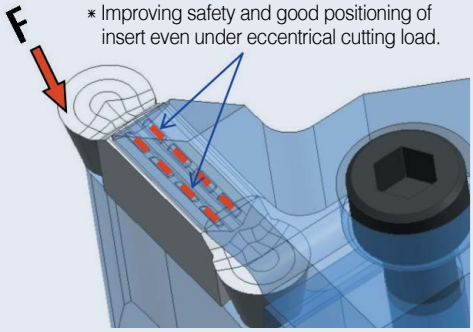
Before tightening

* 1st powerful clamping

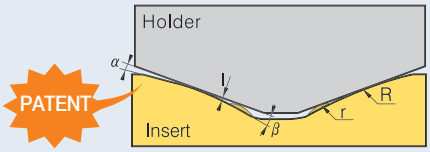


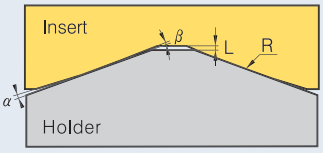
After tightening

* Improving safety and good positioning of insert even under eccentrical cutting load.



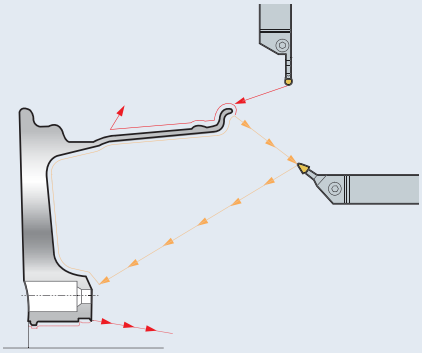
* Reinforcing the clamping force due to radius designed on the top & bottom side of insert and convex "DOT" on the top of insert.



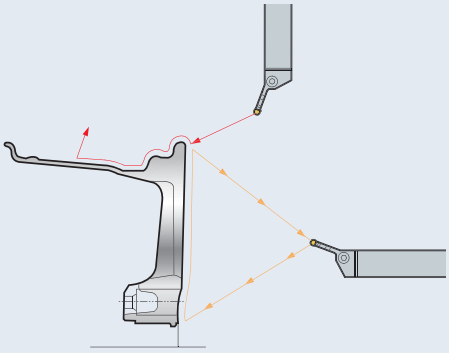


Application of Al Wheels

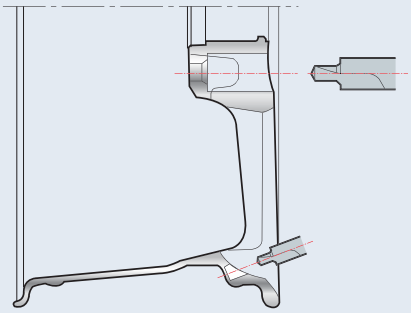
MACHINING A



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

Technical Information for Fine Tools

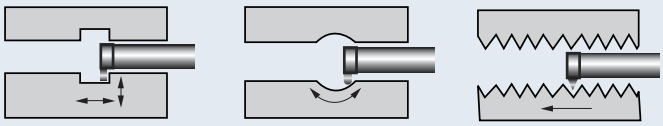
■ Application range

‣Internal grooving, Profiling, Threading and Boring at Ø8mm~Ø16mm

■ Features

‣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.
‣Guarantee long tool life due to good toughness substrate with new TiAlN.
‣Adopting accurate ground insert ensures high precision machining.

■ Application examples



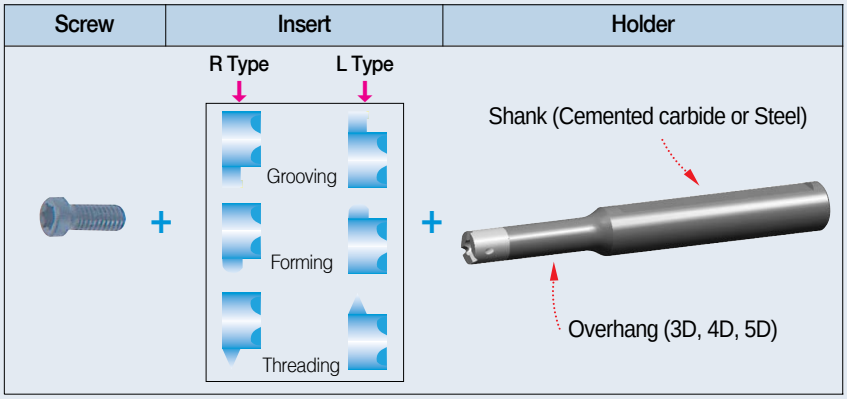
(Grooving, Turning) (Forming) (Threading)

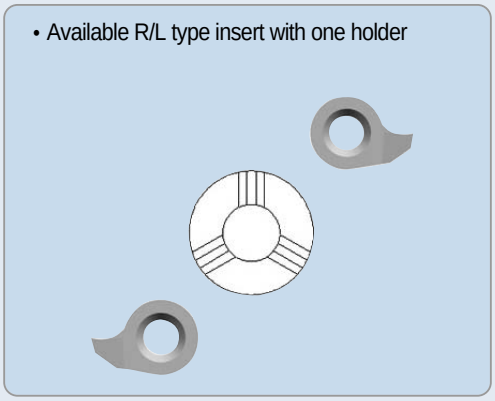
■ Recommended cutting condition

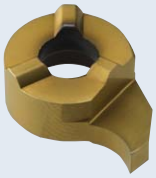
Workpiece	Grade	Cutting Condition				
		Minimum diameter for machining (Ø Dmin)				
	PC130		Ø8	Ø11	Ø14	Ø16
Carbon steel	◎	vc	30~80	30~100	30~100	30~100
		fn	0.01~0.04	0.01~0.05	0.02~0.05	0.02~0.06
Alloy steel	◎	vc	30~80	30~100	30~100	30~100
		fn	0.01~0.02	0.01~0.04	0.02~0.04	0.02~0.05
Cast iron	○	vc	30~80	30~100	30~100	30~100
		fn	0.01~0.05	0.01~0.05	0.02~0.05	0.02~0.05
Non-ferrous alloy	○	vc	70~150	100~150	100~150	100~150
		fn	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 1mm, work to the step feed rate.

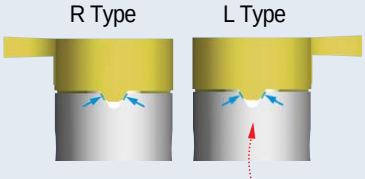
■ Clamping system







Stable clamping according to the tripod structure

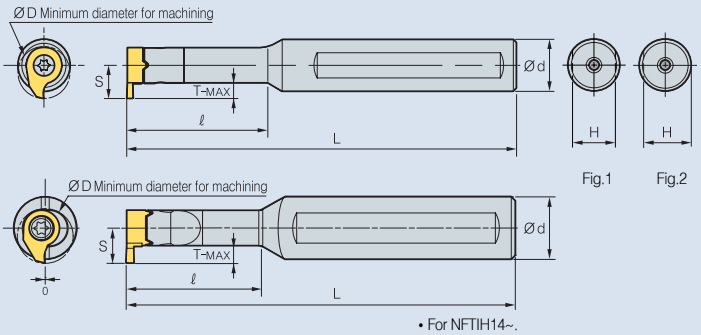


No-Spin-System design for strong clamping

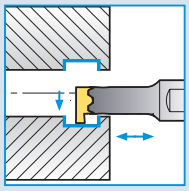
NFTIH

New

NFTF
NFTT
NFTG



• For NFTIH14~.



• R type insert

Designation		Stock	Dimensions (mm) ØD	Ød	L	ℓ	T-MAX	H	S	Applicable inserts NFTG : Grooving NFTT : Threading NFTF : Forming	Parts Screw	Wrench	Side lock Fig.
NFTIH	08206C	●	8	6	65	-	1.0	4	4.8	NFTG08000R/L NFTT08000R/L NFTF08000R/L	PTKA02508	TW08P	1
	08212C	●	8	12	70	15.5	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	NFTG11000R/L NFTT11000R/L NFTF11000R/L	PTKA03510	TW15P	2
	11212C	●	11	12	75	20	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	4.0	9.0	NFTG14000R/L NFTT14000R/L NFTF14000R/L	PTKA0412	TW15P	2
	14016C	●	14	16	75	20	4.0	4.0	9.0				
	14112C	●	14	12	100	34	4.0	4.0	9.0				
	14116C	●	14	16	100	34	4.0	4.0	9.0				
	14212C	●	14	12	110	45	4.0	4.0	9.0				
	14216C	●	14	16	110	45	4.0	4.0	9.0				
	14312C	●	14	12	130	64	4.0	4.0	9.0				
	14312S	○	14	12	130	64	4.0	4.0	9.0				
	14316C	●	14	16	130	64	4.0	4.0	9.0				
	16312C	●	16	12	130	48	4.3	11	10.2	NFTG16000R/L NFTT16000R/L NFTF16000R/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				

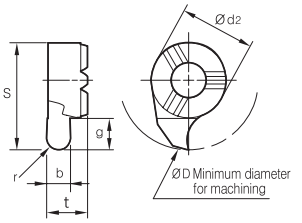
• Applicable inserts, see pages C31, C32

● : Stock item ○ : Under preparing for stock

※Code system : NFTIH 08 3 12 S

- Shank Material (S : Steel, C : Carbide)
- Shank Diameter
- Entering Depth
- Minimum Machined Diameter

Available Inserts

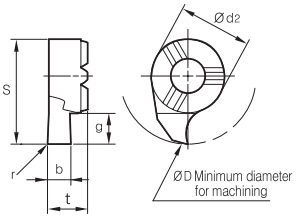
Application	Picture	Designation		Coated PC130	Coated PC215K	Dimensions (mm) ØD	b	r	S	g	Ød2	t	Configuration
Profiling	NFTF R/L New	NFTF	08082R	●		Ø 8	0.82	0.41	7.75	1.3	5.9	3.85	
			08122R	●			1.22	0.61		1.3			
			08182R	●			1.82	0.91		1.3			
			11082R	●		Ø 11	0.82	0.41	10.7	2.6	8	4.9	
			11122R	●			1.22	0.61		2.6			
			11182R	●			1.82	0.91		2.6			
			11202R	●			2.02	1.01		2.6			
			11302R	●			3.02	1.51		2.6			
			14122R	●		Ø 14	1.22	0.61	13.5	4.3	9	5.85	
			14182R	●			1.82	0.91		4.3			
			14202R	●			2.02	1.01		4.3			
			14222R	●			2.22	1.11		4.3			
			14302R	●			3.02	1.51		4.3			
			16182R	●		Ø 16	1.82	0.91	15.7	4.6	11	5.8	
			16222R	●			2.22	1.11		4.6			
			16302R	●			3.02	1.51		4.6			
			16402R	●			4.02	2.01		4.6			

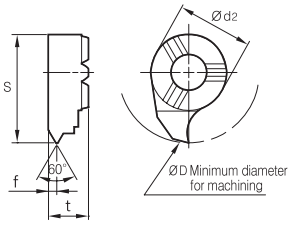
● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation		Coated PC130	Coated PC215K	ØD	b	r	S	g	Ød2	t	Pitch	f	Configuration
Grooving · Threading	NFTG R/L New	NFTG	08075R	●		Ø 8	0.75	-	7.75	1.3	5.9	3.85	-	-	
			08085R	●			0.85			1.3			-	-	
			08095R	●			0.95			1.3			-	-	
			08121R	●			1.21			1.3			-	-	
			08141R	●			1.41			1.3			-	-	
			08152R	●			1.52			1.3			-	-	
			08171R	●			1.71			1.3			-	-	
			08202R	●			2.02			1.3			-	-	
			11075R	●		Ø 11	0.75	-	10.7	1.8	8.0	4.9	-	-	
			11085R	●			0.85			1.8			-	-	
			11095R	●			0.95			1.8			-	-	
			11121R	●			1.21			2.6			-	-	
			11141R	●			1.41			2.6			-	-	
			1115 R	●			1.52			2.6			-	-	
			11171R	●			1.71			2.6			-	-	
			11202R	●			2.02			2.6			-	-	
			11202R - 02	●			2.02	0.2		2.6			-	-	
			11252R	●			2.52			2.6			-	-	
			11302R	●			3.02			2.6			-	-	
			14075R	●		Ø 14	0.75	-	13.5	1.8	9.0	5.85	-	-	
			14085R	●			0.85			1.8			-	-	
			14095R	●			0.95			1.8			-	-	
			14121R	●			1.21			4.3			-	-	
			14141R	●			1.41			4.3			-	-	
			14152R	●			1.52			4.3			-	-	
			14171R	●			1.71			4.3			-	-	
			14202R	●			2.02			4.3			-	-	
			14252R	●			2.52			4.3			-	-	
			14302R	●			3.02			4.3			-	-	
			16075R	●		Ø 16	0.75	-	15.7	1.8	11	5.8	-	-	
			16085R	●			0.85			1.8			-	-	
			16095R	●			0.95			1.8			-	-	
			16121R	●			1.21			4.6			-	-	
			16141R	●			1.41			4.6			-	-	
			16171R	●			1.71			4.6			-	-	
			16202R	●			2.02			4.6			-	-	
			16252R	●			2.52			4.6			-	-	
			16302R	●			3.02			4.6			-	-	
			16352R	●			3.52			4.6			-	-	
			16402R	●			4.02			4.6			-	-	
Threading	NFTT R/L New	NFTT	0805MR	●		Ø 8	-	-	7.75	-	6	3.85	0.5	1.0	
			0810MR	●			-			-			1.0	1.0	
			0815MR	●			-			-			1.5	1.2	
			1110MR	●		Ø 11	-	-	10.7	-	8	4.9	1.0	1.2	
			1115MR	●			-			-			1.5	1.2	
			1120MR	●			-			-			2.0	1.2	
			1125MR	●			-			-			2.5	1.2	
			1410MR	●		Ø 14	-	-	13.5	-	9	5.85	1.0	1.2	
			1415MR	●			-			-			1.5	1.2	
			1420MR	●			-			-			2.0	1.2	
			1425MR	●			-			-			2.5	1.2	
			1610MR	●		Ø 16	-	-	15.7	-	11	5.8	1.0	1.2	
			1615MR	●			-			-			1.5	1.2	
			1620MR	●			-			-			2.0	1.2	
			1625MR	●			-			-			2.5	1.2	
			1630MR	●			-			-			3.0	1.5	
			1635MR	●			-			-			3.5	1.6	
			1640MR	●			-			-			4.0	1.8	

Dimensions (mm)





• Applicable holders, see pages C31

● : Stock item ○ : Under preparing for stock

Threading D

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Thread Insert Code System ---------- D08
External / Internal Code System -------- D08

Thread Insert

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American UN ---------- D12
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Thread Holder

External Holder ---------- D22
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Technical Information for Threading

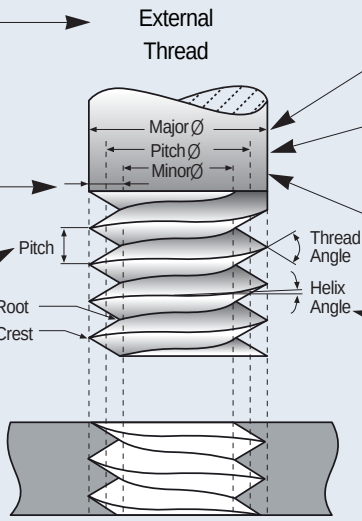
■ Special Features

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 the axis.

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.



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.

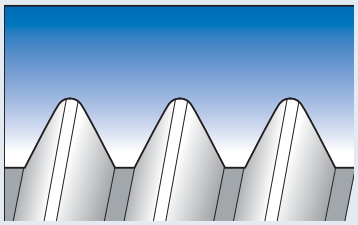
Minor Diameter
The smallest diameter of a screw thread.

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.

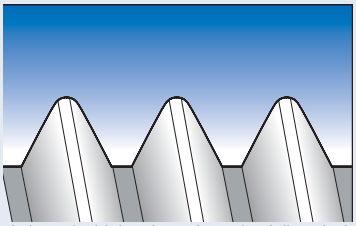
Taper Thread
A thread formed on a cone.

● Left-hand thread



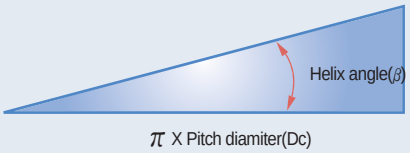
A thread which, when viewed axially, winds in a counterclockwise and receding direction. All left-hand threads are designated LH.

● Right-hand thread



A thread which, when viewed axially, winds in a clockwise and receding direction. Threads are always right-hand unless they are specified.

● The Helix Angle(β)

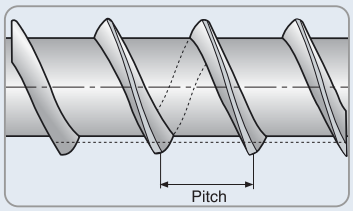


For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite of the lead.

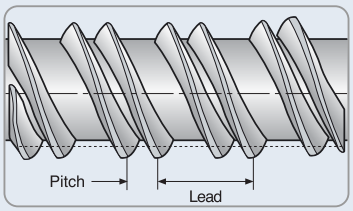
■ Machining a Multi-start Thread

A thread in which the lead is an integral multiple, greater thanone, of the pitch. A multi-start thread permits a more rapid advance without a coarser (larger) thread form.

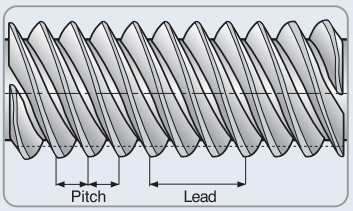
● First Start Machined



● Second Start Machined

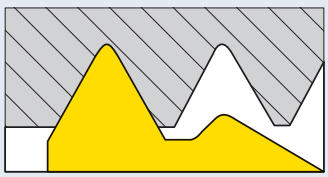


● Third Start Machined (Final, 3 Starts Thread)



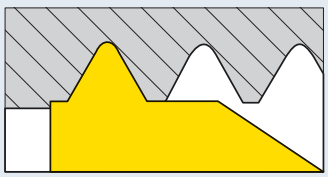
■ Insert Profile Style

● Partial Profile



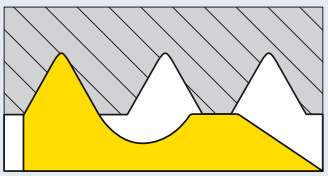
The V partial profile insert cuts without topping the outer diameter of the thread. The same insert can be used for a range of different thread pitches which have a common thread angle.

● Full Profile



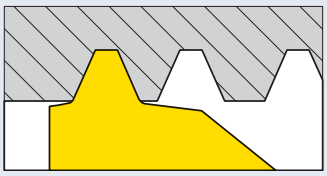
The full profile insert will form a complete thread profile including the crest. For every thread pitch and standard, a separate insert is required.

● 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.

● Semi Full

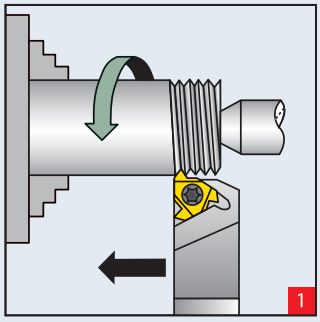


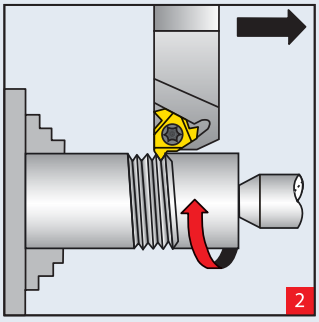
The Semi profile insert will form a complete thread including crest radius but without topping the outer diameter.
Mainly used for trapezoidal profiles.

■ Thread Turning Method

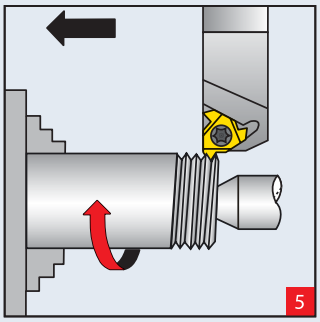
Thread	Inserts & Toolholder	Rotation	Feed Direction	Helix Method	Drawing No.
Right Hand External	EX RH	Counterclockwise	Towards chuck	Regular	1
	EX LH	Clockwise	From chuck	Reversed	2
Right Hand Internal	IN RH	Counterclockwise	Towards chuck	Regular	3
	IN LH	Clockwise	From chuck	Reversed	4
Left Hand External	EX LH	Counterclockwise	Towards chuck	Regular	5
	EX RH	Clockwise	From chuck	Reversed	6
Left Hand Internal	IN LH	Counterclockwise	Towards chuck	Regular	7
	IN RH	Clockwise	From chuck	Reversed	8

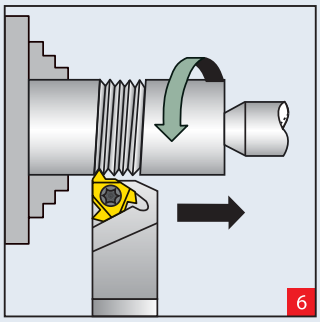
● External RH Thread



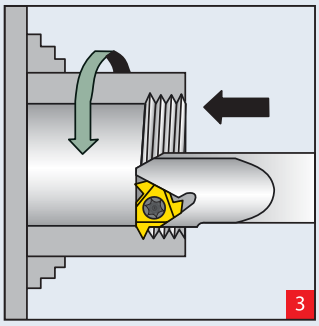


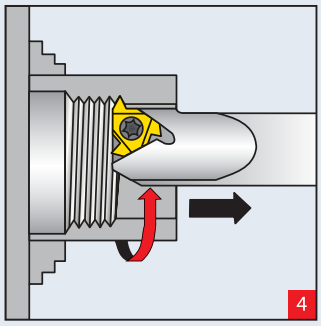
● External LH Thread



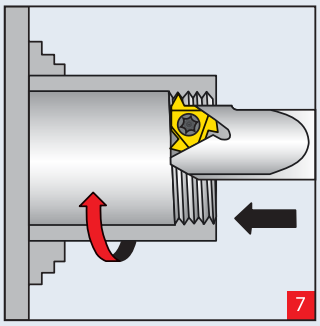


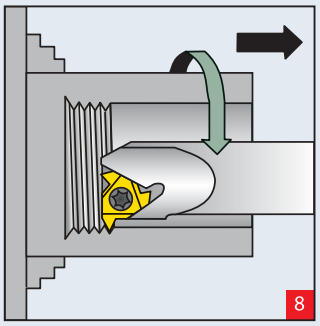
● Internal RH Thread



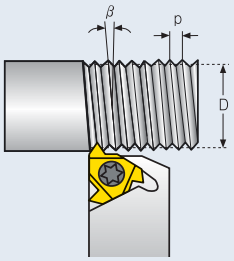


● Internal LH Thread





■ Calculating the Helix Angle(β)



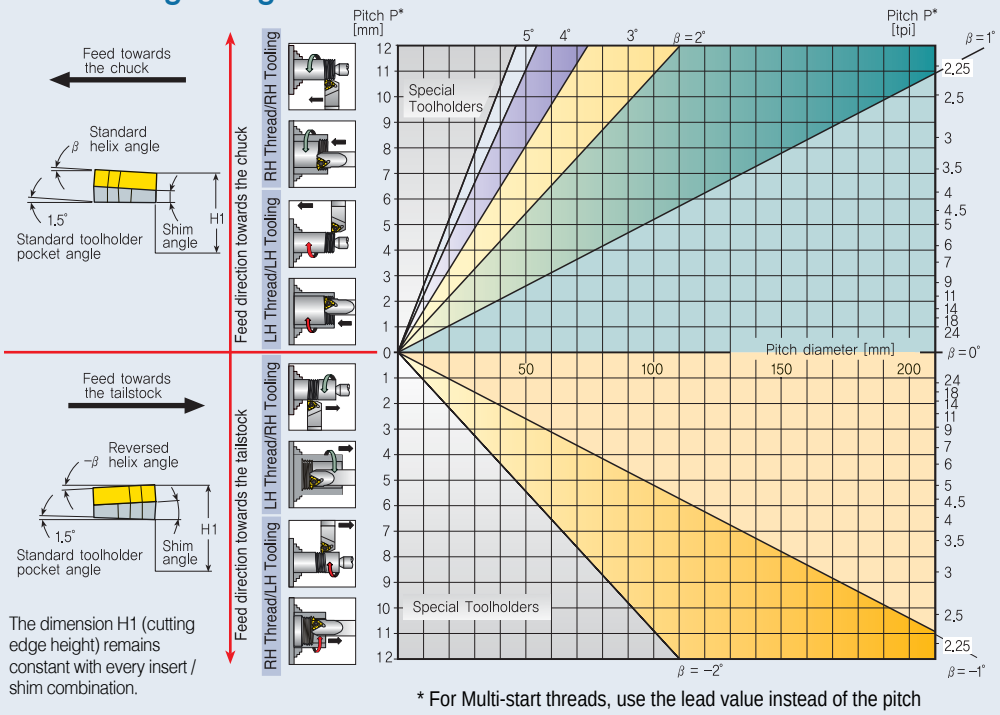
• The helix angle is calculated by the following formula :

$$\beta = \tan^{-1}\frac{P \times N}{\pi \times D}$$

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

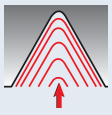
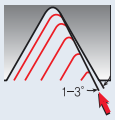


The dimension H1 (cutting edge height) remains constant with every insert / shim combination.

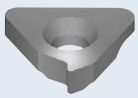
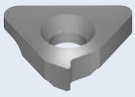
* For Multi-start threads, use the lead value instead of the pitch

Technical Information for Threading

■ Thread Infeed Method

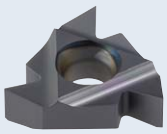
Radial Infeed	Flank Infeed (modified)	Alternate Flank Infeed
 Radial infeed is the simplest and quickest method.The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation. Radial infeed is recommended in 3 cases • when the pitch is smaller than 16 tpi • for material with short chips • for work with hardened material	 Flank infeed is recommended in the following cases. • 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 result in three cutting edges, making chip flow very difficult.	Use of the alternate flank method is recommended especially in large pitches and for materials with long chils. 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.

■ Shim

Standard Shim			Helix angle 1.5°								
ATE	ATI		Insert Size	d	9.525		12.7		15.875	
				L	16		22		27	
			Holder		ER/IL	EL/IR	ER/IL	EL/IR	ER/IL	EL/IR
			Ordering Code		ATE16	ATI16	ATE22	ATI22	ATE27	ATI27

※ Standard shim has lead angle 1.5°

■ Application grade

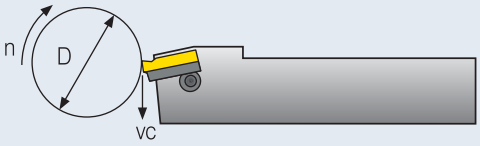
Grade	Application	Sample
PC3030T	A tough sub-micron substrate with TiAlN coating provides good fracture toughness and excellent wear resistance.	

■ Recommended Cutting Speed as per workpiece(vc)

Material			Hardness Brinell (HB)	ISO vc(m/min)
				PC3030T
P	Carbon steel	Low carbon (C=0.1-0.25 %)	125	115~190
		Medium carbon (C=0.25-0.55 %)	150	100~175
		High carbon (C=0.55-0.85 %)	170	90~155
	Low alloy steel (alloying elements ≤ 5%)	Non hardened	180	100~180
		Hardened	275	75~140
		Hardened	350	70~135
	High alloy steel (alloying elements > 5%)	Annealed	200	80~120
		Hardened	325	50~100
	Cast steel	Low alloy (alloying elements <5%)	200	70~130
		High alloy (alloying elements >5%)	225	60~120
M	Stainless steel Ferritic	Non hardened	200	70~130
		Hardened	330	50~95
	Stainless steel Austenitic	Austenitic	180	80~120
		Super austenitic	200	30~100
	Stainless steel Cast ferritic	Non hardened	200	90~120
		Hardened	330	65~110
	Stainless steel Cast austenitic	Austenitic	200	85~110
		Hardened	330	60~100
	High temperature alloy	Annealed (Iron based)	200	45~60
		Aged (Iron based)	280	30~50
		Annealed (Nickel or Cobalt based)	250	20~30
		Aged (Nickel or Cobalt based)	350	15~25
	Titanium alloy	Pure 99.5 Ti	400Rm	140~170
		a+b alloys	1050Rm	50~70
K	Extra hard steel	Hardened & tempered	55HRC	45~60
	Malleable cast iron	Ferritic (short chips)	130	70~120
		Pearlitic (long chips)	230	70~120
	Gray cast iron	Low tensile strength	180	70~130
		High tensile strength	260	60~100
	Nodular SG iron	Ferritic	160	125~160
		Pearlitic	260	90~120
	Aluminum alloy Wrought	non aging	60	100~250
		Aged	100	80~180
	Aluminum alloy	Cast	75	200~400
		Cast & aged	90	200~280
		Cast Si 13-22%	130	60~150
	Copper and copper alloy	Brass	90	80~120
		Bronze and non leaded copper	100	80~120

■ Calculation of N [RPM]

$$n = \frac{1000 \times vc}{\pi \times D} \qquad vc = \frac{\pi \times D \times n}{1000}$$



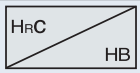
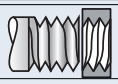
n - Revolution Per Minute [min^{-1}]
vc - Cutting Speed [m/min]
D - Workpiece Diameter [mm]

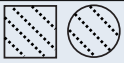
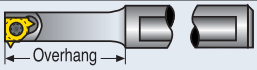
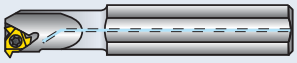
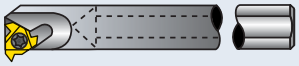
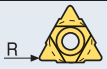
■ Number of Passes

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

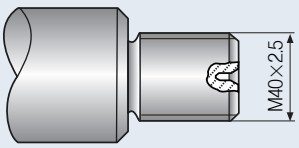
※ One cutting depth is calculated by total cutting depth divided into machining times.
ex) ER16-1.5ISO, hmin 0.92 : If 10times machining, one cutting depth is 0.092(0.92/10)

■ Cutting Condition Depends 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	

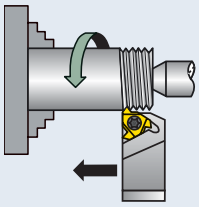
Coolant	Coolant Type	
Holders	Holder Cross Section Area	
	Holder Overhang	
	Through Coolant Option	
	Shank Type: Carbide, Alloy, Carbide Implant	
Insert	Grade	
	Profile Shape: Pitch and Depth	
	Nose Radius	
	Chipbreaker Style	

■ Step by step Thread Turning - Example



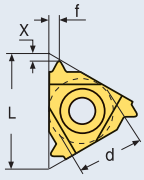
●Application Thread : External Right Hand
ISO Metric M40x2.5
Material : 4140 (25 HRC)

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

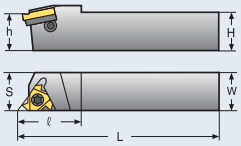


Chosen insert : **ER16 - 2.5 ISO**

Insert size		Pitch	Ordering Code	Shim	Toolholder
d	L	mm	RH	RH	
9.525	16	2.5	ER16-2.5ISO	ATE16	ERH□□-16

Technical Information for Threading

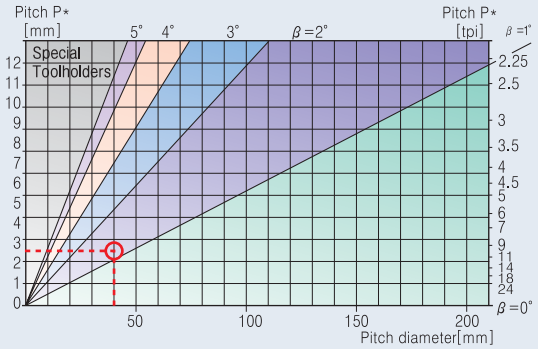
③ Choose the Toolholder



Chosen toolholder : **ERH 25 - 16**

Insert size	Ordering code	Dimensions(mm)				
d	RH	H=h	W	S	L	ℓ
9.525	ER25-16	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

Shim Chosen : **ATE16**

Resultant Helix Angle		1.5°
Insert size		Odering Code
d	L	
9.525	16	ATE16

⑥ Choose the Carbide Grade and Cutting Speed

Carbide grade chosen : PC3030T / Cutting speed : 140m/min

Material			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

⑦ Determine the Number of Passes

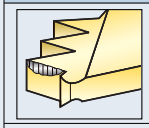
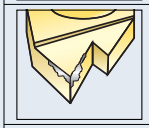
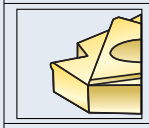
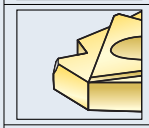
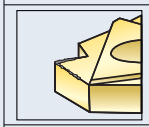
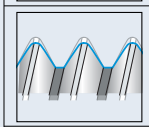
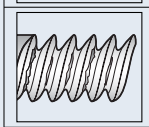
Carbide grade chosen : PC3030T / Cutting speed : 140m/min

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

■ Summary

Thread type	ISO M40 x 2.5External Right Hand
1. Feed Direction	Towards the chuck
2. Insert and Grade	ER16-2.5 ISO, PC3030T
3. Toolholder	ERH25-16
4. Helix Angle	1.5°
5. Shim	ATE16
6. Cutting Speed	140 m/min
7. Number of Passes	10

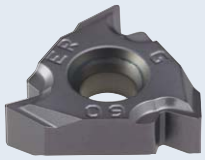
■ Trouble Shooting

Problem		Possible Cause	Solution
	Increased flank wear	Cutting speed too hight Depth of cut too low/too many passes Unsuitable carbide grade Insufficient cooling	► Reduce cutting speed/ use coated insert. ► Increase the depth of cut per pass. ► Use a coated carbide grade. ► Increase coolant flow rate.
	Uneven cutting edge wear	Incorrect helix angle Wrong infeed method	► Choose the correct shim. ► Use the Alternating Flank Infeed method.
	Extreme plastic deformation	Depth of cut too large Insufficient cooling Cutting speed too high Unsuitable carbide grade Nose radius too small	► Decrease depth of cut/ increase number of passes. ► Increase coolant flow rate. ► Reduce cutting speed. ► Use a tougher carbide. ► Use an insert with a larger radius, if possible.
	Cutting edge breakage	Depth of cut too large Extreme plastic deformation Insufficient cooling Unsuitable carbide grade Instability	► Decrease depth of cut/ increase number of passes. ► Use a tougher carbide. ► Increase flow rate and/ or correct flow direction. ► Use a tougher carbide. ► Check stability of the system.
	Built-up edge	Incorrect cutting speed Unsuitable carbide grade	► Change the cutting speed. ► Use a coated carbide.
	Thread profile is too shallow	The tool is not at the workpiece axis height Insert is not machining the thread crest Worn insert	► Change tool height. ► Measure the workpiece diameter. ► Change the cutting edge sooner.
	Poor surface quality	Cutting speed too low Wrong shim Flank infeed method is not appropriate	► Increase cutting speed. ► Choose correct shim. ► Use the alternate flank or radial infeed method.

Threading insert with chip breaker

■ Features

- Fully un-ground insert with specially designed chip breaker for smooth chip control offers reasonable cost to satisfy customer's needs.
- Korloy un-ground threading insert secures to cutting quality as well as the performance of ground insert due to the precision cutting edges.
- ISO Metric, Partial profile 60°, Partial profile 55°.



External Insert

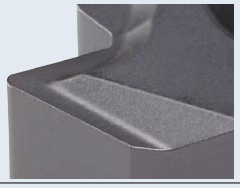
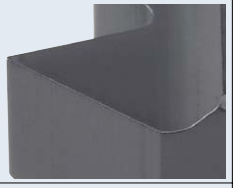
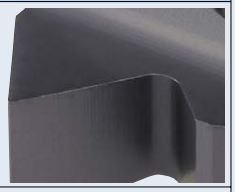
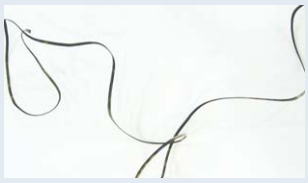
• ERM

Internal Insert

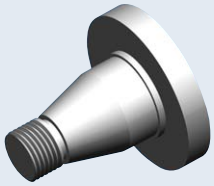
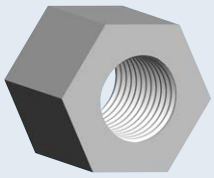
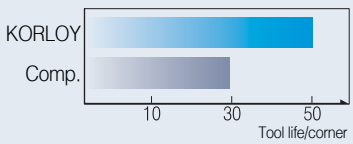
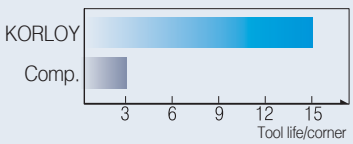
• IRM

■ Chip control test

- Workpiece : SCM440
- Designation : ERM16-1.5ISO[PC3030T] / IRM16-1.5ISO[PC3030T]
- Cutting speed : 100m/min
- Pitch : 1.5mm
- Pass : 6 times
- Wet

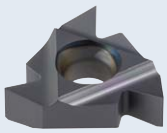
Machining	External threading		Internal threading	
Class	Un-ground Insert(ERM)	Ground Insert(ER)	Un-ground Insert(IRM)	Ground Insert(IR)
Chip breaker				
Chip				
Results	Smooth chip control due to geometry on top face makes to curled chip. → Good chip breaking.	Occurring long chip without chip breaking. → Bad performance by rolled chip at workpiece	Smooth chip curling due to double dot for chip control. → Good chip flow.	Occurring long chip without chip breaking. → Bad performance with jammed-chip at inner threading.

■ Machining Example

Korloy		ERM16-1.5ISO [PC3030T]	IRM16-2.0ISO [PC3030T]
Competitor tools		ERM16-1.5ISO [K-Maker]	IRM16-2.0ISO [S-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			
		Increased tool life with good chip breaking.	Prevention outbreak damage of insert due to smooth chip control.

Threading Insert Code System

E R M 16 – 1.5 ISO
1 2 3 4 5 6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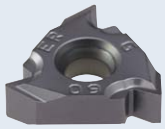

< M class >

1 E R M 16 – 1.5 ISO
Type of Insert

E : External thread
I : Internal thread

2 E R M 16 – 1.5 ISO
Hand of Insert

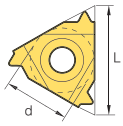
R : Right - hand
L : Left - hand

3 E R M 16 – 1.5 ISO
Class

M : With Chip Breaker

4 E R M 16 – 1.5 ISO
Insert Size

L11 : d = 6.35mm
L16 : d = 9.525mm
L22 : d = 12.7mm
L27 : d = 15.875mm



5 E R M 16 – 1.5 ISO
Pitch

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 E R M 16 – 1.5 ISO
Thread Standard

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-Sägengewinde
API
API Buttress Casing
API Round Casing & Tubing
Extreme Line Casing

Threading holder(External/Internal) Code System

E R H 10 (N) – 11 (C)
1 2 3 4 5 6 7

1 E R H 10 (N) – 11 (C)
Type of Holder

E : For External
I : For Internal

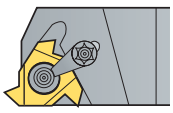
2 E R H 10 (N) – 11 (C)
Hand of Tool

R : Right - hand
L : Left - hand

3 E R H 10 (N) – 11 (C)
Name

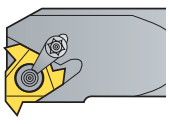
H : Holder

4 E R H 10 (N) – 11 (C)
Height of Shank(Ø)



- External

8, 10, 12, 16, 20,
25, 32, 40, 50



- Internal *

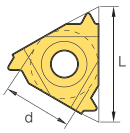
10, 12, 13, 16, 20,
25, 32, 40, 50, 60

5 E R H 10 (N) – 11 (C)
Shim

Not Shown : Shim required
N : No shim required

6 E R H 10 (N) – 11 (C)
Insert Size

L11 : d = 6.35mm
L16 : d = 9.525mm
L22 : d = 12.7mm
L27 : d = 15.875mm



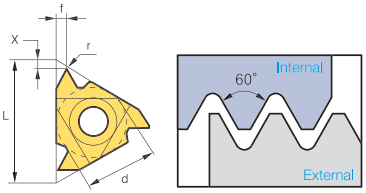
7 E R H 10 (N) – 11 (C)
Clamping System

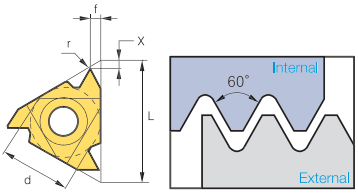
Not Shown : Shim required
C : Clamp on system

* Please refer to detail specification for shank diameter

Partial profile 60°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	TPI	Dimensions (mm) d	L	r	X	f	Picture
External	ER11-A60	○	○	EL11-A60	○	○	0.5-1.5	48-16	6.35	11	0.05	0.8	0.9	
	ER16-A60	●	○	EL16-A60	●	●	0.5-1.5	48-16	9.525	16	0.05	0.8	0.9	
	New ERM16-A60	●	○				05-1.5	48-16	9.525	16	0.05	0.8	0.9	
	ER16-G60	●	○	EL16-G60	○	○	1.75-3.0	14-8	9.525	16	0.27	1.2	1.7	
	New ERM16-G60	●	○				1.75-3.0	14-8	9.525	16	0.27	1.2	1.7	
	ER16-AG60	●	○	EL16-AG60	○	○	0.5-3.0	48-8	9.525	16	0.08	1.2	1.7	
	New ERM16-AG60	●	○				0.5-3.0	48-8	9.2525	16	0.08	1.2	1.7	
	ER22-N60	●	○	EL22-N60	○	○	3.5-5.0	7-5	12.7	22	0.53	1.7	2.5	
	New ERM22-N60	●	○				3.5-5.0	7-5	12.7	22	0.53	1.7	2.5	
	ER27-Q60	●	○	EL27-Q60	○	○	5.5-6.0	4.5-4	15.875	27	0.64	2.1	3.1	
Internal	IR11-A60	●	○	IL11-A60	○	○	0.5-1.5	48-16	6.35	11	0.05	0.8	0.9	
	New IRM11-A60	●	○				0.5-1.5	48-16	6.35	11	0.08	0.8	0.9	
	IR16-A60	●	○	IL16-A60	○	○	0.5-1.5	48-16	9.525	16	0.05	0.8	0.9	
	New IRM16-A60	●	○				0.5-0.5	48-16	9.525	16	0.08	0.8	0.9	
	IR16-G60	●	○	IL16-G60	○	○	1.75-3.0	14-8	9.525	16	0.16	1.2	1.7	
	New IRM16-G60	●	○				1.75-3.0	14-8	9.525	16	0.12	1.2	1.7	
	IR16-AG60	●	○	IL16-AG60	○	○	0.5-3.0	48-8	9.525	16	0.05	1.2	1.7	
	New IRM16-AG60	●	○				0.5-3.0	48-8	9.525	16	0.08	1.2	1.7	
	IR22-N60	●	○	IL22-N60	○	○	3.5-5.0	7-5	12.7	22	0.30	1.7	2.5	
	New IRM22-N60	●	○				3.5-5.0	7-5	12.7	22	0.30	1.7	2.5	
	IR27-Q60	●	○	IL27-Q60	○	○	5.5-6.0	4.5-4	15.872	27	0.30	1.8	2.7	



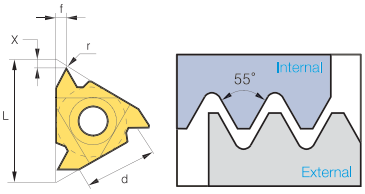


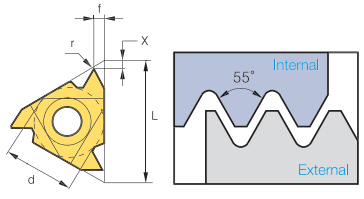
• Applicable holders, see pages D22, D23

● : Stock item ○ : Under preparing for stock

Partial Profile 55°

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	TPI	Dimensions (mm) d	L	r	X	f	Picture
External	ER11-A55	○	○	EL11-A55	○	○	0.5-1.5	48-16	6.35	11	0.05	0.8	0.9	
	ER16-A55	●	○	EL16-A55	○	○	0.5-1.5	48-16	9.525	16	0.05	0.8	0.9	
	New ERM16-A55	●	○				0.5-1.5	48-16	9.525	16	0.08	0.8	0.9	
	ER16-G55	●	○	EL16-G55	○	○	1.75-3.0	14-8	9.525	16	0.21	1.2	1.7	
	New ERM16-G55	●	○				1.75-3.0	14-8	9.525	16	0.21	1.2	1.7	
	ER16-AG55	●	○	EL16-AG55	○	○	0.5-3.0	48-8	9.525	16	0.07	1.2	1.7	
	New ERM16-AG55	●	○				0.5-3.0	48-8	9.525	16	0.07	1.2	1.7	
	ER22-N55	●	○	EL22-N55	○	○	3.5-5.0	7-5	12.7	27	0.43	1.7	2.5	
	New ERM22-N55	●	○				3.5-5.0	7-5	12.7	27	0.43	1.7	2.5	
	ER27-Q55	○	○	EL27-Q55	○	○	5.5-6.0	4.5-4	15.875	27	0.60	2.0	2.9	
Internal	IR11-A55	●	○	IL11-A55	○	○	0.5-1.5	48-16	6.35	11	0.05	0.8	0.9	
	New IRM11-A55	●	○				0.5-1.5	48-16	6.35	11	0.08	0.8	0.9	
	IR16-A55	●	○	IL16-A55	○	○	0.5-1.5	48-16	9.525	16	0.05	0.8	0.9	
	New IRM16-A55	●	○				0.5-1.5	48-16	9.525	16	0.05	0.8	0.9	
	IR16-G55	●	○	IL16-G55	○	○	1.75-3.0	14-8	9.525	16	0.21	1.2	1.7	
	New IRM16-G55	●	○				1.75-3.0	14-8	9.525	16	0.08	1.2	1.7	
	IR16-AG55	●	○	IL16-AG55	○	○	0.5-3.0	48-8	9.525	16	0.07	1.2	1.7	
	New IRM16-AG55	●	○				0.5-3.0	48-8	9.525	16	0.08	1.2	1.7	
	IR22-N55	●	○	IL22-N55	○	○	3.5-5.0	7-5	12.7	22	0.43	1.7	2.5	
	New IRM22-N55	●	○				3.5-5.0	7-5	12.7	22	0.43	1.7	2.5	
	IR27-Q55	○	○	IL27-Q55	○	○	5.5-6.0	4.5-4	15.875	27	0.60	2.0	2.9	



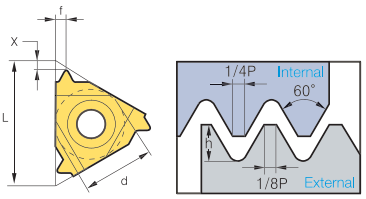


• Applicable holders, see pages D22, D23

● : Stock item ○ : Under preparing for stock

ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-0.35ISO	○	○	EL11-0.35ISO	○	○	0.35	6.35	11	0.21	0.8	0.4	
	ER11-0.4ISO	○	○	EL11-0.4ISO	○	○	0.4	6.35	11	0.25	0.7	0.4	
	ER11-0.45ISO	○	○	EL11-0.45ISO	○	○	0.45	6.35	11	0.28	0.7	0.4	
	ER11-0.5ISO	○	○	EL11-0.5ISO	○	○	0.5	6.35	11	0.31	0.6	0.4	
	ER11-0.6ISO	○	○	EL11-0.6ISO	○	○	0.6	6.35	11	0.37	0.6	0.6	
	ER11-0.7ISO	○	○	EL11-0.7ISO	○	○	0.7	6.35	11	0.43	0.6	0.6	
	ER11-0.75ISO	○	○	EL11-0.75ISO	○	○	0.75	6.35	11	0.46	0.6	0.6	
	ER11-0.8ISO	○	○	EL11-0.8ISO	○	○	0.8	6.35	11	0.49	0.6	0.6	
	ER11-1.0ISO	○	○	EL11-1.0ISO	○	○	1.0	6.35	11	0.61	0.7	0.7	
	ER11-1.25ISO	○	○	EL11-1.25ISO	○	○	1.25	6.35	11	0.77	0.8	0.9	
	ER11-1.5ISO	○	○	EL11-1.5ISO	○	○	1.5	6.35	11	0.92	0.8	1.0	
	ER11-1.75ISO	○	○	EL11-1.75ISO	○	○	1.75	6.35	11	1.07	0.8	1.1	
	ER16-0.35ISO	○	○	EL16-0.35ISO	○	○	0.35	9.525	16	0.21	0.8	0.4	
	ER16-0.4ISO	○	○	EL16-0.4ISO	○	○	0.4	9.525	16	0.25	0.7	0.4	
	ER16-0.45ISO	○	○	EL16-0.45ISO	○	○	0.45	9.525	16	0.28	0.7	0.4	
	ER16-0.5ISO	●	○	EL16-0.5ISO	○	○	0.5	9.525	16	0.31	0.6	0.4	
	ER16-0.6ISO	○	○	EL16-0.6ISO	○	○	0.6	9.525	16	0.37	0.6	0.6	
	ER16-0.7ISO	●	○	EL16-0.7ISO	○	○	0.7	9.525	16	0.43	0.6	0.6	
	ER16-0.75ISO	●	○	EL16-0.75ISO	○	○	0.75	9.525	16	0.46	0.6	0.6	
	ER16-0.8ISO	●	○	EL16-0.8ISO	○	○	0.8	9.525	16	0.49	0.6	0.6	
	ER16-1.0ISO	●	○	EL16-1.0ISO	○	○	1.0	9.525	16	0.61	0.7	0.7	
	ER16-1.25ISO	●	○	EL16-1.25ISO	○	○	1.25	9.525	16	0.77	0.8	0.9	
	ER16-1.5ISO	●	○	EL16-1.5ISO	●	○	1.5	9.525	16	0.92	0.8	1.0	
	New ERM16-1.5ISO	●	○				1.5	9.525	16	0.93	0.8	1.0	
	ER16-1.75ISO	●	○	EL16-1.75ISO	○	○	1.75	9.525	16	1.07	0.9	1.2	
	New ERM16-1.75ISO	●	○				1.75	9.525	16	1.09	0.9	1.2	
	ER16-2.0ISO	●	○	EL16-2.0ISO	●	○	2.0	9.525	16	1.23	1.0	1.3	
	New ERM16-2.0ISO	●	○				2.0	9.525	16	1.25	1.0	1.3	
	ER16-2.5ISO	●	○	EL16-2.5ISO	○	○	2.5	9.525	16	1.53	1.1	1.5	
	ER16-3.0ISO	●	○	EL16-3.0ISO	○	○	3.0	9.525	16	1.84	1.2	1.6	
	New ERM16-3.0ISO	●	○				3.0	9.525	16	1.87	1.2	1.6	
	ER22-3.0ISO	○	○	EL22-3.0ISO	○	○							
	ER22-3.5ISO	●	○	EL22-3.5ISO	○	○	3.5	12.7	22	2.15	1.6	2.3	
	ER22-4.0ISO	●	○	EL22-4.0ISO	○	○	4.0	12.7	22	2.45	1.6	2.3	
	ER22-4.5ISO	●	○	EL22-4.5ISO	○	○	4.5	12.7	22	2.78	1.7	2.4	
	ER22-5.0ISO	●	○	EL22-5.0ISO	○	○	5.0	12.7	22	3.07	1.7	2.5	
	ER27-5.5ISO	○	○	EL27-5.5ISO	○	○	5.5	15.875	27	3.37	1.9	2.7	
	ER27-6.0ISO	○	○	EL27-6.0ISO	○	○	6.0	15.875	27	3.68	2.0	2.9	

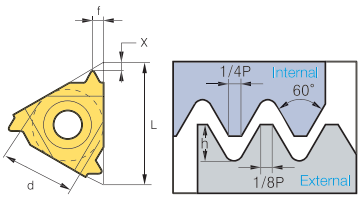


• Applicable holders, see pages **D22**

● : Stock item ○ : Under preparing for stock

ISO Metric

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	h_{min}	X	f	Picture
Internal	IR11-0.35ISO	○	○	IL11-0.35ISO	○	○	0.35	6.35	11	0.20	0.8	0.3	
	IR11-0.4ISO	○	○	IL11-0.4ISO	○	○	0.4	6.35	11	0.23	0.8	0.4	
	IR11-0.45ISO	○	○	IL11-0.45ISO	○	○	0.45	6.35	11	0.26	0.8	0.4	
	IR11-0.5ISO	●	○	IL11-0.5ISO	○	○	0.5	6.35	11	0.29	0.6	0.4	
	IR11-0.6ISO	○	○	IL11-0.6ISO	○	○	0.6	6.35	11	0.35	0.6	0.6	
	IR11-0.7ISO	○	○	IL11-0.7ISO	○	○	0.7	6.35	11	0.40	0.6	0.6	
	IR11-0.75ISO	●	○	IL11-0.75ISO	○	○	0.75	6.35	11	0.43	0.6	0.6	
	IR11-0.8ISO	○	○	IL11-0.8ISO	○	○	0.8	6.35	11	0.46	0.6	0.6	
	IR11-1.0ISO	●	○	IL11-1.0ISO	○	○	1.0	6.35	11	0.58	0.6	0.7	
	IR11-1.25ISO	●	○	IL11-1.25ISO	○	○	1.25	6.35	11	0.72	0.8	0.9	
	IR11-1.5ISO	●	○	IL11-1.5ISO	○	○	1.5	6.35	11	0.87	0.8	1.0	
	IRM11-1.5ISO	●	○				1.5	6.35	11	0.85	0.8	1.0	
	IR11-1.75ISO	●	○	IL11-1.75ISO	○	○	1.75	6.35	11	1.01	0.9	1.1	
	IR11-2.0ISO	●	○	IL11-2.0ISO	○	○	2.0	6.35	11	1.15	0.9	1.1	
	IR11-2.5ISO	○	○	IL11-2.5ISO	○	○	2.5	6.35	11	1.44	0.8	1.1	
	IR16-0.35ISO	○	○	IL16-0.35ISO	○	○	0.35	9.525	16	0.20	0.8	0.3	
	IR16-0.4ISO	○	○	IL16-0.4ISO	○	○	0.4	9.525	16	0.23	0.8	0.4	
	IR16-0.45ISO	○	○	IL16-0.45ISO	○	○	0.45	9.525	16	0.26	0.8	0.4	
	IR16-0.5ISO	●	○	IL16-0.5ISO	○	○	0.5	9.525	16	0.29	0.6	0.4	
	IR16-0.6ISO	○	○	IL16-0.6ISO	○	○	0.6	9.525	16	0.35	0.6	0.6	
	IR16-0.7ISO	○	○	IL16-0.7ISO	○	○	0.7	9.525	16	0.40	0.6	0.6	
	IR16-0.75ISO	●	○	IL16-0.75ISO	○	○	0.75	9.525	16	0.43	0.6	0.6	
	IR16-0.8ISO	○	○	IL16-0.8ISO	○	○	0.8	9.525	16	0.46	0.6	0.6	
	IR16-1.0ISO	●	○	IL16-1.0ISO	○	○	1.0	9.525	16	0.58	0.6	0.7	
	IR16-1.25ISO	●	○	IL16-1.25ISO	○	○	1.25	9.525	16	0.72	0.8	0.9	
	IR16-1.5ISO	●	○	IL16-1.5ISO	○	○	1.5	9.525	16	0.87	0.8	1.0	
	New IRM16-1.5ISO	●	○				1.5	9.525	16	0.85	0.8	1.0	
	IR16-1.75ISO	●	○	IL16-1.75ISO	○	○	1.75	9.525	16	1.01	0.9	1.2	
	IR16-2.0ISO	●	○	IL16-2.0ISO	○	○	2.0	9.525	16	1.15	1.0	1.3	
	New IRM16-2.0ISO	●	○				2.0	9.525	16	1.12	1.0	1.3	
	IR16-2.5ISO	●	○	IL16-2.5ISO	○	○	2.5	9.525	16	1.44	1.1	1.5	
	IR16-3.0ISO	●	○	IL16-3.0ISO	○	○	3.0	9.525	16	1.73	1.1	1.5	
	New IRM16-3.0ISO	●	○				3.0	9.525	16	1.69	1.1	1.5	
	IR22-3.5ISO	●	○	IL22-3.5ISO	○	○	3.5	12.7	22	2.02	1.6	2.3	
	IR22-4.0ISO	●	○	IL22-4.0ISO	○	○	4.0	12.7	22	2.31	1.6	2.3	
	IR22-4.5ISO	●	○	IL22-4.5ISO	○	○	4.5	12.7	22	2.60	1.6	2.4	
	IR22-5.0ISO	●	○	IL22-5.0ISO	○	○	5.0	12.7	22	2.89	1.6	2.3	
	IR27-5.5ISO	○	○	IL27-5.5ISO	○	○	5.5	15.875	27	3.17	1.6	2.3	
	IR27-6.0ISO	○	○	IL27-6.0ISO	○	○	6.0	15.875	27	3.46	1.8	2.5	



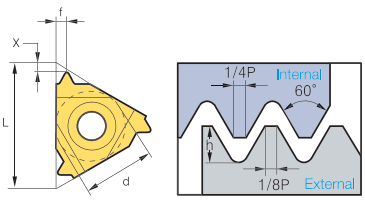
• Applicable holders, see pages D23

● : Stock item ○ : Under preparing for stock

Thread Insert

American UN : UN, UNC, UNF, UNEF

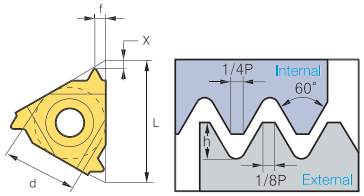
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER11-72UN	○	○	EL11-72UN	○	○	72	6.35	11	0.22	0.8	0.4	
	ER11-64UN	○	○	EL11-64UN	○	○	64	6.35	11	0.24	0.8	0.4	
	ER11-56UN	○	○	EL11-56UN	○	○	56	6.35	11	0.28	0.7	0.4	
	ER11-48UN	○	○	EL11-48UN	○	○	48	6.35	11	0.32	0.6	0.6	
	ER11-44UN	○	○	EL11-44UN	○	○	44	6.35	11	0.35	0.6	0.6	
	ER11-40UN	○	○	EL11-40UN	○	○	40z	6.35	11	0.39	0.6	0.6	
	ER11-36UN	○	○	EL11-36UN	○	○	36	6.35	11	0.43	0.6	0.6	
	ER11-32UN	○	○	EL11-32UN	○	○	32	6.35	11	0.49	0.6	0.6	
	ER11-28UN	○	○	EL11-28UN	○	○	28	6.35	11	0.56	0.6	0.7	
	ER11-27UN	○	○	EL11-27UN	○	○	27	6.35	11	0.58	0.7	0.8	
	ER11-24UN	○	○	EL11-24UN	○	○	24	6.35	11	0.65	0.7	0.8	
	ER11-20UN	○	○	EL11-20UN	○	○	20	6.35	11	0.78	0.8	0.9	
	ER11-18UN	○	○	EL11-18UN	○	○	18	6.35	11	0.87	0.8	1.0	
	ER11-16UN	○	○	EL11-16UN	○	○	16	6.35	11	0.97	0.9	1.1	
	ER11-14UN	○	○	EL11-14UN	○	○	14	6.35	11	1.11	0.9	1.1	
	ER16-72UN	○	○	EL16-72UN	○	○	72	9.525	16	0.22	0.8	0.4	
	ER16-64UN	○	○	EL16-64UN	○	○	64	9.525	16	0.24	0.8	0.4	
	ER16-56UN	○	○	EL16-56UN	○	○	56	9.525	16	0.28	0.7	0.4	
	ER16-48UN	○	○	EL16-48UN	○	○	48	9.525	16	0.32	0.6	0.6	
	ER16-44UN	○	○	EL16-44UN	○	○	44	9.525	16	0.35	0.6	0.6	
	ER16-40UN	○	○	EL16-40UN	○	○	40	9.525	16	0.39	0.6	0.6	
	ER16-36UN	○	○	EL16-36UN	○	○	36	9.525	16	0.43	0.6	0.6	
	ER16-32UN	○	○	EL16-32UN	○	○	32	9.525	16	0.49	0.6	0.6	
	ER16-28UN	●	○	EL16-28UN	○	○	28	9.525	16	0.56	0.6	0.7	
	ER16-27UN	○	○	EL16-27UN	○	○	27	9.525	16	0.58	0.7	0.8	
	ER16-24UN	●	○	EL16-24UN	○	○	24	9.525	16	0.65	0.7	0.8	
	ER16-20UN	●	○	EL16-20UN	○	○	20	9.525	16	0.78	0.8	0.9	
	ER16-18UN	●	○	EL16-18UN	○	○	18	9.525	16	0.87	0.8	1.0	
	ER16-16UN	●	○	EL16-16UN	○	○	16	9.525	16	0.97	0.9	1.1	
	ER16-14UN	●	○	EL16-14UN	○	○	14	9.525	16	1.11	1.0	1.2	
	ER16-13UN	○	○	EL16-13UN	○	○	13	9.525	16	1.20	1.0	1.3	
	ER16-12UN	●	○	EL16-12UN	○	○	12	9.525	16	1.30	1.1	1.4	
	ER16-11.5UN	○	○	EL16-11.5UN	○	○	11.5	9.525	16	1.35	1.1	1.5	
	ER16-11UN	●	○	EL16-11UN	○	○	11	9.525	16	1.42	1.1	1.5	
	ER16-10UN	●	○	EL16-10UN	○	○	10	9.525	16	1.56	1.1	1.5	
	ER16-9UN	●	○	EL16-9UN	○	○	9	9.525	16	1.73	1.2	1.7	
	ER16-8UN	●	○	EL16-8UN	○	○	8	9.525	16	1.95	1.2	1.6	
	ER22-7UN	○	○	EL22-7UN	○	○	7	12.7	22	2.22	1.6	2.3	
	ER22-6UN	○	○	EL22-6UN	○	○	6	12.7	22	2.60	1.6	2.3	
	ER22-5UN	○	○	EL22-5UN	○	○	5	12.7	22	3.12	1.7	2.5	
	ER27-4.5UN	○	○	EL27-4.5UN	○	○	4.5	15.875	27	3.46	1.9	2.7	
	ER27-4UN	○	○	EL27-4UN	○	○	4	15.875	27	3.89	2.1	3.0	



• Applicable holders, see pages **D22**

● : Stock item ○ : Under preparing for stock

American UN : UN, UNC, UNF, UNEF

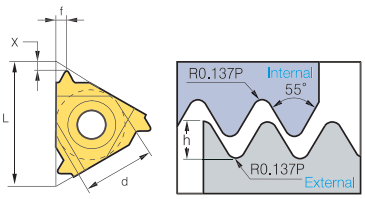
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
Internal	IR11-72UN	○	○	IL11-72UN	○	○	72	6.35	11	0.20	0.8	0.3	
	IR11-64UN	○	○	IL11-64UN	○	○	64	6.35	11	0.23	0.8	0.4	
	IR11-56UN	○	○	IL11-56UN	○	○	56	6.35	11	0.26	0.7	0.4	
	IR11-48UN	○	○	IL11-48UN	○	○	48	6.35	11	0.31	0.6	0.6	
	IR11-44UN	○	○	IL11-44UN	○	○	44	6.35	11	0.33	0.6	0.6	
	IR11-40UN	○	○	IL11-40UN	○	○	40	6.35	11	0.37	0.6	0.6	
	IR11-36UN	○	○	IL11-36UN	○	○	36	6.35	11	0.41	0.6	0.6	
	IR11-32UN	○	○	IL11-32UN	○	○	32	6.35	11	0.46	0.6	0.6	
	IR11-28UN	○	○	IL11-28UN	○	○	28	6.35	11	0.52	0.6	0.7	
	IR11-27UN	○	○	IL11-27UN	○	○	27	6.35	11	0.54	0.7	0.8	
	IR11-24UN	○	○	IL11-24UN	○	○	24	6.35	11	0.61	0.7	0.8	
	IR11-20UN	○	○	IL11-20UN	○	○	20	6.35	11	0.73	0.8	0.9	
	IR11-18UN	○	○	IL11-18UN	○	○	18	6.35	11	0.81	0.8	1.0	
	IR11-16UN	○	○	IL11-16UN	○	○	16	6.35	11	0.92	0.9	1.1	
	IR11-14UN	○	○	IL11-14UN	○	○	14	6.35	11	1.05	0.9	1.1	
	IR11-12UN	○	○	IL11-12UN	○	○	12	6.35	11	1.22	0.8	1.1	
	IR11-11UN	○	○	IL11-11UN	○	○	11	6.35	11	1.33	0.8	1.1	
	IR16-72UN	○	○	IL16-72UN	○	○	72	9.525	16	0.20	0.8	0.3	
	IR16-64UN	○	○	IL16-64UN	○	○	64	9.525	16	0.23	0.8	0.4	
	IR16-56UN	○	○	IL16-56UN	○	○	56	9.525	16	0.26	0.7	0.4	
	IR16-48UN	○	○	IL16-48UN	○	○	48	9.525	16	0.31	0.6	0.6	
	IR16-44UN	○	○	IL16-44UN	○	○	44	9.525	16	0.33	0.6	0.6	
	IR16-40UN	○	○	IL16-40UN	○	○	40	9.525	16	0.37	0.6	0.6	
	IR16-36UN	○	○	IL16-36UN	○	○	36	9.525	16	0.41	0.6	0.6	
	IR16-32UN	○	○	IL16-32UN	○	○	32	9.525	16	0.51	0.6	0.6	
	IR16-28UN	●	○	IL16-28UN	○	○	28	9.525	16	0.52	0.6	0.7	
	IR16-27UN	○	○	IL16-27UN	○	○	27	9.525	16	0.54	0.7	0.8	
	IR16-24UN	○	○	IL16-24UN	○	○	24	9.525	16	0.61	0.7	0.8	
	IR16-20UN	●	○	IL16-20UN	○	○	20	9.525	16	0.73	0.8	0.9	
	IR16-18UN	●	○	IL16-18UN	○	○	18	9.525	16	0.81	0.8	1.0	
	IR16-16UN	●	○	IL16-16UN	○	○	16	9.525	16	0.92	0.9	1.1	
	IR16-14UN	●	○	IL16-14UN	○	○	14	9.525	16	1.05	0.9	1.2	
	IR16-13UN	○	○	IL16-13UN	○	○	13	9.525	16	1.13	1.0	1.3	
	IR16-12UN	●	○	IL16-12UN	○	○	12	9.525	16	1.22	1.1	1.4	
	IR16-11.5UN	○	○	IL16-11.5UN	○	○	11.5	9.525	16	1.28	1.1	1.5	
	IR16-11UN	○	○	IL16-11UN	○	○	11	9.525	16	1.33	1.1	1.5	
	IR16-10UN	○	○	IL16-10UN	○	○	10	9.525	16	1.47	1.1	1.5	
	IR16-9UN	○	○	IL16-9UN	○	○	9	9.525	16	1.63	1.2	1.7	
	IR16-8UN	●	○	IL16-8UN	○	○	8	9.525	16	1.83	1.2	1.5	
	IR22-7UN	○	○	IL22-7UN	○	○	7	12.7	22	2.09	1.6	2.3	
	IR22-6UN	○	○	IL22-6UN	○	○	6	12.7	22	2.44	1.6	2.3	
	IR22-5UN	○	○	IL22-5UN	○	○	5	12.7	22	2.93	1.7	2.3	
	IR27-4.5UN	○	○	IL27-4.5UN	○	○	4.5	15.875	27	3.26	1.9	2.4	
	IR27-4UN	○	○	IL27-4UN	○	○	4	15.875	27	3.67	2.1	2.7	

• Applicable holders, see pages D23

● : Stock item ○ : Under preparing for stock

Whitworth for BSW, BSF, BSP

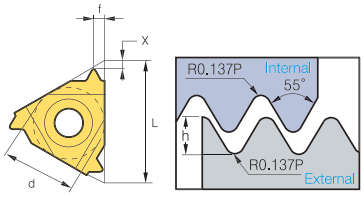
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-72W	○	○	EL11-72W	○	○	72	6.35	11	0.23	0.7	0.4	
	ER11-60W	○	○	EL11-60W	○	○	64	6.35	11	0.27	0.7	0.4	
	ER11-56W	○	○	EL11-56W	○	○	56	6.35	11	0.29	0.7	0.4	
	ER11-48W	○	○	EL11-48W	○	○	48	6.35	11	0.34	0.6	0.6	
	ER11-40W	○	○	EL11-40W	○	○	40	6.35	11	0.41	0.6	0.6	
	ER11-36W	○	○	EL11-36W	○	○	36	6.35	11	0.45	0.6	0.6	
	ER11-32W	○	○	EL11-32W	○	○	32	6.35	11	0.51	0.6	0.6	
	ER11-28W	○	○	EL11-28W	○	○	28	6.35	11	0.58	0.6	0.7	
	ER11-26W	○	○	EL11-26W	○	○	26	6.35	11	0.63	0.7	0.8	
	ER11-24W	○	○	EL11-24W	○	○	24	6.35	11	0.68	0.7	0.8	
	ER11-22W	○	○	EL11-22W	○	○	22	6.35	11	0.74	0.8	0.9	
	ER11-20W	○	○	EL11-20W	○	○	20	6.35	11	0.81	0.8	0.9	
	ER11-19W	○	○	EL11-19W	○	○	19	6.35	11	0.86	0.8	1.0	
	ER11-18W	○	○	EL11-18W	○	○	18	6.35	11	0.90	0.8	1.0	
	ER11-16W	○	○	EL11-16W	○	○	16	6.35	11	1.02	0.9	1.1	
	ER11-14W	○	○	EL11-14W	○	○	14	6.35	11	1.16	1.0	1.2	
	ER16-72W	○	○	EL16-72W	○	○	72	9.525	16	0.23	0.7	0.4	
	ER16-60W	○	○	EL16-60W	○	○	60	9.525	16	0.27	0.7	0.4	
	ER16-56W	○	○	EL16-56W	○	○	56	9.525	16	0.29	0.7	0.4	
	ER16-48W	○	○	EL16-48W	○	○	48	9.525	16	0.34	0.6	0.6	
	ER16-40W	○	○	EL16-40W	○	○	40	9.525	16	0.41	0.6	0.6	
	ER16-36W	○	○	EL16-36W	○	○	36	9.525	16	0.45	0.6	0.6	
	ER16-32W	○	○	EL16-32W	○	○	32	9.525	16	0.51	0.6	0.6	
	ER16-30W	○	○	EL16-30W	○	○	30	9.525	16	0.55	0.6	0.7	
	ER16-28W	●	○	EL16-28W	○	○	28	9.525	16	0.58	0.6	0.7	
	ER16-26W	●	○	EL16-26W	○	○	26	9.525	16	0.63	0.7	0.8	
	ER16-24W	○	○	EL16-24W	○	○	24	9.525	16	0.68	0.7	0.8	
	ER16-22W	○	○	EL16-22W	○	○	22	9.525	16	0.74	0.8	0.9	
	ER16-20W	●	○	EL16-20W	○	○	20	9.525	16	0.81	0.8	0.9	
	ER16-19W	●	○	EL16-19W	○	○	19	9.525	16	0.86	0.8	1.0	
	ER16-18W	●	○	EL16-18W	○	○	18	9.525	16	0.90	0.8	1.0	
	ER16-16W	●	○	EL16-16W	○	○	16	9.525	16	1.02	0.9	1.1	
	ER16-14W	●	○	EL16-14W	○	○	14	9.525	16	1.16	1.0	1.2	
	ER16-12W	●	○	EL16-12W	○	○	12	9.525	16	1.36	1.1	1.4	
	ER16-11W	●	○	EL16-11W	○	○	11	9.525	16	1.48	1.1	1.5	
	ER16-10W	●	○	EL16-10W	○	○	10	9.525	16	1.63	1.1	1.5	
	ER16-9W	●	○	EL16-9W	○	○	9	9.525	16	1.81	1.2	1.7	
	ER16-8W	●	○	EL16-8W	○	○	8	9.525	16	2.03	1.2	1.5	
	ER22-7W	○	○	EL22-7W	○	○	7	12.7	22	3.32	1.6	2.3	
	ER22-6W	○	○	EL22-6W	○	○	6	12.7	22	2.71	1.6	2.3	
	ER22-5W	○	○	EL22-5W	○	○	5	12.7	22	3.25	1.7	2.4	
	ER27-4.5W	○	○	EL27-4.5W	○	○	4.5	15.875	27	3.61	1.8	2.6	
	ER27-4W	○	○	EL27-4W	○	○	4	15.875	27	4.07	2.0	2.9	



• Applicable holders, see pages **D22**

● : Stock item ○ : Under preparing for stock

Whitworth for BSW, BSF, BSP

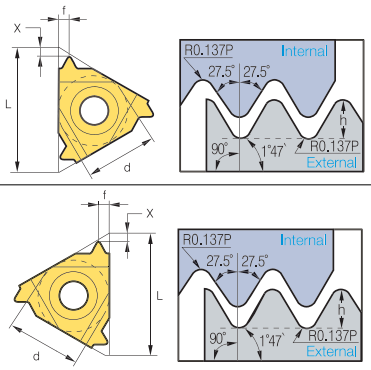
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
Internal	IR11-72W	○	○	IL11-72W	○	○	72	6.35	11	0.23	0.7	0.4	
	IR11-60W	○	○	IL11-60W	○	○	60	6.35	11	0.27	0.7	0.4	
	IR11-56W	○	○	IL11-56W	○	○	56	6.35	11	0.29	0.7	0.4	
	IR11-48W	○	○	IL11-48W	○	○	48	6.35	11	0.34	0.6	0.6	
	IR11-40W	○	○	IL11-40W	○	○	40	6.35	11	0.41	0.6	0.6	
	IR11-36W	○	○	IL11-36W	○	○	36	6.35	11	0.45	0.6	0.6	
	IR11-32W	○	○	IL11-32W	○	○	32	6.35	11	0.51	0.6	0.6	
	IR11-28W	○	○	IL11-28W	○	○	28	6.35	11	0.58	0.6	0.7	
	IR11-26W	○	○	IL11-26W	○	○	26	6.35	11	0.63	0.7	0.8	
	IR11-24W	○	○	IL11-24W	○	○	24	6.35	11	0.68	0.7	0.8	
	IR11-22W	○	○	IL11-22W	○	○	22	6.35	11	0.74	0.8	0.9	
	IR11-20W	○	○	IL11-20W	○	○	20	6.35	11	0.81	0.8	0.9	
	IR11-19W	●	○	IL11-19W	○	○	19	6.35	11	0.86	0.8	1.0	
	IR11-18W	○	○	IL11-18W	○	○	18	6.35	11	0.90	0.8	1.0	
	IR11-16W	○	○	IL11-16W	○	○	16	6.35	11	1.02	0.9	1.1	
	IR11-14W	●	○	IL11-14W	○	○	14	6.35	11	1.16	0.9	1.1	
	IR11-12W	○	○	IL11-12W	○	○	12	6.35	11	1.32	0.9	1.2	
	IR16-72W	○	○	IL16-72W	○	○	72	9.525	16	0.23	0.7	0.4	
	IR16-60W	○	○	IL16-60W	○	○	60	9.525	16	0.27	0.7	0.4	
	IR16-56W	○	○	IL16-56W	○	○	56	9.525	16	0.29	0.7	0.4	
	IR16-48W	○	○	IL16-48W	○	○	48	9.525	16	0.34	0.6	0.6	
	IR16-40W	○	○	IL16-40W	○	○	40	9.525	16	0.41	0.6	0.6	
	IR16-36W	○	○	IL16-36W	○	○	36	9.525	16	0.45	0.6	0.6	
	IR16-32W	○	○	IL16-32W	○	○	32	9.525	16	0.51	0.6	0.6	
	IR16-30W	○	○	IL16-30W	○	○	30	9.525	16	0.55	0.6	0.7	
	IR16-28W	○	○	IL16-28W	○	○	28	9.525	16	0.58	0.6	0.7	
	IR16-26W	○	○	IL16-26W	○	○	26	9.525	16	0.63	0.7	0.8	
	IR16-24W	○	○	IL16-24W	○	○	24	9.525	16	0.68	0.7	0.8	
	IR16-22W	○	○	IL16-22W	○	○	22	9.525	16	0.74	0.8	0.9	
	IR16-20W	○	○	IL16-20W	○	○	20	9.525	16	0.81	0.8	0.9	
	IR16-19W	○	○	IL16-19W	○	○	19	9.525	16	0.86	0.8	1.0	
	IR16-18W	●	○	IL16-18W	○	○	18	9.525	16	0.90	0.8	1.0	
	IR16-16W	○	○	IL16-16W	○	○	16	9.525	16	1.02	0.9	1.1	
	IR16-14W	●	○	IL16-14W	○	○	14	9.525	16	1.16	1.0	1.2	
	IR16-12W	●	○	IL16-12W	○	○	12	9.525	16	1.36	1.1	1.4	
	IR16-11W	●	○	IL16-11W	○	○	11	9.525	16	1.48	1.1	1.5	
	IR16-10W	●	○	IL16-10W	○	○	10	9.525	16	1.63	1.1	1.5	
	IR16-9W	○	○	IL16-9W	○	○	9	9.525	16	1.81	1.2	1.7	
	IR16-8W	●	○	IL16-8W	○	○	8	9.525	16	2.03	1.2	1.5	
	IR22-7W	○	○	IL22-7W	○	○	7	12.7	22	3.32	1.6	2.3	
	IR22-6W	○	○	IL22-6W	○	○	6	12.7	22	2.71	1.6	2.3	
	IR22-5W	○	○	IL22-5W	○	○	5	12.7	22	3.25	1.7	2.4	
	IR27-4.5W	○	○	IL27-4.5W	○	○	4.5	15.875	27	3.61	1.8	2.6	
	IR27-4W	○	○	IL27-4W	○	○	4	15.875	27	4.07	2.0	2.9	

• Applicable holders, see pages D23

● : Stock item ○ : Under preparing for stock

British Standard Pipe Thread : BSPT

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-28BSPT	○	○	EL11-28BSPT	○	○	28	1/4"	11	0.58	0.6	0.6	
	ER11-19BSPT	○	○	EL11-19BSPT	○	○	19	1/4"	11	0.86	0.8	0.9	
	ER11-14BSPT	○	○	EL11-14BSPT	○	○	14	1/4"	11	1.16	0.9	1.0	
	ER16-28BSPT	○	○	EL16-28BSPT	○	○	28	3/8"	16	0.58	0.6	0.6	
	ER16-19BSPT	○	○	EL16-19BSPT	○	○	19	3/8"	16	0.86	0.8	0.9	
	ER16-14BSPT	○	○	EL16-14BSPT	○	○	14	3/8"	16	1.16	1.0	1.2	
	ER16-11BSPT	○	○	EL16-11BSPT	○	○	11	3/8"	16	1.48	1.1	1.5	
Internal	IR11-28BSPT	○	○	IL11-28BSPT	○	○	28	1/4"	11	0.58	0.6	0.6	
	IR11-19BSPT	○	○	IL11-19BSPT	○	○	19	1/4"	11	0.86	0.8	0.9	
	IR11-14BSPT	○	○	IL11-14BSPT	○	○	14	1/4"	11	1.16	0.9	1.0	
	IR16-28BSPT	○	○	IL16-28BSPT	○	○	28	3/8"	16	0.58	0.6	0.6	
	IR16-19BSPT	○	○	IL16-19BSPT	○	○	19	3/8"	16	0.86	0.8	0.9	
	IR16-14BSPT	○	○	IL16-14BSPT	○	○	14	3/8"	16	1.16	1.0	1.2	
	IR16-11BSPT	○	○	IL16-11BSPT	○	○	11	3/8"	16	1.48	1.1	1.5	

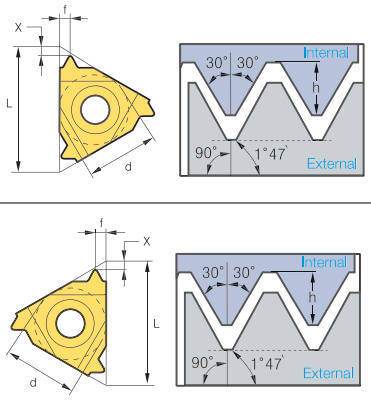


• Applicable holders, see pages **D22, D23**

● : Stock item ○ : Under preparing for stock

National Pipe Thread : NPT

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-27NPT	○	○	EL11-27NPT	○	○	27	1/4"	11	0.66	0.7	0.8	
	ER11-18NPT	○	○	EL11-18NPT	○	○	18	1/4"	11	1.01	0.8	1.0	
	ER11-14NPT	○	○	EL11-14NPT	○	○	14	1/4"	11	1.33	0.8	1.0	
	ER16-27NPT	○	○	EL16-27NPT	○	○	27	3/8"	16	0.66	0.7	0.8	
	ER16-18NPT	●	○	EL16-18NPT	○	○	18	3/8"	16	1.01	0.8	1.0	
	ER16-14NPT	●	○	EL16-14NPT	○	○	14	3/8"	16	1.33	0.9	1.2	
	ER16-11.5NPT	●	○	EL16-11.5NPT	○	○	11.5	3/8"	16	1.64	1.1	1.5	
	ER16-8NPT	●	○	EL16-8NPT	○	○	8	3/8"	16	2.42	1.3	1.8	
Internal	IR11-27NPT	○	○	IL11-27NPT	○	○	27	1/4"	11	0.66	0.7	0.8	
	IR11-18NPT	○	○	IL11-18NPT	○	○	18	1/4"	11	1.01	0.8	1.0	
	IR11-14NPT	○	○	IL11-14NPT	○	○	14	1/4"	11	1.33	0.8	1.0	
	IR16-27NPT	○	○	IL16-27NPT	○	○	27	3/8"	16	0.66	0.7	0.8	
	IR16-18NPT	○	○	IL16-18NPT	○	○	18	3/8"	16	1.01	0.8	1.0	
	IR16-14NPT	●	○	IL16-14NPT	○	○	14	3/8"	16	1.33	0.9	1.2	
	IR16-11.5NPT	●	○	IL16-11.5NPT	○	○	11.5	3/8"	16	1.64	1.1	1.5	
	IR16-8NPT	●	○	IL16-8NPT	○	○	8	3/8"	16	2.42	1.3	1.8	

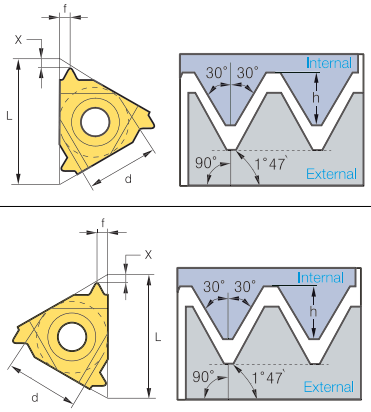


• Applicable holders, see pages **D22, D23**

● : Stock item ○ : Under preparing for stock

National Pipe Threads-Dryseal : NPTF

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-27NPTF	○	○	EL11-27NPTF	○	○	27	1/4"	11	0.64	0.7	0.8	
	ER11-18NPTF	○	○	EL11-18NPTF	○	○	18	1/4"	11	1.00	0.8	1.0	
	ER11-14NPTF	○	○	EL11-14NPTF	○	○	14	1/4"	11	1.35	0.8	1.0	
	ER16-27NPTF	○	○	EL16-27NPTF	○	○	27	3/8"	16	0.64	0.7	0.8	
	ER16-18NPTF	○	○	EL16-18NPTF	○	○	18	3/8"	16	1.00	0.8	1.0	
	ER16-14NPTF	○	○	EL16-14NPTF	○	○	14	3/8"	16	1.35	0.9	1.2	
	ER16-11.5NPTF	○	○	EL16-11.5NPTF	○	○	11.5	3/8"	16	1.63	1.1	1.5	
	ER16-8NPTF	○	○	EL16-8NPTF	○	○	8	3/8"	16	2.38	1.3	1.8	
Internal	IR11-27NPTF	○	○	IL11-27NPTF	○	○	27	1/4"	11	0.64	0.7	0.8	
	IR11-18NPTF	○	○	IL11-18NPTF	○	○	18	1/4"	11	1.00	0.8	1.0	
	IR11-14NPTF	○	○	IL11-14NPTF	○	○	14	1/4"	11	1.35	0.8	1.0	
	IR16-27NPTF	○	○	IL16-27NPTF	○	○	27	3/8"	16	0.64	0.7	0.8	
	IR16-18NPTF	○	○	IL16-18NPTF	○	○	18	3/8"	16	1.00	0.8	1.0	
	IR16-14NPTF	○	○	IL16-14NPTF	○	○	14	3/8"	16	1.35	0.9	1.2	
	IR16-11.5NPTF	○	○	IL16-11.5NPTF	○	○	11.5	3/8"	16	1.63	1.1	1.5	
	IR16-8NPTF	○	○	IL16-8NPTF	○	○	8	3/8"	16	2.38	1.3	1.8	

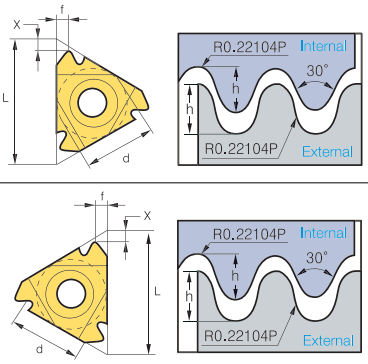


• Applicable holders, see pages **D22, D23**

● : Stock item ○ : Under preparing for stock

Round DIN 405

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER16-10RD	○	○	EL16-10RD	○	○	10	3/8"	16	1.27	1.1	1.2	
	ER16-8RD	○	○	EL16-8RD	○	○	8	3/8"	16	1.59	1.4	1.3	
	ER16-6RD	○	○	EL16-6RD	○	○	6	3/8"	16	2.12	1.5	1.7	
	ER22-6RD	○	○	EL22-6RD	○	○	6	1/2"	22	2.12	1.5	1.7	
	ER22-4RD	○	○	EL22-4RD	○	○	4	1/2"	22	3.18	2.2	2.3	
	ER27-4RD	○	○	EL27-4RD	○	○	4	5/8"	27	3.18	2.2	2.3	
Internal	IR16-10RD	○	○	IL16-10RD	○	○	10	3/8"	16	1.27	1.1	1.2	
	IR16-8RD	○	○	IL16-8RD	○	○	8	3/8"	16	1.59	1.4	1.4	
	IR16-6RD	○	○	IL16-6RD	○	○	6	3/8"	16	2.12	1.4	1.5	
	IR22-6RD	○	○	IL22-6RD	○	○	6	1/2"	22	2.12	1.5	1.7	
	IR22-4RD	○	○	IL22-4RD	○	○	4	1/2"	22	3.18	2.2	2.3	
	IR27-4RD	○	○	IL27-4RD	○	○	4	5/8"	27	3.18	2.2	2.3	

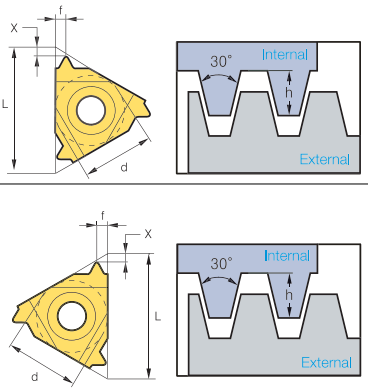


• Applicable holders, see pages D22, D23

● : Stock item ○ : Under preparing for stock

Trapez DIN 103

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-1.5TR	○	○	EL11-1.5TR	○	○	1.5	1/4"	11	0.90	0.8	0.9	
	ER16-1.5TR	○	○	EL16-1.5TR	○	○	1.5	3/8"	16	0.90	1.0	1.1	
	ER16-2.0TR	○	○	EL16-2.0TR	○	○	2.0	3/8"	16	1.25	1.1	1.3	
	ER16-3.0TR	○	○	EL16-3.0TR	○	○	3.0	3/8"	16	1.75	1.3	1.5	
	ER22-4.0TR	○	○	EL22-4.0TR	○	○	4.0	1/2"	22	2.25	1.7	1.9	
	ER22-5.0TR	○	○	EL22-5.0TR	○	○	5.0	1/2"	22	2.75	2.1	2.5	
	ER27-6.0TR	○	○	EL27-6.0TR	○	○	6.0	5/8"	27	3.50	2.3	2.7	
Internal	IR11-1.5TR	○	○	IL11-1.5TR	○	○	1.5	1/4"	11	0.90	0.8	0.9	
	IR16-1.5TR	○	○	IL16-1.5TR	○	○	1.5	3/8"	16	0.90	1.0	1.1	
	IR16-2.0TR	○	○	IL16-2.0TR	○	○	2.0	3/8"	16	1.25	1.1	1.3	
	IR16-2.5TR	○	○	IL16-2.5TR	○	○	2.5	3/8"	16	1.53	1.2	1.4	
	IR16-3.0TR	○	○	IL16-3.0TR	○	○	3.0	3/8"	16	1.75	1.3	1.5	
	IR22-4.0TR	○	○	IL22-4.0TR	○	○	4.0	1/2"	22	2.25	1.7	1.9	
	IR22-5.0TR	○	○	IL22-5.0TR	○	○	5.0	1/2"	22	2.75	2.1	2.5	
	IR27-6.0TR	○	○	IL27-6.0TR	○	○	6.0	5/8"	27	3.50	2.3	2.7	

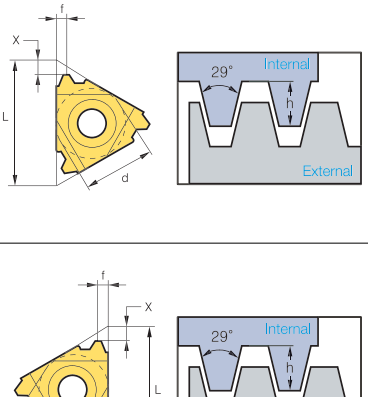


• Applicable holders, see pages D22, D23

● : Stock item ○ : Under preparing for stock

American ACME

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-16ACME	○	○	EL11-16ACME	○	○	16	1/4"	11	0.92	1.0	1.1	
	ER16-16ACME	○	○	EL16-16ACME	○	○	16	3/8"	16	0.92	1.0	1.1	
	ER16-14ACME	○	○	EL16-14ACME	○	○	14	3/8"	16	1.03	1.0	1.2	
	ER16-12ACME	○	○	EL16-12ACME	○	○	12	3/8"	16	1.19	1.1	1.2	
	ER16-10ACME	○	○	EL16-10ACME	○	○	10	3/8"	16	1.52	1.3	1.4	
	ER16-8ACME	○	○	EL16-8ACME	○	○	8	3/8"	16	1.84	1.4	1.5	
	ER16-6ACME	○	○	EL16-6ACME	○	○	6	3/8"	16	2.37	1.7	1.9	
	ER22-6ACME	○	○	EL22-6ACME	○	○	6	1/2"	22	2.37	1.8	2.1	
	ER22-5ACME	○	○	EL22-5ACME	○	○	5	1/2"	22	2.79	2.0	2.3	
	ER27-4ACME	○	○	EL27-4ACME	○	○	4	5/8"	27	3.43	2.4	2.7	
Internal	IR11-16ACME	○	○	IL11-16ACME	○	○	16	1/4"	11	0.92	0.9	0.9	
	IR16-16ACME	○	○	IL16-16ACME	○	○	16	3/8"	16	0.92	1.0	1.1	
	IR16-14ACME	○	○	IL16-14ACME	○	○	14	3/8"	16	1.03	1.1	1.2	
	IR16-12ACME	○	○	IL16-12ACME	○	○	12	3/8"	16	1.19	1.2	1.3	
	IR16-10ACME	○	○	IL16-10ACME	○	○	10	3/8"	16	1.52	1.2	1.3	
	IR16-8ACME	○	○	IL16-8ACME	○	○	8	3/8"	16	1.84	1.4	1.5	
	IR16-6ACME	○	○	IL16-6ACME	○	○	6	3/8"	16	2.37	1.7	1.9	
	IR22-6ACME	○	○	IL22-6ACME	○	○	6	1/2"	22	2.37	1.8	2.1	
	IR22-5ACME	○	○	IL22-5ACME	○	○	5	1/2"	22	2.79	2.0	2.3	
	IR27-4ACME	○	○	IL27-4ACME	○	○	4	5/8"	27	3.43	2.3	2.6	

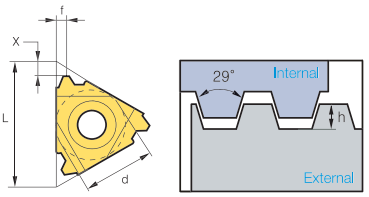


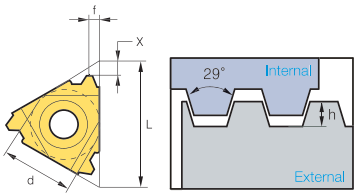
• Applicable holders, see pages D22, D23

● : Stock item ○ : Under preparing for stock

Stub ACME

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER11-16STACME	○	○	EL11-16STACME	○	○	16	1/4"	11	0.60	1.0	1.0	
	ER16-16STACME	○	○	EL16-16STACME	○	○	16	3/8"	16	0.60	1.0	1.0	
	ER16-14STACME	○	○	EL16-14STACME	○	○	14	3/8"	16	0.67	1.1	1.1	
	ER16-12STACME	○	○	EL16-12STACME	○	○	12	3/8"	16	0.76	1.2	1.2	
	ER16-10STACME	○	○	EL16-10STACME	○	○	10	3/8"	16	1.02	1.2	1.3	
	ER16-8STACME	○	○	EL16-8STACME	○	○	8	3/8"	16	1.21	1.4	1.5	
	ER16-6STACME	○	○	EL16-6STACME	○	○	6	3/8"	16	1.52	1.7	1.8	
	ER22-6STACME	○	○	EL22-6STACME	○	○	6	1/2"	22	1.52	1.7	1.8	
	ER22-5STACME	○	○	EL22-5STACME	○	○	5	1/2"	22	1.78	2.1	2.3	
	ER27-4STACME	○	○	EL27-4STACME	○	○	4	5/8"	27	2.16	2.3	2.4	
	ER27-3STACME	○	○	EL27-3STACME	○	○	3	5/8"	27	2.79	2.9	2.9	
Internal	IR11-16STACME	○	○	IL11-16STACME	○	○	16	1/4"	11	0.60	1.0	1.0	
	IR16-16STACME	○	○	IL16-16STACME	○	○	16	3/8"	16	0.60	1.0	1.0	
	IR16-14STACME	○	○	IL16-14STACME	○	○	14	3/8"	16	0.67	1.1	1.1	
	IR16-12STACME	○	○	IL16-12STACME	○	○	12	3/8"	16	0.76	1.1	1.2	
	IR16-10STACME	○	○	IL16-10STACME	○	○	10	3/8"	16	1.02	1.2	1.3	
	IR16-8STACME	○	○	IL16-8STACME	○	○	8	3/8"	16	1.21	1.4	1.5	
	IR16-6STACME	○	○	IL16-6STACME	○	○	6	3/8"	16	1.52	1.7	1.8	
	IR22-6STACME	○	○	IL22-6STACME	○	○	6	1/2"	22	1.52	1.7	1.8	
	IR22-5STACME	○	○	IL22-5STACME	○	○	5	1/2"	22	1.78	2.1	2.3	
	IR27-4STACME	○	○	IL27-4STACME	○	○	4	5/8"	27	2.16	2.3	2.4	
	IR27-3STACME	○	○	IL27-3STACME	○	○	3	5/8"	27	2.79	2.9	2.9	



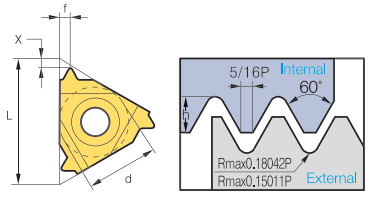


• Applicable holders, see pages **D22**, **D23**

● : Stock item ○ : Under preparing for stock

UNJ

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	hmin	X	f	Picture
External	ER11-48UNJ	○	○	EL11-48UNJ	○	○	48	1/4"	11	0.31	0.6	0.5	
	ER11-44UNJ	○	○	EL11-44UNJ	○	○	44	1/4"	11	0.33	0.6	0.6	
	ER11-40UNJ	○	○	EL11-40UNJ	○	○	40	1/4"	11	0.37	0.6	0.6	
	ER11-36UNJ	○	○	EL11-36UNJ	○	○	36	1/4"	11	0.41	0.6	0.6	
	ER11-32UNJ	○	○	EL11-32UNJ	○	○	32	1/4"	11	0.46	0.6	0.7	
	ER11-28UNJ	○	○	EL11-28UNJ	○	○	28	1/4"	11	0.52	0.7	0.7	
	ER11-24UNJ	○	○	EL11-24UNJ	○	○	24	1/4"	11	0.61	0.7	0.8	
	ER11-20UNJ	○	○	EL11-20UNJ	○	○	20	1/4"	11	0.73	0.8	0.9	
	ER11-18UNJ	○	○	EL11-18UNJ	○	○	18	1/4"	11	0.81	0.8	1.0	
	ER11-16UNJ	○	○	EL11-16UNJ	○	○	16	1/4"	11	0.92	0.9	1.1	
	ER11-14UNJ	○	○	EL11-14UNJ	○	○	14	1/4"	11	1.05	1.0	1.2	
	ER16-48UNJ	○	○	EL16-48UNJ	○	○	48	3/8"	16	0.31	0.6	0.5	
	ER16-44UNJ	○	○	EL16-44UNJ	○	○	44	3/8"	16	0.33	0.6	0.6	
	ER16-40UNJ	○	○	EL16-40UNJ	○	○	40	3/8"	16	0.37	0.6	0.6	
	ER16-36UNJ	○	○	EL16-36UNJ	○	○	36	3/8"	16	0.41	0.6	0.6	
	ER16-32UNJ	○	○	EL16-32UNJ	○	○	32	3/8"	16	0.46	0.6	0.7	
	ER16-28UNJ	○	○	EL16-28UNJ	○	○	28	3/8"	16	0.52	0.7	0.7	
	ER16-24UNJ	○	○	EL16-24UNJ	○	○	24	3/8"	16	0.61	0.7	0.8	
	ER16-20UNJ	○	○	EL16-20UNJ	○	○	20	3/8"	16	0.73	0.8	0.9	
	ER16-18UNJ	○	○	EL16-18UNJ	○	○	18	3/8"	16	0.81	0.8	1.0	
	ER16-16UNJ	○	○	EL16-16UNJ	○	○	16	3/8"	16	0.92	0.9	1.1	
	ER16-14UNJ	○	○	EL16-14UNJ	○	○	14	3/8"	16	1.05	1.0	1.2	
	ER16-13UNJ	○	○	EL16-13UNJ	○	○	13	3/8"	16	1.13	1.0	1.3	
	ER16-12UNJ	○	○	EL16-12UNJ	○	○	12	3/8"	16	1.22	1.1	1.3	
	ER16-11UNJ	○	○	EL16-11UNJ	○	○	11	3/8"	16	1.33	1.2	1.5	
	ER16-10UNJ	○	○	EL16-10UNJ	○	○	10	3/8"	16	1.47	1.2	1.5	
	ER16-9UNJ	○	○	EL16-9UNJ	○	○	9	3/8"	16	1.63	1.3	1.7	
	ER16-8UNJ	○	○	EL16-8UNJ	○	○	8	3/8"	16	1.83	1.2	1.6	
	ER22-7UNJ	○	○	EL22-7UNJ	○	○	7	1/2"	22	2.09	1.7	2.3	
	ER22-6UNJ	○	○	EL22-6UNJ	○	○	6	1/2"	22	2.44	1.7	2.3	
	ER22-5UNJ	○	○	EL22-5UNJ	○	○	5	1/2"	22	2.93	1.8	2.5	
	ER27-4.5UNJ	○	○	EL27-4.5UNJ	○	○	4.5	5/8"	27	3.26	2.0	2.7	
	ER27-4UNJ	○	○	EL27-4UNJ	○	○	4	5/8"	27	3.67	2.2	3.0	

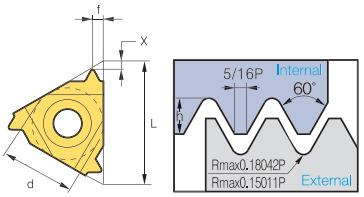


• Applicable holders, see pages **D22**

● : Stock item ○ : Under preparing for stock

UNJ

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
Internal	IR11-48UNJ	○	○	IL11-48UNJ	○	○	48	1/4"	11	0.28	0.6	0.5	
	IR11-44UNJ	○	○	IL11-44UNJ	○	○	44	1/4"	11	0.30	0.6	0.6	
	IR11-40UNJ	○	○	IL11-40UNJ	○	○	40	1/4"	11	0.33	0.6	0.6	
	IR11-36UNJ	○	○	IL11-36UNJ	○	○	36	1/4"	11	0.37	0.6	0.6	
	IR11-32UNJ	○	○	IL11-32UNJ	○	○	32	1/4"	11	0.42	0.6	0.7	
	IR11-28UNJ	○	○	IL11-28UNJ	○	○	28	1/4"	11	0.47	0.7	0.7	
	IR11-24UNJ	○	○	IL11-24UNJ	○	○	24	1/4"	11	0.55	0.7	0.8	
	IR11-20UNJ	○	○	IL11-20UNJ	○	○	20	1/4"	11	0.66	0.8	0.9	
	IR11-18UNJ	○	○	IL11-18UNJ	○	○	18	1/4"	11	0.74	0.8	1.0	
	IR11-16UNJ	○	○	IL11-16UNJ	○	○	16	1/4"	11	0.83	0.9	1.1	
	IR11-14UNJ	○	○	IL11-14UNJ	○	○	14	1/4"	11	0.95	1.0	1.2	
	IR16-48UNJ	○	○	IL16-48UNJ	○	○	48	3/8"	16	0.28	0.6	0.5	
	IR16-44UNJ	○	○	IL16-44UNJ	○	○	44	3/8"	16	0.30	0.6	0.6	
	IR16-40UNJ	○	○	IL16-40UNJ	○	○	40	3/8"	16	0.33	0.6	0.6	
	IR16-36UNJ	○	○	IL16-36UNJ	○	○	36	3/8"	16	0.37	0.6	0.6	
	IR16-32UNJ	○	○	IL16-32UNJ	○	○	32	3/8"	16	0.42	0.6	0.7	
	IR16-28UNJ	○	○	IL16-28UNJ	○	○	28	3/8"	16	0.47	0.7	0.7	
	IR16-24UNJ	○	○	IL16-24UNJ	○	○	24	3/8"	16	0.55	0.7	0.8	
	IR16-20UNJ	○	○	IL16-20UNJ	○	○	20	3/8"	16	0.66	0.8	0.9	
	IR16-18UNJ	○	○	IL16-18UNJ	○	○	18	3/8"	16	0.74	0.8	1.0	
	IR16-16UNJ	○	○	IL16-16UNJ	○	○	16	3/8"	16	0.83	0.9	1.1	
	IR16-14UNJ	○	○	IL16-14UNJ	○	○	14	3/8"	16	0.95	1.0	1.2	
	IR16-13UNJ	○	○	IL16-13UNJ	○	○	13	3/8"	16	1.02	1.0	1.3	
	IR16-12UNJ	○	○	IL16-12UNJ	○	○	12	3/8"	16	1.11	1.1	1.3	
	IR16-11UNJ	○	○	IL16-11UNJ	○	○	11	3/8"	16	1.21	1.2	1.5	
	IR16-10UNJ	○	○	IL16-10UNJ	○	○	10	3/8"	16	1.33	1.2	1.5	
	IR16-9UNJ	○	○	IL16-9UNJ	○	○	9	3/8"	16	1.48	1.3	1.7	
	IR16-8UNJ	○	○	IL16-8UNJ	○	○	8	3/8"	16	1.66	1.2	1.6	
	IR22-7UNJ	○	○	IL22-7UNJ	○	○	7	1/2"	22	1.90	1.7	2.3	
	IR22-6UNJ	○	○	IL22-6UNJ	○	○	6	1/2"	22	2.21	1.7	2.3	
	IR22-5UNJ	○	○	IL22-5UNJ	○	○	5	1/2"	22	2.66	1.8	2.5	
	IR27-4.5UNJ	○	○	IL27-4.5UNJ	○	○	4.5	5/8"	27	2.95	2.0	2.7	
	IR27-4UNJ	○	○	IL27-4UNJ	○	○	4	5/8"	27	3.32	2.2	3.0	

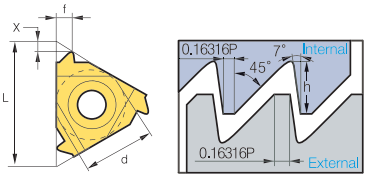


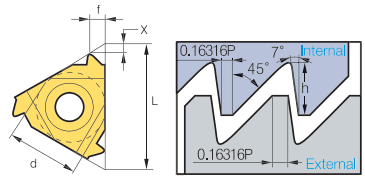
• Applicable holders, see pages D23

● : Stock item ○ : Under preparing for stock

American Buttress

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER11-20ABUT	○	○	EL11-20ABUT	○	○	20	1/4"	11	0.84	1.0	1.4	
	ER11-16ABUT	○	○	EL11-16ABUT	○	○	16	1/4"	11	1.05	1.3	1.9	
	ER16-20ABUT	○	○	EL16-20ABUT	○	○	20	3/8"	16	0.84	1.0	1.4	
	ER16-16ABUT	○	○	EL16-16ABUT	○	○	16	3/8"	16	1.05	1.3	1.9	
	ER16-12ABUT	○	○	EL16-12ABUT	○	○	12	3/8"	16	1.40	1.4	2.0	
	ER16-10ABUT	○	○	EL16-10ABUT	○	○	10	3/8"	16	1.68	1.5	2.3	
	ER22-8ABUT	○	○	EL22-8ABUT	○	○	8	1/2"	22	2.10	2.0	3.2	
	ER22-6ABUT	○	○	EL22-6ABUT	○	○	6	1/2"	22	2.80	2.2	3.5	
Internal	IR11-20ABUT	○	○	IL11-20ABUT	○	○	20	1/4"	11	0.84	1.0	1.4	
	IR11-16ABUT	○	○	IL11-16ABUT	○	○	16	1/4"	11	1.05	1.3	1.9	
	IR16-20ABUT	○	○	IL16-20ABUT	○	○	20	3/8"	16	0.84	1.0	1.4	
	IR16-16ABUT	○	○	IL16-16ABUT	○	○	16	3/8"	16	1.05	1.3	1.9	
	IR16-12ABUT	○	○	IL16-12ABUT	○	○	12	3/8"	16	1.40	1.4	2.0	
	IR16-10ABUT	○	○	IL16-10ABUT	○	○	10	3/8"	16	1.68	1.5	2.3	
	IR22-8ABUT	○	○	IL22-8ABUT	○	○	8	1/2"	22	2.10	2.0	3.2	
	IR22-6ABUT	○	○	IL22-6ABUT	○	○	6	1/2"	22	2.80	2.2	3.5	





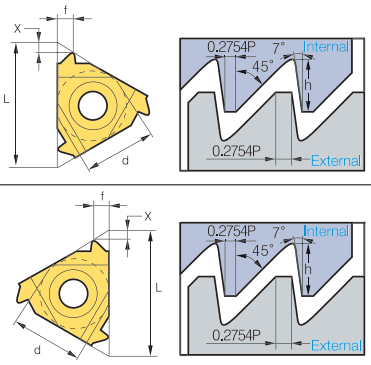
• Applicable holders, see pages D22, D23

● : Stock item ○ : Under preparing for stock

Thread Insert

British Buttress

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER16-16BBUT	○	○	EL16-16BBUT	○	○	16	3/8”	16	0.80	1.1	1.6	
	ER16-12BBUT	○	○	EL16-12BBUT	○	○	12	3/8”	16	1.07	1.4	2.1	
	ER16-10BBUT	○	○	EL16-10BBUT	○	○	10	3/8”	16	1.28	1.4	2.2	
	ER16-8BBUT	○	○	EL16-8BBUT	○	○	8	3/8”	16	1.61	1.6	2.5	
	ER22-8BBUT	○	○	EL22-8BBUT	○	○	8	1/2”	22	1.61	1.6	2.5	
Internal	IR16-16BBUT	○	○	IL16-16BBUT	○	○	16	3/8”	16	0.80	1.1	1.6	
	IR16-12BBUT	○	○	IL16-12BBUT	○	○	12	3/8”	16	1.07	1.4	2.1	
	IR16-10BBUT	○	○	IL16-10BBUT	○	○	10	3/8”	16	1.28	1.4	2.2	
	IR16-8BBUT	○	○	IL16-8BBUT	○	○	8	3/8”	16	1.61	1.6	2.5	
	IR22-8BBUT	○	○	IL22-8BBUT	○	○	8	1/2”	22	1.61	1.6	2.5	

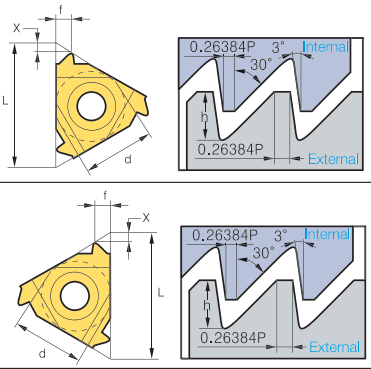


• Applicable holders, see pages **D22**, **D23**

● : Stock item ○ : Under preparing for stock

Metric Buttress

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER16-2.0SAGE	○	○	EL16-2.0SAGE	○	○	2.0	3/8”	16	1.74	1.47	2.08	
	ER22-2.0SAGE	○	○	EL22-2.0SAGE	○	○	2.0	1/2”	22	1.74	1.47	2.08	
	ER22-3.0SAGE	○	○	EL22-3.0SAGE	○	○	3.0	1/2”	22	2.60	1.79	2.60	
	ER27-4.0SAGE	○	○	EL27-4.0SAGE	○	○	4.0	5/8”	27	3.55	1.93	3.20	
Internal	IR16-2.0SAGE	○	○	IL16-2.0SAGE	○	○	2.0	3/8”	16	1.50	1.52	2.2	
	IR22-3.0SAGE	○	○	IL22-3.0SAGE	○	○	3.0	1/2”	22	2.25	1.66	2.9	
	IR27-4.0SAGE	○	○	IL27-4.0SAGE	○	○	4.0	5/8	27	3.09	2.12	3.2	

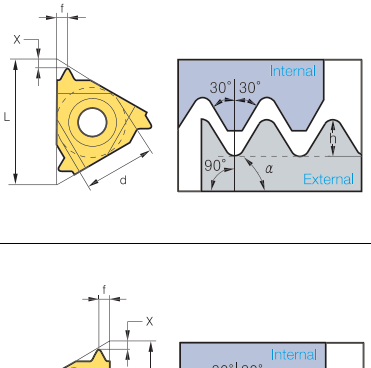


• Applicable holders, see pages **D22**, **D23**

● : Stock item ○ : Under preparing for stock

API

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER22-4API382	○	○	EL22-4API382	○	○	4	1/2”	22	3.09	2.1	2.8	
	ER22-4API383	○	○	EL22-4API383	○	○	4	1/2”	22	3.08	2.1	2.8	
	ER22-4API502	○	○	EL22-4API502	○	○	4	1/2”	22	3.75	2.0	2.9	
	ER22-4API503	○	○	EL22-4API503	○	○	4	1/2”	22	3.74	2.0	2.9	
	ER22-5API403	○	○	EL22-5API403	○	○	5	1/2”	22	2.99	1.8	2.6	
	ER22-6API551	○	○	EL22-6API551	○	○	6	1/2”	22	1.41	2.6	2.0	
	ER27-4API382	○	○	EL27-4API382	○	○	4	5/8”	27	3.09	2.1	2.8	
	ER27-4API383	○	○	EL27-4API383	○	○	4	5/8”	27	3.08	2.1	2.8	
	ER27-4API502	○	○	EL27-4API502	○	○	4	5/8”	27	3.75	2.1	3.1	
	ER27-4API503	○	○	EL27-4API503	○	○	4	5/8”	27	3.74	2.1	3.1	
	ER27-5API403	○	○	EL27-5API403	○	○	5	5/8”	27	2.99	1.9	2.7	
Internal	IR22-4API382	○	○	IL22-4API382	○	○	4	1/2”	22	3.09	2.1	2.8	
	IR22-4API383	○	○	IL22-4API383	○	○	4	1/2”	22	3.08	2.1	2.8	
	IR22-4API502	○	○	IL22-4API502	○	○	4	1/2”	22	3.75	2.1	3.1	
	IR22-4API503	○	○	IL22-4API503	○	○	4	1/2”	22	3.74	2.0	2.9	
	IR22-5API403	○	○	IL22-5API403	○	○	5	1/2”	22	2.99	1.8	2.6	
	IR22-6API551	○	○	IL22-6API551	○	○	6	1/2”	22	1.41	2.6	2.0	
	IR27-4API382	○	○	IL27-4API382	○	○	4	5/8”	27	3.09	2.1	2.8	
	IR27-4API383	○	○	IL27-4API383	○	○	4	5/8”	27	3.08	2.1	2.8	
	IR27-4API502	○	○	IL27-4API502	○	○	4	5/8”	27	3.75	2.1	3.1	
	IR27-4API503	○	○	IL27-4API503	○	○	4	5/8”	27	3.74	2.1	3.1	
	IR27-5API403	○	○	IL27-5API403	○	○	5	5/8”	27	2.99	1.9	2.7	

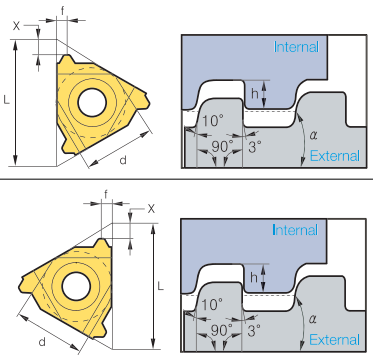


• Applicable holders, see pages **D22**, **D23**

● : Stock item ○ : Under preparing for stock

API Buttress Casing

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	IPF	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER22-5BUT75	○	○	EL22-5BUT75	○	○	5	0.75	1/2"	22	1.55	3.1	1.9	
	ER22-5BUT1	○	○	EL22-5BUT1	○	○	5	1	1/2"	22	1.55	3.1	1.9	
Internal	IR22-5BUT75	○	○	IL22-5BUT75	○	○	5	0.75	1/2"	22	1.55	2.8	1.9	
	IR22-5BUT1	○	○	IL22-5BUT1	○	○	5	1	1/2"	22	1.55	2.8	1.9	

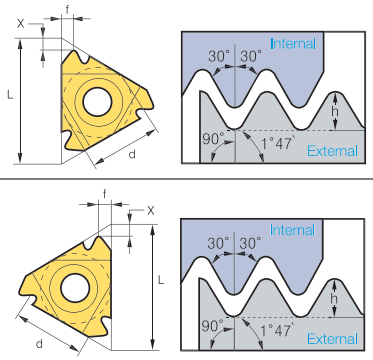


• Applicable holders, see pages **D22**, **D23**

● : Stock item ○ : Under preparing for stock

API Round Casing & Tubing

Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	TPI	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER16-10APIRD	○	○	EL16-10APIRD	○	○	10	3/8"	16	1.41	1.2	1.4	
	ER16-8APIRD	○	○	EL16-8APIRD	○	○	8	3/8"	16	1.81	1.3	1.5	
Internal	IR16-10APIRD	○	○	IL16-10APIRD	○	○	10	3/8"	16	1.41	1.2	1.4	
	IR16-8APIRD	○	○	IL16-8APIRD	○	○	8	3/8"	16	1.81	1.3	1.5	

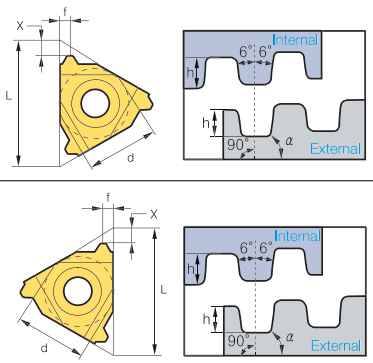


• Applicable holders, see pages **D22**, **D23**

● : Stock item ○ : Under preparing for stock

Extreme Line Casing

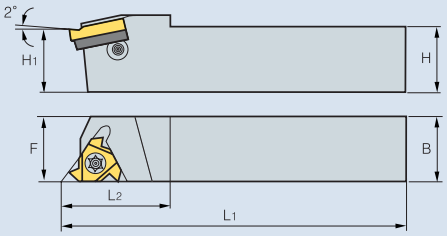
Type	Designation (Right)	PC3030T	PC9070T	Designation (Left)	PC3030T	PC9070T	Pitch (mm)	IPF	Dimensions (mm) d	L	h_{min}	X	f	Picture
External	ER22-6EL15	○	○	EL22-6EL15	○	○	6	1.5	1/2"	22	1.21	1.9	1.9	
	ER22-5EL125	○	○	EL22-5EL125	○	○	5	1.25	1/2"	22	1.71	2.3	2.4	
Internal	IR22-6EL15	○	○	IL22-6EL15	○	○	6	1.5	1/2"	22	1.39	1.8	1.9	
	IR22-5EL125	○	○	IL22-5EL125	○	○	5	1.25	1/2"	22	1.91	2.2	2.4	

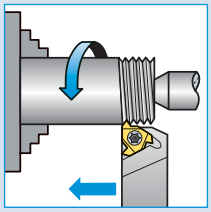


• Applicable holders, see pages **D22**, **D23**

● : Stock item ○ : Under preparing for stock

ER(L)H (Screw on system)





• R type insert

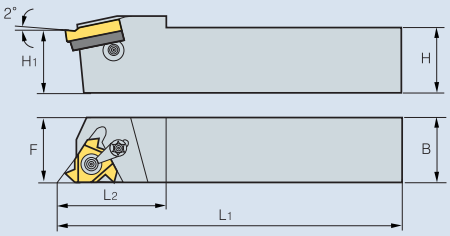
Designation		Stock RH	Stock LH	Dimensions (mm) Inscribed circle	H=H1=B	F	L1	L2	Insert Screw	Shim Screw	Shim RH	Shim LH	Wrench
ER(L)H	08N-11	○	○	6.35	8	11	136.4	17.5	ST11N	-	-	-	TW08P
	10N-11	○	○	6.35	10	11	70.0	17.5					
	12N-11	○	○	6.35	12	12	80.0	17.5					
	12N-16	○	○	9.525	12	16	83.2	22	ST16N	-	-	-	TW10P
	09-16	○	○	9.525	9.52	16	63.6	20.5	ST16	STA16	ATE16	ATI16	TW10P
	12-16	●	○	9.525	12	16	83.2	22					
	16-16	●	○	9.525	16	16	100.0	20.5					
	20-16	●	○	9.525	20	20	128.6	30					
	25-16	●	○	9.525	25	25	153.6	30					
	32-16	●	○	9.525	32	32	173.6	30					
	25-22	●	○	12.7	25	25	155.7	36	ST22	STA22	ATE22	ATI22	TW20P
	32-22	●	○	12.7	32	32	175.7	36					
	40-22	●	○	12.7	40	40	205.7	36					
	25-27	○	○	15.875	25	32	151.6	35	ST27	STA27	ATE27	ATI27	TW25L
	32-27	○	○	15.875	32	32	176.6	40					
	40-27	○	○	15.875	40	40	206.6	40					
	50-27	○	○	15.875	50	50	256.6	40					

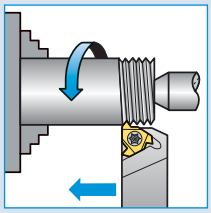
• Applicable inserts, see pages **D09**, **D10**, **D12**, **D14**, **D16~D21**

• Helix angle is 1.5 ° for all holder
• No shim needed for N type holder

● : Stock item ○ : Under preparing for stock

ER(L)H-C (Clamp on system)





• R type insert

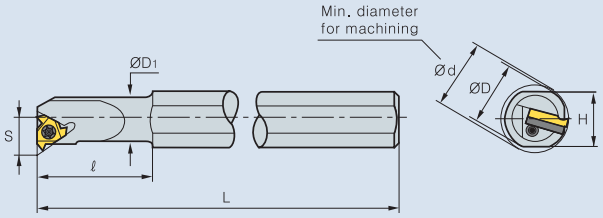
Designation		Stock RH	Stock LH	Dimensions (mm) Inscribed circle	H=H1=B	F	L1	L2	Shim Screw	Clamp	Shim RH	Shim LH	Wrench
ER(L)H-C	20-16C	●	○	9.525	20	20	128.6	30	STA16	CTH16	ATE16	ATI16	TW10P TW15P
	25-16C	●	○	9.525	25	25	153.6	30					
	32-16C	●	○	9.525	32	32	173.6	30					
	25-22C	●	○	12.7	25	25	155.7	36	STA22	CTH22	ATE22	ATI22	TW20P
	32-22C	●	○	12.7	32	32	175.7	36					
	40-22C	●	○	12.7	40	40	205.7	36					
	25-27C	○	○	15.875	25	25	151.6	35	STA27	CTH27	ATE27	ATI27	TW25L
	32-27C	○	○	15.875	32	32	176.6	40					
	40-27C	○	○	15.875	40	40	206.6	40					
	50-27C	○	○	15.875	50	50	256.6	40					

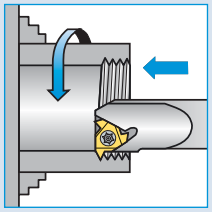
• Applicable inserts, see pages **D09**, **D10**, **D12**, **D14**, **D16~D21**

• Helix angle is 1.5 ° for all holder

● : Stock item ○ : Under preparing for stock

IR(L)H (Screw on system)





• R type insert

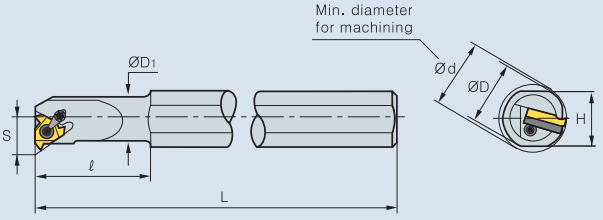
Designation		Stock		Dimensions (mm)								Insert Screw	Shim Screw	Shim RH	Shim LH	Wrench
		RH	LH	Inscribed circle	A	L	L1	Ø D	Ø D1	F	Ø d					
IR(L)H	10DN-11	●	○	6.35		100		10	10.0	7.3	13	ST11N	-	-	-	TW08P
	10N-11	●	○	6.35	18.0	180	25	20	10.0	7.3	13					
	13N-11	●	○	6.35	18.0	180	32	20	13.0	8.9	16					
	13N-16	●	○	9.525	18.0	180	32	20	12.7	10.3	17	ST16N	-	-	-	TW10P
	16N-16	●	○	9.525	18.0	180	40	20	16.0	11.5	20					
	16DN-16	●	○	9.525	15.2	150	32	16	16.0	11.3	20					
	20-16	●	○	9.525	18.0	180	40	20	20.0	13.4	24	ST16	STA16	ATI16	ATE16	TW10P
	25-16	●	○	9.525	29.0	250	60	32	25.0	16.3	29					
	25D-16	●	○	9.525	22.6	200	45	25	24.6	16.1	29					
	32-16	●	○	9.525	29.0	250	60	32	32.0	19.6	36					
	40-16	●	○	9.525	36.0	300	60	40	40.0	23.8	44					
	20N-22	●	○	12.7	18.0	180	50	20	20.0	15.6	27	ST22N	-	-	-	TW20P
	25-22	●	○	12.7	29.0	250	60	32	25.0	17.4	32	ST22	STA22	ATI22	ATE22	TW20P
	25D-22	●	○	12.7	22.6	200	45	25	24.6	17.2	32					
	32-22	●	○	12.7	29.0	250	60	32	32.0	21.5	39					
	40-22	●	○	12.7	36.0	300	60	40	40.0	25.8	47					
	32-27	○	○	15.875	29.0	250	60	32	32.0	22.4	40	ST27	STA27	ATI27	ATE27	TW25L
	40-27	○	○	15.875	36.0	300	60	40	40.0	26.4	48					
	50-27	○	○	15.875	45.0	350	75	50	50.0	31.4	58					
	60-27	○	○	15.875	54.0	400	75	60	60.0	36.4	69					

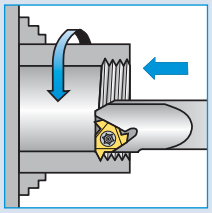
• Applicable inserts, see pages **D09**, **D11**, **D13**, **D15~D21**

• Helix angle is 1.5° for all holder
• No shim needed for N type holder

● : Stock item ○ : Under preparing for stock

IR(L)H-C (Clamp on system)





• R type insert

Designation		Stock		Dimensions (mm)								Shim Screw	Clamp	Shim RH	Shim LH	Wrench
		RH	LH	Inscribed circle	A	L	L1	Ø D	Ø D1	F	Ø d					
IR(L)H	20-16C	●	○	9.525	18.0	180	50	20	20.0	13.4	24	STA16	CTH16	ATI16	ATE16	TW10P TW15P
	25-16C	●	○	9.525	28.0	250	60	32	25.0	16.3	29					
	25D-16C	●	○	9.525	22.6	200	45	25	24.6	16.1	29					
	32-16C	●	○	9.525	29.0	250	60	32	32.0	19.6	36					
	40-16C	●	○	9.525	36.0	300	60	40	40.0	23.8	44					
	25-22C	●	○	12.7	29.0	250	60	32	25.0	17.4	32	STA22	CTH22	ATI22	ATE22	TW20P
	25D-22C	●	○	12.7	22.6	200	45	25	24.6	17.2	32					
	32-22C	●	○	12.7	29.0	250	60	32	32.0	21.5	39					
	40-22C	●	○	12.7	36.0	300	60	40	40.0	25.8	47					
	32-27C	○	○	15.875	29.0	250	60	32	32.0	22.4	40	STA27	CTH27	ATI27	ATE27	TW25L
	40-27C	○	○	15.875	36.0	300	60	40	40.0	26.4	48					
	50-27C	○	○	15.875	45.0	350	75	50	50.0	31.4	58					
	60-27C	○	○	15.875	54.0	400	75	60	60.5	36.4	69					

• Applicable inserts, see pages **D09**, **D11**, **D13**, **D15~D21**

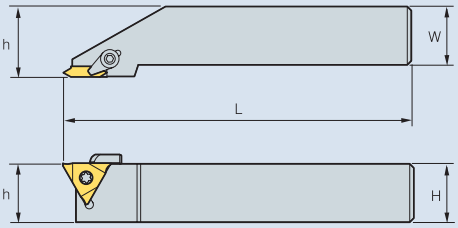
• Helix angle is 1.5° for all holder

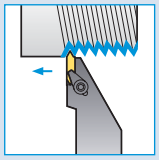
● : Stock item ○ : Under preparing for stock

Vertical Type Holder

VTH

VETR





• R type insert

Designation		Stock	Dimensions (mm)				Parts / Inserts	Clamp	Clamp Screw	Screw	Wrench
			H=(h)	W	L	S					
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					

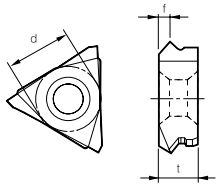
∗ r=0.8 ※For oil hole boring bar.

● : Stock item

Vertical Type Thread Insert

Workpiece			Coated	Cermet	Uncoated
			PC130	CN20	ST10
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



(mm)

Picture	Designation		Coated	Cermet	Uncoated	Pitch	θ	f
VETR	VETR	080				0.8	60°	1.4
		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

Milling

E

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Milling Insert Grades

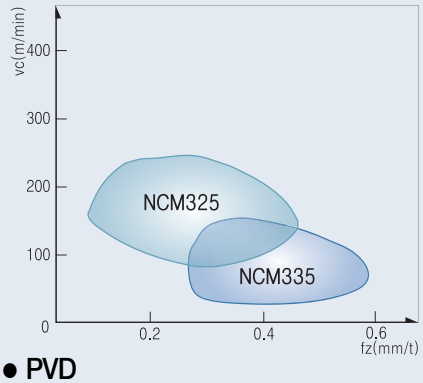
■ Selection system

Workpiece	P						M				K				N			S			H		
ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	N10	N20	N30	S01	S10	S20	H01	H10	H20
Coated carbide		NCM325	NCM335	PC3525	PC3535	PC3545	NCM325	NCM335	PC9530	PC3545	PC205K	PC6510	PC215K						PC8520				
Cermet		CN20	CN30																				
cBN																		KB360				KB350	
Cemented carbide		ST20	ST30A	ST30N	ST40			U10	U20	U40	H01	H05	H10	G10									

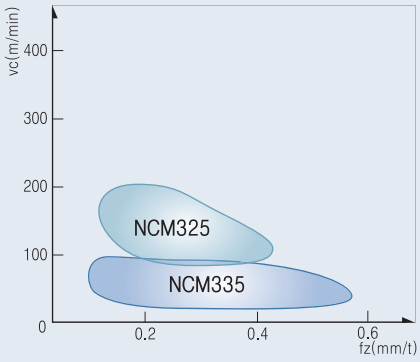
■ Application range

● CVD

1) P : Steel

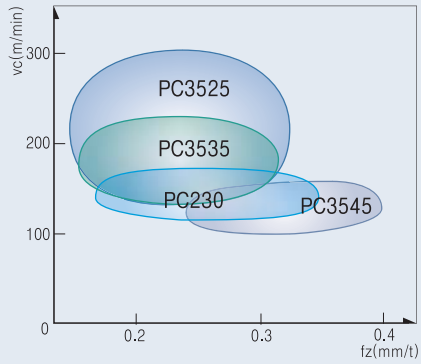


2) M : Stainless steel

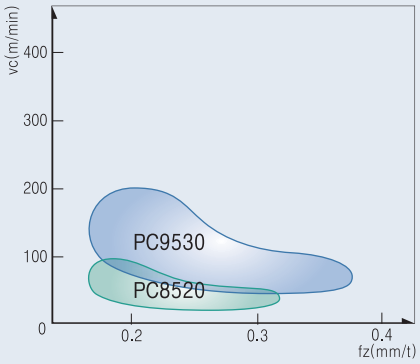


● PVD

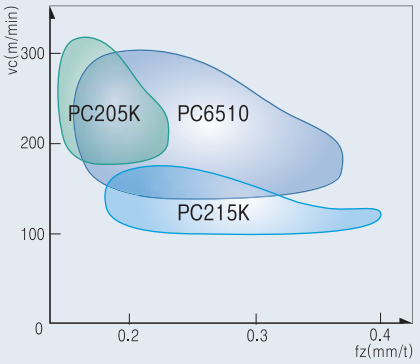
1) P : Steel



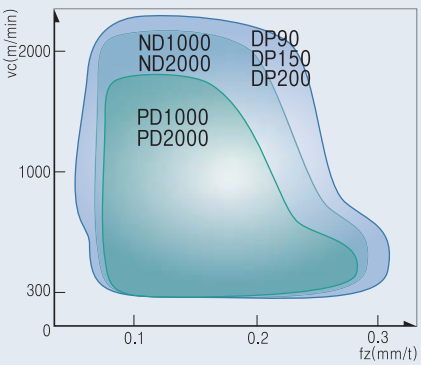
2) M : Stainless steel



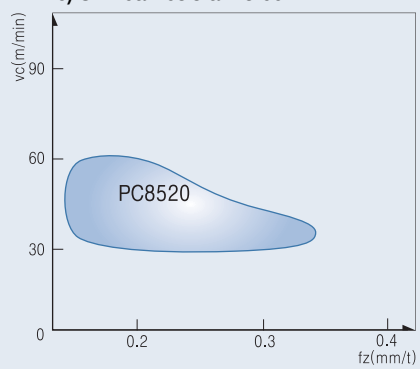
3) K : Cast iron



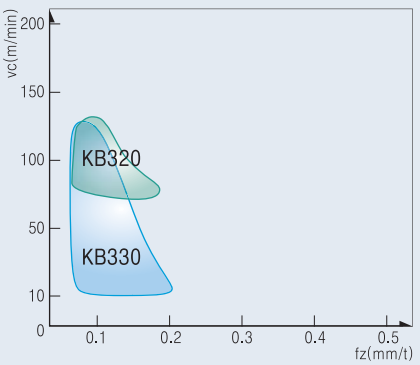
4) N : Non-ferrous metal



5) S : Heat resistant steel



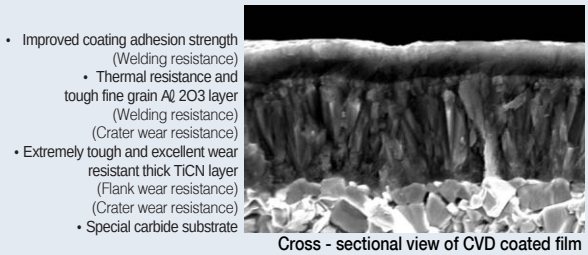
6) H : Hardened steel



CVD Coated Grades

■ Features

- Due to the special crystalline structure, superior wear resistance and toughness have been acquired.
- It is good for general purpose.



Cross - sectional view of CVD coated film

■ Selection system

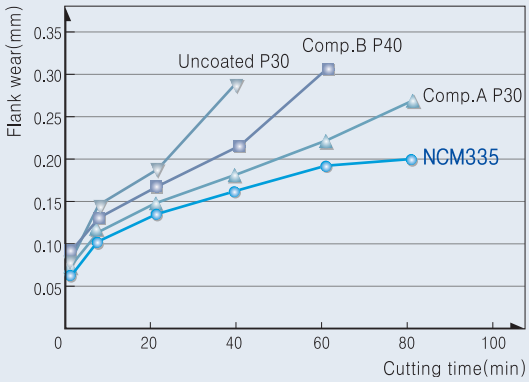
Workpiece	Grade	Recommended cutting speed(m/min)	ISO	Application range
P / Steel & Stainless steel / M	NCM325	250 (150~300)	P20 M20	NCM325
			P30 M30	NCM325 / NCM335
	NCM335	200 (150~250)	P40 M40	NCM335

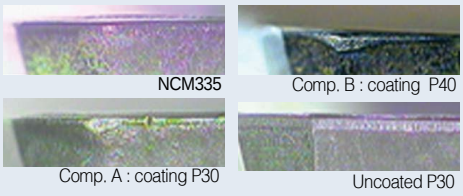
■ The features of CVD coated grades

CVD coated grades	ISO	Features
NCM325	P20 ~ P30 M20 ~ M30	• For high speed milling of steel and stainless steel. • Optimized grade for steel & stainless steel by employing proper substrate. (optimal hardness & toughness combination) and hard coating. • MT-TiCN + Al2O3 + TiN
NCM335	P30 ~ P40 M30 ~ M40	• For interrupted and rough milling of steel and stainless steel. • The toughest substrate with hard coating provides stable tool life even in severe interrupted cutting. • MT-TiCN + Al2O3 + TiN

■ Cutting performance

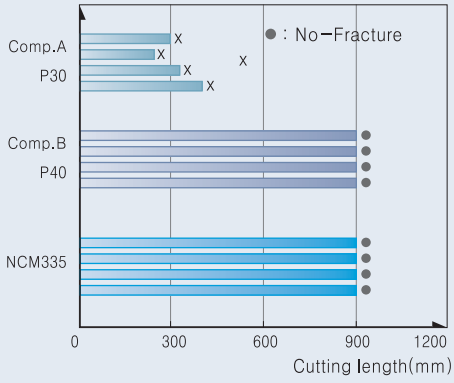
● Wear resistance





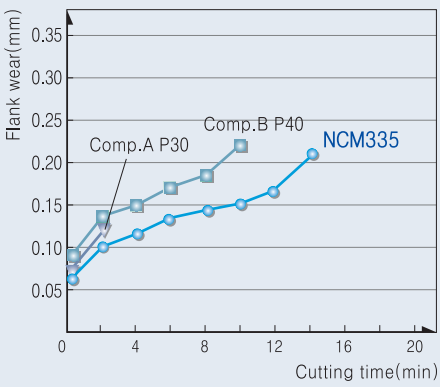
1. Workpiece : SCM440(HB280)
2. Designation : SPXN1203EDR
3. Cutting condition : vc = 188m/min
   fz = 0.20mm/t
   ap = 2.0mm
   Dry

● Impact resistance



1. Workpiece : SCM440(HB280)
2. Designation : SPXN1203EDR
3. Cutting condition :
   vc = 125m/min
   fz = 0.36mm/t
   ap = 2.0mm
   Dry

● Interrupted wear resistance for difficult-to-cut material



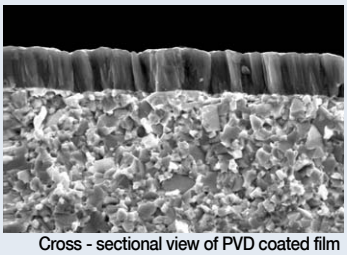
1. Workpiece : STS304
2. Designation : SPXN1203EDR
3. Cutting condition :
   vc = 126m/min
   fz = 0.36mm/t
   ap = 2.0mm
   Dry

PVD coated Grades

■ Features

‣ New TiAlN enhances wear resistance and toughness than conventional TiAlN.
It can be used in dryness, high speed cutting.

1) Developed wear resistance
• Developed adhesion force between substrate and coating
2) Developed toughness
• Combination of tough and heat resistant substrate and PVD coating have good tool life in heavy interruption.



Cross - sectional view of PVD coated film

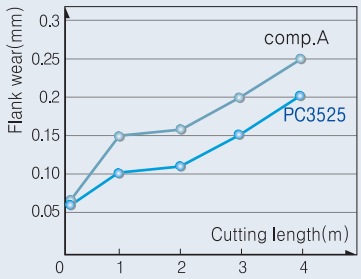
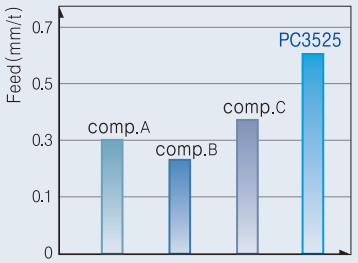
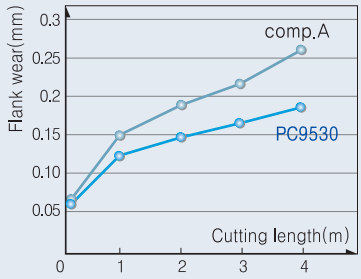
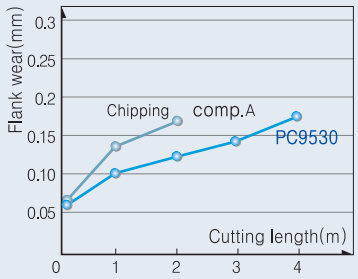
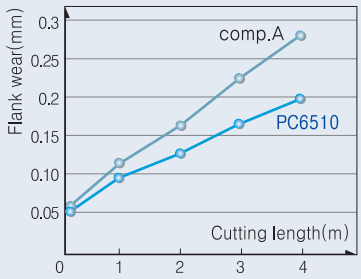
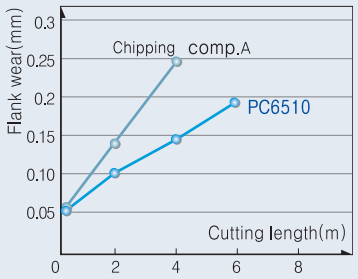
■ Selection system

Workpiece		Machining types	Grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	PC3525	200 (150~250)	P20	PC3525
			PC3535		P30	PC3535
		Interrupted cutting	PC230		P40	PC3545
			PC3545	120 (100~150)	P50	
M	Stainless steel	Continuous cutting	PC8520	120 (100~150)	M20	PC8520
			PC9530	130 (50~200)	M30	PC9530
		Interrupted cutting	PC3545	120 (100~150)	M40	
K	Cast iron	Continuous cutting	PC6510	200 (150~250)	K01	
					K05	PC6510
		Interrupted cutting	PC215K	165 (120~210)	K10	
					K20	PC215K

■ The features of main PVD coated grades

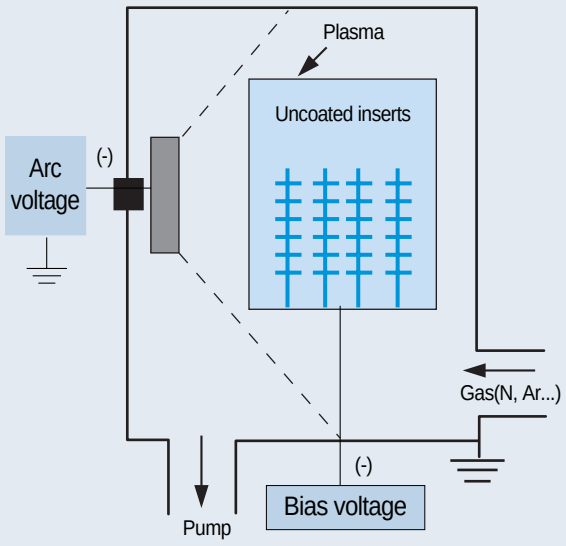
PVD coated grades	ISO	Features
PC3525	P15 ~ P35	• It is harder grade than PC3535. • Due to excellent wear resistance and crater resistance. It can be used in high speed. • New TiAlN.
PC3535	P20 ~ P35	• Milling grade for steel. • First recommended grade for general purpose, because the substrate has good wear resistance and toughness with good heat resistant coating.
PC3545	P30 ~ P50	• Medium and rough milling for steel. • Enhanced chipping resistant substrate. • K-Gold coating.
PC8520	S20 ~ S30	• For medium and rough milling for difficult-to-cut materials and stainless steels. • Enhanced chipping resistant substrate. • K-Gold coating.
PC6510	K01 ~ K15	• High speed milling grade for cast iron and aluminum. • K-Gold coating.
PC215K	K15 ~ K30	• Milling grade for cast iron and aluminum in medium to low cutting speed. • TiAlN.
PC9530	M20 ~ M35	• Milling grade for cast iron and aluminum in medium to low cutting speed. • The toughest sub-micron substrate provides excellent cutting performance at high feed. • TiAlN.

■ Cutting performance

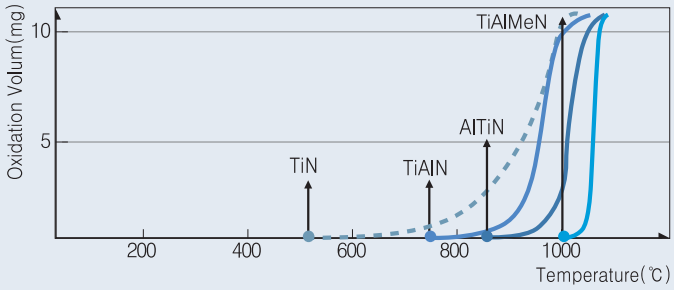
Workpiece		Cutting performance
P	Steel (PC3525)	 • Wear resistance(SKD11) vc= 250m/min fz = 0.2mm/t ap= 2.0mm Dry  • Limit feed rate(SCM440-3) vc = 125m/min fz = variable ap = 2.0mm Dry
M	Stainless steel (PC9530)	 • Wear resistance(STS304) Designation : SPCN1203EDTR-S20 Cutting condition : vc= 200m/min fz = 0.2mm/t ap= 2.0mm Wet  • Wear resistance(STS316) Designation : SECN1203AFTN-S20 Cutting condition : vc = 151m/min fz = 0.167mm/t ap = 2.0mm Wet
K	Cast iron (PC6510)	 • Wear resistance(GC25) Designation : SPCN1203EDER-RH Cutting condition : vc= 300m/min fz = 0.2mm/t ap= 2.0mm Wet  • Wear resistance(GCD60) Designation : SPCN1203EDER-RH Cutting condition : vc = 150m/min fz =0.2mm/t ap=2.0mm Wet

■ Equipment and features

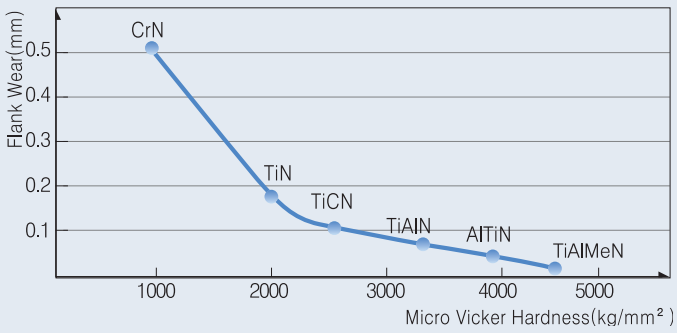
● Process



● Oxidation starting temperature



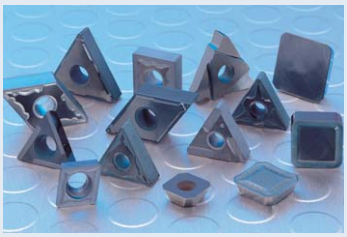
● Hardness & Cutting performance

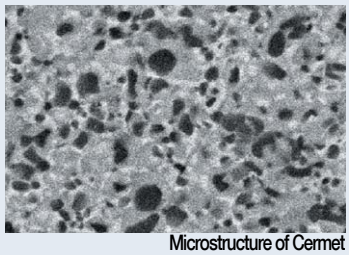


Cermet Grades

■ Features

‣ Korloy cermet is a kind of carbonitride type cermet which has ultra fine micro structure by adding TiN,TiCN powders as additives. It has superior quality than conventional cermet when it comes wear resistance and thermal shock resistance as well as toughness.





Microstructure of Cermet

■ Selection system

Workpiece		Machining types	Grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	Continuous cutting	CN20	180 (130 ~ 230)	P01	CN20
					P10	
		Interrupted cutting	CN30	150 (100 ~ 200)	P20	CN30

■ The features of main cermet grades

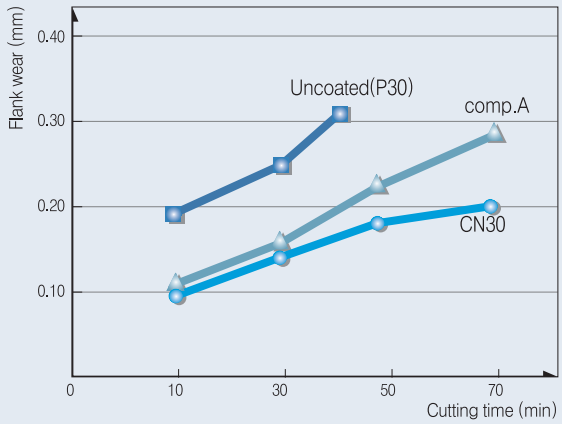
Cermet Grade	ISO	Features
CN20	P10 ~ P20	• Turning and milling for steel. • For general purpose cermet with wear resistance and toughness.
CN30	P20 ~ P30	• Milling for steel. • The toughest cermet with chipping resistance.

■ The physical properties of grades

ISO	Grade	Hardness	TRS	SG
P	CN20	<1600	220 <	7.0~7.2
	CN30	<1500	240 <	7.5~8.0

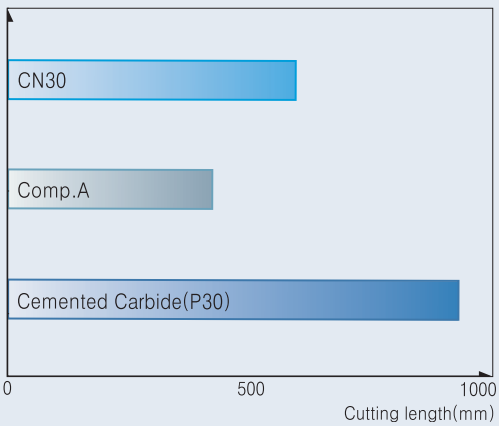
■ Cutting performance

● Wear resistance



vc : 190m/min SDCN42MT
fz : 0.2mm/t AD4160R
ap : 2.0mm SCM440(HB270)

● Impact resistance

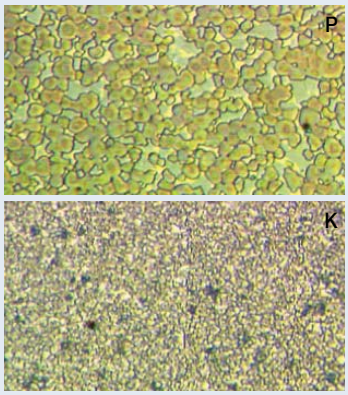


vc : 130m/min SDCN42MT
fz : 0.3mm/t AD4160R
ap : 3.0mm SCM440(HB270)

Cemented Carbide Grades

Features

- Due to the advanced sintering technology that korloy use, korloy uncoated carbide grades have fine alloy structure which is necessary to get superior quality as a cutting tool.



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 great thermal crack resistance of carbide.
- Due to the special design of carbides, it has fine micro structure and low affinity with workpiece.
- It has excellent toughness and low cutting load.

Selection system

Workpiece		Grade	Recommended cutting speed(m/min)	ISO	Application range
P	Steel	ST30A	130 (70 ~ 180)	P30	ST30A
K	Cast iron	H01, H05	150 (100 ~ 200)	K01	
		H10, G10	140 (90 ~ 190)	K10	H01, H05, G10
	Aluminum alloy	H01	500 (300 ~ 800)	K20	
	Copper alloys	H01	200 (150 ~ 300)	K30	

Main composition and application range

ISO	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.

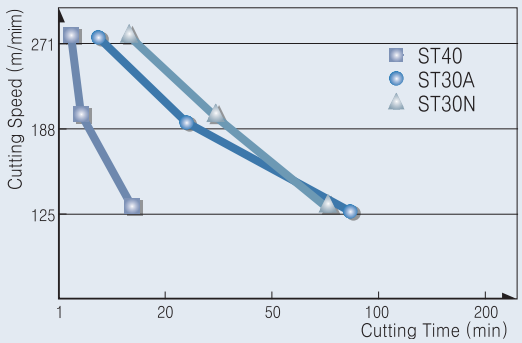
The physical properties of grades

ISO	Grade	Hardness (H_RA)	TRS (kgf/mm²)	Young's modulus (10^3kgf/mm²)	Thermal expansion coefficient (10^{-6}/℃)	Thermal conductivity (cal/cm·sec·℃)
P	ST05	92.7	140	-	-	-
	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U10	92.4	170	47	-	-
	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
	U40	89.2	270	-	-	-
K	H02	93.2	185	61	4.4	105
	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105

* 1Gpa = 102kg/m², 1w/m · k = 2.59×10^{-3}cal/cm · sec · ℃

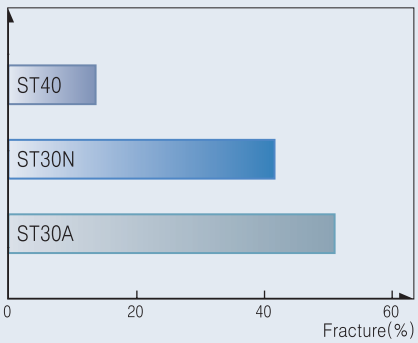
Cutting performance

● Wear resistance



fz : 0.2mm/t
ap : 2.0mm
SPCN1203EDR
EP4160R
42CrMo4(HB280)

● Impact resistance



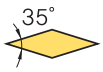
vc : 125m/min
fz : 0.25~45mm/t
ap : 2.0mm
SPCN1203EDR
EP4160R
42CrMo4(HB280)

Milling Insert Code System(ISO)

S	P	K	R	12
1	2	3	4	5

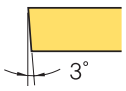
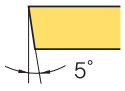
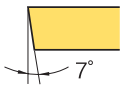
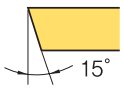
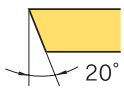
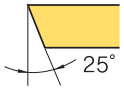
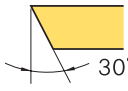
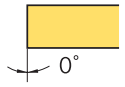
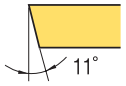
1 S P K R 12 03 ED08 S R – MX

Insert Shape

C	D	H	L	O
				
R	S	T	V	W

2 S P K R 12 03 ED08 S R – MX

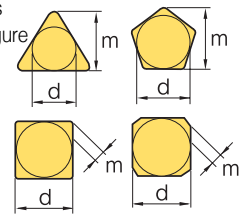
Relief Angle

				
A	B	C	D	E
				
F	G	N	P	

3 S P K R 12 03 ED08 S R – MX

Tolerance

ap : 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,H,R,T,W class (exceptional case)

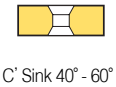
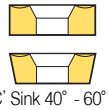
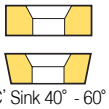
d	Tolerance on d		Tolerance on m	
	J,K,L,M,N	U	M,N	U
6.35	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

■ Tolerance on D class (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 S P K R 12 03 ED08 S R – MX

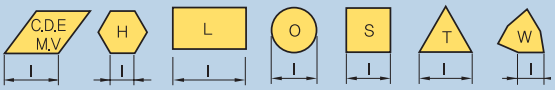
Cross Section Type

	C' Sink 70° - 90°	C' Sink 70° - 90°	
A	B	C	F
	C' Sink 70° - 90°	C' Sink 70° - 90°	
G	H	J	M
	 C' Sink 40° - 60°		 C' Sink 40° - 60°
N	Q	R	T
C' Sink 40° - 60°	 C' Sink 40° - 60°	Special type	
U	W	X	

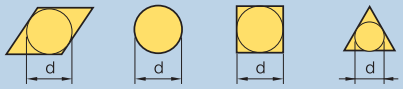
5 S P K R 12 03 ED08 S R – MX

Cutting Edge Length, Diameter of Inscribed circle

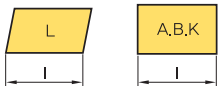
■ Metric system



■ 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 lenght 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 ED08 S R – MX

6 7 8 9 10

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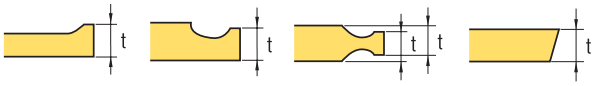
Height of Cutting Edge



Symbol		Height of cutting edge(t)	
Metric	Inch	mm	Inch
-	0.5(1)	0.79	1/32
T0	0.6	1.00	0.040
01	1(2)	1.59	1/16
T1	1.2	1.98	5.64
02	1.5(3)	2.38	3/32
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

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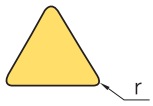
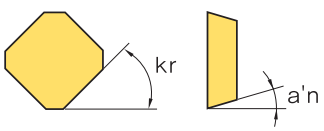
Nose Radius (Nose R)



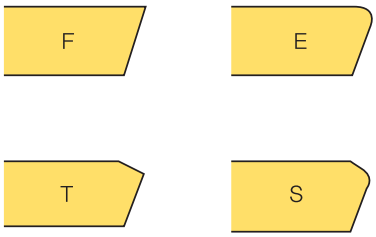
r		Symbol		r		Symbol	
mm	Inch	mm	Inch	mm	Inch	mm	Inch
00	0	0.0		12	3	1.2	3/64
02		0.2		15		1.5	
04	1	0.4	1/64	16	4	1.6	4/64
05		0.5		24	6	2.4	6/64
08	2	0.8	2/64	32	8	3.2	8/64
10		1.0		40		4.0	



Parallel Land	Relief Angle	
kr	a'n	
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 SPKR1203ED08SR–MX

Edge Preparation



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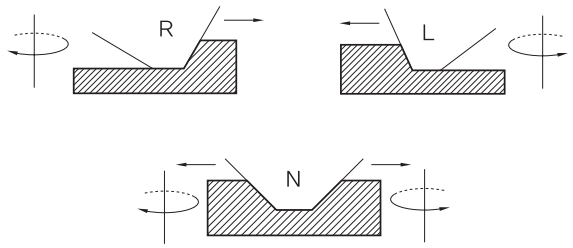
Hand of Tool



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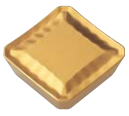
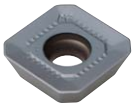
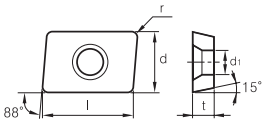
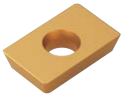
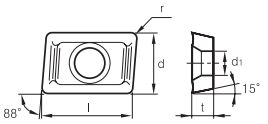
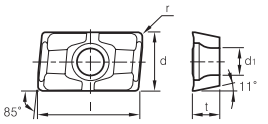
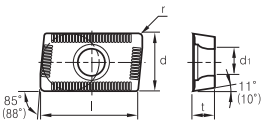
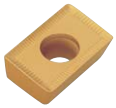
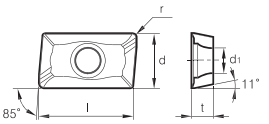
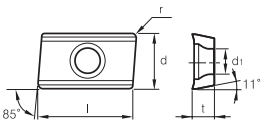
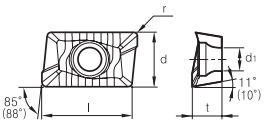
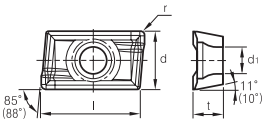
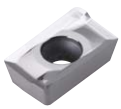
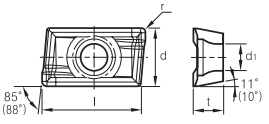
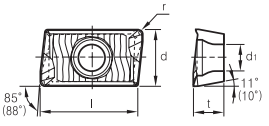
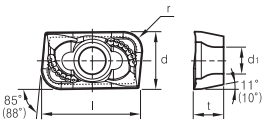
Chip Breaker for Milling

			
MA	MF	MM	MX
			
MF	MM	MR	MA
MA	MF	MM	

Milling Inserts

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

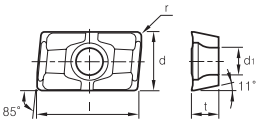
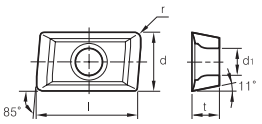
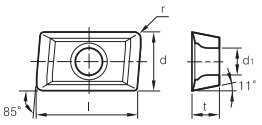
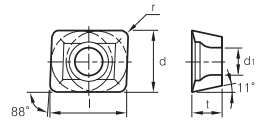
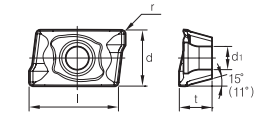
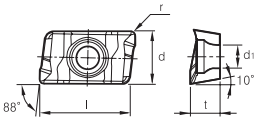
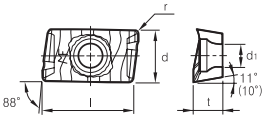
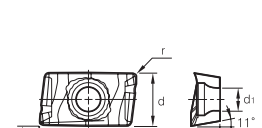
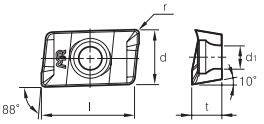
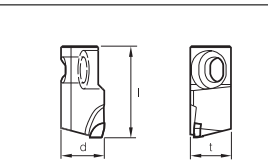
Machining types
- ● Continuous cutting
- ◡ General cutting
- ✚ Interrupted cutting

Inserts	Designation		Coated										Cermet		Uncoated				Dimensions (mm)					Geometries	Applicable Tools
			NCM325	PC230	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	PD2000	CN20	CN30	ST20	ST30A	H01	G10	l	d	t	r	d1		
ADKA	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	ADLT	150308R	●																	14.59	9.525	3.18	0.8	4.5		E112
		150308SR		●	○	●											●			14.59	9.525	3.18	0.8	4.5		
		150308TR													●					14.59	9.525	3.18	0.8	4.5		
APFT-X22	APFT	1604PDSR-X22		●																15.9	9.525	4.76	0.8	4.4		E70 E76 E80
		1604PDTR-X22																		15.9	9.525	4.76	0.8	4.4		
APFT-X28	APFT	1604PDR-X28																		15.9	9.525	4.76	0.8	4.4		E70 E76 E80
		1604PDSR-X28																		15.9	9.525	4.76	0.8	4.4		
		1604PDTR-X28																		15.9	9.525	4.76	0.8	4.4		
APKT	APKT	1604PDSR	●		○	●				●										15.9	9.525	4.76	0.8	4.4		E70 E75
APKT-MA	APKT	15T3PDFR-MA																●		15.5	9.525	4.62	0.8	4.4		E70 E75
		1604PDFR-MA											●					●		15.9	9.525	4.76	0.2	4.4		
APKT-MA2	APKT	1604PDFR-MA2																		15.7	9.49	5.67	0.8	4.4		E70 E75
		160416FR-MA2																		15.7	9.49	5.67	1.6	4.4		
		160432FR-MA2																		15.5	9.49	5.67	3.2	4.4		
APKT-MA3	APKT	1604PDFR-MA3																●		15.86	9.44	5	0.8	4.4		E70 E75
																										
APKT-MF	APKT	1604PDSR-MF	●		○															15.88	9.525	5	0.8	4.4		E70 E75
APKT-MM	APKT	1604PDSR-MM	●	●	○	●	●	●		●	●									16	9.5	5.2	0.8	4.4		E70 E75
APKT-MM1	APKT	160432R-MM1	●																	15.7	9.39	4.76	3.2	4.4		E70 E75

● : Stock item ○ : Under preparing for stock

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

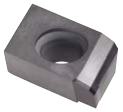
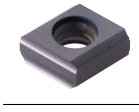
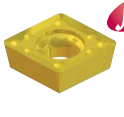
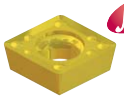
Inserts	Designation		Coated											Cermet		Uncoated			Dimensions (mm)					Geometries	Applicable Tools
			NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC215K	PC6510	PD2000	CN20	CN30	ST20	ST30A	H01	l	d	t	r	d1		
APKT-X22	APKT	1604PDSR-X22	●																	15.9	9.525	4.76	0.8	4.4		E70 E75
		1604PDTR-X22																		15.9	9.525	4.76	0.8	4.4		
APKT-X23	APKT	1604PDR-X23																		15.9	9.525	4.76	1.0	4.4		E70 E75
		1604PDTR-X23																		15.9	9.525	4.76	1.0	4.4		
APKT-X24	APKT	1604PDR-X24																		15.9	9.525	4.76	1.0	4.4		E70 E75
		1604PDFR-X24																		15.9	9.525	4.76	1.0	4.4		
APLT	APLT	070304R	●			○														7.5	6.35	3.18	0.4	2.8		E112
APMT-MM	APMT	0602PDSR-MM				○														5.7	4.24	2.6	0.4	2		E69 E70 E73 E75 E79
		0903PDSR-MM				○														9.4	6.21	3.6	0.4	2.8		
		1806PDSR-MM				○														17.4	10.98	6.35	0.8	4.5		
APXT-MA	APXT	11T3PDR-MA																	●	10.45	6.594	3.6	0.5	2.85		E69 E78 E71 E79 E72 E74 E76 E77
		11T318R-MA																		10.2	6.594	3.45	1.8	2.85		
APXT-MF	APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●							11.3	6.60	3.6	0.5	2.85		E69 E77 E70 E78 E71 E79 E72 E80 E74 E76
		1604PDSR-MF	●			○	●	●	●	●			●							16.5	9.56	5.76	3.2	4.5		
APXT-MM	APXT	11T3PDSR-MM	●	●	●	○	●	●	●		●		●							10.5	6.594	3.6	0.5	2.85		E69 E70 E71 E72 E74 E76 E77 E78 E79 E80
		11T312R-MM	●	●		○	●	●												10.2	6.594	3.5	1.2	2.85		
		11T316R-MM				○		●												10.2	6.594	3.467	1.6	2.85		
		11T318R-MM				○														10.2	6.594	3.447	1.8	2.85		
		11T324R-MM						●			●									10.2	6.594	3.387	2.4	2.82		
		1604PDSR-MM	●	●	●	○	●	●	●	●		●	●							10.2	6.594	3.387	0.8	2.82		
		160416R-MM	●	●		○	●	●			●									16.5	9.56	5.76	1.6	4.5		
		160432R-MM	●			○					●									16.5	9.56	5.76	3.2	4.5		
APXT-MR	APXT	11T3PDSR-MR	●	●																10.5	6.594	3.6	0.5	2.85		E69 E72 E74 E76 E77 E78 E79
		11T308PDR-MR																		10.5	6.594	3.6	0.8	2.85		
BAPDR/L-XAF	BAPDR	XAF													○					31	14	13.8	-	-		E48
	BAPDL	XAF													●					31	14	13.8	-	-		

● : Stock item ○ : Under preparing for stock

Milling Inserts

Workpiece			Coated									PCD	Cermet		Uncoated			Dimensions (mm)						Designation	Applicable Tools
			NCM325	PC230	PC3525	NCM335	PC3545	PC8520	PC9530	PC215K	PC6510	PD2000	DP200	CN20	CN30	ST20	ST30A	H01	G10	l	d	t	r	d_1	C		
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

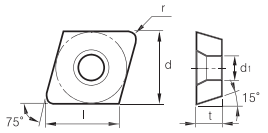
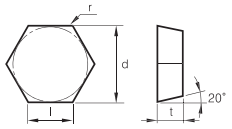
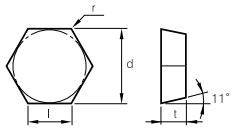
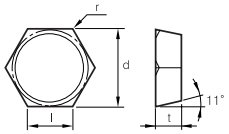
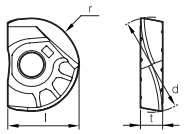
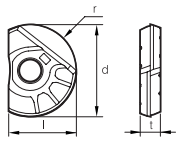
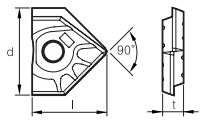
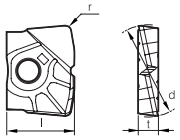
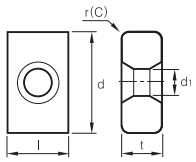
Inserts	Designation																									Applicable Tools
BAPDR/L-XAW	BAPDR	XAW											●							31	13.8	13.8	-	-	-	E48
	BAPDL	XAW											●							31	13.8	13.8	-	-	-	
BAPDR-NAF	BAPDR	NAF											○							31	14	13.8	-	-	-	E48
*																										
BAPDR-NAW	BAPDR	NAW											○							31	13.8	13.8	-	-	-	E48
*																										
CDEW-NAF	CDEW	1204R-NAF											●							12.7	9.525	4.76	-	4.4	-	E48
*																										
CDEW-NAW	CDEW	1204R-NAW											●							12.7	9.525	4.76	-	4.4	-	E48
*																										
CDEW-XAF	CDEW	1204R-XAF											●							12.7	9.525	4.76	-	4.4	-	E48
		1204L-XAF											●							12.7	9.525	4.76	-	4.4	-	
CDEW-XAW	CDEW	1204R-XAW											●							12.7	9.525	4.76	-	4.4	-	E48
		1204L-XAW											●							12.7	9.525	4.76	-	4.4	-	
CDEW-XCF	CDEW	1204R-XCF																●		12.7	9.525	4.76	-	4.4	-	E48
		1204L-XCF																○		12.7	9.525	4.76	-	4.4	-	
CNHQ	CNHQ	C1005-C0.5																		10	10	5.4	-	4.7	0.5	E163 E164
		C1305-C0.5																		12.7	10	5.4	-	4.7	0.5	
		C1606-C0.5																		16	12	6.4	-	5.9	0.5	
CPMH	CPMH	120408-MM			○															12.895	12.7	4.76	0.794	5.5	-	E123
 New																									-	
																									-	
CPMT	CPMT	060204-MF			○															6.448	6.35	2.38	0.397	2.75	-	E123
 New		080308-MF			○															8.06	7.938	3.4	0.794	3.18		
		09T308-MF			○															9.671	9.525	3.97	0.794	4.4		

∗ Nega land applied insert on cutting edge.

● : Stock item ○ : Under preparing for stock

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									Cermet		Uncoated					Dimensions (mm)					Designation	Applicable Tools
			NCM325	PC230	PC3525	NCM335	PC3545	PC8520	PC9530	PC6510	PC210F	PD2000	CN20	CN30	ST20	ST30A	H01	G10	l	d	t	r	d1		
EDCW	EDCW	1604ZDFR									●								16.4	15.875	4.76	0.8	5.5		-
		1605ZDTR									●								16.4	15.875	4.76	0.8	5.5		
HECN	HECN	090408FN																	9.0	15.875	4.76	0.8	-		E154
		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	HPEN	090408FN																	9.0	15.875	4.76	0.8	-		E155
		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	HPEN	090408-WC																	9.0	15.875	4.76	0.8	-		E155
		110412-WC																	11.0	19.05	4.76	1.2	-		
LBH	LBH	080									●								7	8	2.4	4	-		E117 E118
		100									●								8.5	10	2.6	5	-		
		120									●								10	12	3	6	-		
		160									●								12	16	4	8	-		
		200									●								15	20	5	10	-		
		250									●								18.5	25	6	12.5	-		
		300									●								22.5	30	7	15	-		
		320									●								23.5	32	7	16	-		
LBS *	LBS	080																	7	8	2.4	4	-		E117 E118
		100																	8.5	10	2.6	5	-		
		120																	10	12	3	6	-		
		160																	12	16	4	8	-		
		200																	15	20	5	10	-		
		250																	18.5	25	6	12.5	-		
		300																	22.5	30	7	15	-		
		320																	23.5	32	7	16	-		
LCF	LCF	160-D90									○								13.7	16	4	-	-		E117 E118
		200-D90									○								17.0	20	5	-	-		
		250-D90									○								21.5	25	6	-	-		
LFH	LFH	100									○								8.5	10	2.6	1.5	-		E117 E118
		120									○								10	12	3	1.5	-		
		160									○								12	16	4	1.5	-		
		200									○								15	20	5	2.0	-		
		250									○								18.5	25	6	2.0	-		
		300									○								22.5	30	7	2.0	-		
		320									○								23.5	32	7	2.0	-		
LNE	LNE	324-R0.8								○									9.525	15.875	6.35	0.8	4.4		E159
		324-C1.0								○									9.525	15.875	6.35	1.0	4.4		

* LBS : Plan to non-stock item

● : Stock item ○ : Under preparing for stock

Milling Inserts

Workpiece			NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC210F	CN20	CN30	ST20	ST30A	H01	G10
	Steel	P	●	●	●		✚			●							
	Stainless steel	M	●				✚										
	Cast iron	K		●	●					●							
	Non-ferrous metal	N									●						
	Heat resistant alloy, Titanium alloy	S															
	Hardened steel	H															

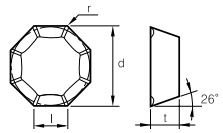
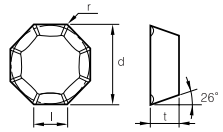
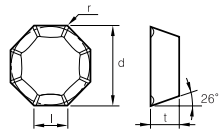
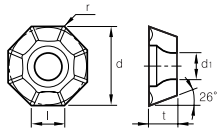
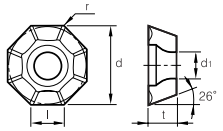
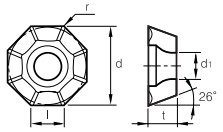
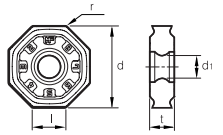
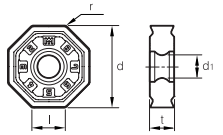
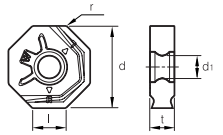
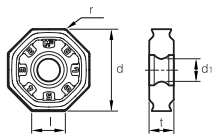
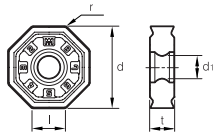
Machining types
- ● Continuous cutting
- ● General cutting
- ✚ Interrupted cutting

Inserts	Designation		Coated									Cermet		Uncoated				Dimensions (mm)					Geometries	Applicable Tools
			NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC210F	CN20	CN30	ST20	ST30A	H01	G10	l	d	t	r	d_1		
LNM(E)X-MF	LNMX	100605PNR-MF		●						●								10.0	6.5	6.5	0.5	3.5		E58 E60 E61
	LNEX	100605PNR-MF		●						●								10.0	6.5	6.5	0.5	3.5		
LNM(E)X-MF	LNMX	151008PNR-MF	○	●						●								15.0	10.0	10.0	0.8	4.5		E58 E60
	LNEX	151008PNR-MF		●						●								15.0	10.0	10.0	0.8	4.5		
LNM(E)X-MM	LNMX	100605PNR-MM		●						●								10.0	6.5	6.5	0.5	3.5		E58 E59 E61
	LNEX	100605PNR-MM		●						●								10.0	6.5	6.5	0.5	3.5		
LNM(E)X-MM	LNMX	151008PNR-MM	○	●			●			●								15.0	10.0	10.0	0.8	4.5		E58 E59 E61
	LNEX	151008PNR-MM		●						●								15.0	10.0	10.0	0.8	4.5		
LRH *	LR(H)	100-R05								●								8.5	10	2.6	0.5	-	LRH Type	E117 E118
		100-R10								●								8.5	10	2.6	1.0	-		
		100-R20								●								8.5	10	2.6	2.0	-		
		120-R05								●								10	12	3	0.5	-		
		120-R10								●								10	12	3	1.0	-		
		120-R20								●								10	12	3	2.0	-		
		160-R05								●								12	16	4	0.5	-		
		160-R10								●								12	16	4	1.0	-		
		160-R20								●								12	16	4	2.0	-		
		160-R30								●								12	16	4	3.0	-		
		200-R05								●								15	20	5	0.5	-		
		200-R10								●								15	20	5	1.0	-		
		200-R20								●								15	20	5	2.0	-		
		200-R30								●								15	20	5	3.0	-		
LR * *		250-R05								●								18.5	25	6	0.5	-	LR Type	
		250-R10								●								18.5	25	6	1.0	-		
		250-R20								●								18.5	25	6	2.0	-		
		250-R30								●								18.5	25	6	3.0	-		
		300-R10								●								22.5	30	7	1.0	-		
		300-R20								●								22.5	30	7	2.0	-		
		300-R30								●								22.5	30	7	3.0	-		
		320-R10								●								23.5	32	7	1.0	-		
		320-R20								●								23.5	32	7	2.0	-		
		320-R30								●								23.5	32	7	3.0	-		
MPMT	MPMT	090308																9.55	9.525	3.18	0.794	4.5		-
		120408																12.73	12.7	4.76	0.794	5.5		
OFCN	OFCN	0704SN	●		●		●											7.4	18	4.76	0.5	-		E46
		0704FN																7.4	18	4.76	0.5	-		
		070408SN																7.4	18	4.76	0.8	-		
		070408FN																7.4	18	4.76	0.8	-		
		07040TN								○														
OFCW	OFCW	05T3SN	●															5.2	12.7	3.97	0.5	4.4		E46
		05T3FN																5.2	12.7	3.97	0.5	4.4		
		05T308FN																5.2	12.7	3.97	0.8	4.4		

* r = Corner Radius　　* LR : Plan to non-stock item　　● : Stock item ○ : Under preparing for stock

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								Cermet		Uncoated				Dimensions (mm)					Geometries	Applicable Tools
			NCM325	PC230	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	CN20	CN30	ST20	ST30A	H01	G10	l	d	t	r	d_1		
OFKR-MA	OFKR	0704FN-MA														●		7.4	18	4.76	0.5	-		E46
		0704EN-MA														●		7.4	18	4.76	0.5	-		
OFKR-MF	OFKR	0704SN-MF	●		○		●		●		○							7.4	18	4.76	0.5	-		E46
		070408SN-MF																7.4	18	4.76	0.8	-		
OFKR-MM	OFKR	0704SN-MM	●	●	○	●	●	●		●	●							7.4	18	4.76	0.5	-		E46
		070408SN-MM	●															7.4	18	4.76	0.8	-		
OFKT-MA	OFKT	05T3FN-MA														●		5.2	12.7	3.97	0.5	4.4		E46
		05T3EN-MA														●		5.2	12.7	3.97	0.5	4.4		
		0704FN-MA														●		7.4	18	4.76	0.5	5.8		
		0704EN-MA														●		7.4	18	4.76	0.5	5.8		
OFKT-MF	OFKT	05T3SN-MF	●		○		●		●									5.2	12.7	3.97	0.5	4.4		E46
		05T308SN-MF																5.2	12.7	3.97	0.8	4.4		
OFKT-MM	OFKT	05T3SN-MM	●	●	○		●			●								5.2	12.7	3.97	0.5	4.4		E46
		05T308SN-MM																5.2	12.7	3.97	0.8	4.4		
		0704SN-MM	●		○													7.4	18	4.76	0.5	5.8		
ONHX-MF	ONHX	060608-MF									○							6.63	16.0	6.0	0.8	5.6		E62
New		080608-MF			●					●	●							8.37	20.2	6.0	0.8	5.6		
ONHX-MM	ONHX	060608-MM									○							6.63	16.0	6.0	0.8	5.6		E62
New		080608-MM			●					●	●							8.37	20.2	6.0	0.8	5.6		
ONHX-W	ONHX	060608-W									○							6.48	16.0	6.0	0.8	5.6		E62
New		080608-W			●					●	●							8.22	20.2	6.0	0.8	5.6		
ONMX-MF	ONMX	060608-MF									○							6.63	16.0	6.0	0.8	5.6		E62
New		080608-MF			●					●	●							8.37	20.2	6.0	0.8	5.6		
ONMX-MM	ONMX	060608-MM									○							6.63	16.0	6.0	0.8	5.6		E62
New		080608-MM			●					●	●							8.37	20.2	6.0	0.8	5.6		

● : Stock item ○ : Under preparing for stock

Milling Inserts

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								Cermet		Uncoated				Dimensions (mm)						Geometries	Applicable Tools
			NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC210F	CN20	CN30	ST20	ST30A	H01	G10	l	d	t	r	d_1	Cutter width		
PNEJ	PNEJ	1223N			●													-	12.7	2.3	-	5.0	4.0		E170 E171
		1225N																-	12.7	2.5	-	5.0	4.5		
		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 *	PNEJ	1223N-C03																-	12.7	2.3	-	5.0	4.0		E170 E171
		1230N-C03																-	12.7	3.0	-	5.0	5.0		
		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	RC	16									●							15.8	16	3.5	8	5.8	-		E119
		20									●							17.8	20	4	10	5.8	-		
		25									●							22	25	5	12.5	6.8	-		
		30									●							26.8	30	6	15	8.8	-		
		32									●							27.8	32	6	16	8.8	-		
RDCT-MA	RDCT	10T3M0-MA														●		-	10	3.97	-	4.0	-		E96 E99 E101
		1204M0-MA														●		-	12	4.76	-	4.5	-		
RDHW	RDHW	0501M0F																-	5	1.59	-	2.3	-		E98 E101
		0501M0E							●									-	5	1.59	-	2.3	-		
		0501M0S																-	5	1.59	-	2.3	-		
		06T1M0F																-	6	1.98	-	2.5	-		
		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	-		
		1605M0F																-	16	5.56	-	5.5	-		E97 E100 E101
		1605M0E																-	16	5.56	-	5.5	-		
		1605M0S																-	16	5.56	-	5.5	-		
		2006M0F																-	20	6.35	-	5.5	-		
		2006M0E																-	20	6.35	-	5.5	-		
		2006M0S																-	20	6.35	-	5.5	-		
RDKT-MF	RDKT	10T3M0-MF		●	●		●	●	●									-	10	3.97	-	3.85	-		E96 E99 E101
		1204M0-MF		●	●		●	●	●									-	12	4.76	-	4.5	-		
RDKT-MM	RDKT	10T3M0-MM	●	●	●	●	●		●	●								-	10	3.97	-	3.85	-		E96 E97 E99 E100 E101
		1204M0-MM	●	●	●	●	●		●	●								-	12	4.76	-	4.5	-		
		1605M0-MM			●		●											-	16	5.56	-	5.5	-		
		2006M0-MM			●		●											-	20	6.35	-	5.5	-		

* C03 : Chamfer 0.3mm C05 : Chamfer 0.5mm

● : Stock item ○ : Under preparing for stock

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									Cermet	Uncoated					Dimensions (mm)							Geometries	Applicable Tools
			NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	PD2000	CN30	ST20	ST30A	H10	H01	G10	l	d	t	r	d1	a	b		
RDKW	RDKW	0501M0E					●												-	5	1.59	-	2.3	-	-		E98 E101
		06T1M0E					●												-	6	1.98	-	2.5	-	-		
		0702M0E					●												-	7	2.38	-	2.8	-	-		
		0803M0E					●												-	8	3.18	-	3.4	-	-		
REKR-MM	REKR	170400-MM				●													-	17.8	4.76	-	-	-	-		E46
SDCN	SDCN	42R																	12.7	-	3.18	-	-	3.5	-		E153
		42L														●			12.7	-	3.18	-	-	3.5	-		
		53R																	15.875	-	4.76	-	-	1.5	-		
		53L																	15.875	-	4.76	-	-	1.5	-		
SDCN		42M																●	12.7	-	3.18	-	-	1.5	-		E33 E34 E43 E44
		42M-G														●			12.7	-	3.18	-	-	1.5	-		
		42MT	○	●	●			●					●	●	●				12.7	-	3.18	-	-	1.5	-		
		42MT-RH																	12.7	-	3.18	-	-	1.5	-		
		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	SDET	09M402R-MA										●					●		9.525	-	3.923	0.2	4.0	1.2	-		E93 E94 E95
		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	SDET	09M405R-MF																	9.525	-	4	0.5	4	1.2	-		E93 E94 E95
		130508R-MF																	13.5	-	5.56	0.8	5.56	2.2	-		
SDET-MM	SDET	09M405R-MM																	9.525	-	4	0.5	4	1.2	-		E93 E94 E95
		130508R-MM																	13.5	-	5.56	0.8	5.56	2.2	-		
		1405AESN-MM																	13.981	-	5.4	-	4.4	2.64	-		
SDKN-SM	SDKN	1203AESN-SM				●		●											12.7	12.7	3.18	-	-	1.64	0.59		E33 E34 E43 E44
		1203AEEN-SM																	12.7	12.7	3.18	-	-	1.64	0.59		
		1504AESN-SM				●		●											15.875	15.875	4.76	-	-	1.64	0.58		
		1504AEEN-SM																	15.875	15.875	4.76	-	-	1.64	0.58		

● : Stock item ○ : Under preparing for stock

Milling Inserts

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								Cermet		Uncoated				Dimensions (mm)						Geometries	Applicable Tools
			NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	CN20	CN30	ST20	ST30A	H01	G10	l	t	r	d_1	a	b		
SDKR-MX	SDKR	1203AESN-MX																12.7	3.18	-	-	2.0	-		E33 E34 E43 E44
		1203AETN-MX																12.7	3.18	-	-	2.0	-		
		1203AEN-MX	●															12.7	3.18	-	-	2.0	-		
		1504AESN-MX				●												15.875	4.76	-	-	2.0	-		
		1504AETN-MX																15.875	4.76	-	-	2.0	-		
		1504AEN-MX	●															15.875	4.76	-	-	2.0	-		
SDKR-SM	SDKR	1203AESN-SM	○	○					○									12.7	3.18	-	-	1.64	0.59		E33 E34 E43 E44
		1504AESN-SM	○	○					○									15.875	4.76	-	-	1.64	0.58		
SDMT-MM New	SDMT	090308-MM	○	○						○								9.525	3.18	0.8	4.4	-	-		E112 E113
SDXN-FM	SDXN	1203AESN-FM			●		●											12.7	3.18	-	-	1.43	0.71		E33 E34 E43 E44
		1203AEEN-FM																12.7	3.18	-	-	1.43	0.71		
		1504AESN-FM			●													15.875	4.76	-	-	1.43	0.70		
		1504AEEN-FM																15.875	4.76	-	-	1.43	0.70		
SDXR-FM	SDXR	1203AESN-FM																12.7	3.18	-	-	1.43	0.71		E33 E34 E43 E44
		1504AESN-FM																15.875	4.76	-	-	1.43	0.70		
SDXT-MA	SDXT	09M405R-MA														●		9.525	4.0	0.5	4.0	1.2	-		E93 E94 E95 E165 E166
		130508R-MA														●		13.5	5.56	0.8	5.56	2.2	-		
SDXT-MF	SDXT	09M403R-MF																9.525	4.0	0.3	4.0	1.2	-		E93 E94 E95 E165 E166
		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	SDXT	09M405R-MM	●		●	●		●	●	●								9.525	4.0	0.5	4.0	1.2	-		E93 E94 E95 E165 E166
		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	-		
		1405AESN-MM																13.981	5.40	-	4.40	2.64	-		
SECA	SECA	1204AFSN	●			●							○					12.7	4.76	-	5.56	2.66	-		-
		1205AFTN																12.7	4.76	-	5.56	2.66	-		
		1206AFFN																12.7	4.76	-	5.56	2.66	-		
		1207AFEN																12.7	4.76	-	5.56	2.66	-		
		1504AFSN																15.875	4.76	-	5.5	2.8	-		
		1505AFTN																15.875	4.76	-	5.5	2.8	-		
		1506AFFN																15.875	4.76	-	5.5	2.8	-		

● : Stock item ○ : Under preparing for stock

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

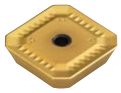
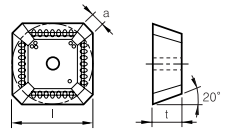
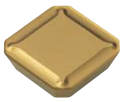
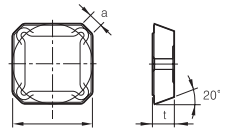
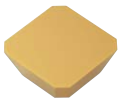
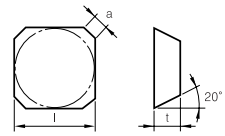
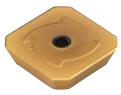
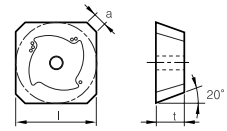
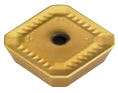
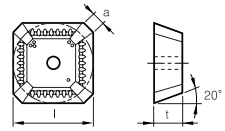
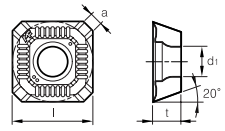
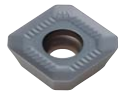
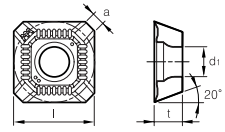
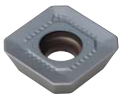
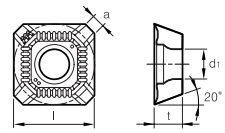
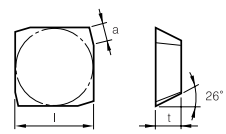
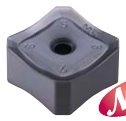
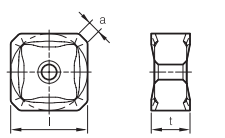
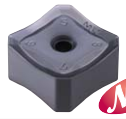
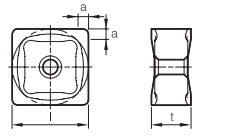
Inserts	Designation		Coated											Cermet		Uncoated			Dimensions (mm)					Geometries	Applicable Tools
			NCM325	PC130	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	NCM120	PD2000	CN20	CN30	ST30A	H01	G10	l	d	t	d_1	a		
SECN	SECN	1203AFFN																●	●	12.7	-	3.18	-	2.3		E35 E36
		1203AFTN				●					●				●	●	●			12.7	-	3.18	-	2.3		
		1203AFEN																		12.7	-	3.18	-	2.3		
		1203AFSN	●						●											12.7	-	3.18	-	2.3		
		1203AFEN-RH										●								12.7	-	3.18	-	2.36		
		1203AFSN-RH						●				●								12.7	-	3.18	-	2.36		
		1203AFTN-S20									●									12.7	-	3.18	-	2.3		
		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																								
SEET-MA	SEET	0903AGFN-MA												●				●		9.525	-	3.18	3.4	1.44		E90 E91 E92
		14M4AGFN-MA												●				●		14.0	-	4.0	4.4	1.81		
SEET-MF	SEET	0903AGSN-MF	●								●									9.525	-	3.18	3.4	2.11		E90 E91 E92
		14M4AGSN-MF	●						●		●	●								14	-	4.0	4.4	2.64		
SEET-MM	SEET	0903AGSN-MM	●								●									9.525	-	3.18	3.4	2.11		E90 E91 E92
		14M4AGSN-MM	●					●	●		●									14	-	4	4.4	2.64		
SEEW	SEEW	0903AGTN														●				9.525	-	3.18	3.4	2.11		E90 E91 E92
		14M4AGTN														●				14.0	-	4.0	4.4	2.64		
SEEW-W	SEEW	14M4AGFN-W										○								14.0	18.2	4.0	4.4	-		E90 E91 E92
		14M4AGSN-W										○								14.0	18.6	4.0	4.4	-		
		14M4AGTN-W										○								14.0	18.6	4.0	4.4	-		
SEKN-SM	SEKN	1203AFSN-SM					●			●										12.7	-	3.18	-	2.46		E35 E36
		1203AFEN-SM																		12.7	-	3.18	-	2.46		
		1504AFSN-SM					●			●										15.875	-	4.76	-	2.50		
		1504AFEN-SM																		15.875	-	4.76	-	2.50		
SEKR-MF1	SEKR	1203AFSN-MF1	○				○													12.7	-	3.18	-	1.62		E35
SEKR-MX	SEKR	1203AFSN-MX	●	●	●				●		●		●			●				12.7	-	3.18	-	1.62		E35 E36
		1204AFSN-MX	●																	12.7	-	3.18	-	1.62		
		1504AFSN-MX	●						●		●									15.875	-	4.76	-	2.4		

● : Stock item ○ : Under preparing for stock

Milling Inserts

Workpiece			NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	CN20	CN30	ST20	ST30A	H01	G10
	Steel	P	◡	◡	◡	✚	✚										
	Stainless steel	M	◡			◡	✚	◡	◡						✚		
	Cast iron	K		◡	◡					◡	●					●	◡
	Non-ferrous metal	N															
	Heat resistant alloy, Titanium alloy	S						●	●								
	Hardened steel	H															

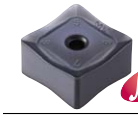
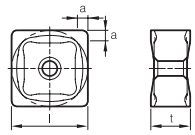
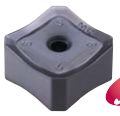
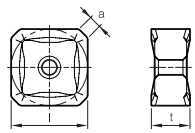
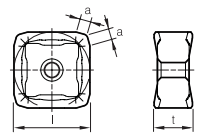
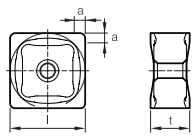
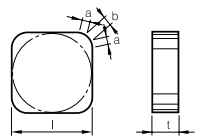
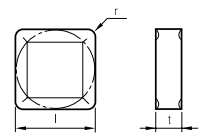
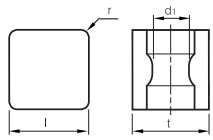
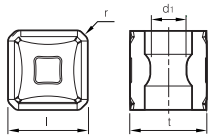
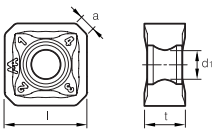
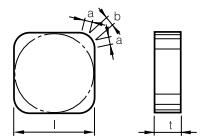
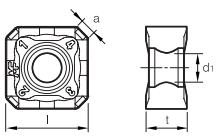
Machining types
- ● Continuous cutting
- ◡ General cutting
- ✚ Interrupted cutting

Inserts	Designation		Coated									Cermet		Uncoated				Dimensions (mm)				Geometries	Applicable Tools
			NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	CN20	CN30	ST20	ST30A	H01	G10	l	t	d_1	a		
SEKR-SM 	SEKR	1203AFSN-SM			●													12.7	3.18	-	2.46		E35 E36
		1504AFSN-SM																15.875	4.76	-	2.50		
SEKR-X35 	SEKR	1203AFSN-X35																12.7	3.18	-	2.46		E35
		1203AFFN-X35																12.7	3.18	-	2.3		
		1204AFFN-X35																12.7	4.76	-	2.3		
SEMN 	SEMN	1204AZ	●												●		●	12.7	4.76	-	2.0		-
SEXN-FM 	SEXN	1203AFSN-FM			●		●											12.7	3.18	-	2.36		E35 E36
		1203AFEN-FM																12.7	3.18	-	2.36		
		1504AFSN-FM			●		●											15.875	4.76	-	2.40		
		1504AFEN-FM																15.875	4.76	-	2.40		
SEXR-FM 	SEXR	1203AFSN-FM					●											12.7	3.18	-	2.36		E35 E36
		1504AFSN-FM																15.875	4.76	-	2.40		
SEXT-MF	SEXT	0903AGSN-MF			○						●							9.525	3.18	3.4	2.11		E90 E91 E92
		14M4AGSN-MF	●		○			●			●							14.0	4.0	4.4	2.64		
SEXT-MM 	SEXT	0903AGSN-MM			●					●	●							9.505	3.18	3.4	2.11		E90 E91 E92
		14M4AGSN-MM	●		●	●			●	●	●							13.981	4.0	4.4	2.64		
SEXT-MR 	SEXT	0903AGSN-MR			●													9.485	3.18	3.4	2.11		E90 E91 E92
		14M4AGSN-MR	●		●				●									13.951	4.0	4.4	2.64		
SFCN	SFCN	1203EFR														●	●	12.7	3.18	-	2.5		E37
SNC(M)F-MF  New	SNCF	1206ANN-MF		●						●								12.7	6.6	-	2		E63
		1507ANN-MF		●			●											15.875	7.35	-	2.1		
	SNMF	1206ANN-MF		●														12.7	6.6	-	2		
		1507ANN-MF																15.875	7.35	-	2.1		
SNC(M)F-MF  New	SNCF	1206ENN-MF		●						●								12.7	6.6	-	1.8		E64
		1507ENN-MF		●						●								15.875	7.35	-	1.8		
	SNMF	1206ENN-MF																12.7	6.6	-	1.8		
		1507ENN-MF																15.875	7.35	-	1.8		

● : Stock item ○ : Under preparing for stock

Workpiece			NCM325	PC230	PC3525	NCM335	PC3545	PC8520	PC9530	PC6510	CN20	CN30	H01	G10	ST30A	ST20
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

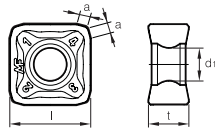
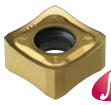
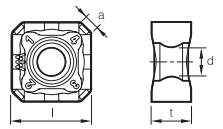
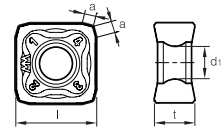
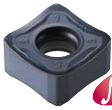
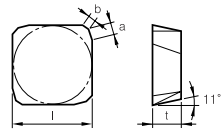
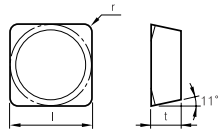
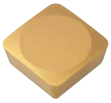
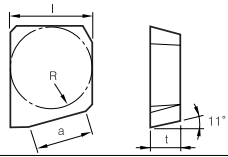
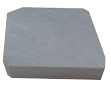
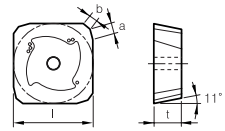
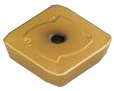
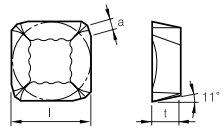
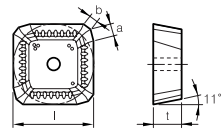
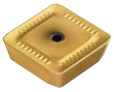
Inserts	Designation		Coated NCM325	PC230	PC3525	NCM335	PC3545	PC8520	PC9530	PC6510	Cermet CN20	CN30	Uncoated H01	G10	ST30A	ST20	Dimensions (mm) l	t	r	d1	a	b	Geometries	Applicable Tools
SNC(M)F-MF  New	SNCF	1206QNN-MF			●					●							12.7	6.6	-	-	1	-		E65
	SNMF	1206QNN-MF			●												12.7	7.35	-	-	1	-		
SNC(M)F-MM  New	SNCF	1206ANN-MM			●		●										12.7	6.6	-	-	2	-		E63
		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 New	SNCF	1206ENN-MM			●		●										12.7	6.6	-	-	1.8	-		E64
		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 New	SNCF	1206QNN-MM			●		●										12.7	6.6	-	-	1	-		E65
	SNMF	1206QNN-MM															12.7	7.35	-	-	1	-		
SNCN	SNCN	1204ENN	●											●	●	●	12.7	4.76	-	-	1.4	1.0		E38 E152
		1504ENN												○	●		15.875	4.76	-	-	1.4	1.0		
SNEF	SNEF	435								●							12.7	4.76	2.0	-	-	-		E156
		535															15.875	4.76	2.0	-	-	-		
SNEX	SNEX	101010								●							10	10	1.0	4.6	-	-		E158
		1010ZNN								●							10	10	(1.0)	4.6	-	-		
SNEX-CU1	SNEX	101010-CU1								●							10	10	1.0	4.6	-	-		E158
		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 New	SNEX	1206ANN-MA							●				○				12.7	6.35	-	4.5	2.36	-		E56
SNKN	SNKN	1204ENN								●							12.7	4.76	-	-	1.4	1.0		E38 E152
		1504ENN	●							○							15.875	4.76	-	-	1.4	1.0		
SNM(E)X-MF New	SNMX	1206ANN-MF			●					●							12.7	6.35	-	4.5	2.36	-		E56
	SNEX	1206ANN-MF			●					●							12.7	6.35	-	4.5	2.36	-		

● : Stock item ○ : Under preparing for stock

Milling Inserts

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

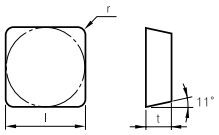
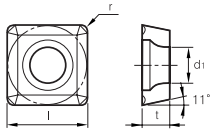
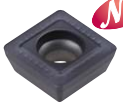
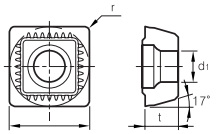
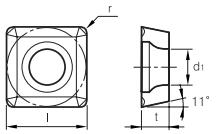
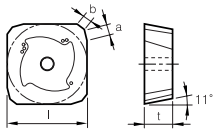
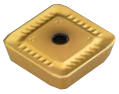
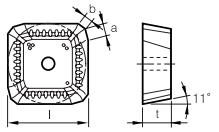
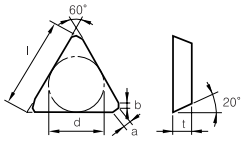
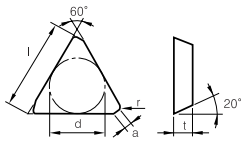
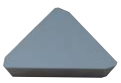
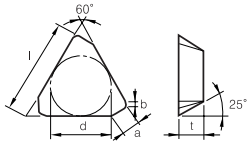
Machining types
- ● Continuous cutting
- ● General cutting
- ✚ Interrupted cutting

Inserts	Designation		Coated									Cermet		Uncoated					Dimensions (mm)						Geometries	Applicable Tools
			NCM325	PC130	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	CN20	CN30	ST20	ST30A	H01	H10	G10	l	t	r	d_1	a	b		
SNM(E)X-MF	SNMX	1206ENN-MF					●					●								12.7	6.35	-	5.2	1.82	-		E57
	SNEX	1206ENN-MF					●					●								12.7	6.35	-	5.2	1.82	-		
SNM(E)X-MM	SNMX	1206ANN-MM					●					●								12.7	6.35	-	4.5	2.36	-		E56
	SNEX	1206ANN-MM	●				●					●								12.7	6.35	-	4.5	2.36	-		
SNM(E)X-MM	SNMX	1206ENN-MM					●					●								12.7	6.35	-	5.2	1.82	-		E57
	SNEX	1206ENN-MM					●					●								12.7	6.35	-	5.2	1.82	-		
SPCN	SPCN	1203EDR	●	●	●	●			●						●	●	●	●	●	12.7	3.18	-	-	1.4	1.0		E39 E40
		1203EDL										●				●		●	●	12.7	3.18	-	-	1.4	1.0		
		1203EDR-G															●			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	-	-	1.4	1.0		
		1504EDR	●	●	●				●						●	●	●		●	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		
		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		
SPEN-WC	SPEN	120416-WC																		12.7	4.76	1.6	-	-	-		E157
		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	SPEX	1203EDR-1																		12.7	3.18	-	-	10.2	-		E39 E40
		1203EDL-1																		12.7	3.18	-	-	10.2	-		
		1504EDR-1																		15.875	4.76	-	-	10.2	-		
		1504EDL-1																		15.875	4.76	-	-	10.2	-		
		1904EDR-1																		19.05	4.76	-	-	10.2	-		
		1904EDL-1																		19.05	4.76	-	-	10.2	-		
SPKN-SM	SPKN	1203EDSR-SM					●	●		●										12.7	3.18	-	-	1.66	0.92		E39 E40
		1203EDER-SM																		12.7	3.18	-	-	1.66	0.92		
		1504EDSR-SM					●	●		●										15.875	4.76	-	-	1.62	0.93		
		1504EDER-SM																		15.875	4.76	-	-	1.62	0.93		
SPKR-MX	SPKR	1203EDSR-MX	●						●											12.7	3.18	-	-	1.4	-		E39 E40
		1203EDSL-MX	●																	12.7	3.18	-	-	1.4	-		
		1504EDR-MX	●																	15.875	4.76	-	-	1.45	-		
		1504EDSR-MX							●		●									15.875	4.76	-	-	1.45	-		
SPKR-SM	SPKR	1203EDSR-SM	○								○									12.7	3.18	-	-	1.66	0.92		E39 E40
		1504EDSR-SM	○								○									15.875	4.76	-	-	1.62	0.81		

● : Stock item ○ : Under preparing for stock

Workpiece			Coated										Cermet		Uncoated				
			NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	CN20	CN30	ST20	ST30A	H01	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

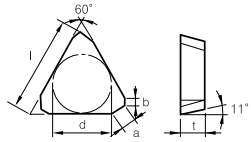
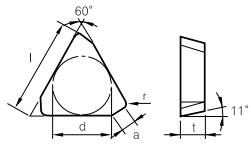
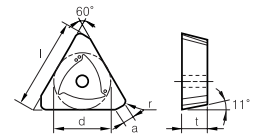
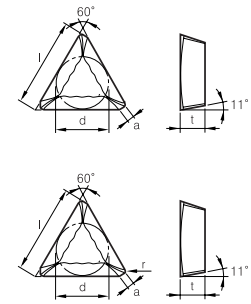
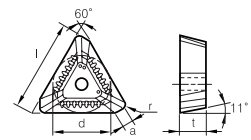
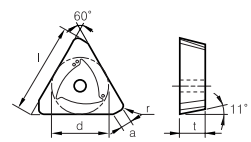
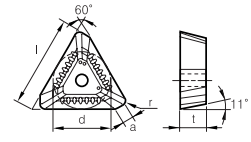
Inserts	Designation		Dimensions (mm)							Geometries	Applicable Tools
			l	d	t	r	d_1	a	b		
SPMN	SPMN	120308	12.7	-	3.18	0.8	-	-	-		E121
SPMT	SPMT	060304	6.35	-	3.18	0.4	2.8	-	-		E112 E113
SPMT-KC New 	SPMT	110408-KC	11.5	-	4.8	0.8	4.5	-	-		E121
SPMT-MM New	SPMT	120408-MM	12.7	-	4.76	0.8	5.6	-	-		E112 E113
SPXN-FM	SPXN	1203EDSR-FM	12.7	-	3.18	-	-	1.41	1.00		E39 E40
		1203EDER-FM	12.7	-	3.18	-	-	1.41	1.00		
		1504EDSR-FM	15.875	-	4.76	-	-	1.38	1.01		
		1504EDER-FM	15.875	-	4.76	-	-	1.38	1.01		
SPXR-FM 	SPXR	1203EDSR-FM	12.7	-	3.18	-	-	1.41	1.00		E39 E40
		1504EDSR-FM	15.875	-	4.76	-	-	1.38	1.01		
TECN	TECN	22R	11.0	6.35	3.18	-	-	1.0	0.5		E45
		22TR	11.0	6.35	3.18	0.8	-	0.5	-		
		32R	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	-		
	TEEN	32TR	16.5	9.525	3.18	0.8	-	0.5	-		
		43R	22.0	12.7	4.76	-	-	1.9	0.5		
		43R-G	22.0	12.7	4.76	-	-	1.9	0.5		
TEEN		43TR	22.0	12.7	4.76	0.8	-	1.5	-		E45
		43TR-S20	22.0	12.7	4.76	0.8	-	1.5	-		
		43TR-Z	22.0	12.7	4.76	0.8	-	1.5	-		
		43TR-ZH	22.0	12.7	4.76	0.8	-	1.5	-		
TFCN 	TFCN	2203PFR	22.0	12.7	3.18	-	-	2.42	0.71		E41
		2203PFL	22.0	12.7	3.18	-	-	2.42	0.71		

● : Stock item ○ : Under preparing for stock

Milling Inserts

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

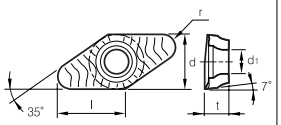
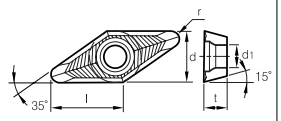
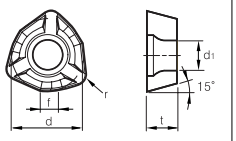
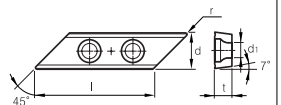
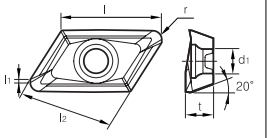
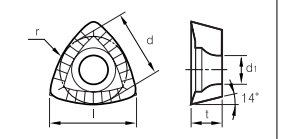
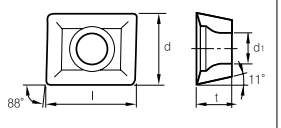
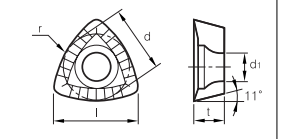
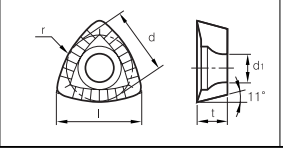
Inserts	Designation		Coated										Cermet		Uncoated				Dimensions (mm)						Geometries	Applicable Tools
			NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC3530	CN20	CN30	ST20	ST30A	H01	G10	l	d	t	r	a	b		
TPCN	TPCN	1103PPN													●	●	●		●	11.0	6.35	3.18	-	0.7	0.7		E42 E168 E169
		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-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	
		2204PDR	●		●										●	●	●		●	22.0	12.7	4.76	-	1.4	0.7	
		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	
TPKN-SM	TPKN	1603PDSR-SM				●			●											16.5	9.525	3.18	1.0	1.70			E42
		1603PDER-SM																		16.5	9.525	3.18	1.0	1.70		
		2204PDSR-SM				●	●		●											22.0	12.7	4.76	1.0	1.91		
		2204PDER-SM																		22.0	12.7	4.76	1.0	1.91		
TPKR-MX	TPKR	1603PDSN-MX																		16.5	9.525	3.18	-	1.2	1.2		E42
		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	-	
TPKR-SM	TPKR	1603PDSR-SM																		16.5	9.525	3.18	1.0	1.70	-		E42
		2204PDSR-SM	○			○														22.0	12.7	4.76	1.0	1.91	-	
TPXN-FM	TPXN	1603PDSR-FM					●		●											16.5	9.525	3.18	1.0	1.30	-		E42
		1603PDER-FM																		16.5	9.525	3.18	1.0	1.30	-	
		2204PDSR-FM					●		●											22.0	12.7	4.76	1.0	1.51	-	
		2204PDER-FM																		22.0	12.7	4.76	1.0	1.51	-	
TPXR-FM	TPXR	1603PDSR-FM							●											16.5	9.525	3.18	1.0	1.30	-		E42
		2204PDSR-FM							●											22.0	12.7	4.76	1.0	1.51	-	

* TPC(K)N □□□□P~N → For FC · HC
□□□□P~R → For facing cutter

● : Stock item ○ : Under preparing for stock

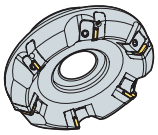
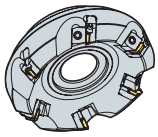
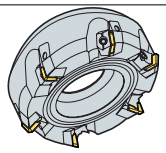
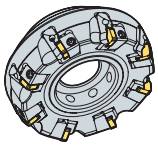
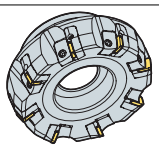
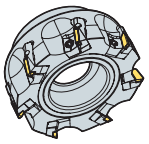
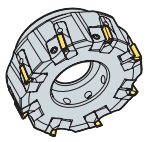
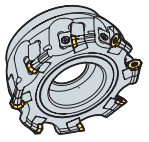
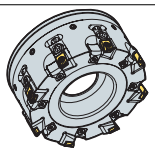
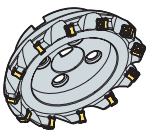
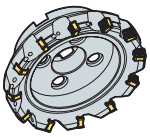
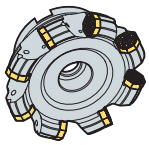
Workpiece		
Steel	P	
Stainless steel	M	
Cast iron	K	
Non-ferrous metal	N	
Heat resistant alloy, Titanium alloy	S	
Hardened steel	H	

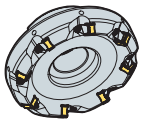
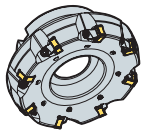
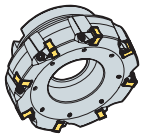
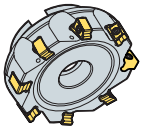
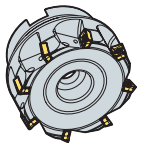
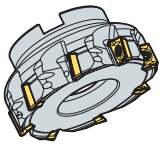
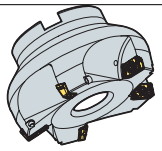
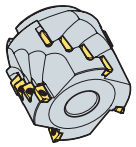
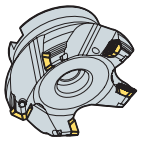
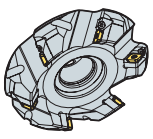
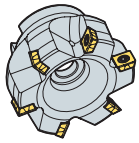
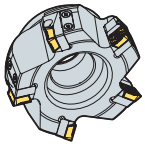
Machining types
- ● Continuous cutting
- ◡ General cutting
- ✚ Interrupted cutting

Inserts	Designation		Coated									Cermet		Uncoated				Dimensions (mm)								Geometries	Applicable Tools
			PC230	PC3525	NCM335	PC3545	PC8520	PC9530	PC6510	PC3530	PC3535	PD2000	CN20	CN30	ST20	ST30A	H01	G10	l	l_2	l_1	d	t	r	d_1	f		
VCKT-MA	VCKT	220530N-MA															●		15.6	-	-	12.7	5.56	3.0	5.6	-		E130 E131
VDKT-MA	VDKT	11T210N-MA															●		8.8	-	-	6.35	2.87	1.0	2.8	-		E131 E132
WDKT-MH	WDKT	080316ZDSR-MH		●		●	●	●	●		●								-	-	-	8.0	3.18	1.6	3.3	1.8		E108 E109 E110 E111
		10T320ZDSR-MH		●		●	●	●	●		●								-	-	-	10.0	3.97	2.0	4.3	2.3		
		130520ZDSR-MH		●		●	●	●	●		●								-	-	-	13.5	5.56	2.0	5.56	3.1		
		150625ZDSR-MH		●		●	●	●	●		●								-	-	-	15.0	6.35	2.5	5.56	3.5		
XCET-KC	XCET	310404ER-KC	●												●			●	30.9	-	-	9.525	4.5	0.4	4.4	-		E122
XEKT-MA	XEKT	19M504FR-MA										●					●		18	16.4	1.4	-	5	0.4	4.4	-		E126 E127 E128
		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	-		
	Neu	250608FR-MA										○					○		24	21.9	1.2	-	6.35	0.8	6.0	-		
	Neu	250640FR-MA										○					○		22	21.9	1.2	-	6.35	4.0	6.0	-		
ZDMT-MM	ZDMT	080310R-MM		○		○													8.4	-	-	6.75	3.2	10	2.8	-		E113
		110312.5R-MM		○		○													10.6	-	-	8.5	3.65	12.5	2.8	-		
		130416R-MM		○		○													13.2	-	-	10.5	4.76	16	4.4	-		
ZPMT-MM	ZPMT	1504PPSR-MM		○		○													15.9	-	-	12.7	4.76	-	5.6	-		E112
ZPMT-R-MM	ZPMT	160520R-MM		○		○													16.1	-	-	12.7	5.56	20	5.6	-		E113
		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	ZPMT	160525R-MR		○		○													17.6	-	-	12.7	5.56	25	5.6	-		E113

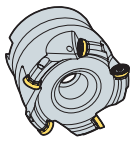
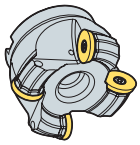
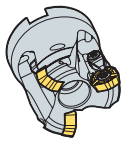
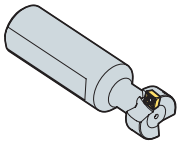
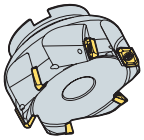
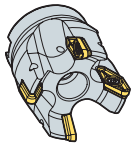
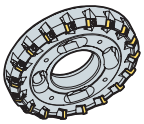
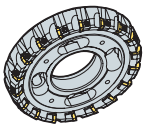
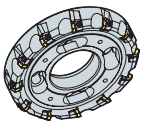
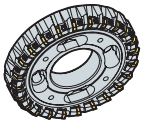
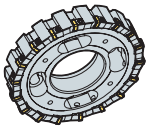
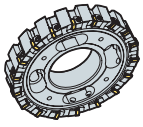
● : Stock item ○ : Under preparing for stock

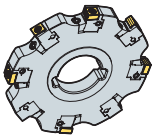
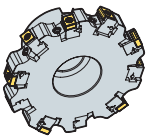
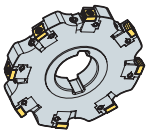
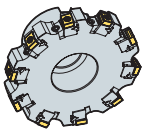
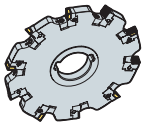
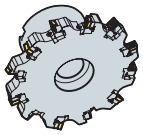
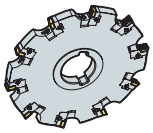
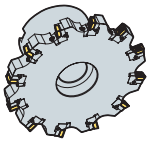
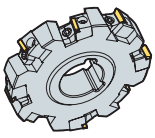
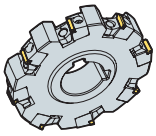
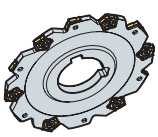
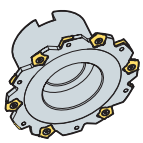
Cutter Table

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Mill-max	ADNM 4000,5000		45°	Ø80~Ø315	Excellent cutting edge strength and chip flow.	●					E33 E34
		AEM 4000,5000		45°	Ø80~Ø315	Low cutting force and good machinability.	●					E35 E36
		EFM 4000		15°	Ø80~Ø315	High rake angle prevents welding.	●					E37
		ENM 4000		15°	Ø80~Ø315	Economical because double sided inserts applied.	●					E38
		EPNM 4000,5000		15°	Ø80~Ø315	Double posi rake angle and low cutting force.	●					E39 E40
		PFM 4000		0°	Ø80~Ø315	High rake angle and good machinability.	●	●	●			E41
		PPNM 4000		0°	Ø80~Ø315	Double posi rake angle and low cutting force.	●	●	●			E42
	Double mill	AFOM4000		45°	Ø80~Ø125	High rake angle low cutting force. Economical (8 corners available).	●					E46
		AFOM5000			Ø80~Ø315							
	Aero mill	APDM AType, BType		0°	Ø80~Ø315	Aluminum cutter body suitable for high speed machining, Both cemented carbides and PCD inserts are available, G2.5 balance possible.	●					E48
	Rich mill	RM8ACM 4000		45°	Ø50~Ø250	8 corners available. Double sided insert for steel, cast iron, stainless steel, aluminum.	●					E56
		RM8ECM 4000		15°	Ø50~Ø200	8 corners available. Double sided insert for steel, cast iron.	●					E57
		RM16ACM 6000,8000		45°	Ø63~Ø200	16 corners avaiable. Wiper inserts can be applied for good surface finish. Strong insert and powerful clamping.	●					E62

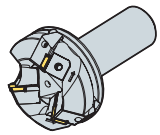
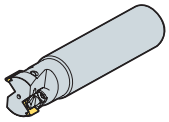
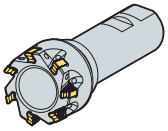
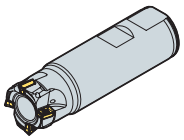
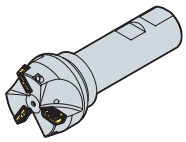
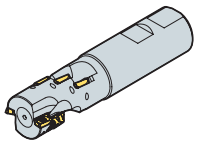
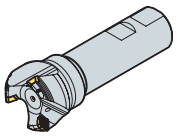
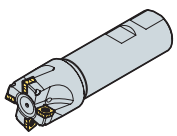
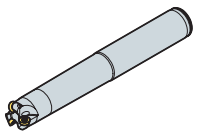
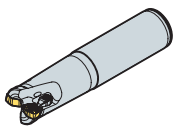
Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Rich mill	RMT8AM 4000,5000		45°	Ø80~Ø315	Easy insert change and good machinability due to latch clamping system. 8 corners available. Excellent surface finish.	●					E63
		RMT8EM 4000,5000		15°	Ø80~Ø315		●					E64
		RMT8QM		2°	Ø80~Ø315		●					E65
Cutters for molds	Rich mill	RM4PCM3000		0°	Ø40~Ø100	4corners available. High rake angle insert reduces cutting force. Excellent insert rigidity.	●	●	●		●	E58
		RM4PCM4000			Ø50~Ø160							
	Alpha-mill	AMCM 1000S 1500S 2000S		0°	Ø32~Ø100	3 dimensional chip breaker design for grooving, shouldering and facing.	●					E69
		AMCM 3000S 3000S-K 4000S		0°	Ø40~Ø125							E70
		AMCM 2000SE 3000SE		15°	Ø80~Ø100			●	●			E71
		AMCM 2000M		0°	Ø50~Ø100		●					E72
	Future mill	FMACM3000		45°	Ø50~Ø125	Accurate inserts and cutter, Excellent chip flow.	●					E90
		FMACM4000			Ø50~Ø200							
		FMACM3000A		45°	Ø63~Ø125	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body.	●					E91
		FMACM4000A			Ø63~Ø315							
		FMPCM3000		0°	Ø50~Ø100	4 corners avaiable various inserts can be applied to machine for different types of workpiece.	●	●	●			E93
		FMPCM4000			Ø63~Ø125							
		FMPCM3000A		0°	Ø63~Ø100	Excellent in high speed cutting and tapping center, low power machine due to light aluminum body.		●	●			E94
		FMPCM4000A			Ø63~Ø315							

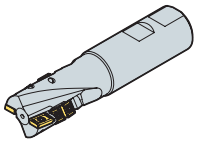
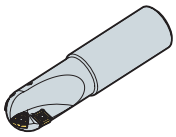
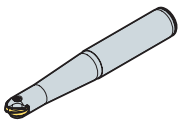
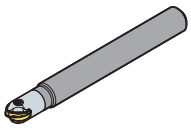
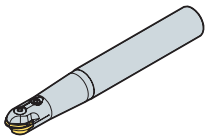
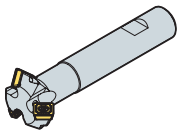
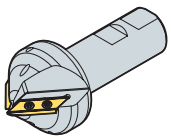
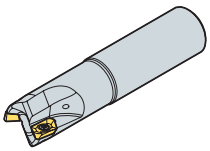
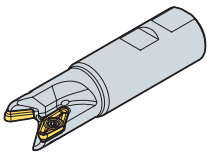
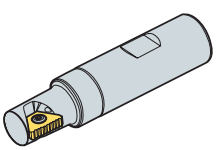
Cutter Table

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Future mill	FMRCM3000		-	Ø40~Ø100	4~8 corners available. Double contact faces between insert & seat part of cutter for stable clamping. Excellent rotating-free machining.	●			●	●	E96
		FMRCM4000			Ø50~Ø125							
		FMRCM5000		-	Ø50~Ø125							E97
		FMRCM6000			Ø63~Ø160							
	HRM	HRMCM13		75°	Ø50~Ø80	Powerful clamping by double clamping system. 3 corners available high feed cutting with low cutting load.	●	●	●	●	●	E108
		HRMCM15			Ø63~Ø160							
	T-Cutter	TFE		0°	Ø21~Ø50	For slotting.						E123
Cutters for aluminum	Pro-X mill	PAXCM5000		0°	Ø40~Ø125	Powerful clamping. Excellent body rigidity for rectangular and curve machining.	●	●	●	●	●	E126
		PAXCM6000			Ø50~Ø125							
	Pro-A mill	PACM4000		0°	Ø40~Ø100	Buffed insert controls chip flow without built-up edge.	●	●	●	●	●	E130
High feed cutter for cast iron		ANH4000,5000		45°	Ø100~Ø450	Excellent cutting strength. Good chip flow.	●					E152
		CDH4000,5000		25°	Ø100~Ø450	Double positive rake angle. Minimized cutting load.	●					E153
		DEH5000		30°	Ø100~Ø450	For aluminum & aluminum alloy. Hexagonal insert available.	●					E154
		DPH5000		30°	Ø100~Ø450	Hexagonal insert available. Economical cutter.	●					E155
		PNH4000,5000		0°	Ø125~Ø450	Wiper insert available. Double negative rake angle. Excellent surface finish.	●					E156
		PPH4000		0°	Ø125~Ø450	Square insert and wiper insert available. Excellent surface finish.	●					E157

Type	Korloy cutter		Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
								Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Indexable side cutter	Tangential type	Full-side cutter	TAFCP		-	Ø100~Ø315	Wide range of machining width with only one side cutter due to adjustable cutting edge height.		●	●			E163
			TAFCB		-	Ø100~Ø315		●	●	●			E163
		Half-side cutter	TAHCP		-	Ø100~Ø315	Strong cutting edge. Shows excellent cutting performance during medium and roughing in wide width side cutting.		●	●			E164
			TAHCB		-	Ø100~Ø315		●	●	●			E164
	Radial type	Full-side cutter	RAFCP		-	Ø100~Ø315	Wide range of machining width with only one side cutter due to adjustable cutting edge height.		●	●			E165
			RAFCB		-	Ø100~Ø315		●	●	●			E165
		Half-side cutter	RAHCP		-	Ø100~Ø315	Suitable for medium and finishing in narrow width side cutting due to good chip evacuation by 3-dimensional chip breaker.		●	●			E166
			RAHCB		-	Ø100~Ø315		●	●	●			E166
Side cutter			FCM		-	Ø80~Ø315	Good chip evacuation with low cutting load. Effective cutting.		●	●			E168
			HCM		-	Ø100~Ø315	Good chip evacuation with low cutting load. Effective cutting.		●	●			E169
			SPPM		-	Ø80~Ø200	Economical by using pentagonal insert. Suitable for narrow & deep grooving.			●			E170
			SPBM		-	Ø80~Ø200	Economical by using pentagonal insert. Suitable for narrow & deep grooving.			●			E171

Shank Table

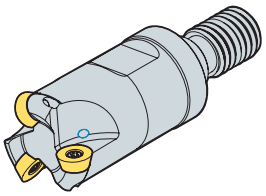
Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for face milling	Turbo mill	ADS 4000,5000		45°	Ø50~Ø63	Uneven insert spacing prevents chattering.	●					E43 E44
		PES 2000,3000,4000		0°	Ø20~Ø63	Good machinability due to the high rake angle.	●	●	●			E45
Cutters for molds	Rich mill	RM4PS3000		0°	Ø14~Ø50	4 corners available. High rake angle insert reduces cutting force. Excellent insert rigidity.	●	●	●		●	E59
		RM4PS4000			Ø32~Ø63		●	●	●		●	E60
	Alpha-mill	AMS 1000S,1500S 2000S,3000S-K 3000S,4000S		0°	Ø10~Ø63	Multi functional tool can do facing, grooving, square shouldering, etc 3 dimensional chip breaker applied	●	●	●	●	●	E73 E74 E75
		AMS 2000SE 3000SE		15°	Ø25~Ø63		●	●	●	●	●	E76
		AMS2000M		0°	Ø20~Ø40		●	●	●	●	●	E77
		AMS 2000MH 3000MH			Ø25~Ø40							E78
	Future mill	FMAS3000		45°	Ø25~Ø63	For precision machining. Excellent chip evacuation.	●					E92
		FMAS4000			Ø50~Ø63							
		FMPS3000		0°	Ø25~Ø63	4 corners available. Strong cutting edge with low cutting load.	●					E95
		FMPS4000			Ø40~Ø63							
		FMRS 1000,2000,2500 3000,4000,5000 6000		-	Ø8~Ø63	2 touch clamping system, convenient insert change.	●	●	●	●	●	E98 E99 E100
	HRM	HRMS 08,10,13,15		75°	Ø20~Ø63	Powerful clamping by double clamping system. 3 corners available. High feed cutting with low cutting load.	●	●	●	●	●	E109 E110

Type	Korloy cutter	Designation	Shape	A.A	Diameter range	Features	Machinable type					Page
							Facing	Shouldering	Slotting	Copying	Ramping, Helical	
Cutters for molds	Tank mill	THE		0°	Ø25~Ø50	Right-hand helix angle employed for good chip evacuation. Special surface treatment prevents body breaking and improves rigidity. Strong cutting edge.	●	●				E112
	Mach mill	BRE		-	Ø20~Ø63	Right-hand helix angle employed for good chip evacuation. Strong cutting edge.	●			●		E113
	Laser mill	LBE□□		-	Ø8~Ø32	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available.	●	●	●			E117
		LBE□□-C		-	Ø8~Ø32	Indexable ball endmill for precise mold. Rigid holder with simple design finishing MQL is available. Carbide shank.	●	●	●			E118
	Mach mill	BFE		-	Ø16~Ø32	Good cutting preformance with wavy S type cutting edge.	●	●	●			E119
	Chamfer tool	CE (Back & Front chamfering)		(Chamfer) 15° 30° 45° 60°	Ø25~Ø30 Ø25~Ø35 Ø7~Ø39 Ø25~Ø42	For Back & Front high quality champering and various champering angle machining.	-	-	-	-	-	E121
		CE (Long Chamfering)		(Chamfer) 30° 45° 60°	Ø5~Ø35 Ø5~Ø48 Ø5~Ø57	For high quality long champering and various champering angle.	-	-	-	-	-	E122
Cutters for aluminum	Pro-X mill	PAXS 5000,6000		0°	Ø20~Ø40 Ø25~Ø40	Excellent clamping power, Strong cutter body. For rectangular machining and curving.	●		●			E127
	Pro-A mill	PAS 2000,4000		0°	Ø12~Ø42 Ø32~Ø40	Buffed on top face controls good chip flow and reduces built-up edge.	●		●			E131
Thread milling		TM		-	Ø32~Ø50	For internal and external threading.	●					E150

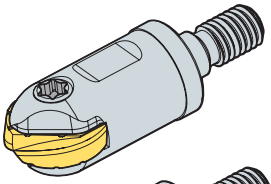
Modular Adaptor Table

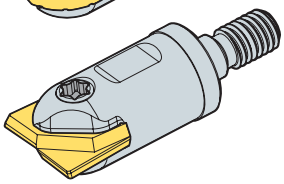
■ Modular Adaptor

- FMRM type
  - see page E101

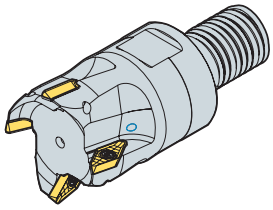


- LBE-MHD type
  - see page E118

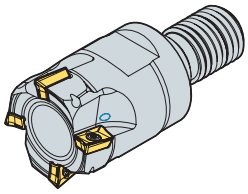




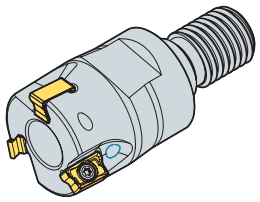
- PAM type
  - see page E132



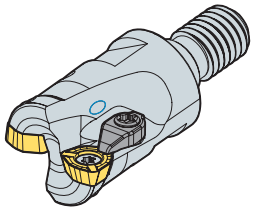
New
- AMM type
  - see page E79



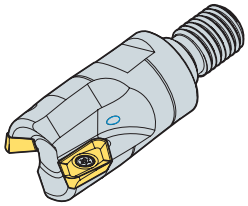
New
- RM4PM type
  - see page E61



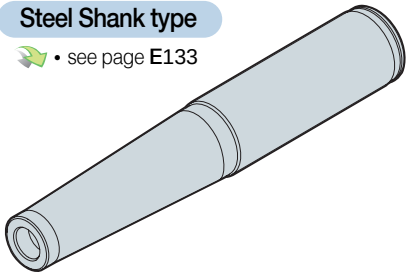
New
- HRMM type
  - see page E111



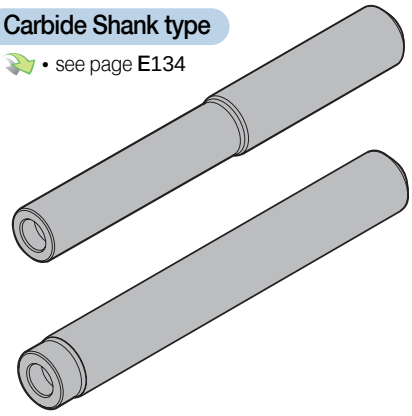
New
- PAXM type
  - see page E128



Steel Shank type
- see page E133



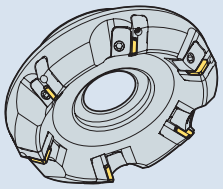
Carbide Shank type
- see page E134



ADNM4000

AA 45°

• AR : 15°
• RR : -4°



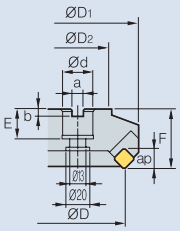


Fig. 1

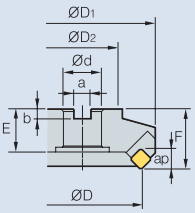


Fig. 2

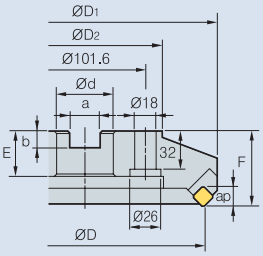


Fig. 3

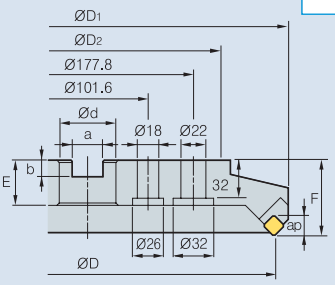


Fig. 4

(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
ADNM	4080R/L	●		4	80	105	57	27	12.4	7	22	50	6	1.9	1
	4100R/L	●		5	100	125	67	32	14.4	8	28	50	6	2.5	2
	4125R/L	●		6	125	149	87	40	16.4	9	30	63	6	4.3	2
	4160R/L	●	○	8	160	183	107	40	16.4	9	30	63	6	6.4	2
	4200R/L	●	○	10	200	223	130	60	25.7	14	38	63	6	8.7	3
	4250R/L	●	○	12	250	273	180	60	25.7	14	38	63	6	14.0	3
	4315R/L			14	315	338	240	60	25.7	14	38	63	6	21.0	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LADN4R/L	WEPN4R/L	DHA0821F	LTX0514	HW40

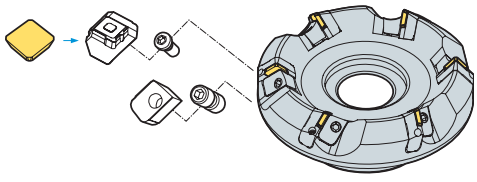
● Available Arbors

Designation		Arbors
ADNM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
	4160R/L	BT□□-FMB40-□□
	4200R/L	BT□□-FMB60-□□
	4250R/L	BT□□-FMB60-□□
	4315R/L	-

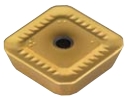
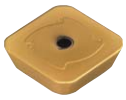
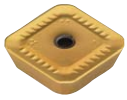
● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



● Available Inserts

SDCN	SDKN-SM	SDKR-MX
SDKR-SM	SDXN-FM	SDXR-FM
		

Designation		Coated NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	Cermet CN30	Uncoated ST20	ST30A	G10	H01	Page
SDCN	42M													●		E17
	42M-G														●	
	42MT	○	●	●			●				●	●	●			
	42MT-RH															
	42MT-S20								●							
	1203AEEN															
	1203AEEN-RH									●						
	1203AESN															
	1203AESN-RH					●				●						
SDKN	1203AESN-SM				●			●								E17
	1203AEEN-SM															
SDKR	1203AESN-MX															E18
	1203AETN-MX															
	1203AEN-MX	●														
	1203AESN-SM	○			○				○							
SDXN	1203AESN-FM					●		●								E18
	1203AEEN-FM															
SDXR	1203AESN-FM															E18

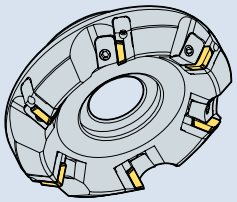
● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages **E17, E18**
• Detail cutter spec. see pages **E172~E174**

ADNM5000

AA 45°

• AR : 15°
• RR : -4°



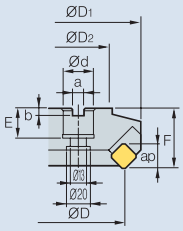


Fig. 1

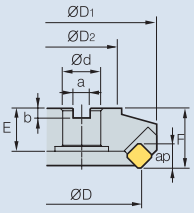


Fig. 2

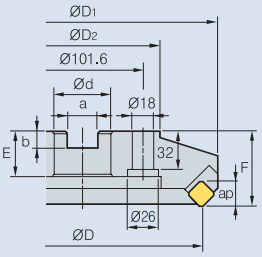


Fig. 3

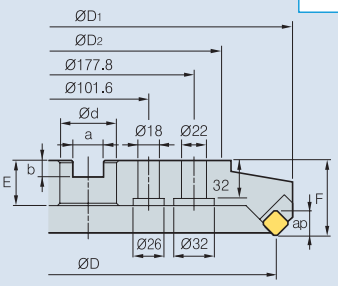


Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
ADNM	5080R/L	●		4	80	107	57	27	12.4	7	22	50	8	2.0	1
	5100R/L	●		5	100	126	67	32	14.4	8	28	50	8	2.7	2
	5125R/L	●		6	125	150	87	40	16.4	9	30	63	8	4.3	2
	5160R/L	●	○	8	160	185	107	40	16.4	9	30	63	8	6.5	2
	5200R/L	●	○	10	200	225	130	60	25.7	14	38	63	8	9.1	3
	5250R/L	●	○	12	250	275	180	60	25.7	14	38	63	8	14.5	3
	5315R/L	●		14	315	340	240	60	25.7	14	38	63	8	21.0	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LADN5R/L	WEPN5R/L	DHA0821F	LTX0514	HW40

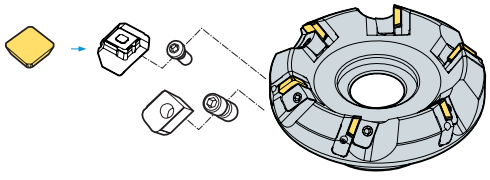
● Available Arbors

Designation		Arbors
ADNM	5080R/L	BT□□-FMC27-□□
	5100R/L	BT□□-FMC32-□□
	5125R/L	BT□□-FMB40-□□
	5160R/L	BT□□-FMB40-□□
	5200R/L	BT□□-FMB60-□□
	5250R/L	BT□□-FMB60-□□
	5315R/L	-

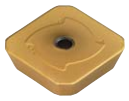
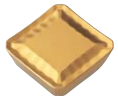
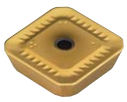
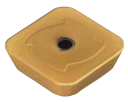
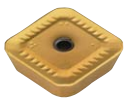
● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



● Available Inserts

SDCN	SDKN-SM	SDKR-MX
		
SDKR-SM	SDXN-FM	SDXR-FM
		

Designation		Coated NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	Cermet CN30	Uncoated ST20	ST30A	H01	G10	Page
SDCN	53M														●	E17
	53M-G													●		
	53MT	●	●	●			●				●	●	●			
	53MT-RH															
	53MT-S20								●							
	1504AEEN															
	1504AEEN-RH									●						
	1504AESN															
	1504AESN-RH					●				●						
SDKN	1504AESN-SM				●			●								E17
	1504AEEN-SM															
SDKR	1504AESN-MX						●									E18
	1504AETN-MX															
	1504AEN-MX	●														
	1504AESN-SM	○			○				○							
SDXN	1504AESN-FM					●										E18
	1504AEEN-FM															
SDXR	1504AESN-FM															E18

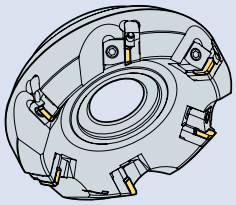
● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages **E17**, **E18**
• Detail cutter spec. see pages **E172~E174**

AEM4000

AA 45°

• AR : 20°
• RR : -3°



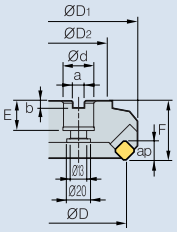


Fig. 1

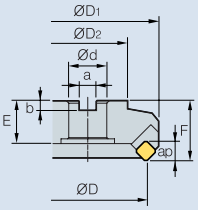


Fig. 2

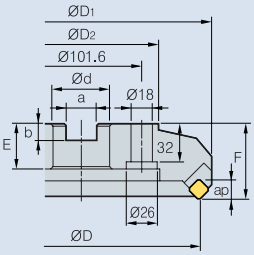


Fig. 3

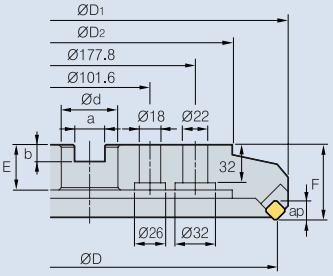


Fig. 4

(mm)

Designation		Stock R	Stock L		øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
AEM	4080R/L	●		4	80	103	60	27	12.4	7	22	50	5.5	1.7	1
	4100R/L	●		5	100	122	80	32	14.4	8	28	50	5.5	2.9	2
	4125R/L	●		6	125	146	100	40	16.4	9	30	63	5.5	4.4	2
	4160R/L	●		8	160	181	120	40	16.4	9	30	63	5.5	6.1	2
	4200R/L	●		10	200	220	130	60	25.7	14	38	63	5.5	8.9	3
	4250R/L	●		12	250	270	180	60	25.7	14	38	63	5.5	15.7	3
	4315R/L			15	315	335	240	60	25.7	14	38	63	5.5	25.1	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LAE4R/L	WAE4R/L	DHA0821F	LTX0512	HW40

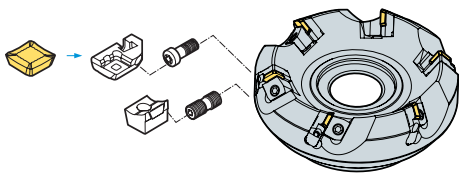
● Available Arbors

Designation		Arbors
AEM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
	4160R/L	BT□□-FMB40-□□
	4200R/L	BT□□-FMB60-□□
	4250R/L	BT□□-FMB60-□□
	4315R/L	-

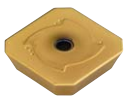
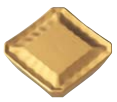
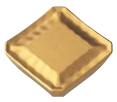
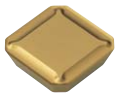
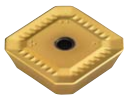
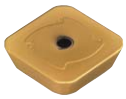
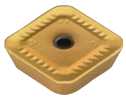
● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



● Available Inserts

SECN	SEKN-SM	SEKR-MF1	SEKR-MX
			
SEKR-X35	**SEKR-SM**	**SEXN-FM**	**SEXR-FM**
			

Designation		Coated NCM325	PC130	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	NCM120	Cermet CN20	CN30	Uncoated ST30A	H01	G10	Page
SECN	1203AFFN															●	●	E19
	1203AFTN				●					●			●	●	●			
	1203AFEN																	
	1203AFSN	●						●										
	1203AFEN-RH										●							
	1203AFSN-RH						●				●							
	1203AFTN-S20									●								
SEKN	1203AFSN-SM					●			●									E19
	1203AFEN-SM																	
SEKR	1203AFSN-MF1	○				○												E19
	1203AFSN-MX	●	●	●				●		●		●		●				E19
	1203AFSN-X35																	E20
	1203AFFN-X35																	
	1203AFSN-SM						●											E20
SEXN	1203AFSN-FM						●		●									E20
	1203AFEN-FM																	
SEXR	1203AFSN-FM								●									E20

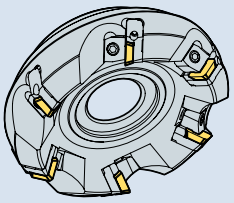
● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages **E19**, **E20**
• Detail cutter spec. see pages **E172**~**E174**

AEM5000

AA 45°

• AR : 20°
• RR : -3°



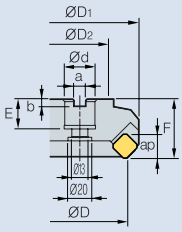


Fig. 1

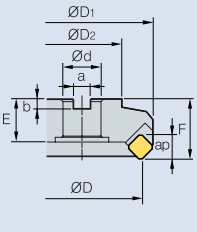


Fig. 2

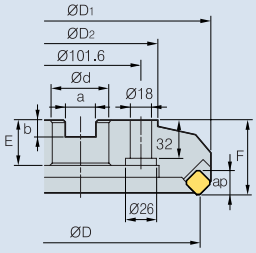


Fig. 3

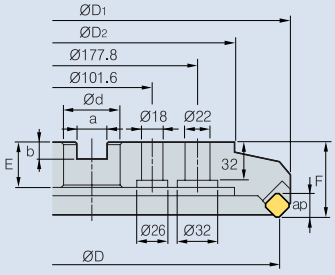


Fig. 4

(mm)

Designation		Stock R	Stock L	⊙	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
AEM	5080R/L			4	80	103	60	27	12.4	7	22	50	7.5	1.7	1
	5100R/L			5	100	122	80	32	14.4	8	28	50	7.5	2.9	2
	5125R/L	○		6	125	146	100	40	16.4	9	30	63	7.5	4.4	2
	5160R/L	○		8	160	181	120	40	16.4	9	30	63	7.5	6.1	2
	5200R/L	○		10	200	220	130	60	25.7	14	38	63	7.5	8.9	3
	5250R/L			12	250	270	180	60	25.7	14	38	63	7.5	15.7	3
	5315R/L			15	315	335	240	60	25.7	14	38	63	7.5	25.1	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LAE5R/L	WAE5R/L	DHA0821F	LTX0512	HW40

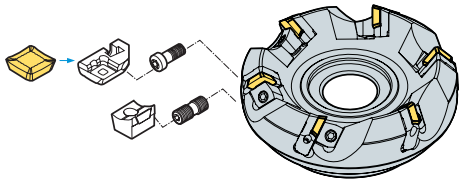
● Available Arbors

Designation		Arbors
AEM	5080R/L	BT□□-FMC27-□□
	5100R/L	BT□□-FMC32-□□
	5125R/L	BT□□-FMB40-□□
	5160R/L	BT□□-FMB40-□□
	5200R/L	BT□□-FMB60-□□
	5250R/L	BT□□-FMB60-□□
	5315R/L	-

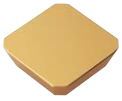
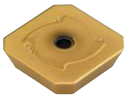
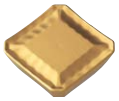
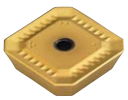
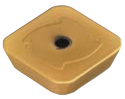
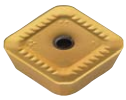
● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



● Available Inserts

SECN	SEKN-SM	SEKR-MX
		
SEKR-SM	SEXN-FM	SEXR-FM
		

Designation		Coated NCM325	PC130	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	Cermet CN30	Uncoated ST30A	G10	Page
SECN	1504AFFN											●	E19
	1504AFTN		●							●	●		
	1504AFEN												
	1504AFSN	●				●							
	1504AFEN-RH								●				
	1504AFSN-RH				●				●				
	1504AFTN-S20												
SEKN	1504AFSN-SM			●			●						E19
	1504AFEN-SM												
SEKR	1504AFSN-MX	●				●		●					E19
	1504AFSN-SM												E20
SEXN	1504AFSN-FM				●		●						E20
	1504AFEN-FM												
SEXR	1504AFSN-FM												E20

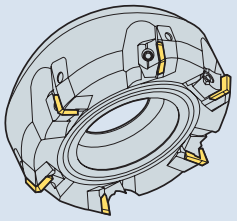
● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages E17, E18
• Detail cutter spec. see pages E172~E174

EFM4000

AA 15°

• AR : 18°
• RR : 11°



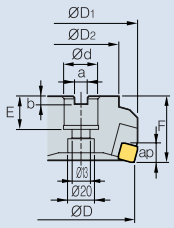


Fig. 1

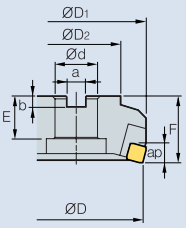


Fig. 2

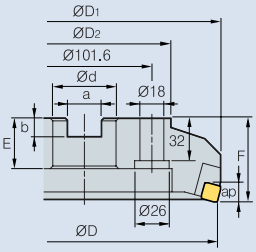


Fig. 3

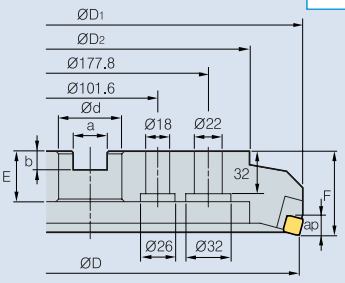


Fig. 4

(mm)

Designation		Stock R	Stock L	⊙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EFM	4080R/L	●		4	80	89	57	27	12.4	7	22	50	8.0	1.5	1
	4100R/L	●		5	100	108	70	32	14.4	8	28	50	8.0	2.1	2
	4125R/L	●		6	125	133	87	40	16.4	9	30	63	8.0	3.8	2
	4160R/L	●		8	160	168	107	40	16.4	9	30	63	8.0	5.5	2
	4200R/L	●		10	200	208	130	60	25.7	14	38	63	8.0	8.2	3
	4250R/L	●		12	250	257	180	60	25.7	14	38	63	8.0	13.4	3
	4315R/L	●		16	315	322	240	60	25.7	14	38	63	8.0	21.2	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LEF4R/L LEF4R1*/L1*	WEFR/L	DHA0821F	LTX0512	HW40

⋆ : Ø80 ~ Ø125

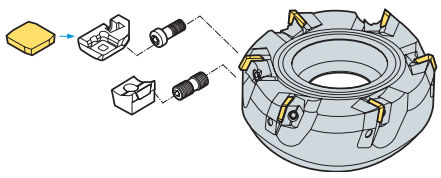
● Available Arbors

Designation		Arbors
EFM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
	4160R/L	BT□□-FMB40-□□
	4200R/L	BT□□-FMB60-□□
	4250R/L	BT□□-FMB60-□□
	4315R/L	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
K	400 ~ 500	0.05 ~ 0.20	H01

Assembling



● Available Inserts

SFCN

Designation	Uncoated H01	Uncoated G10	Page
SFCN 1203EFR	●	●	E20

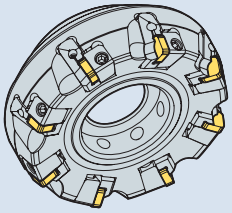
● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages **E20**
• Detail cutter spec. see pages **E172~E174**

ENM4000

AA 15°

• AR : -6°
• RR : -5°



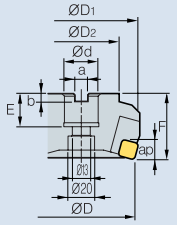


Fig. 1

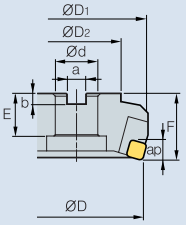


Fig. 2

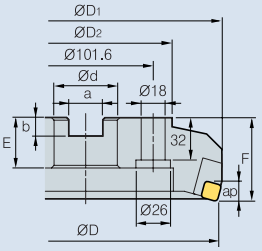


Fig. 3

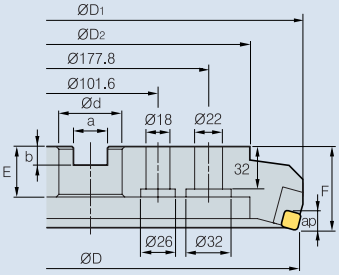


Fig. 4

(mm)

Designation		Stock R	Stock L	⊚	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
ENM	4080R/L	●		5	80	87	57	27	12.4	7	22	50	8.5	1.4	1
	4100R/L	●		6	100	107	67	32	14.4	8	28	50	8.5	2.1	2
	4125R/L	●	●	8	125	132	87	40	16.4	9	30	63	8.5	3.8	2
	4160R/L	●	●	10	160	167	107	40	16.4	9	30	63	8.5	5.7	2
	4200R/L	●	●	12	200	207	130	60	25.7	14	38	63	8.5	8.4	3
	4250R/L	●		16	250	257	180	60	25.7	14	38	63	8.5	13.8	3
	4315R/L			20	315	322	240	60	25.7	14	38	63	8.5	21.6	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LEN4R/L	WENR/L WENR1*/L1*	DHA0830 DHA0825*	LTX0512	HW40

⋆ : Ø80 ~ Ø100

● Available Arbors

Designation		Arbors
ENM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
	4160R/L	BT□□-FMB40-□□
	4200R/L	BT□□-FMB60-□□
	4250R/L	BT□□-FMB60-□□
	4315R/L	-

● Available Inserts

SNCN SNKN

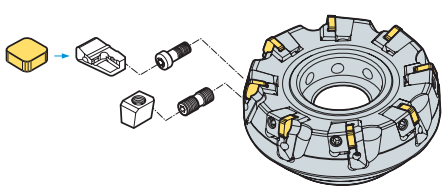
Designation		Coated NCM325	Coated PC6510	Uncoated ST20	Uncoated ST30A	Uncoated G10	Page
SNCN	1204ENN	●	○	●	●	●	E21
SNKN	1204ENN		●				E21

● : Stock item ○ : Under preparing for stock

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 180	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	NCM325 PC3525 ST30A
M	50 ~ 200 80 ~ 140	0.10 ~ 0.25 0.10 ~ 0.25	PC9530 ST30A
K	150 ~ 250 100 ~ 250	0.10 ~ 0.30 0.10 ~ 0.30	PC6510 G10

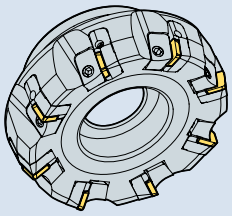
Assembling

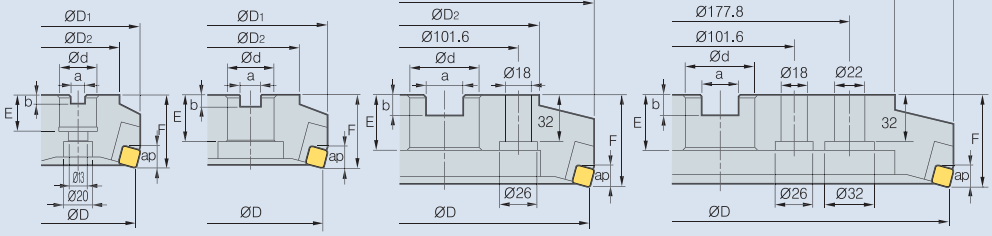


• Applicable inserts, see pages E21
• Detail cutter spec. see pages E172~E174

EPNM4000

AA 15° | • AR : 7° • RR : 0°





(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EPNM	4080R/L	●	○	5	80	86	57	27	12.4	7	22	50	9	1.4	1
	4100R/L	●	○	6	100	107	67	32	14.4	8	28	50	9	2.1	2
	4125R/L	●	●	8	125	132	87	40	16.4	9	30	63	9	3.8	2
	4160R/L	●	●	10	160	166	107	40	16.4	9	30	63	9	5.7	2
	4200R/L	●	●	12	200	206	130	60	25.7	14	38)	63	9	8.2	3
	4250R/L	●		16	250	256	180	60	25.7	14	38	63	9	13.5	3
	4315R/L			20	315	321	240	60	25.7	14	38	63	9	21.1	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LEPN4R/L *LEPN4R1/L1	WEPN4R/L	DHA0821F *DHA0818F	LTX0514	HW40

⋆ : Ø80 ~ Ø100

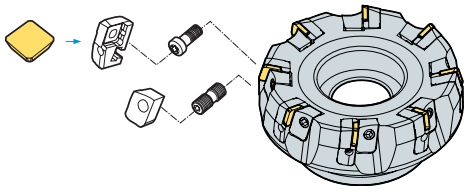
● Available Arbors

Designation		Arbors
EPNM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
	4160R/L	BT□□-FMB40-□□
	4200R/L	BT□□-FMB60-□□
	4250R/L	BT□□-FMB60-□□
	4315R/L	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

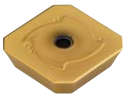
Assembling



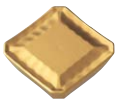
● Available Inserts

SPCN

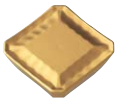
SPKN-SM



SPKR-MX

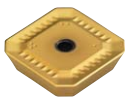


SPKR-SM



SPXN-FM

SPXR-FM



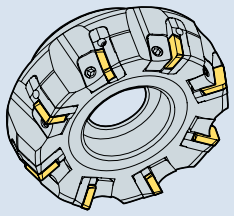
Designation		Coated NCM325	PC130	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	Cermet CN30	Uncoated ST20	ST30A	H01	H10	G10	Page
SPCN	1203EDR	●	●	●	●			●				●	●	●	●	●	●	E22
	1203EDL										●			●		●	●	
	1203EDR-G														●			
	1203EDER-RH										●							
	1203EDSR-RH						●				●							
	1203EDTR-RH																	
	1203EDR-S20									●								
SPKN	1203EDSR-SM					●	●		●									E22
	1203EDER-SM																	
SPKR	1203EDSR-MX	●						●										E22
	1203EDSL-MX	●																
	1203EDSR-SM	○								○								E22
SPXN	1203EDSR-FM						●		●									E23
	1203EDER-FM																	
SPXR	1203EDSR-FM								●									E23

● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages **E22, E23**
• Detail cutter spec. see pages **E172~E174**

EPNM5000

AA 15° | • AR : 7° • RR : 0°



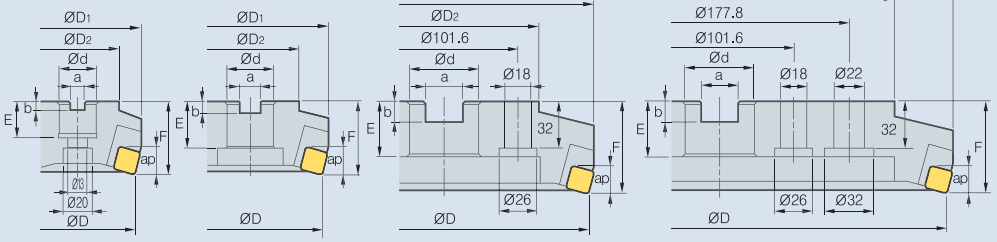


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock R	Stock L		ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
EPNM	5080R/L	●		5	80	91	57	27	12.4	7	22	50	12	1.5	1
	5100R/L	●		6	100	110	67	32	14.4	8	28	50	12	2.1	2
	5125R/L	●	●	8	125	134	87	40	16.4	9	30	63	12	3.9	2
	5160R/L	●	●	10	160	169	107	40	16.4	9	30	63	12	5.7	2
	5200R/L	●	●	12	200	209	130	60	25.7	14	38	63	12	8.4	3
	5250R/L	●		16	250	259	180	60	25.7	14	38	63	12	13.6	3
	5315R/L	●		20	315	324	240	60	25.7	14	38	63	12	21.6	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LEPN5R/L *LEPN5R1/L1	WEPN5R/L	DHA0821F *DHA0818F	LTX0514	HW40

⋆ : Ø80 ~ Ø100

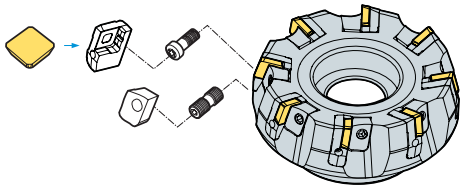
● Available Arbors

Designation		Arbors
EPNM	5080R/L	BT□□-FMC27-□□
	5100R/L	BT□□-FMC32-□□
	5125R/L	BT□□-FMB40-□□
	5160R/L	BT□□-FMB40-□□
	5200R/L	BT□□-FMB60-□□
	5250R/L	BT□□-FMB60-□□
	5315R/L	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

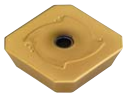
Assembling



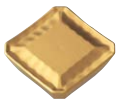
● Available Inserts

SPCN

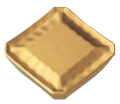
SPKN-SM



SPKR-MX

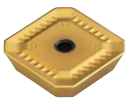


SPKR-SM



SPXN-FM

SPXR-FM



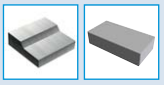
Designation		Coated NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	Cermet CN30	Uncoated ST20	ST30A	H01	G10	Page
SPCN	150412T												●			E22
	1504EDR	●	●	●							●	●	●		●	
	1504EDSR				○		●									
	1504EDL															
	1504EDR-G													●		
	1504EDER-RH															
	1504EDSR-RH					●				●						
	1504EDTR-RH															
	1504EDR-S20								●							
SPKN	1504EDSR-SM				●	●		●								E22
	1504EDER-SM															
SPKR	1504EDR-MX	●														E22
	1504EDSR-MX						●		●							
	1504EDSR-SM	○							○							E22
SPXN	1504EDSR-FM					●		●								E23
	1504EDER-FM															
SPXR	1504EDSR-FM							●								E23

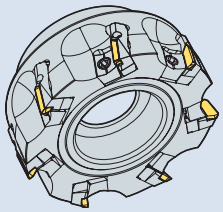
● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages E22, E23
• Detail cutter spec. see pages E172~E174

PFM4000

AA 0° | • AR : 15° • RR : 14°





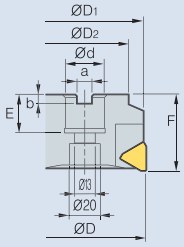


Fig. 1

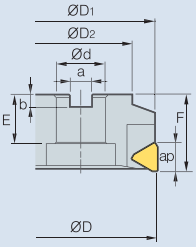


Fig. 2

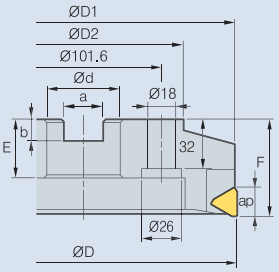


Fig. 3

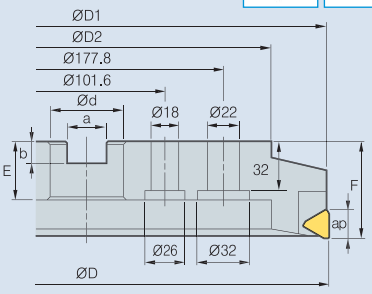


Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
PFM	4080R/L	●		4	80	79	57	27	12.4	7	22	50	16	1.2	1
	4100R/L	●		4	100	97	67	32	14.4	8	28	50	16	1.8	2
	4125R/L	●		7	125	122	87	40	16.4	9	30	63	16	3.1	2
	4160R/L	●		9	160	158	107	40	16.4	9	30	63	16	5.6	2
	4200R/L			11	200	197	130	60	25.7	14	38	63	16	8.8	3
	4250R/L			15	250	247	180	60	25.7	14	38	63	16	16	3
	4315R/L			19	315	311	240	60	25.7	14	38	63	16	22	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LPF4R/L LPF4R1**/L1**	WPFR/L	DHA0821F DHA0818F*	LTX0512	HW40

* : Ø80 ~ Ø100 / ** : Ø80 ~ Ø125

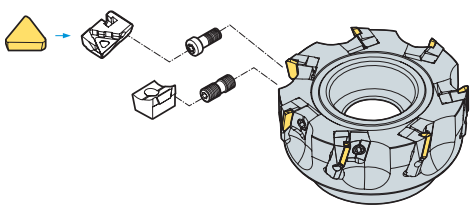
● Available Arbors

Designation		Arbors
PFM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
	4160R/L	BT□□-FMB40-□□
	4200R/L	BT□□-FMB60-□□
	4250R/L	BT□□-FMB60-□□
	4315R/L	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

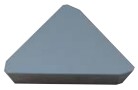
Assembling



• Applicable inserts, see pages **E23**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

TFCN



Designation		Uncoated H01	Page
TFCN	2203PFR	●	E23
	2203PFL		

● : Stock item ○ : Under preparing for stock

PPNM4000

AA 0°

• AR : 7°
• RR : 0°

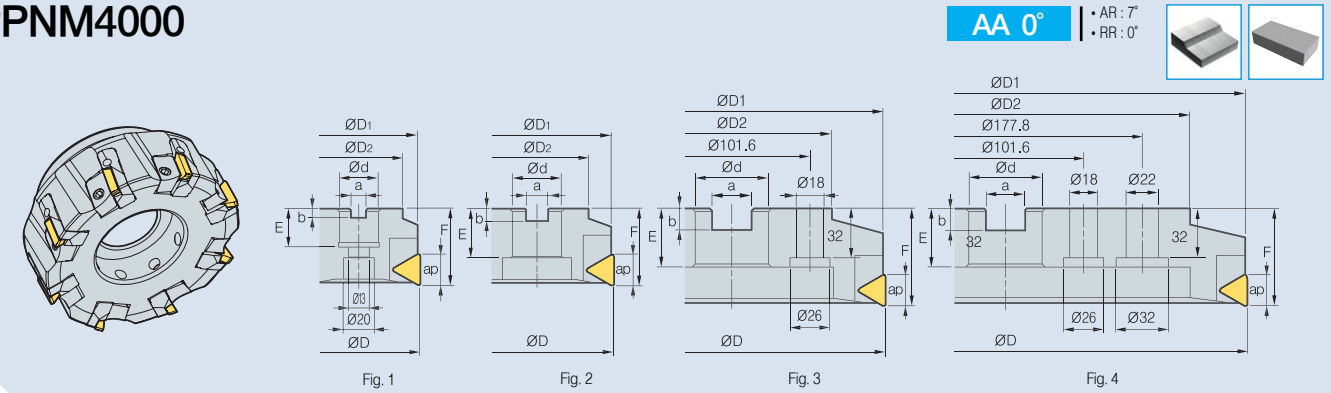


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock R	Stock L	⊙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
PPNM	4080R/L	●		5	80	79	57	27	12.4	7	22	50	18	1.3	1
	4100R/L	●	○	6	100	99	67	32	14.4	8	28	50	18	1.9	2
	4125R/L	●	○	8	125	124	87	40	16.4	9	30	63	18	3.5	2
	4160R/L	●	○	10	160	158	107	40	16.4	9	30	63	18	5.6	2
	4200R/L	●		12	200	198	130	60	25.7	14	38	63	18	8.1	3
	4250R/L			16	250	248	180	60	25.7	14	38	63	18	13.3	3
	4315R/L			20	315	313	240	60	25.7	14	38	63	18	21.4	4

● : Stock item ○ : Under preparing for stock

● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LPPN4R/L *LPPN4R1/L1	WPPN4R/L	DHA0821F *DHA0818F	LTX0514	HW40

*: Ø80 ~ Ø100

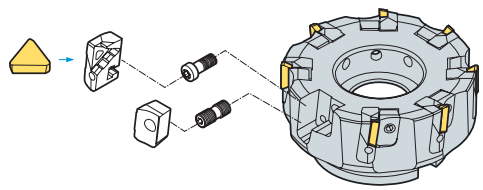
● Available Arbors

Designation		Arbors
PPNM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
	4160R/L	BT□□-FMB40-□□
	4200R/L	BT□□-FMB60-□□
	4250R/L	BT□□-FMB60-□□
	4315R/L	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



● Available Inserts

TPCN	TPKN-SM	TPKR-MX
TPKR-SM	**TPXN-FM**	**TPXR-FM**

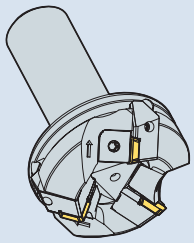
Designation		Coated NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	Cermet CN30	Uncoated ST20	ST30A	H01	G10	Page
TPCN	2204PDR	●		●							●	●	●		●	E24
	2204PDR-G													●		
	2204PDL		●										●			
	2204PDSR						●									
	2204PDTR															
	2204PDR-RH								●							
	2204PDER-RH									●						
	2204PDSR-RH					●				●						
	2204PDR-S20								●							
TPKN	2204PDSR-SM				●	●		●								E24
	2204PDER-SM															
TPKR	2204PDR-MX	●														E24
	2204PDSR-MX						●									
	2204PPR-MX															
	2204PDSR-SM	○		○												E24
TPXN	2204PDSR-FM					●		●								E24
	2204PDER-FM															
TPXR	2204PDSR-FM							●								E24

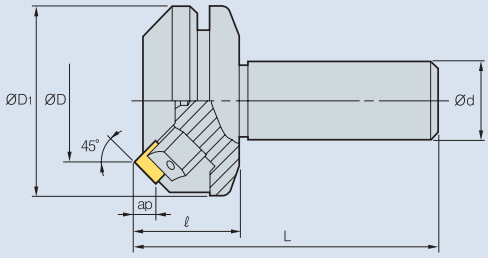
● : Stock item ○ : Under preparing for stock

• Applicable inserts, see pages **E24**
• Detail cutter spec. see pages **E172~E174**

ADS4000

AA 45° | • AR : 15° • RR : -3°





(mm)

Designation		Stock R	Stock L		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

● : Stock item ○ : Under preparing for stock

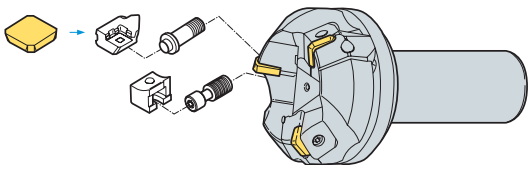
● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LASS4R/L	WASR/L	WTX0817	LTX0512	TW25

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 250 120 ~ 200 100 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	NCM325 PC3525 ST30A
M	50 ~ 150 50 ~ 120	0.10 ~ 0.25 0.10 ~ 0.30	PC9530 ST30A
K	130 ~ 200 100 ~ 150	0.10 ~ 0.30 0.10 ~ 0.30	PC6510 G10

Assembling

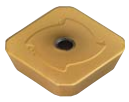


• Applicable inserts, see pages **E17**, **E18**

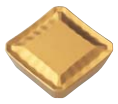
● Available Inserts

SDCN

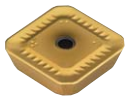
SDKN-SM



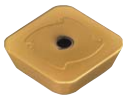
SDKR-MX



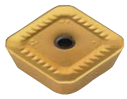
SDKR-SM



SDXN-FM



SDXR-FM

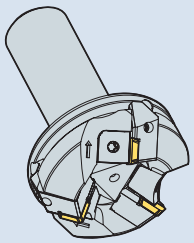


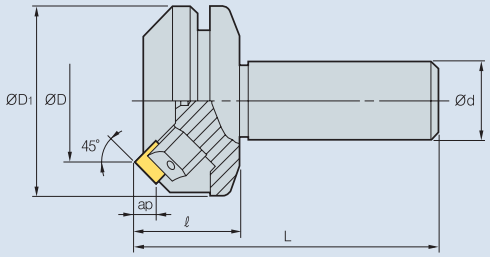
Designation		Coated NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	Cermet CN30	Uncoated ST20	ST30A	H01	G10	Page
SDCN	42M													●	E17
	42M-G												●		
	42MT		●	●			●			●	●	●			
	42MT-RH														
	42MT-S20								●						
	1203AEEN														
	1203AEEN-RH					●									
	1203AESN														
	1203AESN-RH														
SDKN	1203AESN-SM				●			●							E17
	1203AEEN-SM														
SDKR	1203AESN-MX														E18
	1203AETN-MX														
	1203AEN-MX	●													
	1203AESN-SM	○			○				○						E18
SDXN	1203AESN-FM					●		●							E18
	1203AEEN-FM														
SDXR	1203AESN-FM														E18

● : Stock item ○ : Under preparing for stock

ADS5000

AA 45° | • AR : 15° • RR : -3°





(mm)

Designation		Stock R	Stock L	⊚	ØD	ØD1	Ød	ℓ	L	ap	kg
ADS	5050R	●		3	50	75	32	40	120	8.5	1.9
	5050RS42	○		3	50	75	42	40	120	8.5	2.3
	5063R	●		4	63	87	32	40	120	8.5	2.4
	5063RS42	○		4	63	87	42	40	120	8.5	2.8

● : Stock item ○ : Under preparing for stock

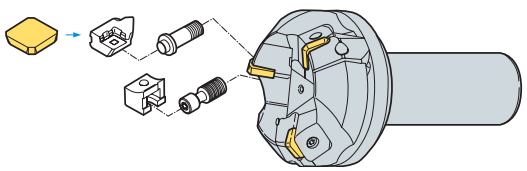
● Parts

Locator	Wedge	Wedge Screw	Locator Screw	Wrench
LASS5R/L	WASR/L	WTX0817	LTX0512	TW25

● Recommended Cutting Condition

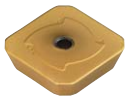
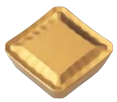
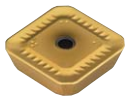
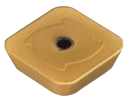
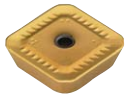
Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 250 120 ~ 200 100 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	NCM325 PC3525 ST30A
M	50 ~ 150 50 ~ 120	0.10 ~ 0.25 0.10 ~ 0.30	PC9530 ST30A
K	130 ~ 200 100 ~ 150	0.10 ~ 0.30 0.10 ~ 0.30	PC6510 G10

Assembling



• Applicable inserts, see pages **E17**, **E18**

● Available Inserts

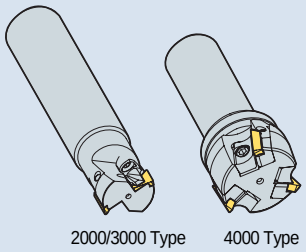
SDCN	SDKN-SM	SDKR-MX
		
SDKR-SM	**SDXN-FM**	**SDXR-FM**
		

Designation		Coated NCM325	PC130	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	Cermet CN30	Uncoated ST20	ST30A	H01	G10	Page
SDCN	53M														●	E17
	53M-G													●		
	53MT	●	●	●			●				●	●	●			
	53MT-RH															
	53MT-S20								●							
	1504AEEN															
	1504AEEN-RH									●						
	1504AESN															
	1504AESN-RH					●				●						
SDKN	1504AESN-SM				●			●								E17
	1504AEEN-SM															
SDKR	1504AESN-MX						●									E18
	1504AETN-MX															
	1504AEN-MX	●														
	1504AESN-SM	○			○					○						E18
SDXN	1504AESN-FM					●										E18
	1504AEEN-FM															
SDXR	1504AESN-FM															E18

● : Stock item ○ : Under preparing for stock

PES2000/3000/4000

AA 0°



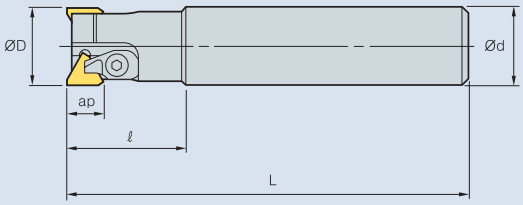


Fig. 1

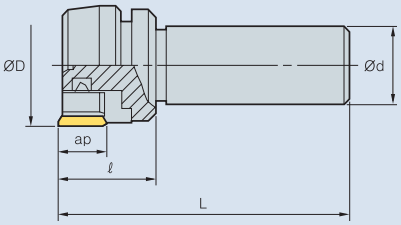


Fig. 2

(mm)

Designation		Stock R	Stock L	⊚	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
	4050RS42	○		3	50	42	40	120	16.5	1.5	2
	4063R	●		4	63	32	40	120	16.5	1.5	2
	4063RS42	○		4	63	42	40	120	16.5	1.8	2

● : Stock item ○ : Under preparing for stock

● Parts

	Locator	Wedge	Wedge Screw	Locator Screw
2000 Type	-	-	-	CHX0407
3000 Type	-	-	-	CHX0510
4000 Type	LPTS4R/L	WPTSR	DHA0815	LTX0512
	Wrench		**Clamp**	**Ring**
2000 Type	HW25L	-	CH4R1	ER03
3000 Type	HW30L	-	CH5R1	ER04
4000 Type	-	HW40	-	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 250 120 ~ 200 100 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	NCM325 PC3525 ST30A
M	50 ~ 150 50 ~ 120	0.10 ~ 0.25 0.10 ~ 0.30	PC9530 ST30A
K	130 ~ 200 100 ~ 150	0.10 ~ 0.30 0.10 ~ 0.30	PC6510 G10

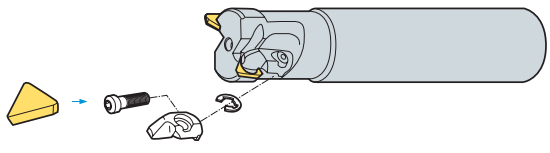
● Available Inserts

TECN TEEN

Designation		Coated NCM325	PC130	PC230	PC3535	NCM335	PC9530	PC6510	Cermet CN30	Uncoated ST20	ST30A	H01	G10	Type	Page
TECN	22R												●	2000 Type	E23
	22TR		●						●		●				
TECN	32R												●	3000 Type	E23
	32TR		●			●			●		●				
	32TR-S20						●								
TEEN	43R												●	4000 Type	E23
	43R-G											●			
	43TR	●	●	●		●		●	●	●	●				
	43TR-S20						●								
	43TR-Z										●				
	43TR-ZH				●		●								

● : Stock item ○ : Under preparing for stock

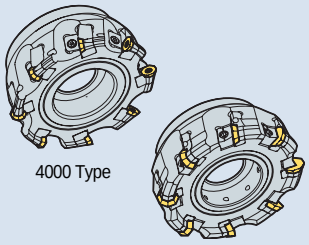
Assembling



• Applicable inserts, see pages E23

AFOM4000/5000

AA 45°
• AR : 15°
• RR : 5°



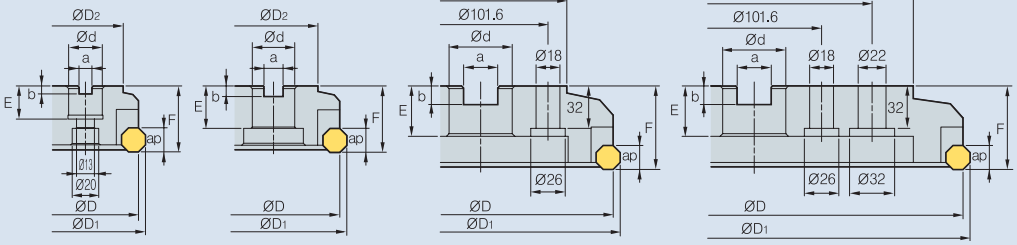


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	øD	øD1	øD2	ød	a	b	E	F	ap	kg	Fig.
AFOM	4080R/L	●		5	80	88	60	27	12.4	7	22	50	6.5	1.4	1
	4100R/L	●		6	100	108	80	32	14.4	8	28	50	6.5	2.0	1
	4125R/L	●		8	125	133	100	40	16.4	9	30	63	6.5	3.1	1
AFOM	5080R/L	●		5	80	91	60	27	12.4	7	22	50	9.5	1.4	1
	5100R/L	●		6	100	111	80	32	14.4	8	28	50	9.5	2.0	2
	5125R/L	●		8	125	136	100	40	16.4	9	30	63	9.5	3.1	2
	5160R/L	●		10	160	171	120	40	16.4	9	30)	63	9.5	5.2	2
	5200R/L	●		12	200	211	130	60	25.7	14	38	63	9.5	7.5	3
	5250R/L	●		16	250	261	180	60	25.7	14	38	63	9.5	16.1	3
	5315R/L	●		20	315	326	240	60	25.7	14	38	63	9.5	22.8	4

● : Stock item ○ : Under preparing for stock

● Parts

	Locator	Wedge	Wedge Screw	Screw	Wrench	
4000 Type	LAF04R/L	WAFO4R/L	DHA0815	FTKA0408	TW15S	-
5000 Type	LAF05R/L *LAF05R/L-1	WEFR/L	DHA0821F	LTX0512	-	HW40

⋆ : Ø80 ~ Ø100

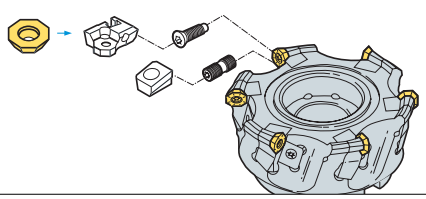
● Available Arbors

Designation		Arbors
AFOM	4080R/L	BT□□-FMC27-□□
	4100R/L	BT□□-FMC32-□□
	4125R/L	BT□□-FMB40-□□
AFOM	5080R/L	BT□□-FMC27-□□
	5100R/L	BT□□-FMC32-□□
	5125R/L	BT□□-FMB40-□□
	5160R/L	BT□□-FMB40-□□
	5200R/L	BT□□-FMB60-□□
	5250R/L	BT□□-FMB60-□□
	5315R/L	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	150 ~ 300 120 ~ 230 100 ~ 200	0.05 ~ 0.15 0.05 ~ 0.20 0.05 ~ 0.20	NCM325 PC3525 ST30A
M	50 ~ 200 50 ~ 120	0.05 ~ 0.20 0.05 ~ 0.20	PC9530 ST30A
K	150 ~ 250 100 ~ 200	0.05 ~ 0.30 0.05 ~ 0.30	PC6510 G10

Assembling



● Available Inserts

OFCW OFKT-MF OFKT-MM OFKT-MA OFCN

OFKR-MF OFKR-MM OFKR-MA REKR-MM

Designation		Coated NCM325	PC230	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC205K	PC6510	Uncoated H01	Type	Page
OFCW	05T3SN	●												
	05T3FN													E14
	05T308FN													
OFKT	05T3SN-MF	●		○		●		●						
	05T308SN-MF												4000 Type	
	05T3SN-MM	●	●	○		●			●					E15
	05T308SN-MM													
	05T3FN-MA											●		
	05T3EN-MA													
OFCN	0704SN	●			●		●							
	0704FN													E14
	070408SN													
	070408FN													
OFKR	0704SN-MF	●		○		●		●			○			
	070408SN-MF													
	0704SN-MM	●	●	○	●	●	●		●		●			E15
	070408SN-MM	●											5000 Type	
	0704FN-MA											●		
	0704EN-MA													
OFKT	0704SN-MM	●		○										
	0704FN-MA											●		E15
	0704EN-MA													
REKR	170400-MM			●										E17

● : Stock item ○ : Under preparing for stock

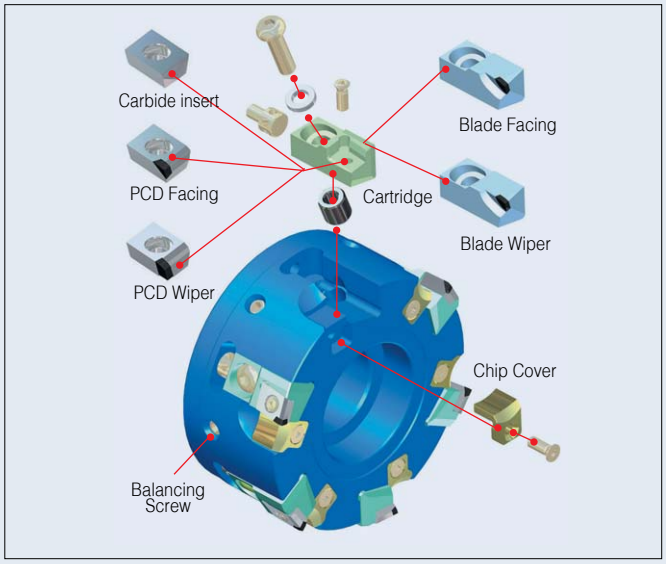
• Applicable inserts, see pages E14, E15, E17
• Detail cutter spec. see pages E172~E174

Technical Information for Aero Mill

■ Special features

- Excellent machining performance can be acquired especially at the high speed cutting due to the light aluminum cutter body that 50% weight of conventional steel cutter body.
- High speed milling cutter can afford to precise machining.
- Special Aluminum material and high rake angle of insert provide rigid & stable machining.
- High class surface finish can be acquired due to the low cutting load provided from high rake angle.
- Balanceable up to G2.5 level.

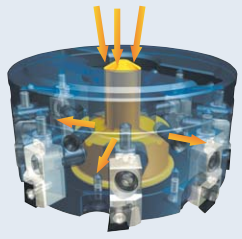
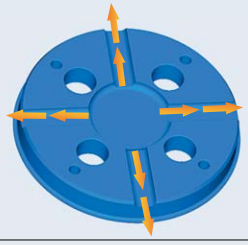
■ Assembly structure of cutter



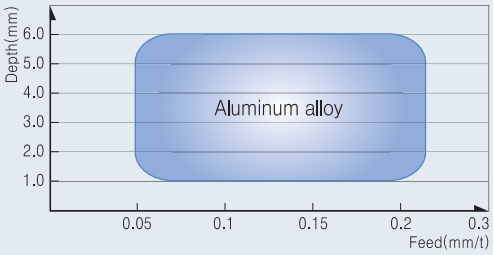
- Locator improves cutter's durability.
- It is possible to use both insert type & blade type cutting edge.
- Wide chip pocket guarantees smooth chip flow.
- Cemented carbide, PCD insert can be applied for various workpieces.
- Chip cvr made of steel is put at chip pocket area, protects aluminum cutter from scratch & damage of machining.

■ Coolant through system

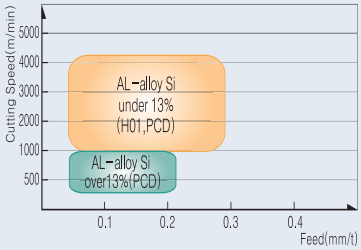
- Specially designed coolant through system provides coolant from the center of the cutter to the insert. It enhances the cooling rate and chip evacuation properity.
- Since shooting direction of coolant has designed directly to the insert cutting edge, it has maximized chip evacuation.
- Coolant bolt is applicable upto Ø160, coolant cover is applicable from Ø200 and over. Coolant devices are sold seperately. For through coolant system, through coolant arbor has to be used.

Coolant Bolt	Coolant Cover
	
For Ø80~Ø160	For Ø200 and over

■ Application range



■ Recommended cutting condition



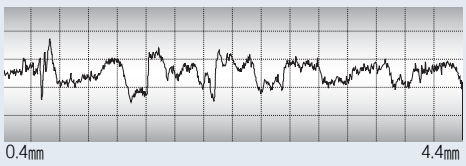
■ Maximum revolution available

Diameter	Maximum revolution(rpm)
Ø80	16,000
Ø100	15,000
Ø125	12,500
Ø160	10,000
Ø200	8,000
Ø250	6,500
Ø315	5,000

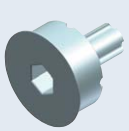
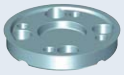
■ Maximum revolution

- **Machine** : PCV620
- **vc** = 1570m/min
- **Workpiece** : A6061
- **n** = 5000 rpm
- **Cutter** : APDM100R-A6Z
- **vf** = 3000mm/min
- **Insert** : CDEW1204R-XCF(H01)
- **fz** = 0.1mm/t
- **ap** = 0.5mm

- Rmax : 2.1㎛
- Rz : 1.6㎛
- Ra : 0.3㎛

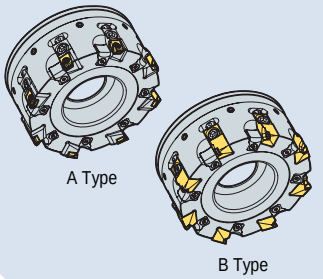


■ Coolant parts

Diameter	Type	Designation	Shape	Note
Ø 80	Coolant Bolt	CBP080-MM		Extra charge
Ø 100	Coolant Bolt	CBP100-MM-1		
Ø 125	Coolant Bolt	CBP125-MM-1		
Ø 160	Coolant Bolt	CBP160-MM		
Ø 200	Coolant Cover	CCP200		Extra charge
Ø 250	Coolant Cover	CCP250		
Ø 315	Coolant Cover	CCP315		

APDM-A/B

AA 0°



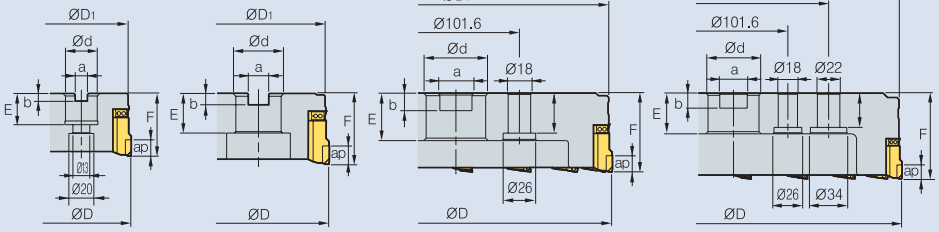


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD1	Ød	a	b	E	F	ap	Max rpm	kg	Fig.
APDM	080R/L-A6Z	●		6	80	76	27	12.4	7	22	50	6	16000	0.75	1
	100R/L-A6Z	●		6	100	95	32	14.4	8	28	50	6	15000	0.95	2
	125R/L-A8Z	●		8	125	120	40	16.4	9	30	63	6	12500	1.8	2
	160R/L-A10Z			10	160	155	40	16.4	9	30	63	6	10000	2.9	2
	200R/L-A12Z			12	200	195	60	25.7	14	38	63	6	8000	4.0	3
	250R/L-A16Z			16	250	245	60	25.7	14	38	63	6	6500	6.3	3
	315R/L-A18Z			18	315	310	60	25.7	14	38	80	6	5000	11.3	4
APDM	080R/L-B6Z			6	80	76	27	12.4	7	22	50	6	16000	0.75	1
	100R/L-B6Z			6	100	95	32	14.4	8	28	50	6	15000	0.95	2
	125R/L-B8Z			8	125	120	40	16.4	9	30	63	6	12500	1.8	2
	160R/L-B10Z			10	160	155	40	16.4	9	30	63	6	10000	2.9	2
	200R/L-B12Z			12	200	195	60	25.7	14	38	63	6	8000	4.0	3
	250R/L-B16Z			16	250	245	60	25.7	14	38	63	6	6500	6.3	3
	315R/L-B18Z			18	315	310	60	25.7	14	38	80	6	5000	11.3	4

• A type : Cartridge + Insert, B type : Blade

● : Stock item ○ : Under preparing for stock

● Parts

	Cartridge	Chip cover	Chip cover Screw	Insert Screw
APD-A	LAPDR/L-AJ	CAPDR/L-AJ	PTMA0411	FTNA0411
APD-B	LAPDR/L-AJ	CAPDR/L-AJ	PTMA0411	-
	Adjust Screw	**Cartridge Screw**	**Wrench for Insert**	**Wrench for Cartridge**
APD-A	AZ0514	BHA0619-NYLOK	TW15S	HW50
APD-B	AZ0514	BHA0619-NYLOK	-	HW50

● Available Arbors

Designation		Arbors
APDM	080R/L	BT□□-FMC27-□□
	100R/L	BT□□-FMC32-□□
	125R/L	BT□□-FMB40-□□
	160R/L	BT□□-FMB40-□□
	200R/L	BT□□-FMB60-□□
	250R/L	BT□□-FMB60-□□
	315R/L	-

● Recommended Cutting Condition

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
Aluminum	1,000 ~ 4,000 500 ~ 2,500	0.05 ~ 0.30 0.05 ~ 0.20	DP200 H01

• Applicable inserts, see pages E11, E12
• Detail cutter spec. see pages E172~E174

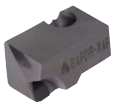
● Available Inserts

CDEW-XCF	CDEW-XAF,NAF	CDEW-XAW,NAW

Designation		PCD DP200	Uncoated H01	Page
CDEW	1204R-XCF		●	E12
	1204L-XCF		○	
	1204R-XAF	●		E12
	1204L-XAF	●		
	1204R-NAF	●		E12
	1204R-XAW	●		E12
	1204L-XAW	●		
	1204R-NAW	●		E12

● : Stock item ○ : Under preparing for stock

● Available Blades

BAPDR-XAF	BAPDR-NAF	BAPDR-XAW	BAPDR-NAW
			

Designation		PCD DP200	Page
BAPDR	XAF	○	E11
BAPDL	XAF	●	
BAPDR	NAF	○	E12
BAPDR	XAW	○	E12
BAPDL	XAW		
BAPDR	NAW	○	E12
BAPDL	NAW		

● : Stock item ○ : Under preparing for stock

Rich Mill series

■ Features

- Rich mill series is one of innovations that provides more available cutting edges by double sided insert and longer tool life for our customers.
- The unique geometry and special cutting edge guarantee low cutting load and long tool life.
- Rich mill series has a wide application range from steel and stainless steel to cast iron and aluminum.
- Applying negative insert makes it stronger and long tool life.
- Rich mill series has both screw on clamping system and latch clamping system.

■ Rich Mill series

RM8, RM4, RMT, RM16

Rich Mill Code System

∗ Available insert designation is based on ISO

①	②	③	④	⑤	⑥	⑦	⑧	⑨
RM16	A	C	M	4	100	H	R	– M

① RM4 : Number of edges-4 RM8 : Number of edges-8
RM10 : Number of edges-10 RM12 : Number of edges-12
RM16 : Number of edges-16 RMT : Latch Clamp

② Approach angle
A : 45° D : 30° E : 15°
F : 5° P : 0° Q : 2°

③ Tool type
C : Cutter
S : Shank

④ Arbor type
M : Metric
A : Inch

⑤ I/C size of insert
3 : 9.525 4 : 12.7
5 : 15.875

⑥ Tool diameter
ISO : mm
AISI : inch

⑦ Coolant type
H : Thru-Hole
Unmarked : No Thru-Hole

⑧ Hand of tool
R : Right
L : Left

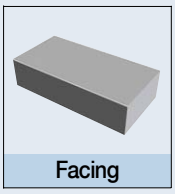
⑨ Pitch type
M : Close H : Extra Close
∗ Clamping type
LT : Latch Clamp

▶ Rich mill is korloy' s new milling tool for high productivity

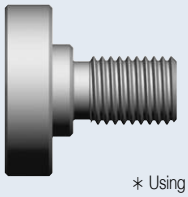
Rich Mill RM8

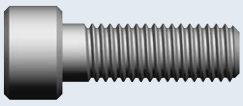
■ Double sided insert to use 8 cutting edges

- 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 guarantee excellent surface finish. Applicable for various workpiece like steel, stainless steel, cast iron, aluminum.
- Combination with the innovative geometry and various grades provide developed 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.


Facing

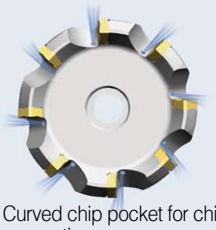
■ Clamping bolt

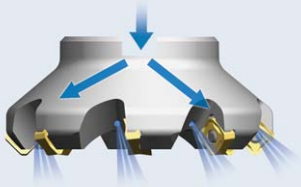

∗ Using RM4, RM8, RM16
Mounting bolt
(Φ160~Φ250 → Mounting bolt for general face milling)


∗ Using RM4, RM8, RM16
Socket bolt
(Φ50~Φ125 → Hexagonal socket bolt)

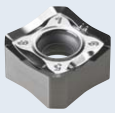
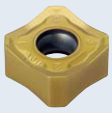
■ Through coolant system

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. but through coolant arbor is necessary.

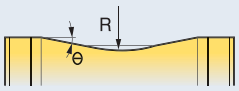
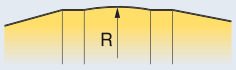

Curved chip pocket for chip evacuation.


Through coolant system for decreasing cutting heat and good chip evacuation.

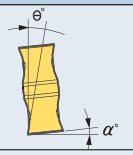
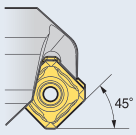
■ Chip breaker

Insert		Cutting edge	Features
For aluminum MA			Due to sharp cutting edge and buffed surface, it has good chip flow and welding resistance.
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.

■ Features of insert

Insert	Cutting edge	Features
		High rake chip breaker & positive setting angle for low cutting load.
		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.

■ Features of cutter

Shape	Cutting edge	Features
		High rake angle makes positive setting angle for low cutting load.
		Suitable for facing and chamfering.

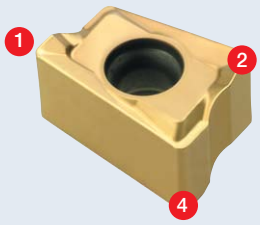
■ Recommended cutting condition

ISO	Grade	SNM(E)X1206ANN-MM		SNM(E)X1206ANN-MF	
		fz(mm/t)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	NCM325	150~300	0.10~0.35	200~300	0.05~0.30
	PC3525	150~300	0.10~0.35	200~300	0.05~0.30
	PC3535	120~250	0.10~0.35	150~250	0.05~0.30
M	PC9530	120~180	0.10~0.35	100~180	0.05~0.30
K	PC6510	150~300	0.10~0.40	150~300	0.08~0.35

Rich Mill RM4

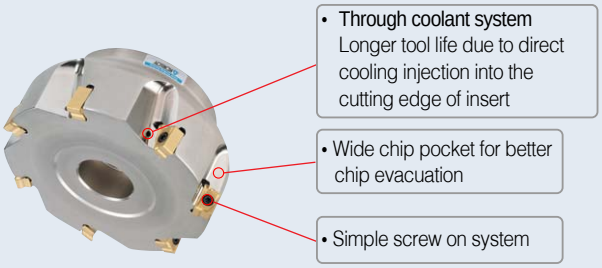
■ Economical 4 cutting edges by using double-sided insert

- RM4,as a multi functional milling tool, offers economical 4 cutting edges by using innovative double-sided insert.
- Special designed chip breaker consists of high rake angle and strong cutting edge decreases the cutting load.
- RM4 is multi functional tool 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.



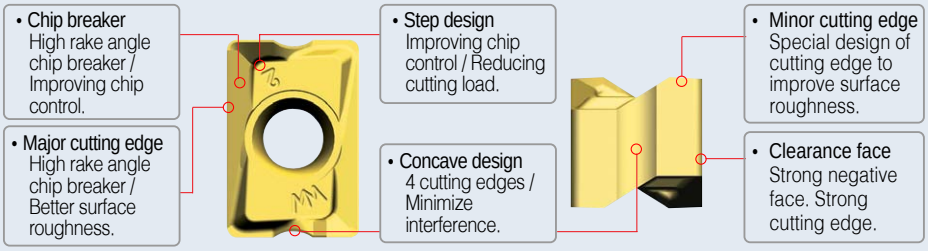
■ Features

- 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, high economy, multi functional tool.

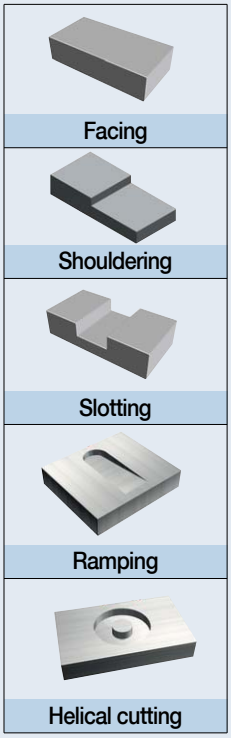


■ Inserts

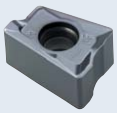
- Double-sided insert using 4 cutting edges.
- High rake angle chip breaker, cutting edge.
- Flexibility of product.
- High efficiency, high economy, multi functional tool
- Negative insert has strong cutting edge.



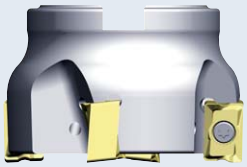
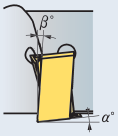
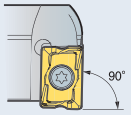
■ Uses



■ Chip breaker

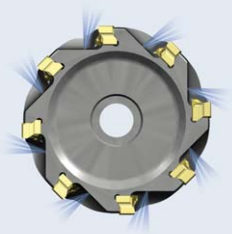
Insert		Cutting edge	Features
Light cutting **MF**			Due to low cutting load, it is good for light cutting and difficult-to-cut material.
General cutting **MM**			It is suitable design for general milling.

■ Setting configuration

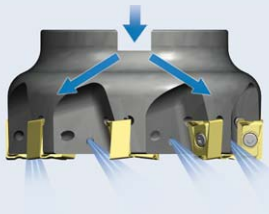
Insert	Setting angle of insert	Features
		High rake chip breaker & positive setting angle for low cutting load → Improving machinability
		Multi applications for facing, shouldering, slotting, ramping, helical cutting, etc.

■ Through coolant system

By using 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 necessary)



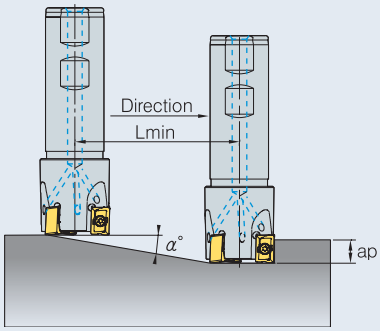
Curved chip pocket for chip evacuation



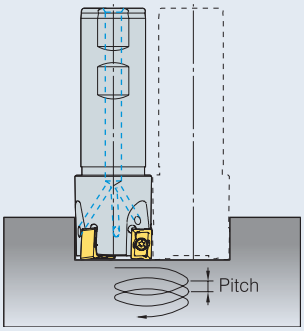
Through coolant system for decreasing cutting heat and good chip evacuation

■ Ramping and Helical cutting

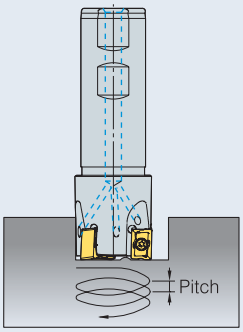
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole



1. Ramping				2. Helical cutting for blind hole				3.Helical cutting for through hole	
Designation	D	α(°)	Lmin	Maximum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch	Minimum Hole Diameter	Maximum Pitch
RM4PS3014HR	14	5	114	27	3	25	2.5	19	1.0
RM4PS3016HR	16	4	143	31	3	29	2.0	23	1.0
RM4PS3018HR	18	4	143	35	3	33	3.0	27	2.0
RM4PS3020HR	20	4	143	39	4	37	3.0	31	2.0
RM4PS3025HR	25	3.5	163	49	4	47	4.0	41	3.0
RM4PS3032HR	32	5	191	63	4.5	61	4.0	55	3.5
RM4PS3040HR	40	2	286	79	4	77	3.5	71	3.0
RM4PS3050HR	50	1.5	382	99	3.5	97	3.5	91	3.0
RM4PC(M)3040HR	40	2	286	79	4	77	4.0	71	3.0
RM4PC(M)3050HR	50	1.5	382	99	3.5	97	3.5	91	3.0
RM4PC(M)3063HR	63	1	573	125	3	123	3.0	117	2.5
RM4PC(M)3080HR	80	1	573	159	4	157	4.0	151	3.5
RM4PCM3100HR	100	0.5	1146	199	2	197	2.0	191	2.0
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
RM4PCM4100HR	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

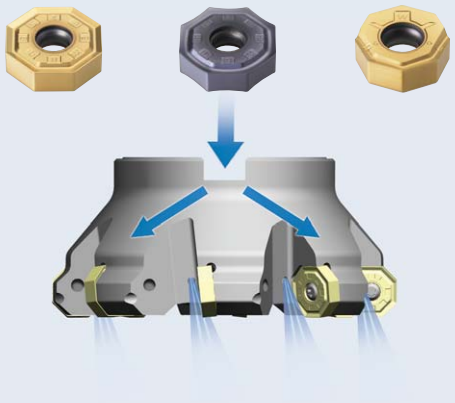
* The Lmin is when depth of cut is 10.0mm (Lmin = 10/tan θ)

■ Recommended cutting condition

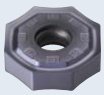
ISO	Grade	LNM(E)X100605PNR-MM		LNM(E)X100605PNR-MF		LNM(E)X15008PNR-MM		LNM(E)X151008PNR-MF	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	NCM325	-	-	-	-	120~300	0.05~0.25	150~300	0.05~0.25
	PC3525	120~300	0.05~0.25	150~300	0.05~0.2	120~300	0.05~0.25	150~300	0.05~0.25
	PC3535	100~250	0.05~0.25	150~250	0.05~0.2	100~250	0.05~0.25	150~250	0.05~0.25
M	PC9530	100~180	0.05~0.25	120~180	0.05~0.2	100~180	0.05~0.25	120~180	0.05~0.25
K	PC6510	120~300	0.08~0.25	150~300	0.08~0.25	120~300	0.08~0.30	150~300	0.08~0.30

Rich Mill RM16

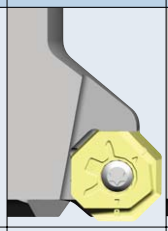
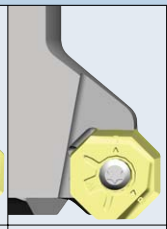
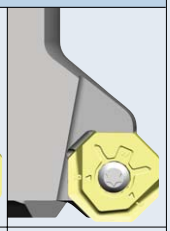
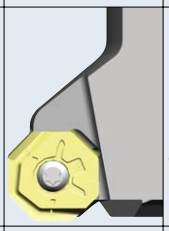
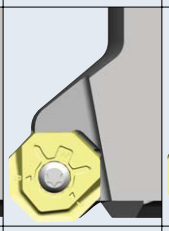
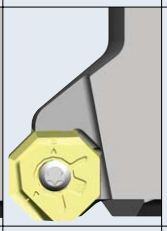
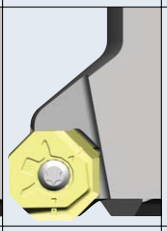
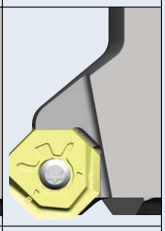
- Economical 16 cutting edges.
- It can reduce cost in medium cutting.
- Wiper insert can be used for good surface roughness.
- Optimal matching of the special cutting edge geometry with variety of new grades provides consistence & long tool life of insert.
- When it is used 16 corners, maximum cutting depth is 5.5mm, but it is used 8 corners, maximum cutting depth is 13mm.
- Wiper insert is placed 0.05mm lower than facing insert in cutter.
- When feed is bigger than wiper cutting edge length(7mm), 2 wiper inserts are placed in symmetrical position.



■ Chip breaker

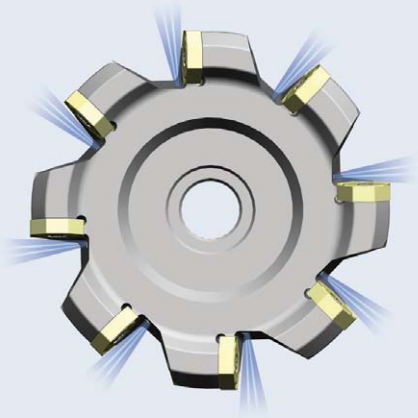
Insert		Cutting edge	Features
General cutting **MM**			It is suitable design for general milling.
Light cutting **MF**			Due to low cutting load, it is good for light cutting and difficult-to-cut material.
Wiper **W**			It has good surface roughness than MM,MF chip breaker.

■ Instruction for wiper insert

Hand of tool	Correct setting	Incorrect setting			
Right hand					
	O	X	X	X	X
Left hand					
	O	X	X	X	X

■ Through coolant system

- Well designed chip pocket for better chip flow
- Through coolant system reduces cutting heat and improves chip evacuation.



■ Recommended cutting condition

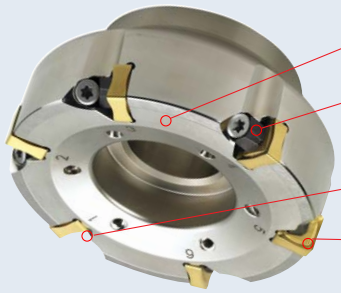
ISO	Grade	ONM(H)X060608-MM		ONM(H)X060608-MF		ONHX060608-W		ONM(H)X080608-MM		ONM(H)X080608-MF		ONHX080608-W	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	NCM325	150~300	0.1~0.35	200~300	0.05~0.3	200~300	0.05~0.2	150~300	0.1~0.4	200~300	0.05~0.35	200~300	0.05~0.25
P	PC3525	150~300	0.1~0.35	200~300	0.05~0.3	200~300	0.05~0.2	150~300	0.1~0.4	200~300	0.05~0.35	200~300	0.05~0.25
P	PC3535	120~250	0.1~0.35	150~250	0.05~0.3	150~250	0.05~0.2	120~250	0.1~0.4	150~250	0.05~0.35	150~250	0.05~0.25
M	PC9530	120~180	0.1~0.35	100~180	0.05~0.3	100~180	0.05~0.2	120~180	0.1~0.4	100~180	0.05~0.35	100~180	0.05~0.25
K	PC6510	150~300	0.1~0.4	150~300	0.08~0.35	150~300	0.05~0.25	150~300	0.1~0.45	150~300	0.08~0.4	150~300	0.05~0.3

Rich Mill RMT

■ New generation clamping system

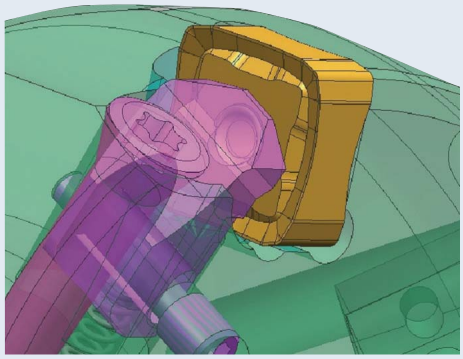
- New latch clamping system ensures the powerful cutting force and easy to insert change.
- New grades with chipping resistance provides good surface roughness and better tool life.
- Due to the specially designed chip breaker, all operations are possible.
- RMT with various pitches can replace conventional ISO milling tool.

■ Features of RMT

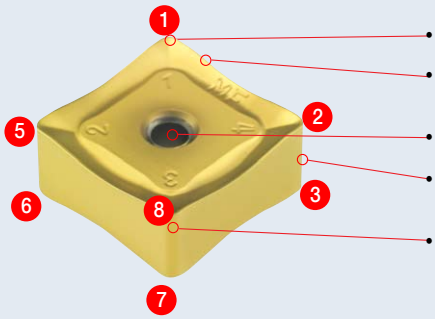


- High rigidity cutter body to improve durability.
- New latch clamping system ensures the powerful cutting force and easy to insert change.
- The chip pocket design of 3-dimensional for smooth chip control.
- Economical 8 corners by using double-sided insert.

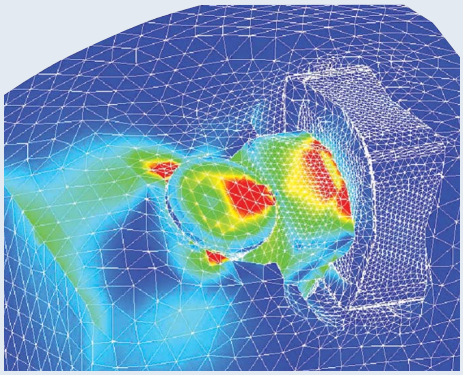
■ Clamping force analysis



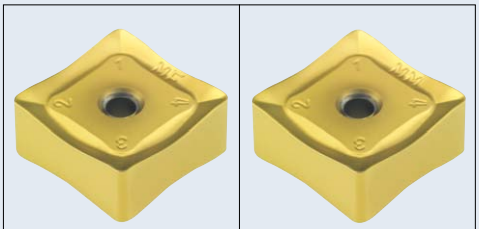
■ Features of RMT insert(using R/L)



- Economical 8 corners.
- Low cutting load due to high rake angle chip breaker.
- The chamber shape for stable clamping.
- Coated grades with improved chipping resistance.
- Optimal design of minor cutting edge to use in R/L cutting type Good surface roughness.



■ Chip breaker



• MF(sharp cutting edge)	• MM(strong cutting edge)

■ Rich Mill code system

① Rich mill - Latch type 8corners	② Approach angle Q : 2° F : 5° E : 15° C : 25° A : 45°	③ Arbor type M : Metric A : Inch

RMT8	E	M	4	250	R	–	M
①	②	③	④	⑤	⑥		⑦

④ I/C size of insert 4 : 12.7 5 : 15.875	⑤ Tool diameter ISO : mm AISI : inch	⑥ Hand of tool R : Right L : Left	⑦ Pitch type M : Close H : Extra Close * Clamping type LT : Latch Clamp

■ Recommended grades and chip breakers

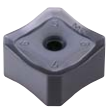
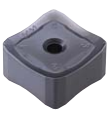
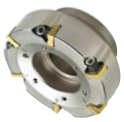
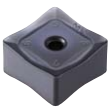
ISO	Grade	MM	MF
P	NCM325	◎	○
	PC3525	◎	○
	PC3545	◎	○
M	PC9530	△	◎
K	PC6510	○	◎

◎ : Optimum ○ : Proper △ : General × : Unmatched

■ Recommended cutting condition

ISO	Grade	MM		MF	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
P	NCM325	150~300	0.05~0.3	150~300	0.05~0.2
	PC3525	150~300	0.05~0.3	150~300	0.05~0.2
	PC3545	150~300	0.05~0.3	150~300	0.05~0.2
M	PC9530	120~180	0.05~0.2	120~180	0.05~0.2
K	PC6510	150~300	0.05~0.3	150~300	0.05~0.2

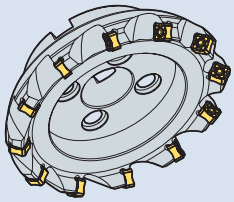
Rich Mill series

Cutter type		Cutter diameter	AA	Application		Features	Page
RM8AM RM8AC4000		Ø 50 ~ Ø 250	45°	SNMX1206ANN-MM SNEX1206ANN-MM SNMX1206ANN-MF SNEX1206ANN-MF SNEX1206ANN-MA		• Economical 8 corners. • Low cutting load and excellent smooth cutting.	E56
RM8EM RM8EC4000		Ø 50 ~ Ø 200	15°	SNMX1206ENN-MM SNEX1206ENN-MM SNMX1206ENN-MF SNEX1206ENN-MF		• Economical 8 corners. • Deep cutting depth.	E57
RM4PM RM4PC3000		Ø 40 ~ Ø 100	90°	LNMX100605PNR-MM LNEX100605PNR-MM LNMX100605PNR-MF LNEX100605PNR-MF		• Economical 4 corners. • Screw on type for slotting, facing.	E58
RM4P RM4PCM4000		Ø 50 ~ Ø 160		LNMX151008PNR-MM LNEX151008PNR-MM LNMX151008PNR-MF LNEX151008PNR-MF			
RM4P RM4PS3000		Ø 14 ~ Ø 50	90°	LNMX100605PNR-MM LNEX100605PNR-MM LNMX100605PNR-MF LNEX100605PNR-MF			E59
RM4P RM4PS4000		Ø 32 ~ Ø 63		LNMX151008PNR-MM LNEX151008PNR-MM LNMX151008PNR-MF LNEX151008PNR-MF			E60
RM4PM Modular Type		Ø 14 ~ Ø 50	90°	LNMX100605PNR-MM LNEX100605PNR-MM LNMX100605PNR-MF LNEX100605PNR-MF			E61
RM16AC RM16ACM6000 RM16ACM8000		Ø 63 ~ Ø 200	45°	ONMX080608-MM / MF ONMX060608-MM / MF ONHX080608-MM / MF ONHX060608-MM / MF ONHX080608-W ONHX060608-W		• Economical 16 corners. • Wiper insert for surface roughness.	E62
RMT8A RMT8AM4000 RMT8AM5000		Ø 80 ~ Ø 315	45°	SNCF1206ANN-MF / MM SNCF1507ANN-MF / MM SNMF1206ANN-MF / MM SNMF1507ANN-MF / 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.	E63
RMT8E RMT8EM4000 RMT8EM5000		Ø 80 ~ Ø 315	15°	SNCF1206ENN-MF / MM SNCF1507ENN-MF / MM SNMF1206ENN-MF / MM SNMF1507ENN-MF / MM			E64
RMT8Q RMT8QM4000		Ø 80 ~ Ø 315	2°	SNCF1206QNN-MF SNCF1507QNN-MM SNMF1206QNN-MF SNMF1507QNN-MM			E65

RM8ACM4000

New

AA 45°



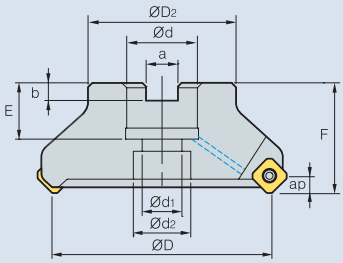


Fig. 1

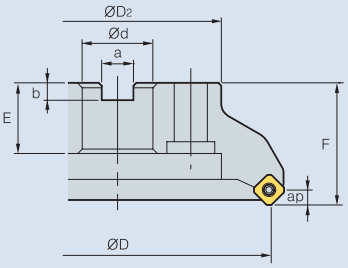


Fig. 2

(mm)

Designation		Stock R	Stock L	⊙	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
RM8ACM	4050HR-M	●		4	50	49	22	10.4	6.3	20	40	11	18	6.0	0.5	1
	4050HR-H	●		6	50	49	22	10.4	6.3	20	40	11	18	6.0	0.5	1
	4063HR-M	●		6	63	49	22	10.4	6.3	20	40	11	18	6.0	0.7	1
	4063HR-H	●		8	63	49	22	10.4	6.3	20	40	11	18	6.0	0.7	1
	4080HR			5	80	57	27	12.4	7	23	50	14	20	6.0	1.2	1
	4080HR-M	●		7	80	57	27	12.4	7	23	50	14	20	6.0	1.2	1
	4080HR-H	●		10	80	57	27	12.4	7	23	50	14	20	6.0	1.3	1
	4100HR			6	100	67	32	14.4	8	25.5	50	18	26	6.0	1.7	1
	4100HR-M	●		8	100	67	32	14.4	8	25.5	50	18	26	6.0	1.7	1
	4100HR-H	●		12	100	67	32	14.4	8	25.5	50	18	26	6.0	1.7	1
	4125HR			8	125	87	40	16.4	9	30	63	22	32	6.0	3.6	1
	4125HR-M	●		10	125	87	40	16.4	9	30	63	22	32	6.0	3.6	1
	4125HR-H	●		16	125	87	40	16.4	9	30	63	22	32	6.0	3.7	1
	4160R			10	160	107	40	16.4	9	32	63	-	107	6.0	4.8	2
	4160R-M	●		12	160	107	40	16.4	9	32	63	-	107	6.0	5.3	2
	4160R-H	●		50	160	107	40	16.4	9	32	63	-	107	6.0	5.4	2
	4200R-M			14	200	130	60	25.7	14	32	63	-	135	6.0	7.1	2
	4200R-H			24	200	130	60	25.7	14	32	63	-	135	6.0	7.1	2
	4250R-M			16	250	180	60	25.7	14	32	63	-	180	6.0	11.9	2
	4250R-H			30	250	180	60	25.7	14	32	63	-	180	6.0	12.0	2

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
FTKA0410	TW15S

● Available Arbors

Designation		Arbors
RM8ACM	4050HR-M 4050HR-H 4063HR-M 4063HR-H	BT30 / BT40/BT50 FMC22
	4080HR 4080HR-M 4080HR-H	BT40 / BT50 FMB / FMC27
	4100HR 4100HR-M 4100HR-H	BT40 / BT50 FMC32
	4125HR 4125HR-M 4125HR-H	BT40 / BT50 FMB / FMC40
	4160R 4160R-M 4160R-H	
	4200R-M 4200R-H 4250R-M 4250R-H	BT50 FMB60

• Applicable inserts, see pages **E22**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

SNMX-MM	SNEX-MM	SNMX-MF

SNEX-MF	SNEX-MA

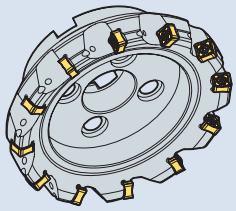
Designation		Coated NCM325	Coated PC3525	Coated PC9530	Coated PC6510	Uncoated H01	Page
SNEX	1206ANN-MA			●			E22
SNEX	1206ANN-MF		●		●		E22
SNEX	1206ANN-MM	●	●		●		E22
SNMX	1206ANN-MF		●		●		E22
SNMX	1206ANN-MM		●		●	○	E22

● : Stock item ○ : Under preparing for stock

RM8ECM4000

New

AA 45°



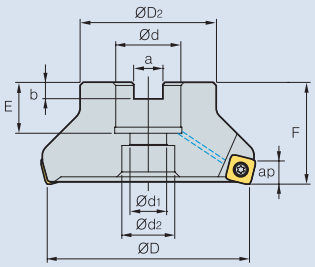


Fig. 1

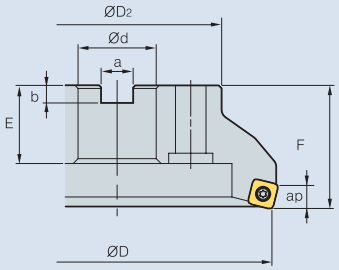


Fig. 2

(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg	Fig.
RM8ECM	4050HR-M	●		4	50	49	22	10.4	6.3	20	40	11	18	9.0	0.5	1
	4063HR-M	●		6	63	49	22	10.4	6.3	20	40	11	18	9.0	0.6	1
	4080HR			5	80	57	25.4	9.5	6	25	50	14	20	9.0	1.2	1
	4080HR-M	●		7	80	57	27	12.4	7	23	50	14	20	9.0	1.1	1
	4100HR			6	100	67	31.75	12.7	8	33	50	18	26	9.0	1.7	1
	4100HR-M	●		8	100	67	32	14.4	8	25.5	50	18	26	9.0	2.5	1
	4125HR			8	125	87	38.1	15.9	10	36	63	22	32	9.0	3.0	1
	4125HR-M	●		10	125	87	40	16.4	9	30	63	22	32	9.0	3.1	1
	4160R			10	160	107	50.8	19	11	38	63	-	107	9.0	4.5	2
	4160R-M	●		12	160	107	40	16.4	9	32	63	-	107	9.0	4.0	2
	4200R-M			16	160	130	60	25.7	14	32	63	-	135	9.0	5.9	2

● : Stock item ○ : Under preparing for stock

● Parts

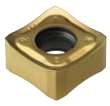
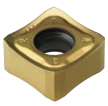
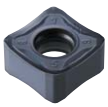
Screw	Wrench
PTKA0411-R3	TW15S

● Available Arbors

Designation		Arbors
RM8ECM	4050HR-M 4063HR-M	BT30 / BT40 BT50 FMC22
	4080HR-M	BT40 / BT50 FMB / FMC27
	4100HR-M	BT40 / BT50 FMC32
	4125HR-M 4160R-M	BT40 / BT50 FMB / FMC40
	4200R-M	BT50 FMB60

• Applicable inserts, see pages **E22**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

SNEX-MF	SNEX-MM	SNMX-MF	SNMX-MM
			

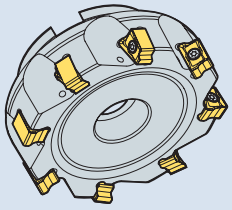
Designation		Coated PC3525	Coated PC6510	Page
SNEX	1206ENN-MF	●	●	E22
SNEX	1206ENN-MM	●	●	E22
SNMX	1206ENN-MF	●	●	E22
SNMX	1206ENN-MM	●	●	E22

● : Stock item ○ : Under preparing for stock

RM4PCM3000/4000

New

AA 0°



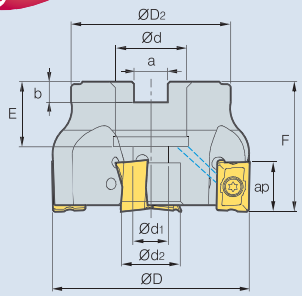


Fig. 1

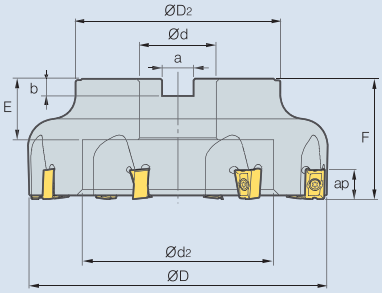


Fig. 2

(mm)

Designation		Stock R	Stock L	⊚	øD	øD2	ød	a	b	E	F	ød1	ød2	ap	kg	Bolt	Fig.
RM4PCM	3040HR	●		4	40	35	16	8.4	5.6	19	40	9	14	9.0	0.24	SB0825	1
	3040HR-M	●		5	40	35	16	8.4	5.6	19	40	9	14	9.0	0.23	SB0825	1
	3050HR	●		5	50	42	22	10.4	6.3	20	40	11	18	9.0	0.36	SB1025	1
	3050HR-M	●		7	50	42	22	10.4	6.3	20	40	11	18	9.0	0.35	SB1025	1
	3063HR	●		7	63	49	22	10.4	6.3	20	40	11	18	9.0	0.61	SB1025	1
	3063HR-M	●		9	63	49	22	10.4	6.3	20	40	11	18	9.0	0.6	SB1025	1
	3080HR	●		8	80	57	27	12.4	7.0	23	50	14	20	9.0	1.24	SB1230	1
	3080HR-M	●		10	80	57	27	12.4	7.0	23	50	14	20	9.0	1.23	SB1230	1
	3100HR	●		9	100	67	32	14.4	8.0	25	50	18	26	9.0	1.94	SB1630	1
	3100HR-M	●		12	100	67	32	14.4	8.0	25	50)	18	26	9.0	1.93	SB1630	1
RM4PCM	4050HR	●		3	50	46	22	10.4	6.3	20	40	11	18	14	0.36	SB1025	1
	4050HR-M	●		4	50	46	22	10.4	6.3	20	40	11	18	14	0.35	SB1025	1
	4063HR	●		4	63	49	22	10.4	6.3	20	40	11	18	14	0.56	SB1025	1
	4063HR-M	●		6	63	49	22	10.4	6.3	20	40	11	18	14	0.57	SB1025	1
	4080HR	●		5	80	57	27	12.4	7.0	23	50	14	20	14	1.16	SB1230	1
	4080HR-M	●		7	80	57	27	12.4	7.0	23	50	14	20	14	1.14	SB1230	1
	4100HR	●		5	100	67	32	14.4	8.0	25	50	18	26	14	1.84	SB1630	1
	4100HR-M	●		8	100	67	32	14.4	8.0	25	50	18	26	14	1.82	SB1630	1
	4125HR	●		7	125	87	40	16.4	9.0	30	63	22	32	14	3.79	SB2040	1
	4125HR-M	●		10	125	87	40	16.4	9.0	30	63	22	32	14	3.70	SB2040	1
	4160R			8	160	107	40	16.4	9.0	32	63	-	100	14	4.75	MBA	2
	4160R-M			12	160	107	40	16.4	9.0	32	63	-	100	14	4.71	MBA	2

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
3000 Type	FTKA0307	TW09S
4000 Type	FTKA0412B	TW15S

● Available Arbors

Designation		Arbors
RM4PCM	3040HR 3040HR-M	BT30 / BT40 / BT50 FMC / SMA16
	3050HR 3050HR-M 3063HR 3063HR-M	BT30 / BT40 / BT50 FMC22
	3080HR 3080HR-M	BT40 / BT50 FMB / FMC27
	3100HR 3100HR-M	BT40 / BT50 FMC32
RM4PCM	4050HR 4050HR-M 4063HR 4063HR-M	BT30 / BT40 / BT50 FMC22
	4080HR 4080HR-M	BT40 / BT50 FMB / FMC27
	4100HR 4100HR-M	BT40 / BT50 FMC32
	4125HR 4125HR-M 4160R 4160R-M	BT40 / BT50 FMB / FMC40

● Available Inserts

LNEX-MF	LNEX-MM	LNMX-MF	LNMX-MM

Designation		Coated NCM325	Coated PC3525	Coated PC3545	Coated PC6510	Type	Page
LNEX	100605PNR-MF		●		●	3000 Type	E14
LNEX	100605PNR-MM		●		●		
LNMX	100605PNR-MF		●		●		
LNMX	100605PNR-MM		●		●		
LNEX	151008PNR-MF		●		●	4000 Type	E14
LNEX	151008PNR-MM		●		●		
LNMX	151008PNR-MF	○	●		●		
LNMX	151008PNR-MM	○	●	●	●		

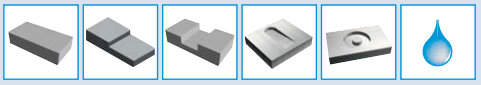
● : Stock item ○ : Under preparing for stock

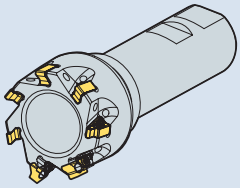
• Applicable inserts, see pages **E14**
• Detail cutter spec. see pages **E172~E174**

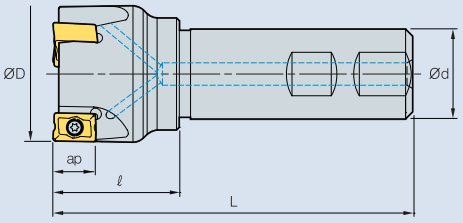
RM4PS3000

New

AA 0°







(mm)

Designation		Stock	⚙	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

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
FTKA0307	TW09S

• Applicable inserts, see pages **E14**

● Available Inserts

LNEX-MF	LNEX-MM	LNMX-MF	LNMX-MM

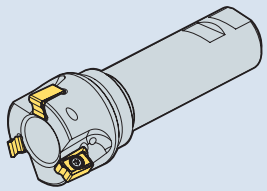
Designation		Coated		Page
		PC3525	PC6510	
LNEX	100605PNR-MF	●	●	E14
LNEX	100605PNR-MM	●	●	
LNMX	100605PNR-MF	●	●	E14
LNMX	100605PNR-MM	●	●	

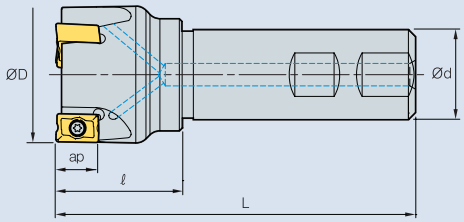
● : Stock item ○ : Under preparing for stock

RM4PS4000

New

AA 0°





(mm)

Designation		Stock		øD	ød	ℓ	L	ap	kg
RM4PS	4032HR-S32	●	2	32	32	40	125	14	0.68
	4040HR-S32	●	3	40	32	42	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

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
FTKA0412B	TW15S

• Applicable inserts, see pages **E14**

● Available Inserts

LNM(E)X-MF LNM(E)X-MM

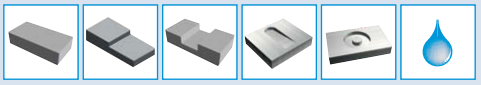
Designation		Coated				Page
		NCM325	PC3525	PC3545	PC6510	
LNEX	151008PNR-MF		●		●	E14
LNEX	151008PNR-MM		●		●	
LNMX	151008PNR-MF	○	●		●	E14
LNMX	151008PNR-MM	○	●	●	●	

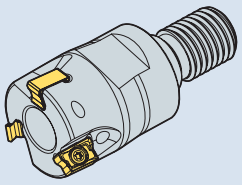
● : Stock item ○ : Under preparing for stock

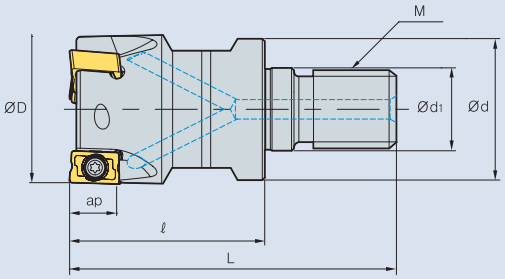
RM4PM

New

AA 0°







(mm)

Designation		Stock	⚙	øD	ød	ød1	L	ℓ	M	ap	kg
RM4PM	3014HR-M06	○	1	14	12	6.5	40	25	M06	10	0.02
	3016HR-M08	○	1	16	14.5	8.5	42	25	M08	10	0.02
	3018HR-M08	○	2	18	14.5	8.5	42	25	M08	10	0.03
	3020HR-M10	○	2	20	18	10.5	51	30	M10	10	0.06
	3025HR-M12	○	2	25	23	12.5	59	35	M12	10	0.11
	3032HR-M16	○	3	32	28	17	67	40	M16	10	0.21
	3040HR-M16	○	4	40	28	17	67	40	M16	10	0.26
	3050HR-M16	○	5	50	30	17	72	45	M16	10	0.41

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
FTKA0307	TW09S

● Available Adoptor

Designation		Applicable Adoptor
RM4PM	3014HR-M06	MAT - M06
	3016HR-M08	MAT - M08
	3018HR-M08	MAT - M08
	3020HR-M10	MAT - M10
	3025HR-M12	MAT - M12
	3032HR-M16	MAT - M16
	3040HR-M16	MAT - M16
	3050HR-M16	MAT - M16

• Applicable inserts, see pages **E14**
• Applicable adoptors, see pages **E133~E134**

● Available Inserts

LNM(E)X-MF	LNM(E)X-MM

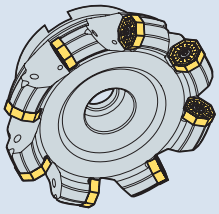
Designation		Coated		Page
		PC3525	PC6510	
LNEX	100605PNR-MF	●	●	E14
LNEX	100605PNR-MM	●	●	
LNMX	100605PNR-MF	●	●	E14
LNMX	100605PNR-MM	●	●	

● : Stock item ○ : Under preparing for stock

RM16ACM6000/8000

New

AA 45°



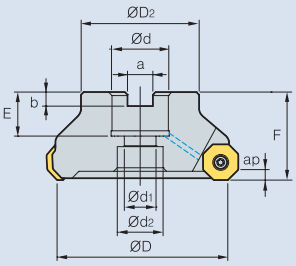


Fig. 1

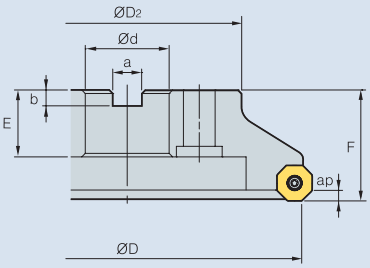


Fig. 2

(mm)

Designation		Stock R	Stock L	⊙	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
	6080HR-M	○		6	80	57	27	14	20	12.4	7	23	50	4.0	1.2	1
	6100HR-M	○		7	100	67	32	18	26	14.4	8	25.5	50	4.0	1.9	1
	6125HR-M	○		8	125	87	40	22	32	16.4	9	30	63	4.0	3.5	1
	6160R-M	○		10	160	107	40	-	107	16.4	9	32	63	4.0	4.1	2
	6200R-M	○		12	200	130	60	-	135	25.7	14	32	63	4.0	6.1	2
RM16ACM	8063HR-M	●		5	63	49	22	11	18	10.4	6.3	20	40	5.5	0.7	1
	8080HR-M	●		6	80	57	27	14	20	12.4	7	23	50	5.5	1.2	1
	8100HR-M	●		7	100	67	32	18	26	14.4	8	25.5	50	5.5	1.8	1
	8125HR-M	●		8	125	87	40	22	32	16.4	9	30	63	5.5	3.5	1
	8160R-M	●		10	160	107	40	-	107	16.4	9	32	63	5.5	4.5	2
	8200R-M	●		12	200	130	60	-	135	25.7	14	32	63	5.5	5.8	2

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
6000 Type	FTGA0513	TW20-100
8000 Type	FTGA0513	TW20-100

● Available Arbors

	Designation	Arbors
RM16ACM	6063HR-M	BT30 / BT40 / BT50 FMC22
	6080HR-M	BT40 / BT50 FMB / FMC27
	6100HR-M	BT40 / BT50 FMC32
	6125HR-M	BT40 / BT50 FMB / FMC40
	6160R-M	
	6200R-M	BT50 FMB60
RM16ACM	8063HR-M	BT30 / BT40 / BT50 FMC22
	8080HR-M	BT40 / BT50 FMB / FMC27
	8100HR-M	BT40 / BT50 FMC32
	8125HR-M	BT40 / BT50 FMB / FMC40
	8160R-M	
	8200R-M	BT50 FMB60

• Applicable inserts, see pages **E15**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

ONHX-MF ONHX-MM ONHX-W

ONMX-MF ONMX-MM

Designation	Coated PC3525	Coated PC9530	Coated PC6510	Type	Page
ONMX 060608-MM			○	6000 Type	E15
ONHX 060608-MM			○		
ONMX 060608-MF			○		
ONHX 060608-MF			○		
ONHX 060608-W			○		
ONMX 080608-MM	●	●	●	8000 Type	E15
ONHX 080608-MM	●	●	●		
ONMX 080608-MF	●	●	●		
ONHX 080608-MF	●	●	●		
ONHX 080608-W	●	●	●		

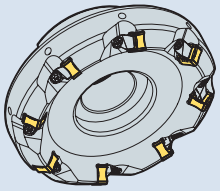
● : Stock item ○ : Under preparing for stock

RMT8AM4000/5000

New

AA 45°

• AR : 15°
• RR : - 4°



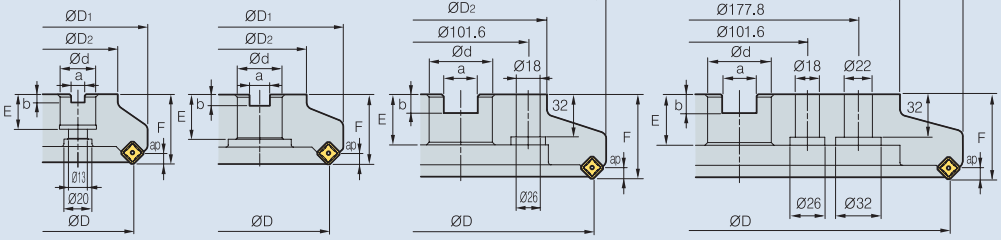


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8AM	4080R		5	80	100	57	27	12.4	7	22	50	4	1.6	1
	4080R-M		6	80	100	57	27	12.4	7	22	50	4	1.6	1
	4100R	●	6	100	120	70	32	14.4	8	28	50	4	2.3	2
	4100R-M		8	100	120	70	32	14.4	8	28	50	4	2.3	2
	4125R		8	125	144	87	40	16.4	9	30	63	4	4.3	2
	4125R-M		10	125	144	87	40	16.4	9	30	63	4	4.3	2
	4160R	●	10	160	179	110	40	16.4	9	30	63	4	6.5	2
	4160R-M		14	160	179	110	40	16.4	9	30	63	4	6.5	2
	4200R		12	200	219	130	60	25.7	14	38	63	4	8.8	3
	4200R-M		18	200	219	130	60	25.7	14	38	63	4	8.8	3
	4250R		16	250	269	180	60	25.7	14	38	63	4	14.1	3
	4250R-M		22	250	269	180	60	25.7	14	38	63	4	14.1	3
	4315R		20	315	334	240	60	25.7	14	38	63	4	22.3	4
	4315R-M		28	315	334	240	60	25.7	14	38	63	4	22.3	4
RMT8AM	5080R	●	5	80	104	57	27	12.4	7	22	50	6	1.8	1
	5080R-M		6	80	104	57	27	12.4	7	22	50	6	1.8	1
	5100R	●	6	100	124	70	32	14.4	8	28	50	6	2.6	2
	5100R-M		8	100	124	70	32	14.4	8	28	50	6	2.6	2
	5125R	●	8	125	149	87	40	16.4	9	30	63	6	4.3	2
	5125R-M		10	125	149	87	40	16.4	9	30	63	6	4.3	2
	5160R	●	10	160	184	110	40	16.4	9	30	63	6	6.5	2
	5160R-M		14	160	184	110	40	16.4	9	30	63	6	6.5	2
	5200R		12	200	224	130	60	25.7	14	38	63	6	9.0	3
	5200R-M		18	200	224	130	60	25.7	14	38	63	6	9.0	3
	5250R		16	250	274	180	60	25.7	14	38	63	6	14.4	3
	5250R-M		22	250	274	180	60	25.7	14	38	63	6	14.4	3
	5315R		20	315	339	240	60	25.7	14	38	63	6	22.2	4
	5315R-M		28	315	339	240	60	25.7	14	38	63	6	22.2	4

● : Stock item ○ : Under preparing for stock

● Parts

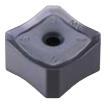
	Screw	Screw	Spring	Latch	Wrench
4000 Type	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100
5000 Type	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

● Available Arbors

Designation		Arbors
RMT8AM	☐080R	BT40 / BT50 FMA / FMC27
	☐100R	BT40 / BT50 FMC32
	☐125R	BT40 / BT50 FMB / FMC40
	☐160R	
	☐200R	BT50 FMB60
	☐250R	
	☐315R	-

• Applicable inserts, see pages **E20**, **E21**
• Detail cutter spec. see pages **E172**~**E174**

● Available Inserts

SNC(M)F-MF	SNC(M)F-MM
	

Designation		Coated		Type	Page
		PC3525	PC6510		
SNCF	1206ANN-MF	●	●	4000 Type	E20
SNCF	1206ANN-MM	●	●		E21
SNMF	1206ANN-MF	●			E20
SNMF	1206ANN-MM	●			E21
SNCF	1507ANN-MF	●		5000 Type	E20
SNCF	1507ANN-MM	●			E21
SNMF	1507ANN-MF				E20
SNMF	1507ANN-MM				E21

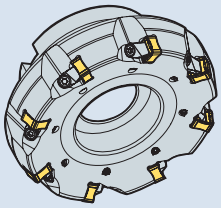
● : Stock item ○ : Under preparing for stock

RMT8EM4000/5000

New

AA 15°

• AR : 7°
• RR : 0°



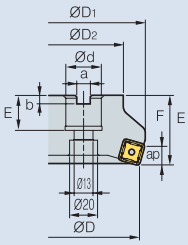


Fig. 1

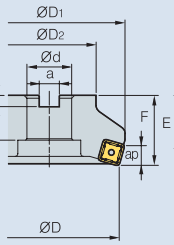


Fig. 2

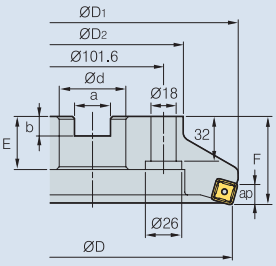


Fig. 3

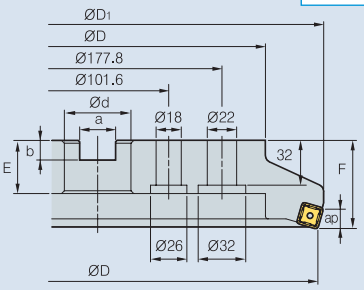


Fig. 4

(mm)

Designation		Stock	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8EM	4080R	●	5	80	87	57	27	12.4	7	22	50	5	1.5	1
	4080R-M		6	80	87	57	27	12.4	7	22	50	5	1.5	1
	4100R	●	6	100	107	67	32	14.4	8	28	50	5	2	2
	4100R-M		8	100	107	67	32	14.4	8	28	50	5	2	2
	4125R	●	8	125	132	87	40	16.4	9	30	63	5	3.8	2
	4125R-M		10	125	132	87	40	16.4	9	30	63	5	3.8	2
	4160R	●	10	160	167	107	40	16.4	9	30	63	5	5.8	2
	4160R-M		14	160	167	107	40	16.4	9	30	63	5	5.8	2
	4200R		12	200	207	130	60	25.7	14	38	63	5	7.9	3
	4200R-M		18	200	207	130	60	25.7	14	38	63	5	7.9	3
	4250R		16	250	257	180	60	25.7	14	38	63	5	13.0	3
	4250R-M		22	250	257	180	60	25.7	14	38	63	5	13.0	3
	4315R		20	315	322	240	60	25.7	14	38	63	5	20.5	4
	4315R-M		28	315	322	240	60	25.7	14	38	63	5	20.5	4
RMT8EM	5080R	●	5	80	88	57	27	12.4	7	22	50	8	1.4	1
	5080R-M		6	80	88	57	27	12.4	7	22	50	8	1.4	1
	5100R	●	6	100	108	67	32	14.4	8	28	50	8	1.9	2
	5100R-M		8	100	108	67	32	14.4	8	28	50	8	1.9	2
	5125R	●	8	125	133	87	40	16.4	9	30	63	8	3.7	2
	5125R-M		10	125	133	87	40	16.4	9	30	63	8	3.7	2
	5160R	●	10	160	168	107	40	16.4	9	30	63	8	5.7	2
	5160R-M		14	160	168	107	40	16.4	9	30	63	8	5.7	2
	5200R		12	200	208	130	60	25.7	14	38	63	8	7.5	3
	5200R-M		18	200	208	130	60	25.7	14	38	63	8	7.5	3
	5250R		16	250	258	180	60	25.7	14	38	63	8	12.4	3
	5250R-M		22	250	258	180	60	25.7	14	38	63	8	12.4	3
	5315R		20	315	323	240	60	25.7	14	38	63	8	19.9	4
	5315R-M		28	315	323	240	60	25.7	14	38	63	8	19.9	4

● : Stock item ○ : Under preparing for stock

● Parts

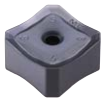
	Screw	Screw	Spring	Latch	Wrench
4000 Type	ETKA0523	KHB0417	SPR0315	LTC05SR-RM4	TW20-100
5000 Type	ETKA0625	KHB0417	SPR0415	LTC06SR-RM5	TW20-100

● Available Arbors and Adaptors

Designation		Arbors
RMT8EM	☐080R	BT40 / BT50 FMA / FMC27
	☐100R	BT40 / BT50 FMC32
	☐125R	BT40 / BT50 FMB / FMC40
	☐160R	
	☐200R	BT50 FMB60
	☐250R	
	☐315R	-

• Applicable inserts, see pages E20, E21
• Detail cutter spec. see pages E172~E174

● Available Inserts

SNC(M)F-MF	SNC(M)F-MM
	

Designation		Coated			Type	Page
		PC3525	PC3545	PC6510		
SNCF	1206ENN-MF	●		●	4000 Type	E20
	1206ENN-MM	●	●			E21
SNMF	1206ENN-MF					E20
	1206ENN-MM	●				E21
SNCF	1507ENN-MF	●		●	5000 Type	E20
	1507ENN-MM	●	●			E21
SNMF	1507ENN-MF					E20
	1507ENN-MM					E21

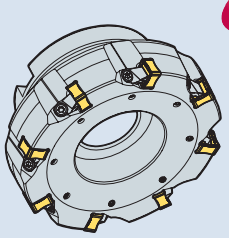
● : Stock item ○ : Under preparing for stock

RMT8QM

New

AA 2°

• AR : 7°
• RR : 0°



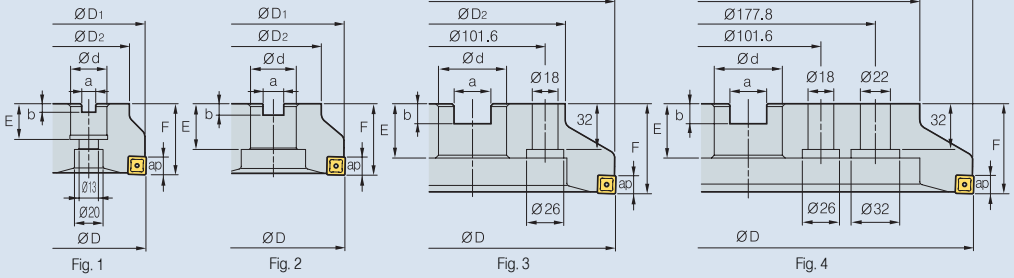


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(mm)

Designation		Stock	⚙	ØD	ØD1	ØD2	Ød	a	b	E	F	ap	kg	Fig.
RMT8QM	4080R	●	5	80	79	57	27	12.4	7	22	50	5	1.4	1
	4080R-M	●	6	80	79	57	27	12.4	7	22	50	5	1.4	1
	4100R	●	6	100	99	67	32	14.4	8	28	50	5	1.8	2
	4100R-M	●	8	100	99	67	32	14.4	8	28	50	5	1.8	2
	4125R	●	8	125	124	87	40	16.4	9	30	63	5	3.6	2
	4125R-M	●	10	125	124	87	40	16.4	9	30	63	5	3.6	2
	4160R	●	10	160	159	107	40	16.4	9	30	63	5	5.7	2
	4160R-M		14	160	159	107	40	16.4	9	30	63	5	5.7	2
	4200R		12	200	199	130	60	25.7	14	38	63	5	7.5	3
	4200R-M		18	200	199	130	60	25.7	14	38	63	5	7.5	3
	4250R		16	250	249	180	60	25.7	14	38	63	5	12.5	3
	4250R-M		22	250	249	180	60	25.7	14	38	63	5	12.5	3
	4315R		20	315	314	240	60	25.7	14	38	63	5	19.9	4
	4315R-M		28	315	314	240	60	25.7	14	38	63	5	19.9	4

● : Stock item ○ : Under preparing for stock

● Parts

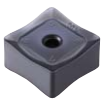
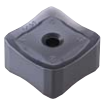
Screw	Screw	Spring	Latch	Wrench
ETKA0523	KHB0417	SPR0315	LTCO5SR-RM4	TW20-100

● Available Arbors and Adaptors

Designation		Arbors
RMT8QM	4080R	BT40 / BT50 FMA / FMC27
	4100R	BT40 / BT50 FMC32
	4125R	BT40 / BT50 FMB / FMC40
	4160R	
	4200R	BT50 FMB60
	4250R	
	4315R	-

• Applicable inserts, see pages **E21**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

SNMF-MF	SNMF-MM
	

Designation		Coated PC3525	Page
SNMF	1206QNN-MF	●	E21
	1206QNN-MM		E21

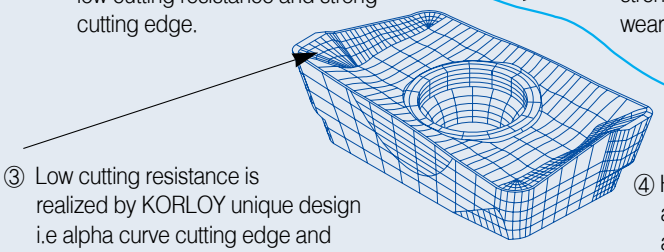
● : Stock item ○ : Under preparing for stock

Alpha-mill Multifunctional Insert

■ Alpha-mill Insert

① Long tool life at high speed, high feed and deeper cutting by low cutting resistance and strong cutting edge.

② Distinguished features of Alpha-Curve make cutting resistance reduce and the strength of cutting edge and wear resistance improve.



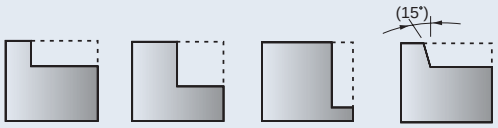
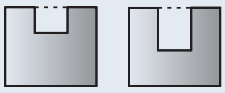
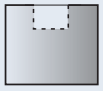
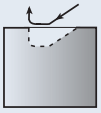
③ Low cutting resistance is realized by KORLOY unique design i.e alpha curve cutting edge and optimal convex and concave design.

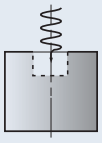
④ High efficient machining is available by the ideal application of the grade to material.

■ Inserts Feature & Application

- Innovative curve cutting edge and chip-breaker design ensure ideal 90 degree cutting and lower cutting resistance.
- Various applications are available with multi-functional cutters.
  (Facing, Slotting, Square shoulder milling and etc.)
- Improved insert life time with optimized per each application.
- Excellent perfomance ensured at large depth of cutting operations due to strong cutting edge and low cutting resistance.

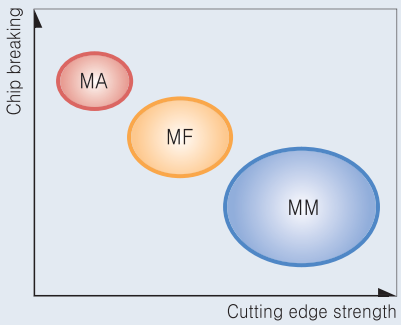
■ Application example

Shouldering	Slotting
	
Drilling	**Ramping**
	

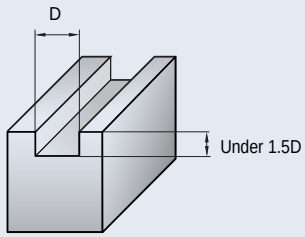
Helical cutting


■ Recommended grades and chip breakers by workpiece

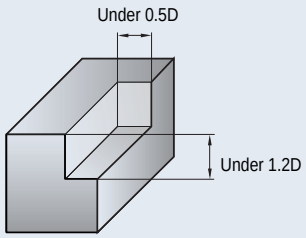
Chip breaker	Cutter edge		Recommended C/B and grade as per workpiece(●: 1st)									
			Low carbon steel Mild steel		High carbon steel Alloy steel		Stainless steel		Cast iron		Aluminum alloy	
			C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade
MF		Sharp cutting edge	●	○NCM325 ●NCM335 ○PC3535		●NCM325 ○NCM335 ○PC3535	●	○NCM325 ●NCM335 ○PC3535	●	○PC215K	-	-
MM		Strong cutting edge	-	○NCM325 ○NCM335 ●PC3535	●	○NCM325 ○NCM335 ●PC3535	●	○NCM325 ○NCM335 ●PC3535	●	○NCM325 ○NCM335 ●PC3535	-	-



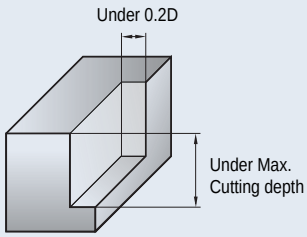
■ Recommended depth of cut



① Slotting



② Shouldering



③ Shouldering

■ Recommended cutting condition(for multi edge type)

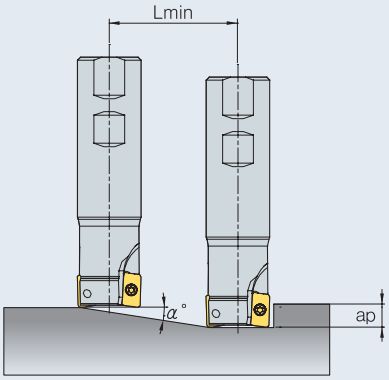
Workpiece	Grades	Fig.	Tool diameter							
			ø20, 25		ø32, 40		ø50, 63		ø80, 100	
			vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
Mild steel, Low carbon steel	NCM325 PC3535	①	80~100	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08	100~120	0.05~0.08
		②	100~120	0.08~0.1	120~140	0.08~0.1	120~140	0.08~0.1	120~140	0.08~0.1
		③	100~120	0.1~0.15	140~140	0.1~0.15	120~140	0.1~0.15	130~150	0.1~0.15
High carbon steel, Alloy steel	NCM325 PC3535	①	60~80	0.05	80~100	0.05	80~100	0.05	80~100	0.05
		②	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	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	NCM325 PC3535	①	50~70	0.05	70~90	0.05	70~90	0.05	70~90	0.05
		②	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	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	NCM325 PC9530	①	50~70	0.054	70~90	0.05	70~90	0.05	70~90	0.05
		②	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	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	PC215K	①	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	80~100	0.12	90~120	0.12	100~140	0.12	100~140	0.12
		③	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	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	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	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	NCM325 PC3535	①	50~70	0.03	60~90	0.03	60~90	0.03	60~90	0.03
		②	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	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)

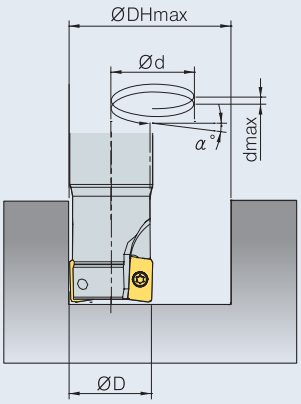
Workpiece	Grades	Fig.	Tool diameter							
			ø20, 25		ø32, 40		ø50, 63		ø80, 100	
			vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
Mild steel, Low carbon steel	NCM325 PC3535	①	60~80	0.05~0.08	80~120	0.05~0.08	120~200	0.05~0.08	150~200	0.05~0.08
		②	80~120	0.08~0.1	120~180	0.08~0.1	180~250	0.08~0.1	200~250	0.08~0.1
		③	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	NCM325 PC3535	①	50~80	0.05	80~110	0.05	100~150	0.05	100~150	0.05
		②	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	80~100	0.1~0.15	120~150	0.1~0.15	180~200	0.1~0.15	80~200	0.1~0.15
Alloy tool steel	NCM325 PC3535	①	50~70	0.05	80~100	0.05	100~130	0.05	100~130	0.05
		②	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	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	NCM325 PC9530	①	50~70	0.05	80~100	0.05	100~130	0.05	100~130	0.05
		②	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	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	PC215K	①	80~100	0.08~0.12	80~100	0.15	120~150	0.15	120~150	0.15
		②	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	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	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	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	250~900	0.25~0.3	350~950	0.25~0.3	400~1,000	0.3~0.1	400~1,000	0.3~0.4
Hardened steel	NCM325 PC3535	①	50~70	0.03	60~90	0.03	60~90	0.03	60~90	0.03
		②	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	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

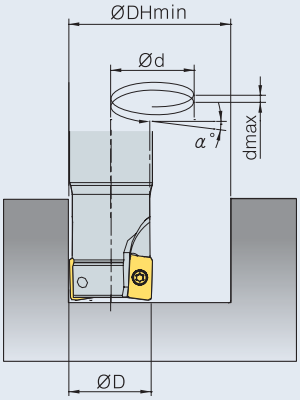
1. Ramping



2. Helical cutting for blind hole



3. Helical cutting for through hole

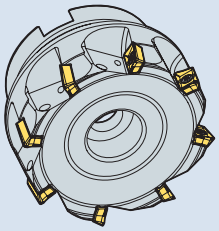


Designation	Tool diameter ØD(min)	Ramping		Helical cutting for blind hole				Helical cutting for through hole	
		Maximum angle α(°)	Lmin(mm)	Max. desirable hole diameter Ø DHmax(mm)	Max. pitch dmax(mm)	Min. desirable hole diameter Ø DHmin(mm)	Max. pitch dmax(mm)	Min. desirable hole diameter Ø DHmin(mm)	Max. pitch dmax(mm)
AMS2010HS	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	11	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
AMC2050HS	50	0.36	1576	98	0.6	96	0.6	91	0.6
AMC2063HS	63	0.27	2104	124	0.6	122	0.6	117	0.6
AMC2080HS	80	0.21	2784	158	0.6	156	0.6	151	0.5
AMC2100HS	100	0.16	3584	198	0.6	196	0.5	191	0.5
AMS3025HS	25	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
AMC3040HS	40	1.99	288	78	2.7	76	2.6	66	2.3
AMC3050HS	50	1.67	343	98	2.9	96	2.8	86	2.5
AMC3063HS	63	1.22	470	124	2.6	122	2.6	112	2.4
AMC3080HS	80	0.90	636	158	2.5	156	2.5	146	2.3
AMC3100HS	100	0.69	830	198	2.4	196	2.4	186	2.2
AMS2025MH	25	1.50	764	48	1.3	46	1.2	-	-
AMS2032MH	32	1.50	1146	62	1.6	60	1.6	-	-
AMS3040MH	40	1.50	1528	78	2.0	76	2.0	-	-

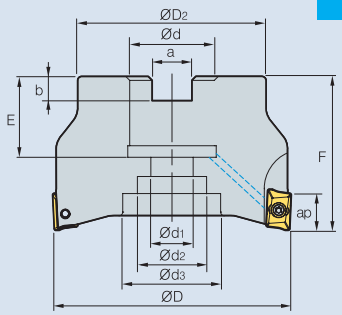
* Lmin is ap = 10mm
* Lmin : Min. inclination cutting length
  α° : Max. ramping angle
  ap : Depth of cut

$$L\,min = \frac{ap}{\tan \alpha^{\circ}} (mm)$$

AMCM1000S/1500S/2000S

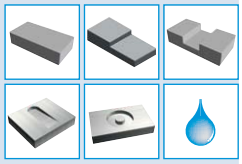


New



AA 0°

• AR°
1000 Type : 13°
1500 Type : 12.5°
2000 Type : 9°



(mm)

Designation		Stock		øD	øD2	ød	F	a	b	ød1	ød2	ød3	E	AR°	RR°	ap	kg
AMCM	1032HS		8	32	30	16	40	8.4	5.6	9	14	-	19	13°	6°	5.6	0.15
New	1040HS-16		10	40	34	16	40	8.4	5.6	9	14	-	19	13°	5°	5.6	0.24
	1040HS-22		10	40	34	22	40	10.4	6.3	11	18	-	21	13°	5°	5.6	0.24
	1050HS		12	50	42	22	40	10.4	6.3	11	18	-	21	13°	6°	5.6	0.36
	1063HS		14	63	49	22	40	10.4	6.3	11	18	-	21	13°	6°	5.6	0.61
AMCM	15040HS		5	40	34	16	40	8.4	5.6	9	14	-	19	12.5°	14°	9.2	0.22
New	15050HS		6	50	42	22	50	10.4	6.3	11	18	-	21	12.5°	14°	9.2	0.34
	15063HS		8	63	49	22	50	10.4	6.3	11	18	-	21	12.5°	13°	9.2	0.57
	15080HS	○	10	80	57	27	50	12.4	7.0	14	20	35	23	12.5°	13°	9.2	1.1
	15100HS	○	12	100	67	32	63	14.4	8.0	18	26	42	26	12.5°	12°	9.2	2.1
AMCM	2040HS	●	5	40	-	16	40	8.4	5.6	9	14	-	18	9°	-10°	11	0.2
	2050HS	●	6	50	-	22	40	10.4	6.3	11	18	-	20	9°	-9°	11	0.32
	2063HS	●	8	63	-	22	40	10.4	6.3	11	18	-	20	9°	-8°	11	0.6
	2080HS	●	8	80	-	27	50	12.4	7.0	14	20	-	22	9°	-7°	11	1.2
	2100HS	●	10	100	-	32	63	14.4	8.0	18	26	-	28	9°	-5°	11	2.5

• AR° : Axial rake angle RR° : Radial rake angle

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench	
1000 Type	FTKA01842	-	TW06S-A
1500 Type	FTKA02565S	TW08S	-
2000 Type	FTKA02565S	TW08S	-

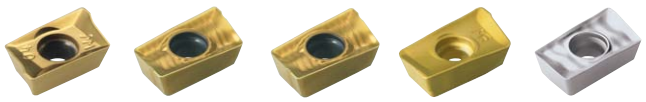
● Available Arbors

Designation		ø d	Arbors
AMCM	1032HS	16	BT□□-FMC16-□□
	1040HS-16	16	BT□□-FMC16-□□
	1040HS-22	22	BT□□-FMC22-□□
	1050HS	22	BT□□-FMC22-□□
	1063HS	22	BT□□-FMC22-□□
AMCM	15040HS	16	BT□□-FMC16-□□
	15050HS	22	BT□□-FMC22-□□
	15063HS	22	BT□□-FMC22-□□
	15080HS	27	BT□□-FMC27-□□
	15100HS	32	BT□□-FMC32-□□
AMCM	2040HS	16	BT□□-FMC16-□□
	2050HS	22	BT□□-FMC22-□□
	2063HS	22	BT□□-FMC22-□□
	2080HS	27	BT□□-FMC27-□□
	2100HS	32	BT□□-FMC32-□□

• Applicable inserts, see pages **E11**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

APMT-MM APXT-MF APXT-MM APXT-MR APXT-MA

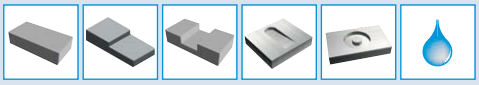


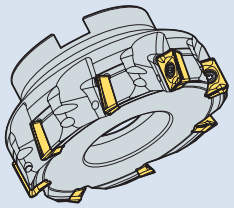
Designation		Coated										Uncoated	Type	Page
		NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01		
APMT	0602PDSR-MM				○									1000 Type	E11
APMT	0903PDSR-MM				○									1500 Type	
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		2000 Type	E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●				
	11T312R-MM	●	●		○	●	●								
	11T316R-MM				○		●								
	11T318R-MM				○										
	11T324R-MM						●			●					
	11T3PDSR-MR	●	●												
	11T308PDR-MR														
	11T3PDR-MA												●		
	11T318R-MA														

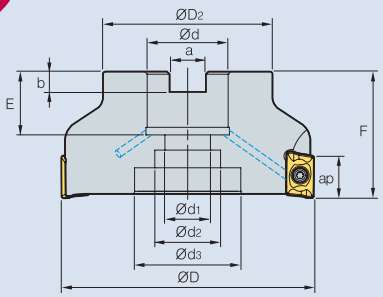
● : Stock item ○ : Under preparing for stock

AMCM3000S/3000S-K/4000S

AA 0°







(mm)

Designation		Stock	⌀	øD	øD2	ød	ød1	ød2	ød3	a	b	E	F	AR°	RR°	ap	kg
AMCM	3040HS	●	4	40	34	16	9	14	-	8.4	5.6	18	40	14°	-12°	16	0.2
	3050HS	●	5	50	42	22	11	18	-	10.4	6.3	20	40	14°	-11°	16	0.3
	3063HS	●	6	63	49	22	11	18	-	10.4	6.3	20	40	14°	-9°	16	0.5
	3080HS	●	7	80	57	27	14	20	-	12.4	7.0	22	50	14°	-8°	16	1.2
	3100HS	●	8	100	67	32	18	26	-	14.4	8.0	28	63	14°	-8°	16	2.5
AMCM New	3040HS-K		4	40	34	16	9	14	-	8.4	5.6	18	40	14°	-12°	16	0.2
	3050HS-K		5	50	42	22	11	18	-	10.4	6.3	20	40	14°	-11°	16	0.3
	3063HS-K		6	63	49	22	11	18	-	10.4	6.3	20	40	14°	-9°	16	0.5
	3080HS-K		7	80	57	27	14	20	-	12.4	7.0	22	50	14°	-8°	16	1.2
	3100HS-K		8	100	67	32	18	26	-	14.4	8.0	28	63	14°	-8°	16	2.5
AMCM New	4050HS		5	50	42	22	11	18	-	10.4	6.3	21	40	13°	7°	17	0.28
	4063HS		6	63	49	22	11	18	-	10.4	6.3	21	40	13°	5°	17	0.5
	4080HS		7	80	57	27	14	20	35	12.4	7.0	28	50	15°	5°	17	1
	4100HS		8	100	67	32	18	26	42	14.4	8.0	26	50	15°	4°	17	1.7
	4125HS		9	125	87	40	22	32	52	16.4	9.0	29	63	15°	4°	17	3.3

• AR° : Axial rake angle RR° : Radial rake angle

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
3000S Type	FTKA0410	TW15S
3000S-K Type	FTKA0410	TW15S
4000S Type	FTKA0410	TW15S

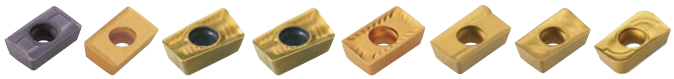
● Available Arbors

Designation		⌀ d	Arbors
AMCM	3040HS	16	BT□□-FMC16-□□
	3050HS	22	BT□□-FMC22-□□
	3063HS	22	BT□□-FMC22-□□
	3080HS	27	BT□□-FMC27-□□
	3100HS	32	BT□□-FMC32-□□
AMCM	3040HS-K	16	BT□□-FMC16-□□
	3050HS-K	22	BT□□-FMC22-□□
	3063HS-K	22	BT□□-FMC22-□□
	3080HS-K	27	BT□□-FMC27-□□
	3100HS-K	32	BT□□-FMC32-□□
AMCM	4050HS	22	BT□□-FMC22-□□
	4063HS	22	BT□□-FMC22-□□
	4080HS	22	BT□□-FMC22-□□
	4100HS	27	BT□□-FMC27-□□
	4125HS	32	BT□□-FMC32-□□

• Applicable inserts, see pages E10, E11
• Detail cutter spec. see pages E172~E174

● Available Inserts

APFT-X22 APFT-X28 APXT-MF APXT-MM APKT APKT-MF APKT-MM APKT-MM1



APKT-MA APKT-MA2 APKT-MA3 APKT-X22 APKT-X23 APKT-X24 APMT-MM

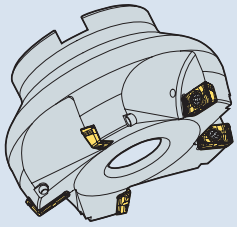
Designation		Coated NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	Uncoated PD2000	H01	Type	Page
APFT	1604PDSR-X22		●												3000S Type	E10
	1604PDTR-X22															
	1604PDR-X28															E10
	1604PDSR-X28															
	1604PDTR-X28															E11
APXT	1604PDSR-MF	●			○	●	●	●	●		●					
	1604PDSR-MM	●	●	●	○	●	●	●	●		●	●				E11
	160416R-MM	●	●		○	●	●			●						
	160432R-MM	●			○					●						
APKT	1604PDSR	●			○	●					●					
	1604PDSR-MF	●			○											
	1604PDSR-MM	●	●		○	●	●	●		●	●					E10
	160432R-MM1	●														
	1604PDFR-MA												●	●		
	1604PDFR-MA2															
	160416FR-MA2														3000S-K Type	
	160432FR-MA2															
	1604PDFR-MA3													●		
	1604PDSR-X22	●														
	1604PDTR-X22															
	1604PDR-X23															E11
	1604PDTR-X23															
	1604PDR-X24															
	1604PDFR-X24															
APMT	1806PDSR-MM				○										4000S Type	E11

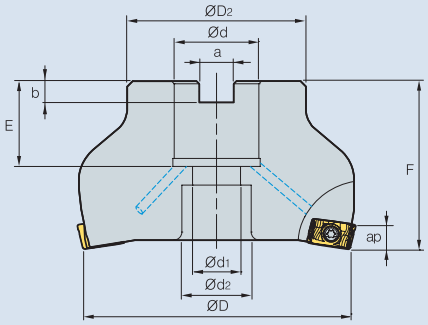
● : Stock item ○ : Under preparing for stock

AMCM2000SE/3000SE

AA 15°

• AR : 4.5°
• RR : 0°





(mm)

Designation		Stock		øD	øD2	ød	ød1	ød2	a	b	E	F	ap	kg
AMCM	2080HSE	●	5	80	57	27	14	20	12.4	7.0	22	50	11	1.2
	2100HSE	●	6	100	67	32	18	26	14.4	8.0	28	63	11	2.33
AMCM	3080HSE	●	4	80	57	27	14	20	12.4	7.0	22	50	11	1.3
	3100HSE	●	5	100	67	32	18	26	14.4	8.0	28	63	11	2.3

● : Stock item ○ : Under preparing for stock

● Parts

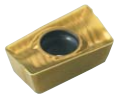
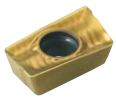
	Screw	Wrench
2000 Type	FTKA02565S	TW 08S
3000 Type	FTKA0410	TW 15S

● Available Arbors

Designation		ø d	Arbors
AMCM	2080SE	27	BT□□-FMC27-□□
	2100SE	32	BT□□-FMC32-□□
AMCM	3080SE	27	BT□□-FMC27-□□
	3100SE	32	BT□□-FMC32-□□

• Applicable inserts, see pages E11
• Detail cutter spec. see pages E172~E174

● Available Inserts

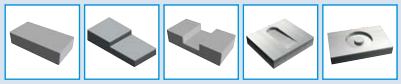
APXT-MF	APXT-MM	APXT-MA	APKT-MA2
			

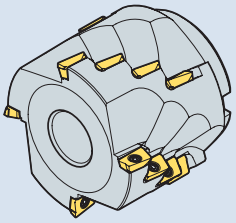
Designation		Coated										Uncoated	Type	Page
		NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01		
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		2000 Type	E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●				
	11T312R-MM	●	●		○	●	●								E11
	11T316R-MM				○		●								
	11T324R-MM						●			●					
	11T3PDR-MA												●		E11
	11T318R-MA														
APXT	1604PDSR-MF	●			○	●	●	●	●		●			3000 Type	E11
	1604PDSR-MM	●	●		○	●	●	●	●		●	●			E11
	160416R-MM	●	●		○	●	●			●					
APKT	1604PDFR-MA2														E11
	160416FR-MA2														
	160432FR-MA2														

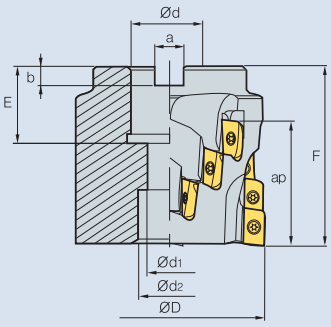
● : Stock item ○ : Under preparing for stock

AMCM2000M

AA 0°







(mm)

Designation		Stock		ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	No.of column	RR°	ap	kg
AMCM	2050M	●	16	50	40	22	11	18	10.4	6.3	29	58	4	-9°	39	0.7
	2063M	●	16	63	50	22	13.5	20	12.4	7.0	25	58	4	-8°	39	0.8
	2080M	●	20	80	60	27	-	45	14.4	8.0	35	63	5	-7°	39	0.96
	2100M	●	24	100	80	32	-	56	16.4	9.0	38	63	6	-5°	39	0.12

• AR° : Axial rake angle RR° : Radial rake angle

● : Stock item ○ : Under preparing for stock

● Parts

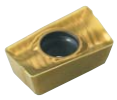
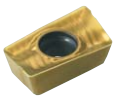
Screw	Wrench
FTKA02565S	TW08S

● Available Arbors

Designation		ø d	Arbors
AMCM	2050M	22	BT□□-FMC22-□□
	2063M	22	BT□□-FMC22-□□
	2080M	27	BT□□-FMC27-□□
	2100M	32	BT□□-FMC32-□□

• Applicable inserts, see pages E11
• Detail cutter spec. see pages E172~E174

● Available Inserts

APXT-MF	APXT-MM	APXT-MR	APXT-MA
			

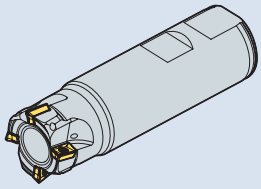
Designation		Coated										Uncoated	Page
		NCM325	PC240	PC230	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01	
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●			
	11T312R-MM	●		●	○	●	●							
	11T316R-MM				○		●							E11
	11T318R-MM				○									
	11T324R-MM						●			●				
	11T3PDSR-MR	●		●										E11
	11T308PDR-MR													
	11T3PDR-MA												●	E11
	11T318R-MA													

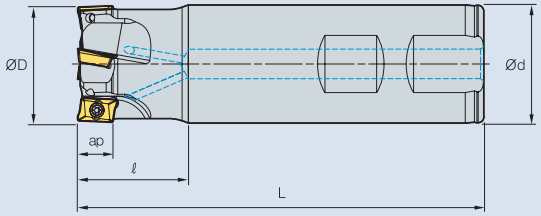
● : Stock item ○ : Under preparing for stock

AMS1000S/1500S

New

AA 0°





(mm)

Designation		Stock		ØD	Ød	ℓ	L	AR°	RR°	ap	kg
AMS	1010HS	○	2	10	10	20	80	7.5°	-17°	5.6	0.04
	1011HS	○	2	11	10	20	80	7.5°	-17°	5.6	0.04
	1012HS-2	○	2	12	12	25	80	7.5°	-12°	5.6	0.06
	1012HS-3	○	3	12	12	25	80	7.5°	-12°	5.6	0.06
	1014HS-2	○	2	14	16	25	90	10°	-10°	5.6	0.11
	1014HS-3	○	3	14	16	25	90	10°	-10°	5.6	0.11
	1015HS	○	3	15	16	25	90	10°	-10°	5.6	0.11
	1016HS-3	○	3	16	16	25	90	13°	-10°	5.6	0.12
	1016HS-4	○	4	16	16	25	90	13°	-10°	5.6	0.12
	1017HS	○	4	17	16	25	90	13°	-10°	5.6	0.12
	1018HS	○	4	18	16	25	90	13°	-10°	5.6	0.12
	1020HS-4	○	4	20	20	30	110	13°	-7°	5.6	0.23
	1020HS-5	○	5	20	20	30	110	13°	-7°	5.6	0.23
	1021HS	○	5	21	20	30	110	13°	-7°	5.6	0.24
	1022HS	○	5	22	20	30	110	13°	-7°	5.6	0.27
	1025HS	○	7	25	25	30	120	13°	-6°	5.6	0.39
	1026HS	○	7	26	25	30	120	13°	-6°	5.6	0.39
	1032HS	○	8	32	32	35	120	13°	-6°	5.6	0.65
	1033HS	○	8	33	32	35	120	13°	-6°	5.6	0.65
AMS	15010HS	○	1	10	10	25	80	7.5°	-28°	9.4	0.04
	15012HS	○	1	12	12	25	80	7.5°	-24°	9.4	0.1
	15013HS	○	1	13	12	25	80	7.5°	-24°	9.4	0.1
	15014HS	○	2	14	16	25	80	9.5°	-20°	9.4	0.1
	15016HS	○	2	16	16	30	90	9.5°	-20°	9.4	0.11
	15017HS	○	2	17	16	30	90	9.5°	-20°	9.4	0.12
	15018HS	○	2	18	16	30	90	9.5°	-20°	9.4	0.14
	15019HS	○	2	19	16	30	90	12.5°	-17°	9.4	0.16
	15020HS	○	2	20	20	30	90	12.5°	-17°	9.4	0.18
	15021HS	○	2	21	20	30	90	12.5°	-17°	9.4	0.2
	15022HS	○	3	22	20	30	110	12.5°	-17°	9.4	0.23
	15024HS	○	3	24	20	30	110	12.5°	-16°	9.4	0.3
	15025HS	○	3	25	25	30	110	12.5°	-16°	9.4	0.35
	15028HS	○	4	28	25	30	110	12.5°	-15°	9.4	0.36
	15030HS	○	4	30	25	30	110	12.5°	-15°	9.4	0.38
	15032HS	○	4	32	32	30	110	12.5°	-15°	9.4	0.6
	15035HS	○	5	35	32	30	110	12.5°	-15°	9.4	0.7
	15040HS-S32	○	5	40	32	35	130	12.5°	-14°	9.4	0.8
	15040HS-S40	○	5	40	40	35	130	12.5°	-14°	9.4	1.13
	15040HS-S42	○	5	40	42	35	130	12.5°	-14°	9.4	1.23

• AR° : Axial rake angle RR° : Radial rake angle

● : Stock item ○ : Under preparing for stock

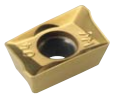
● Parts

	Screw	Wrench	
1000 Type	FTKA01842	-	TW06S-A
1500 Type	FTKA02555 / FTKA02565S	TW07S / TW08S	-

• Applicable inserts, see pages **E11**

● Available Inserts

APMT-MM

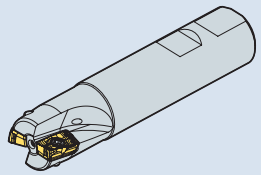


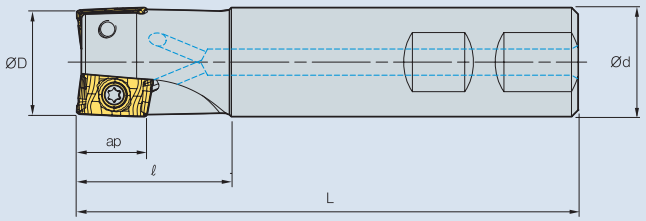
Designation	Coated PC3525	Type	Page
APMT 0602PDSR-MM	○	1000 Type	E11
APMT 0903PDSR-MM	○	1500 Type	

● : Stock item ○ : Under preparing for stock

AMS2000S/3000S

AA 0°





(mm)

Designation		Stock		øD	ød	ℓ	L	AR°	RR°	ap	kg
AMS	2010HS	●	1	10	10	20	85	3°	-25°	11	0.04
	2012HS	●	1	12	16	25	85	5°	-24°	11	0.1
	2014HS	●	1	14	16	25	90	7°	-15°	11	0.12
	2016HS	●	2	16	16	25	90	7°	-15°	11	0.12
	2018HS	●	2	18	16	25	90	7°	-14°	11	0.12
	2020HS	●	2	20	20	30	100	9°	-13°	11	0.21
	2022HS	●	3	22	20	35	115	9°	-13°	11	0.25
	2025HS	●	3	25	25	35	115	9°	-12°	11	0.4
	2032HS	●	4	32	32	40	125	9°	-11°	11	0.7
	2040HS	●	5	40	32	42	130	9°	-10°	11	0.84
New	2040HS-S40		5	40	40	42	130	9°	-10°	11	1.15
New	2040HS-S42		5	40	42	42	130	9°	-10°	11	2.0
	2050HS	●	6	50	32	45	135	9°	-9°	11	1.06
New	2050HS-S40		6	50	40	45	135	9°	-9°	11	1.38
New	2050HS-S42		6	50	42	45	135	9°	-9°	11	1.5
	2063HS	●	8	63	32	45	135	9°	-8°	11	1.31
New	2063HS-S40		8	63	40	45	135	9°	-8°	11	1.62
New	2063HS-S42		8	63	42	45	135	9°	-8°	11	1.7
AMS	3025HS	●	2	25	25	35	115	14°	18°	16	0.4
	3032HS	●	3	32	32	40	125	14°	14°	16	0.69
	3040HS	●	4	40	32	42	130	14°	12°	16	0.8
New	3040HS-S40		4	40	40	42	130	14°	12°	16	1.1
New	3040HS-S42		4	40	42	42	130	14°	12°	16	1.2
	3050HS	●	5	50	32	45	135	14°	11°	16	1.0
New	3050HS-S40		5	50	40	45	135	14°	11°	16	1.3
New	3050HS-S42		5	50	42	45	135	14°	11°	16	1.4
	3063HS	●	6	63	32	45	135	14°	10°	16	1.25
New	3063HS-S40		6	63	40	45	135	14°	10°	16	1.5
New	3063HS-S42		6	63	42	45	135	14°	10°	16	1.54

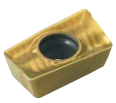
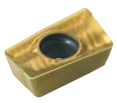
• AR° : Axial rake angle RR° : Radial rake angle

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
2000 Type	FTKA02565S	TW 08S
3000 Type	FTKA0408, FTKA0410	TW 15S

● Available Inserts

APXT-MF	APXT-MM	APXT-MR	APXT-MA
			

• Applicable inserts, see pages E11

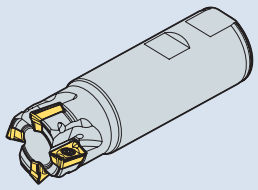
Designation		Coated										Uncoated	Type	Page
		NCM325	PC240	PC230	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01		
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		2000 Type	E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●				E11
	11T312R-MM	●		●	○	●	●								
	11T316R-MM				○		●								
	11T318R-MM				○										
	11T324R-MM						●			●					
	11T3PDSR-MR	●		●											E11
	11T308PDR-MR														
	11T3PDR-MA												●		E11
	11T318R-MA														
APXT	1604PDSR-MF	●			○	●	●	●	●		●			3000 Type	E11
	1604PDSR-MM	●	●	●	○	●	●	●	●		●	●			E11
	160416R-MM	●		●		●	●			●		○			
	160432R-MM	●			○					●					

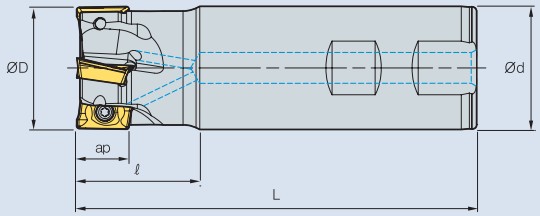
● : Stock item ○ : Under preparing for stock

AMS3000S-K/4000S

New

AA 0°





(mm)

Designation		Stock	⊙	ØD	Ød	ℓ	L	AR°	RR°	ap	kg
AMS	3025HS-K	○	2	25	25	35	115	14°	18°	16	0.4
	3032HS-K	○	3	32	32	40	125	14°	14°	16	0.69
	3040HS-K	○	4	40	32	42	130	14°	12°	16	0.8
	3040HS-K-40	○	4	40	40	42	130	14°	12°	16	1.1
	3040HS-K-42	○	4	40	42	42	130	14°	12°	16	1.2
	3050HS-K	○	5	50	32	45	135	14°	11°	16	1.0
	3050HS-K-40	○	5	50	40	45	135	14°	11°	16	1.3
	3050HS-K-42	○	5	50	42	45	135	14°	11°	16	1.4
	3063HS-K	○	6	63	32	45	135	14°	10°	16	1.25
	3063HS-K-40	○	6	63	40	45	135	14°	10°	16	1.5
	3063HS-K-42	○	6	63	42	45	135	14°	10°	16	1.54
AMS	4032HS	○	3	32	32	40	125	13°	10°	17	0.65
	4040HS-S32	○	4	40	32	40	130	13°	9°	17	0.76
	4040HS-S40	○	4	40	40	40	130	13°	9°	17	1.1
	4040HS-S42	○	4	40	42	40	130	13°	9°	17	1.2
	4050HS-S32	○	5	50	32	40	135	13°	7°	17	0.95
	4050HS-S40	○	5	50	40	40	135	13°	7°	17	1.3
	4050HS-S42	○	5	50	42	40	135	13°	7°	17	1.4
	4063HS-S32	○	9	63	32	40	135	13°	6°	17	1.25
	4063HS-S40	○	9	63	40	40	135	13°	6°	17	1.6
	4063HS-S42	○	9	63	42	40	135	13°	6°	17	1.7

• AR° : Axial rake angle RR° : Radial rake angle

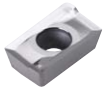
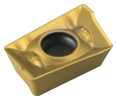
● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
3000 Type	FTKA0408, FTKA0410	TW 15S
4000 Type	FTKA0410	TW 15S

● Available Inserts

APKT	APKT-MF	APKT-MM	APKT-MM1	APKT-MA	APKT-MA2

APKT-MA3	APKT-X22	APKT-X23	APKT-X24	APMT-MM
				

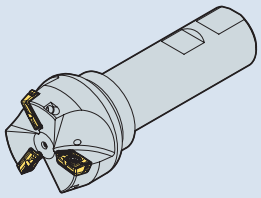
• Applicable inserts, see pages E10, E11

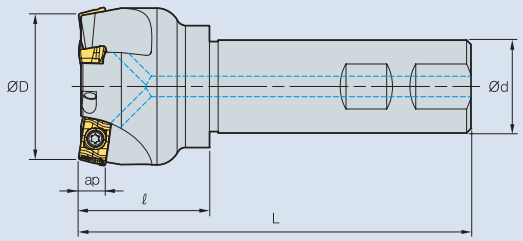
Designation		Coated								Uncoated	Type	Page
		NCM325	PC230	PC3525	PC3535	NCM335	PC3545	PC9530	PC6510	PD2000	H01		
APKT	1604PDSR	●		○	●				●			3000 Type	E10
	1604PDSR-MF	●		○									
	1604PDSR-MM	●	●	○	●	●	●	●	●				
	160432R-MM1	●											
	1604PDFR-MA									●	●		
	1604PDFR-MA2												
	160416FR-MA2												
	160432FR-MA2												
	1604PDFR-MA3										●		
	1604PDSR-X22	●											E11
	1604PDTR-X22												
	1604PDR-X23												
	1604PDTR-X23												
	1604PDR-X24												
	1604PDFR-X24												
APMT	1806PDSR-MM			○								4000 Type	E11

● : Stock item ○ : Under preparing for stock

AMS2000SE/3000SE

AA 15°





(mm)

Designation		Stock		øD	ød	ℓ	L	AR°	RR°	ap	kg
AMS	2025HSE	●	2	25	25	30	115	-1°	-3°	4	0.4
	2032HSE	●	3	32	32	40	125	-1°	0°	4	0.72
	2040HSE	●	3	40	32	40	130	-1°	0°	4	0.86
New	2040HSE-S40		3	40	40	40	130	-1°	0°	4	1.2
New	2040HSE-S42		3	40	42	40	130	-1°	0°	4	1.3
	2050HSE	●	4	50	32	40	135	-1°	0°	4	0.98
New	2050HSE-S40		4	50	40	40	135	-1°	0°	4	1.3
New	2050HSE-S42		4	50	42	40	135	-1°	0°	4	1.4
	2063HSE	●	5	63	32	40	135	-1°	0°	4	1.24
New	2063HSE-S40		5	63	40	40	135	-1°	0°	4	1.57
New	2063HSE-S42		5	63	42	40	135	-1°	0°	4	1.62
AMS	3050HSE	●	3	50	32	45	135	-4.5°	0°	6	1.0
New	3050HSE-S40		3	50	40	45	135	-4.5°	0°	6	1.3
New	3050HSE-S42		3	50	42	45	135	-4.5°	0°	6	1.4
	3063HSE	●	4	63	32	45	135	-4.5°	0°	6	1.3
New	3063HSE-S40		4	63	40	45	135	-4.5°	0°	6	1.6
New	3063HSE-S42		4	63	42	45	135	-4.5°	0°	6	1.7

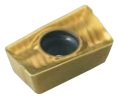
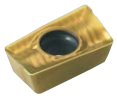
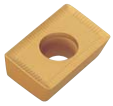
• AR° : Axial rake angle RR° : Radial rake angle

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
2000 Type	FTKA02565S	TW 08S
3000 Type	FTKA0410	TW 15S

● Available Inserts

APXT-MF	APXT-MM	APXT-MR
		
APXT-MA	**APFT-X22**	**APFT-X28**
		

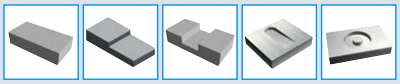
• Applicable inserts, see pages **E10**, **E11**

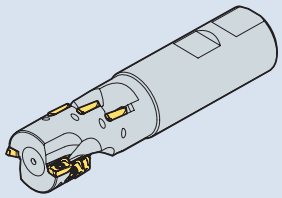
Designation		Coated										Uncoated	Type	Page
		NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01		
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		2000 Type	E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●				E11
	11T312R-MM	●	●		○	●	●								
	11T316R-MM				○		●								
	11T318R-MM				○										
	11T324R-MM						●			●					
	11T3PDSR-MR	●	●												E11
	11T308PDR-MR														
	11T3PDR-MA												●		E11
	11T318R-MA														
APFT	1604PDSR-X22		●											3000 Type	E10
	1604PDTR-X22														
	1604PDR-X28														E10
	1604PDSR-X28														
	1604PDTR-X28														
APXT	1604PDSR-MF	●			○	●	●	●	●		●				E11
	1604PDSR-MM	●	●	●	○	●	●	●	●		●	●			E11
	160416R-MM	●	●		○	●	●			●					
	160432R-MM	●			○			●		●					

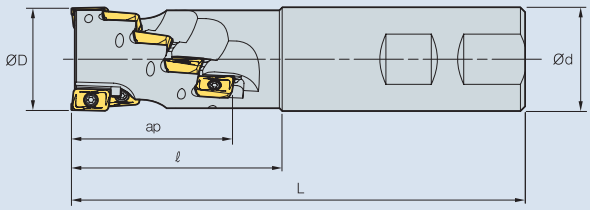
● : Stock item ○ : Under preparing for stock

AMS2000M

AA 0°







(mm)

Designation		Stock	⊙	ØD	Ød	RR°	L	ℓ	No.of column	ap	kg
AMS	2020M	●	3	20	20	-13°	120	45	1	29.4	0.32
	2025M	●	8	25	25	-12°	130	55	2	38.9	0.4
	2032M	●	10	32	32	-11°	140	65	2	48.5	0.65
	2040M	●	14	40	42	-10°	150	75	2	58.0	0.75

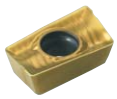
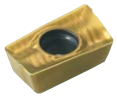
● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
FTKA 02565S	TW 08S

• Applicable inserts, see pages E11

● Available Inserts

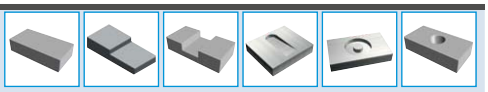
APXT-MF	APXT-MM	APXT-MR	APXT-MA
			

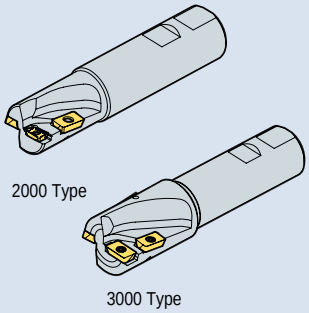
Designation		Coated										Uncoated	Page
		NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01	
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●			E11
	11T312R-MM	●	●		○	●	●							E11
	11T316R-MM				○		●							
	11T318R-MM				○									
	11T324R-MM						●			●				
	11T3PDSR-MR	●	●											E11
	11T308PDR-MR													
	11T3PDR-MA												●	E11
	11T318R-MA													

● : Stock item ○ : Under preparing for stock

AMS2000MH/3000MH

AA 0°





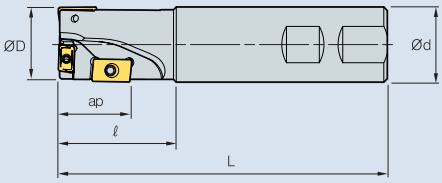


Fig. 1

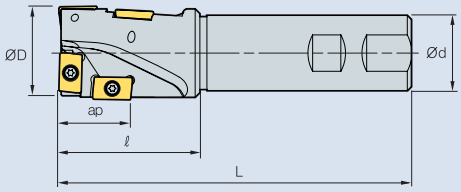


Fig. 2

(mm)

Designation		Stock		øD	ød	L	ℓ	ap	kg	APXT 11T3 ~	APXT 1604 ~	Fig.
AMS	2025MH	●	3	25	25	130	40	20	0.45	3	-	1
	2032MH	●	3	32	32	140	50	30	0.75	1	2	1
AMS	3040MH	●	4	40	32	150	60	40	0.9	-	4	2

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
FTKA 02565S	TW 08S

• Applicable inserts, see pages E10, E11

● Available Inserts

APXT-MF APXT-MM APXT-MR APXT-MA APKT-MA2

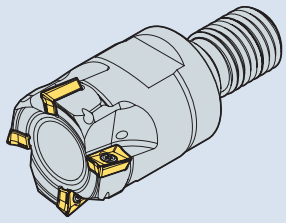
Designation		Coated										Uncoated	Type	Page
		NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01		
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		2000 Type	E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●				E11
	11T312R-MM	●	●		○	●	●								
	11T316R-MM				○		●								
	11T318R-MM				○										
	11T324R-MM						●			●					
	11T3PDSR-MR	●	●												E11
	11T308PDR-MR														
	11T3PDR-MA												●		E11
	11T318R-MA														
APXT	1604PDSR-MF	●			○	●	●	●	●		●			3000 Type	E11
	1604PDSR-MM	●	●	●	○	●	●	●			●	●			
APKT	1604PDFR-MA2														E10

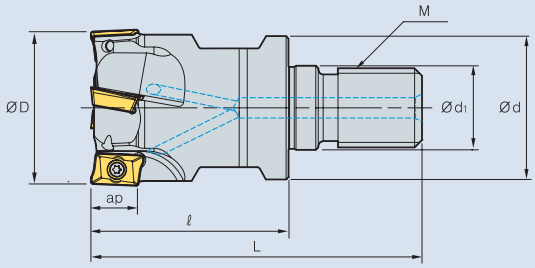
● : Stock item ○ : Under preparing for stock

AMM1000/1500/2000

New

AA 0°





(mm)

Designation		Stock	⚙	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
AMM	15010HR-M06	○	1	10	6.5	6.5	25	40	M06	9.4	0.01
	15012HR-M08	○	1	12	6.5	6.5	25	40	M08	9.4	0.02
	15016HR-M08	○	2	16	8.5	8.5	25	42	M08	9.4	0.03
	15020HR-M10	○	2	20	18	10.5	30	51	M10	9.4	0.06
	15025HR-M12	○	3	25	23	12.5	35	59	M12	9.4	0.12
	15032HR-M16	○	4	32	29	17	40	67	M16	9.4	0.22
AMM	2016HR-M08	○	1	16	8.5	8.5	25	42	M08	11	0.02
	2020HR-M10	○	1	20	18	10.5	30	51	M10	11	0.03
	2025HR-M12	○	2	25	23	12.5	35	59	M12	11	0.04
	2032HR-M16	○	2	32	29	17	40	67	M16	11	0.07
	2040HR-M16	○	3	40	29	17	40	67	M16	11	0.11
	2042HR-M16	○	4	42	29	17	40	67	M16	11	0.23

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench	
1000 Type	FTKA01842	-	TW06S-A
1500 Type	FTKA02555 / FTKA02565S	TW07S / TW08S	-
2000 Type	FTKA02565S	TW08S	-

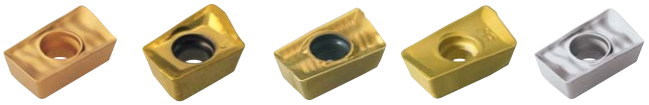
● Available Adaptor

Designation		Available Adaptor
AMM	1012HR-M06	MAT - M06
	1016HR-M08	MAT - M08
	1020HR-M10	MAT - M10
	1025HR-M12	MAT - M12
	1032HR-M16	MAT - M16
	15010HR-M06	MAT - M06
	15012HR-M08	MAT - M08
	15016HR-M08	MAT - M08
	15020HR-M10	MAT - M10
	15025HR-M12	MAT - M12
	15032HR-M16	MAT - M16
	2016HR-M08	MAT - M08
	2020HR-M10	MAT - M10
	2025HR-M12	MAT - M12
	2032HR-M16	MAT - M16
	2040HR-M16	MAT - M16
	2042HR-M16	MAT - M16

• Applicable inserts, see pages E11
• Applicable adaptors, see pages E133~E134

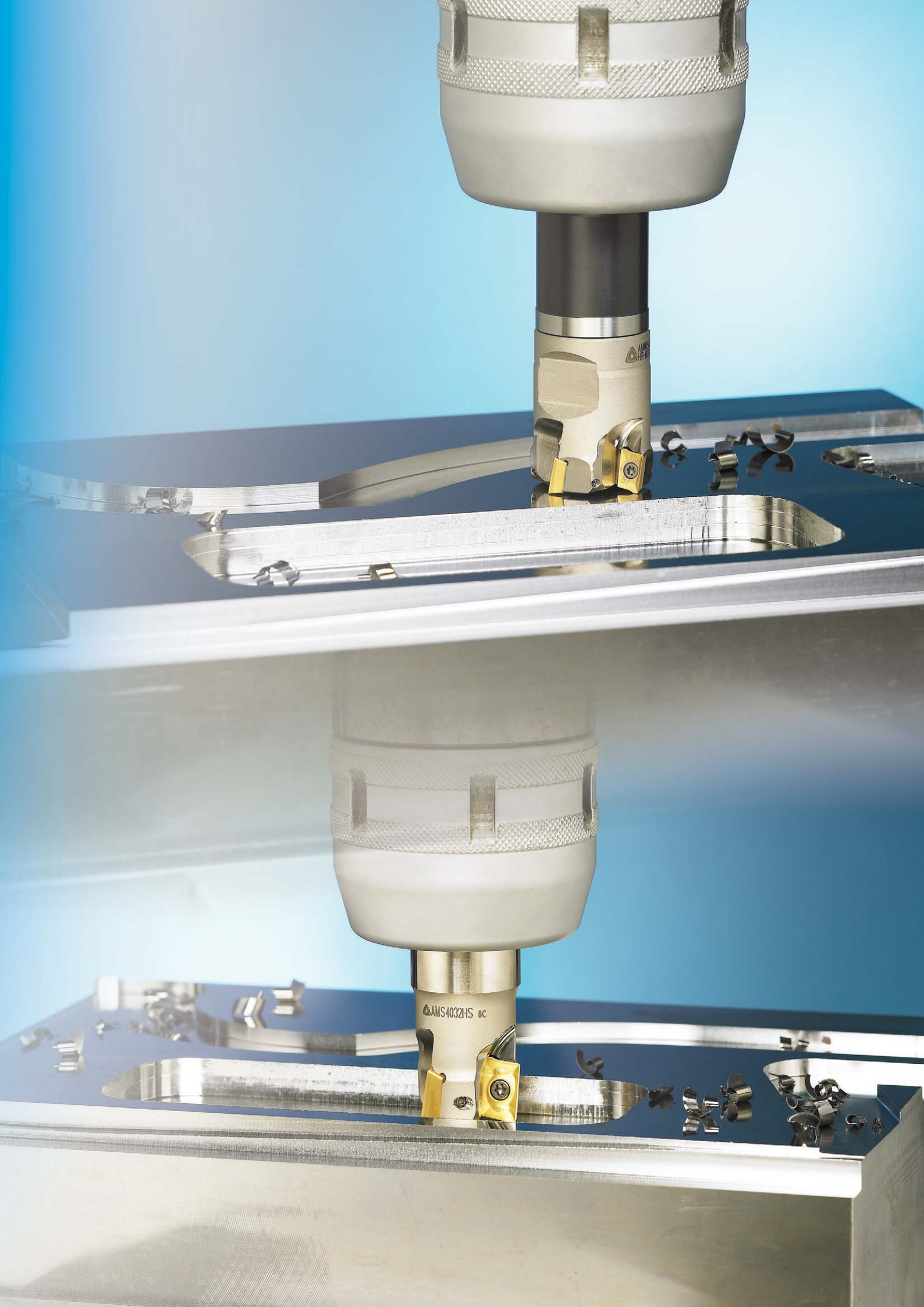
● Available Inserts

APXT-MM APMT-MM APXT-MF APXT-MR APXT-MA



Designation		Coated										Uncoated	Type	Page
		NCM325	PC230	PC240	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PC215K	H01		
APMT	0602PDSR-MM				○									1000 Type	E11
APMT	0903PDSR-MM				○									1500 Type	
APXT	11T3PDSR-MF	●			○	●	●		●	●	●	●		2000 Type	E11
	11T3PDSR-MM	●	●	●	○	●	●	●		●	●				E11
	11T312R-MM	●	●		○	●	●								
	11T316R-MM				○		●								
	11T318R-MM				○										
	11T324R-MM						●			●					
	11T3PDSR-MR	●	●												E11
	11T308PDR-MR														
	11T3PDR-MA												●		E11
	11T318R-MA														

● : Stock item ○ : Under preparing for stock

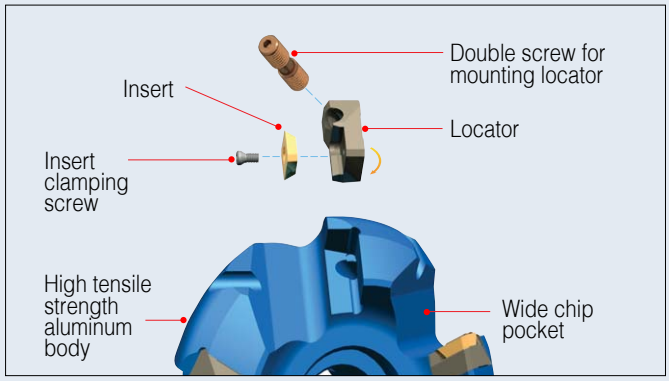

AMS4032HS 8C

Technical Information for Future Mill- Aluminum body

■ Features

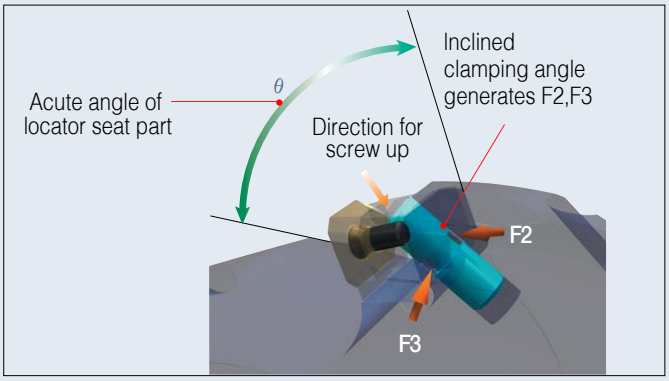
- Light aluminum body(50% of steel body) can be used high speed cutting, tapping center, low power machine.
- Easy handling.
- It can be used aluminum alloy, medium cutting of steel and cast iron.
- Rigid body employs high tensile aluminum.
- Locator for excellent durability.
- Various kinds of chip breaker are available.
- Due to the high rake angle, it provides low cutting load and good surface roughness.

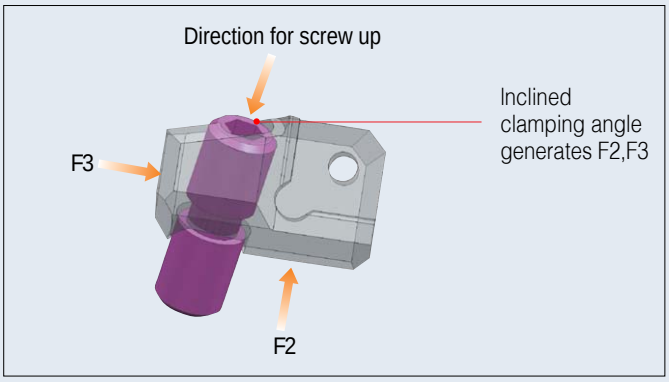
■ Cutter



- 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.

■ Locator

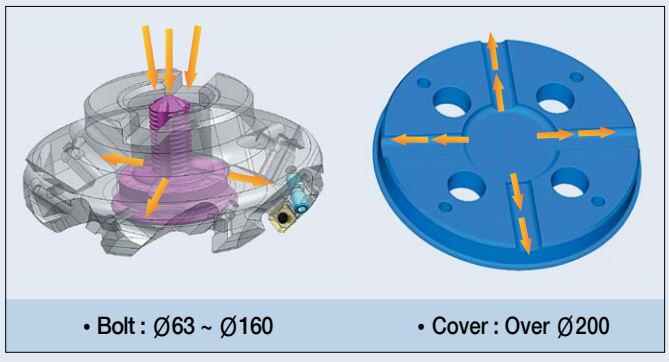




■ Through coolant system

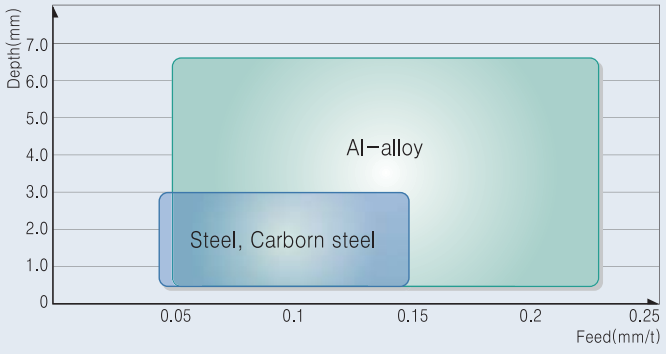
- Exclusively designed coolant bolt and cover provide excellent coolant action and chip evacuation from center of the cutter toward outside.
- Exact coolant direction to cutting area.
- Exclusive coolant bolt and cover are sold separately. Through coolant arbor is necessary .

■ Coolant Bolt & Cover Bolt

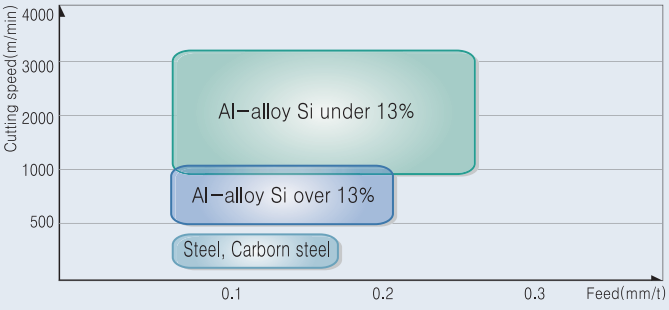


• Bolt : Ø63 ~ Ø160 • Cover : Over Ø200

■ Application range as per workpiece



■ Cutting speed



■ Max. available revolution

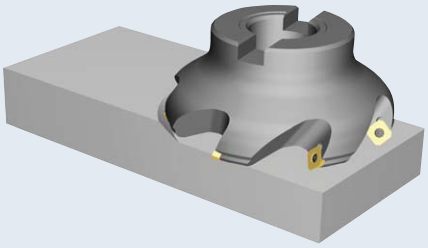
Cutter diameter	Max. revolution
Ø63	20,000
Ø80	16,000
Ø100	13,000
Ø125	10,000
Ø160	8,000
Ø200	6,500
Ø250	5,000
Ø315	4,000

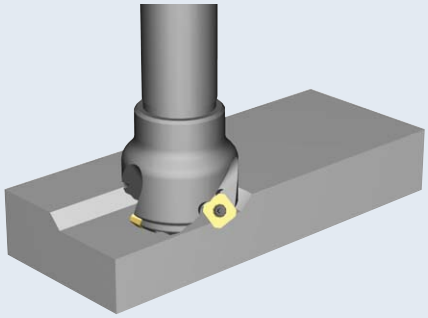
Technical Information for Future Mill(FMA)

■ Features

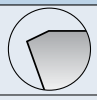
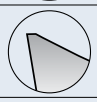
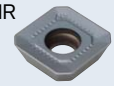
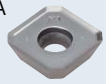
- General milling cutter for high productivity.
- Adjustable pitch of cutter and various chip breaker offer wide application range.
- Light cutter body can make high speed cutting and can be used in low horse power machine.
- Smooth cutting with low cutting load is accomplished with high rake angle.

■ Machining examples





■ Chip breaker

	Chip breaker	Cutting edge	Features of chip breaker
Light cutting	None 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.

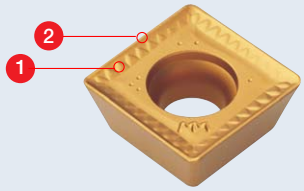
■ Recommended cutting condition

ISO	C/B / Grade	MF		MM		MR		MA	
		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	200 ~ 300	0.05 ~ 0.2	150 ~ 300	0.1 ~ 0.3	150 ~ 250	0.1 ~ 0.3	-	-
	PC3525	200 ~ 300	0.05 ~ 0.2	150 ~ 300	0.1 ~ 0.3	100 ~ 250	0.1 ~ 0.3	-	-
M	PC9530	100 ~ 180	0.05 ~ 0.15	120 ~ 180	0.1 ~ 0.3	-	-	-	-
	NCM335	120 ~ 200	0.05 ~ 0.15	120 ~ 200	0.1 ~ 0.3	-	-	-	-
K	PC215K	150 ~ 250	0.05 ~ 0.2	150 ~ 250	0.1 ~ 0.3	-	-	-	-
Aluminum	H01	-	-	-	-	-	-	350 ~ 1,000	0.1 ~ 0.35

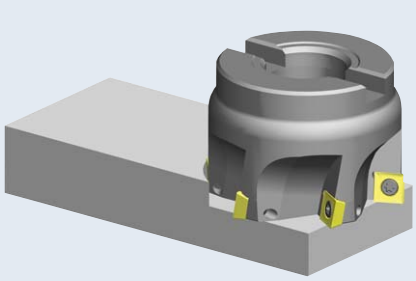
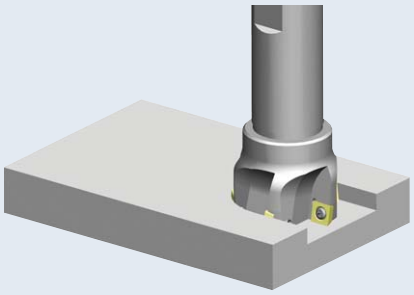
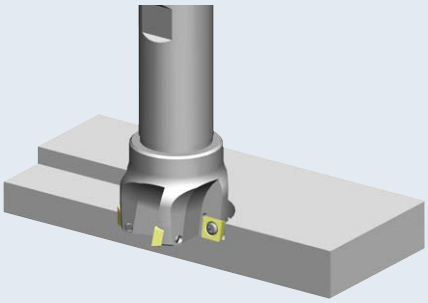
Technical Information for Future Mill(FMP)

■ Features of FMP insert

- Extremely excellent tool life is ensured in high feed and high speed, deep depth with low cutting load and strong cutting edge.
- Optimal grades for workpiece make high efficiency cutting.
- Unique chip breaker make good chip evacuation and lower cutting load (①).
- Innovative curve cutting edge makes lower cutting load and 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.

Chip breaker		Cutter edge	Recommended C/B and grade as per workpiece(●:1st)									
			Low carbon steel Mild steel		High carbon steel Alloy steel		Stainless steel		Cast iron		Aluminum alloy	
			C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade	C/B	Grade
Low cutting load type	MF		●	○NCM325 ○PC230 ●NCM335		●NCM325 ○PC230 ○NCM335	●	○NCM325 ○PC230 ●NCM335	●	●PC6510 ○PC215K	–	–
Reinforced cutting edge type	MM			○NCM325 ○PC230 ●NCM335	●	●NCM325 ○PC230 ○NCM335	●	○NCM325 ○PC230 ●NCM335	●	●PC6510 ○PC215K	–	–
Sharp cutting edge type	MA		–	–	–	–	–	–	–	–	●	●H01 ○G10

■ Recommended cutting condition

: 1st recommendation

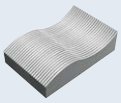
Workpiece	Feed (mm/t)	Cutting Speed vc(m/min)							
		CVD Coated		PVD Coated					Carbide
		NCM325	NCM335	PC3535	PC3545	PC6510	PC8520	PC9530	H01
SM□□C	~0.3	100~250	100~220	100~250	100~220	-	100~250	100~250	-
SCM									
STD	~0.25	100~220	100~200	100~220	100~200	-	100~220	100~220	-
KP									
NAK	~0.2	100~220	100~180	100~200	100~180	-	100~200	100~200	-
STS	~0.2	-	-	-	80~200	-	80~200	80~200	-
GC/GCD	~0.25	-	-	-	-	100~200	-	-	-
Non-ferrous Aluminum	~0.4	-	-	-	-	-	-	-	400~1,000

Technical Information for Future Mill(FMR)

Features

- Wide coverage for medium to roughing, general steel to high hardness mold materials.
- 2 step shape of insert provides strong clamp and can be minimize components to replace shim.
- 4-8 cutting edge available per insert.(Inscribed circle 05, 06, 07, 08, 10, 12, 16, 20).
- Uneven flute spacing prevents vibration at high speed application and provides stable machining.
- Precise design on insert seat part prevents insert from chattering.
- Special design put on insert bottom part prevent movement and chatter of insert.
- Very easy to change cutting edge due to the rotate prevention part of insert.

Machining examples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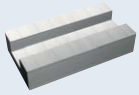
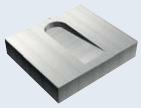
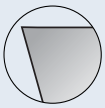
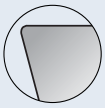
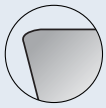

Slotting & Side cutting


Ramping

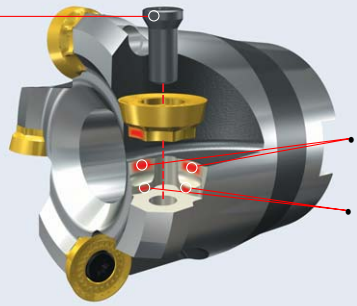
Chip breakers

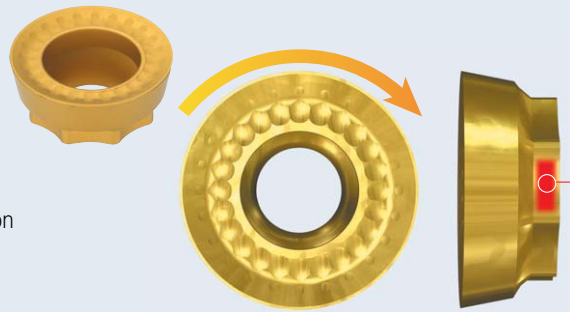
Chip breakers		Cutter edge	Features
Finishing	MF		Low cutting resistance chip breaker design guarantees long tool life good performance at finishing and difficult-to-cut material machining.
Medium	MM		Suitable for general milling at wide application range.
Aluminum	MA		Sharp cutting edge and buffed top face for aluminum machining prevent welding and control chip flow.

FMR Insert cutting edge shape

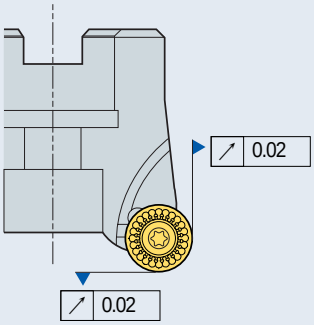
Cutting edge shape (G calss)			
Designation	RDHW□□□□M0F	RDHW□□□□M0E	RDHW□□□□M0S

Clamping system

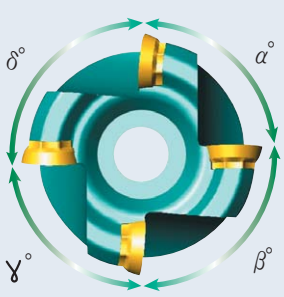




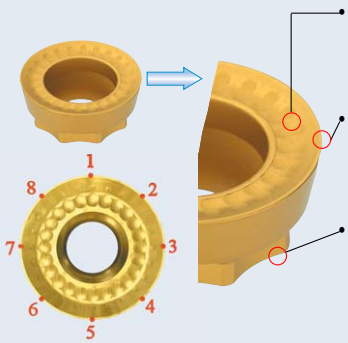
FMR□3000 Type	FMR□5000 Type	RDKT10T3M0-□□	RDKT1605M0-MM
FMR□4000 Type	FMR□6000 Type	RDKT1204M0-□□	RDKT2006M0-MM



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.

Technical Information for Future Mill(FMR)

■ Chip removal rate (cm³/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)	PC3525	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
	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
	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
	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
	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
M	Stainless steel	PC9530 PC8520	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
K	Cast iron	PC6510	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

■ Required machine power(PKW = 0.75 x PHP)

• RDKT10□□

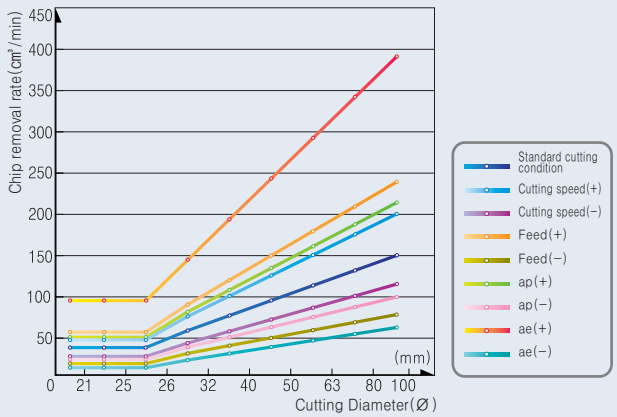
Workpiece		Grades	Ø21	Ø25	Ø26	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Cutting condition			
												vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3525	2.2	2.2	2.2	3.3	4.4	5.5	6.6	7.7	8.8	250	0.4	1.5	0.5D
	General carbon steel (under 30 HRC)		2.1	2.1	2.1	3.1	4.1	5.2	6.2	7.3	8.3	200	0.4	1.5	0.5D
	High carbon 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	PC9530 PC8520	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	PC6510	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

• RDKT12□□

Workpiece		Grades	Ø32	Ø33	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Cutting condition			
											vc	fz	ap	ae
P	General structure steel(under 200HB)	PC3525	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	PC9530 PC8520	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	PC6510	0.6	0.6	0.9	1.2	0.7	1.5	1.8	2.1	180	0.2	1.5	0.5D

■ Chip removal rate by cutting condition

• Used insert : RDKT10□



• Variation of cutting condition

	ISO
Standard	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	FMRS1000		FMRS1500		FMRS2000		FMRS2500		FMRS3000		FMRS4000		FMRS5000		FMRS6000	
					ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3525	100~250	≤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
P	General carbon steel	30HRC≤	PC3525	100~220	≤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
P	High carbon steel,Alloy steel	30~40HRC	PC3525	100~200	≤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
P	High carbon steel,Alloy steel	40~50HRC	PC3525	90~150	≤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
P	Alloy steel	50HRC≥	PC3525	90~150	≤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
M	Stainless steel	270HB≤	PC9530	50~200	≤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
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC6510	150~250	≤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

• Pocketing

	Workpiece	Hardness	Grades	Cutting speed	FMRS1000		FMRS1500		FMRS2000		FMRS2500		FMRS3000		FMRS4000		FMRS5000		FMRS6000	
					ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3525	100~250	≤1.0	≤0.3	≤1.2	≤0.3	≤1.5	≤0.3	≤1.7	≤0.3	≤2.0	≤0.4	≤2.4	≤0.5	≤3.0	≤0.6	≤4.0	≤0.7
P	General carbon steel	30HRC≤	PC3525	100~220	≤0.7	≤0.3	≤1.2	≤0.3	≤1.5	≤0.3	≤1.7	≤0.3	≤2.0	≤0.4	≤2.4	≤0.5	≤3.0	≤0.6	≤4.0	≤0.7
P	High carbon steel,Alloy steel	30~40HRC	PC3525	100~200	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
P	High carbon steel,Alloy steel	40~50HRC	PC3525	90~150	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
P	Alloy steel	50HRC≥	PC3525	90~150	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
M	Stainless steel	270HB≤	PC9530	50~200	≤0.7	≤0.1	≤0.9	≤0.1	≤1.2	≤0.1	≤1.5	≤0.1	≤1.7	≤0.2	≤2.0	≤0.3	≤2.7	≤0.4	≤3.7	≤0.5
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC6510	150~250	≤1.0	≤0.3	≤1.2	≤0.3	≤1.5	≤0.3	≤1.7	≤0.3	≤2.0	≤0.4	≤2.4	≤0.5	≤3.0	≤0.6	≤4.0	≤0.7

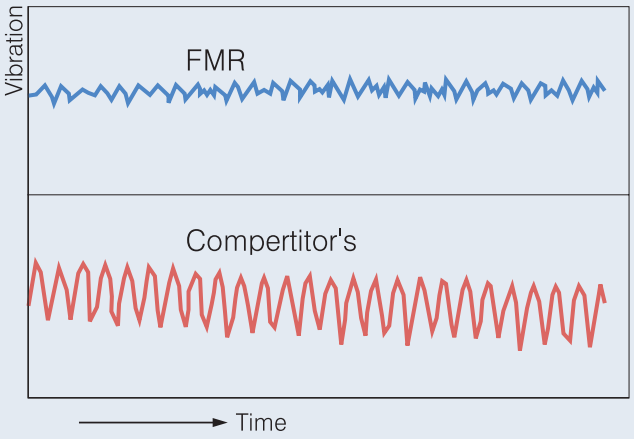
• Plunging

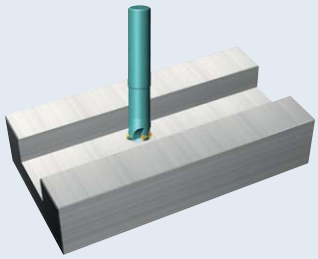
	Workpiece	Hardness	Grades	Cutting speed	FMRS1000		FMRS1500		FMRS2000		FMRS2500		FMRS3000		FMRS4000		FMRS5000		FMRS6000	
					ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3525	100~250	≤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
P	General carbon steel	30HRC≤	PC3525	100~220	≤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
P	High carbon steel,Alloy steel	30~40HRC	PC3525	100~200	≤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
P	High carbon steel,Alloy steel	40~50HRC	PC3525	90~150	≤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
P	Alloy steel	50HRC≥	PC3525	90~150	≤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
M	Stainless steel	270HB≤	PC9530	50~200	≤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
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC6510	150~250	≤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

• Helical cutting

	Workpiece	Hardness	Grades	Cutting speed	FMRS1000		FMRS1500		FMRS2000		FMRS2500		FMRS3000		FMRS4000		FMRS5000		FMRS6000	
					ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)	ae (mm)	fz (mm/t)
P	General structure steel	200HB≤	PC3525	100~250	≤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
P	General carbon steel	30HRC≤	PC3525	100~220	≤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
P	High carbon steel,Alloy steel	30~40HRC	PC3525	100~200	≤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
P	High carbon steel,Alloy steel	40~50HRC	PC3525	90~150	≤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
P	Alloy steel	50HRC≥	PC3525	90~150	≤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
M	Stainless steel	270HB≤	PC9530	50~200	≤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
K	Cast iron, Ductile cast iron	Tensile strength 350Mpa≤	PC6510	150~250	≤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

■ FMR Vibration test





● Machining example
- Test sample : FMRS3032RD-S / RDKT10T3M0-MM (PC3535)
- Workpiece : STD11
- Cutting condition : vc = 200m/min fz = 0.40mm/t
  ap = 2.0mm ae = 4.0mm

■ Cutting condition formulas for milling

• Cutting speed

$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}$$

• RPM

$$n = \frac{v \times 1000}{\pi \times D} \text{ (min}^{-1}\text{)}$$

• Feed(per tooth)

$$fz = \frac{vf}{n \times z} \text{ (mm/t)}$$

• Feed(per minute)

$$vf = fz \times n \times z \text{ (mm/min)}$$

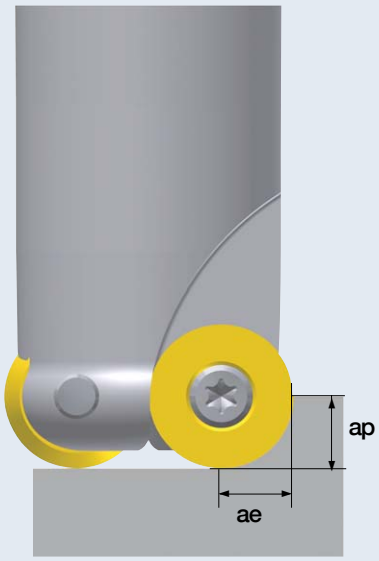
• Chip removal rate

$$Q = \frac{ap \times ae \times vf}{1000} \text{ (cm}^3\text{/min)}$$

• Required machine power

$$Pc = \frac{Q \times kc}{60 \times 102 \times \eta} \text{ (kW)}$$

$$H = \frac{Pc}{0.75} \text{ (Hp)}$$

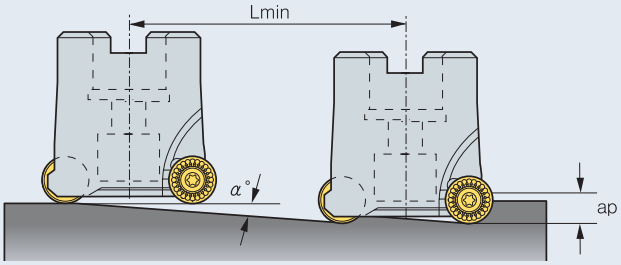


vc	=	Cutting speed(m/min)
n	=	Revolution per a minute(min^{-1})
D	=	Cutting diameter(mm)
vf	=	Feed per a minute(mm/min)
fz	=	Feed per tooth(mm/t)
z	=	Number of tooth
Pc	=	Power requirement(kW)
H	=	Horsepower requirement(Hp)
Q	=	Chip removal amount(cm^3/min)
ap	=	Depth of cut(mm)
ae	=	Width of cut(mm)
Kc	=	Specific cutting resistance(MPa)
η	=	Mechanical efficiency(%)

■ 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

■ Ramping technical data

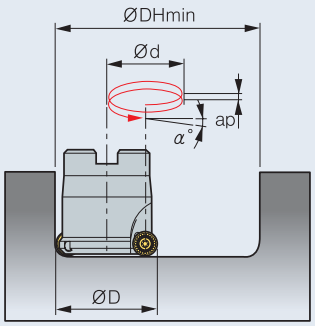


$$Lmin = \frac{ap}{\tan \alpha^\circ} \text{ (mm)}$$

※ Lmin : Min. inclination cutting length.
α° : Max. ramping angle.
ap : Depth of cut.

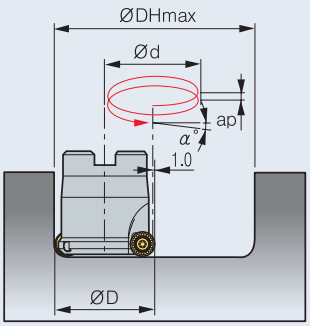
Section	Tool diameter(Ø)	Ramping angle α° (Max)	Cutting length by ramping angle L(mm)									
			ap=1mm	ap=2mm	ap=2.5mm	ap=3mm	ap=3.5mm	ap=4mm	ap=5mm	ap=6mm	ap=8mm	ap=10mm
FMR1000	08	18.14	3	6	8	-	-	-	-	-	-	-
	10	11.7	5	10	12	-	-	-	-	-	-	-
	12	8.43	7	13	17	-	-	-	-	-	-	
	15	5.93	10	19	24	-	-	-	-	-	-	-
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

■ Helical cutting technical data - ØDHmin



Section	Insert	Tool diameter(Ø)	Ø DHmin	Ød	Ramping angle(α°) ap= 1	2	2.5	3	3.5	4	5	6	8	10
FMR 1000	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	-	-	-	-	-	-	-
FMR 1500	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	-	-	-	-	-	-
FMR 2000	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	-	-	-	-	-
FMR 2500	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	-	-	-	-
FMR 3000	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	-	-	-
FMR 4000	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	-	-
FMR 5000	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	-
FMR 6000	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

■ Helical cutting technical data - ØDHmax

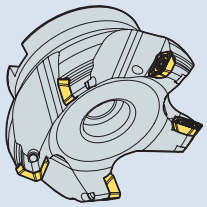


Section	Insert	Tool diameter(Ø)	Ø DHmax	Ød	Ramping angle(α°) ap= 1	2	2.5	3	3.5	4	5	6	8	10
FMR 1000	5	08	14	6	3.04	6.11	7.65	-	-	-	-	-	-	-
	5	10	18	8	2.28	4.57	5.72	-	-	-	-	-	-	-
	5	12	22	10	1.83	3.65	4.57	-	-	-	-	-	-	-
	5	15	28	13	1.40	2.81	3.51	-	-	-	-	-	-	-
FMR 1500	6	10	18	8	2.28	4.57	5.72	6.88	-	-	-	-	-	-
	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	-	-	-	-	-	-
FMR 2000	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	-	-	-	-	-
FMR 2500	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	-	-	-	-
FMR 3000	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	-	-	-
FMR 4000	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	-	-
FMR 5000	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	-
FMR 6000	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

- ØD = Tool diameter(mm), ØDHmin, max = Min, Max diameter(mm)
- Ød = Tool Path, mm
- ØDHmin(Max diameter) = ØD * 2 - Insert size, ØDHmax(Max diameter) = ØD * 2 - 2
- Ød(tool path) = ØDHmin, max - ØD

FMACM3000/4000

AA 45°



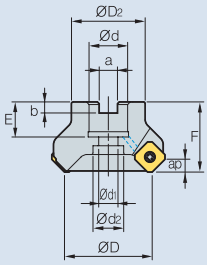


Fig. 1

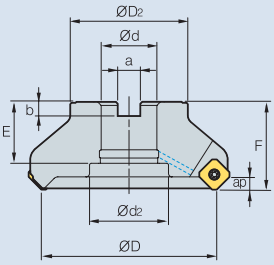


Fig. 2

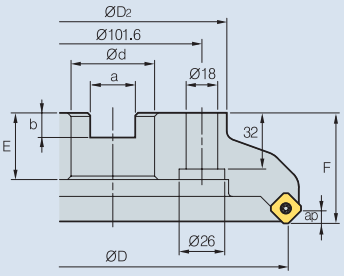


Fig. 3

(mm)

Designation		Stock R	Stock L	⌀	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
	3080HR	●		6	80	57	27	12.4	7.0	23	50	14	20	4.0	1.1	2
	3080HR-H	●		10	80	57	27	12.4	7.0	23	50	14	20	4.0	1.2	2
	3100HR	●		7	100	67	32	14.4	8.0	25.2	50	18	26	4.0	1.7	2
	3100HR-H	●		12	100	67	32	14.4	8.0	25.2	50	18	26	4.0	1.7	2
	3125HR	●		8	125	87	40	16.4	9.0	29	63	22	32	4.0	3.5	2
	3125HR-H	●		14	125	87	40	16.4	9.0	29	63	22	32	4.0	3.5	2
FMACM	4050HR	●		3	50	49	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
	4080HR	●		5	80	57	27	12.4	7.0	23	50	14	20	6.5	1.1	2
	4080HR-M	●		6	80	57	27	12.4	7.0	23	50	14	20	6.5	1.1	2
	4080HR-H	●		8	80	57	27	12.4	7.0	23	50	14	20	6.5	1.1	2
	4100HR	●		5	100	67	32	14.4	8.0	25	50	18	26	6.5	1.6	2
	4100HR-M	●		7	100	67	32	14.4	8.0	25	50	18	26	6.5	1.6	2
	4100HR-H	●		10	100	67	32	14.4	8.0	25	50	18	26	6.5	1.6	2
	4125HR	●		6	125	87	40	16.4	9.0	29	63	22	32	6.5	3.1	2
	4125HR-M	●		8	125	87	40	16.4	9.0	29	63	22	32	6.5	3.1	2
	4125HR-H	●		12	125	87	40	16.4	9.0	29	63	22	32	6.5	3.1	2
	4160R	●		7	160	107	40	16.4	9.0	35	63	-	-	6.5	4.8	3
	4160R-M	●		10	160	107	40	16.4	9.0	35	63	-	-	6.5	4.8	3
	4160R-H	●		16	160	107	40	16.4	9.0	35	63	-	-	6.5	4.8	3
	4200R	●		8	200	130	60	25.7	14.0	32	63	-	-	6.5	6.1	3
	4200R-M	●		12	200	130	60	25.7	14.0	32	63	-	-	6.5	6.1	3
	4200R-H	●		18	200	130	60	25.7	14.0	32	63	-	-	6.5	6.1	3

Note) Through coolant type between ø 50 ~ ø 125

● : Stock item ○ : Under preparing for stock

● Parts

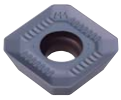
	Screw	Insert Wrench	Shim Wrench	Shim Screw	Shim
3000 Type	FTKA0307	-	-	-	-
4000 Type	FTGA03512	TW15S	HW35L	SHXN0509F	SS42SAF

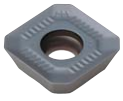
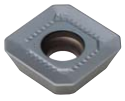
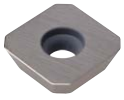
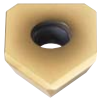
● Available Arbors

Designation		Ød	Arbors
FMACM	3050HR-□	22	BT□□-FMA22-□□
	3063HR-□	22	BT□□-FMC22-□□
	3080HR-□	27	BT□□-FMC27-□□
	3100HR-□	32	BT□□-FMC32-□□
	3125HR-□	40	BT□□-FMB40-□□
FMACM	4050HR-□	22	BT□□-FMA22-□□
	4063HR-□	22	BT□□-FMC22-□□
	4080HR-□	27	BT□□-FMC27-□□
	4100HR-□	32	BT□□-FMC32-□□
	4125HR-□	40	BT□□-FMB40-□□
	4160R-□	40	BT□□-FMB40-□□
	4200R-□	60	BT□□-FMB60-□□

• Applicable inserts, see pages E19, E20
• Detail cutter spec. see pages E172~E174

● Available Inserts

SEET-MA	SEET-MF	SEET-MM	SEXT-MF
			

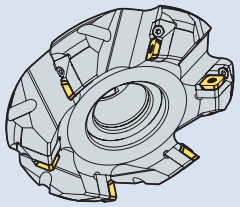
SEXT-MM	SEXT-MR	SEEW	SEEW-W
			

Designation		Coated NCM325	PC3535	NCM335	PC8520	PC9530	PC6510	PC215K	PD2000	Cermet CN30	Uncoated H01	Type	Page
SEET	0903AGFN-MA								●		●	3000 Type	E19
	0903AGSN-MF	●				●							
	0903AGSN-MM	●				●							
SEXT	0903AGSN-MF		○					●					E20
	0903AGSN-MM		●				●	●					
	0903AGSN-MR		●										
SEEW	0903AGTN									●			E19
SEET	14M4AGFN-MA								●		●	4000 Type	E19
	14M4AGSN-MF	●		●		●	●						
	14M4AGSN-MM	●	●	●		●							
SEXT	14M4AGSN-MF	●	○		●			●					E20
	14M4AGSN-MM	●	●	●		●	●	●					
	14M4AGSN-MR	●	●			●							
SEEW	14M4AGTN									●			E19
	14M4AGFN-W						○						
	14M4AGSN-W						○						
	14M4AGTN-W						○						

● : Stock item ○ : Under preparing for stock

FMACM3000-A/4000-A (Aluminum body)

AA 45°



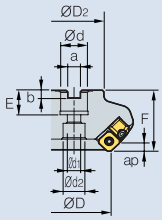


Fig. 1

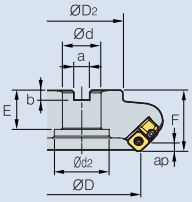


Fig. 2

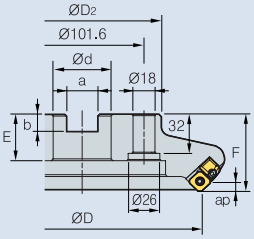


Fig. 3

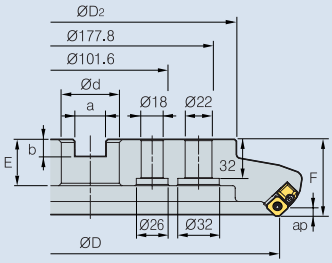


Fig. 4

(mm)

Designation		Stock R	Stock L	⊚	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
	3080R-A	●		4	80	57	27	12.4	7	25	50	13.5	20	4	0.6	1
	3100R-A	●		5	100	67	32	14.4	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	40	16.4	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
FMACM	4063R-A	●		3	63	49	22	10.4	6.3	20	50	11	18	6.5	0.6	1
	4080R-A	●		4	80	67	27	12.4	7	22	50	13.5	20	6.5	0.8	1
	4100R-A	●		5	100	67	32	14.4	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	40	16.4	9	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	40	16.4	9	35	63	-	75	6.5	2.5	2
	4200R-A	●		8	200	130	60	25.7	14	32	63	-	-	6.5	3.2	3
	4250R-A			10	250	180	60	25.7	14	38	63	-	-	6.5	4.1	3
	4315R-A			12	315	240	60	25.7	14	38	63	-	-	6.5	6.7	3

Note) Through coolant type between ø 50 ~ ø 125

● : Stock item ○ : Under preparing for stock

● Parts

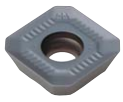
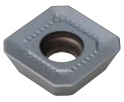
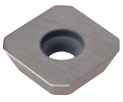
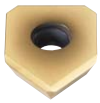
	Screw	Insert Wrench	Locator Wrench	Locator	Locator Screw
3000 Type	FTKA0307	TW09S	HW30L	LFMA3R-A	DHA620
4000 Type	FGKA03512	TW15S	HW40L	LFMA4R-A	DHA0830

● Available Arbors

Designation		Ød	Arbors
FMACM	3063R-□ 4063R-□	22	BT□□-FMC22-□□
	3080R-□ 4080R-□	27	BT□□-FMC27-□□
	3100R-□ 4100R-□	32	BT□□-FMC32-□□
	3125R-□ 4125R-□	40	BT□□-FMB40-□□
	4160R-□	40	BT□□-FMB40-□□
	4200R-□ 4250R-□ 4315R-□	60	BT□□-FMB60-□□

• Applicable inserts, see pages **E19, E20**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

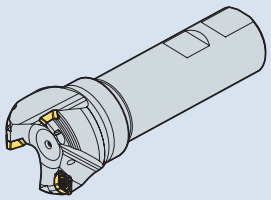
SEET-MA	SEET-MF	SEET-MM	SEXT-MF
SEXT-MM	**SEXT-MR**	**SEEW**	**SEEW-W**
			

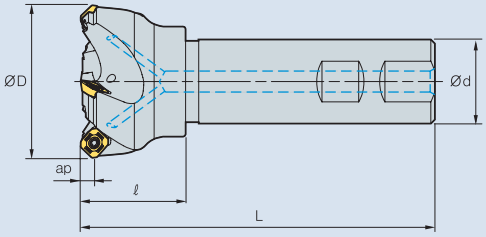
Designation		Coated NCM325	PC3535	NCM335	PC8520	PC9530	PC6510	PC215K	PD2000	Cermet CN30	Uncoated H01	Type	Page
SEET	0903AGFN-MA								●		●	3000 Type	E19
	0903AGSN-MF	●				●							
	0903AGSN-MM	●				●							
SEXT	0903AGSN-MF		○					●					E20
	0903AGSN-MM		●				●	●					
	0903AGSN-MR		●										
SEEW	0903AGTN									●			E19
SEET	14M4AGFN-MA								●		●	4000 Type	E19
	14M4AGSN-MF	●		●		●	●						
	14M4AGSN-MM	●	●	●		●							
SEXT	14M4AGSN-MF	●	○		●			●					E20
	14M4AGSN-MM	●	●	●		●	●	●					
	14M4AGSN-MR	●	●			●							
SEEW	14M4AGTN									●			E19
	14M4AGFN-W						○						
	14M4AGSN-W						○						
	14M4AGTN-W						○						

● : Stock item ○ : Under preparing for stock

FMAS3000/4000

AA 45°





(mm)

Designation		Stock		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
New	3032HR-S32		3	32	32	40	130	4	0.8
	3040HR	●	3	40	32	40	130	4	0.9
New	3040HR-S40		3	40	40	40	140	4	1.3
New	3040HR-S42		3	40	42	40	140	4	1.4
	3050HR	●	4	50	32	40	135	4	1
New	3050HR-S40		4	50	40	40	140	4	1.3
New	3050HR-S42		4	50	42	40	140	4	1.5
	3063HR	●	5	63	32	45	135	4	1.2
New	3063HR-S40		5	63	40	45	145	4	1.6
New	3063HR-S42		5	63	42	45	145	4	1.7
FMAS	4050HR	●	3	50	32	45	135	6.5	1.5
New	4050HR-S40		3	50	40	45	135	6.5	2.1
New	4050HR-S42		3	50	42	45	135	6.5	2.7
	4063HR	●	4	63	32	45	135	6.5	2
New	4063HR-S40		4	63	40	45	135	6.5	2.6
New	4063HR-S42		4	63	42	45	135	6.5	3.2

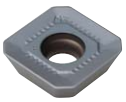
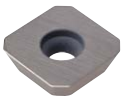
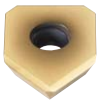
Note) Through coolant type between ø 25 ~ ø 63

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Insert Wrench	Shim Wrench	Shim Screw	Shim
3000 Type	FTKA0307	TW09S	-	-	-
4000 Type	FGKA03512	TW15S	HW35L	SHXN0509F	SS42SAF

● Available Inserts

SEET-MA	SEET-MF	SEET-MM	SEXT-MF
SEXT-MM	**SEXT-MR**	**SEEW**	**SEEW-W**
			

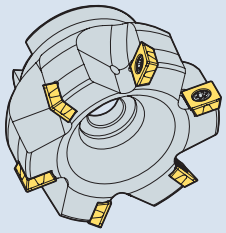
• Applicable inserts, see pages **E19, E20**

Designation		Coated NCM325	PC3535	NCM335	PC8520	PC9530	PC6510	PC215K	PD2000	Cermet CN30	Uncoated H01	Type	Page
SEET	0903AGFN-MA								●		●	3000 Type	E19
	0903AGSN-MF	●				●							
	0903AGSN-MM	●				●							
SEXT	0903AGSN-MF		○					●					E20
	0903AGSN-MM		●				●	●					
	0903AGSN-MR		●										
SEEW	0903AGTN									●		4000 Type	E19
SEET	14M4AGFN-MA								●		●		E19
	14M4AGSN-MF	●		●		●	●						
	14M4AGSN-MM	●	●	●		●							
SEXT	14M4AGSN-MF	●	○		●			●					E20
	14M4AGSN-MM	●	●	●		●	●	●					
	14M4AGSN-MR	●	●			●							
SEEW	14M4AGTN									●			E19
	14M4AGFN-W						○						
	14M4AGSN-W						○						
	14M4AGTN-W						○						

● : Stock item ○ : Under preparing for stock

FMPCM3000/4000

AA 0°



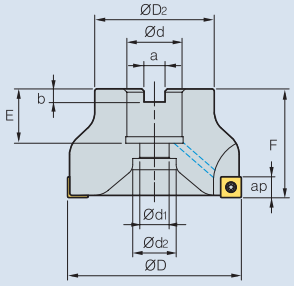


Fig. 1

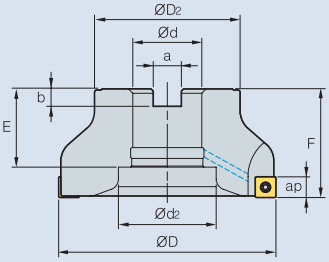


Fig. 2

(mm)

Designation		Stock R	Stock L	⌀	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
FMPCM	3050HS	●		5	50	40	22	11	18	10.4	6.3	20.0	40	7	0.3	1
	3063HS	●		6	63	40	22	11	18	10.4	6.3	20.0	40	7	0.5	1
	3080HS	●		7	80	55	27	14	20	12.4	7.0	22.0	50	7	1.0	1
	3100HS	●		8	100	67	32	18	26	14.4	8.0	26.0	50	7	1.5	1
FMPCM	4063HS	●		5	63	49	22	11	18	10.4	6.3	20	50	11	0.4	1
	4080HS	●		6	80	57	27	14	20	12.4	7.0	23	50	11	0.9	1
	4100HS	●		7	100	67	32	18	26	14.4	8.0	25	50	11	1.5	1
	4125HS	●		8	125	87	40	22	32	16.4	9.0	29	63	11	3.1	1

Note) Through coolant type between ø 50~ ø 125

● : Stock item ○ : Under preparing for stock

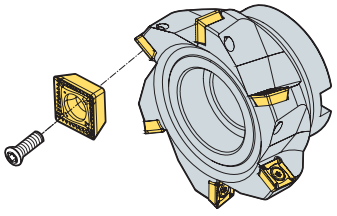
● Parts

	Screw	Wrench
3000 Type	FTGA03508	TW15S
4000 Type	FTNC04511	TW20S

● Available Arbors

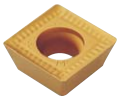
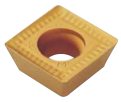
Designation		Ød	Arbors
FMPCM	3050HS	22	BT□□-FMC22-□□
	3063HS	22	BT□□-FMC22-□□
	3080HS	27	BT□□-FMC27-□□
	3100HS	32	BT□□-FMC32-□□
FMPCM	4063HS	22	BT□□-FMC22-□□
	4080HS	27	BT□□-FMC27-□□
	4100HS	32	BT□□-FMC32-□□
	4125HS	40	BT□□-FMB40-□□

Assembling



• Applicable inserts, see pages E17, E18
• Detail cutter spec. see pages E172~E174

● Available Inserts

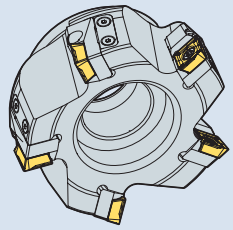
SDET-MA	SDET-MF	SDET-MM
		
SDXT-MF	**SDXT-MM**	**SDXT-MA**
		

Designation		Coated NCM325	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PD2000	Uncoated H01	Type	Page
SDET	09M402R-MA								●	●	3000 Type	E17
	09M405R-MF											
	09M405R-MM											
SDXT	09M405R-MF	●		●		●	●					E18
	09M405L-MF											
	09M405R-MM	●	●	●		●	●	●				
	09M405L-MM											
	09M405R-MA									●		
SDET	130504R-MA										4000 Type	E17
	130508R-MF											
	130508R-MM											
SDXT	130508R-MF	●		●		●	●					E18
	130508R-MM	●	●	●	●	●	●	●				
	130538-MM											
	130508R-MA									●		

● : Stock item ○ : Under preparing for stock

FMPCM3000-A / 4000-A (Aluminum body)

AA 0°



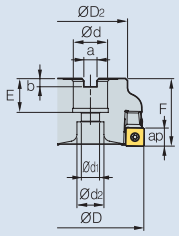


Fig. 1

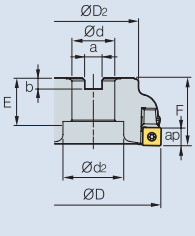


Fig. 2

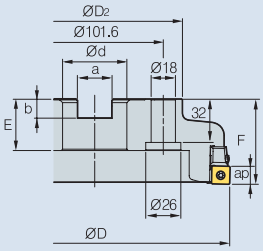


Fig. 3

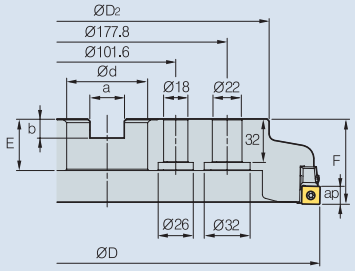


Fig. 4

(mm)

Designation		Stock R	Stock L	⚙	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg	Fig.
FMPCM	3063S-A	●		3	63	40	22	11.0	18	10.4	6.3	20	40	4	0.2	1
	3080S-A	●		4	80	55	27	13.5	20	12.4	7.0	22	50	4	0.4	1
	3100S-A	●		5	100	67	32	-	45	14.4	8.0	32	50	4	0.6	2
	3100S-25.4-A			5	100	67	25.4	-	38	9.5	6.0	25	50	4	0.7	2
FMPCM	4063S-A	●		3	63	40	22	11.0	18	10.4	6.3	20	40	6.5	0.2	1
	4080S-A	●		4	80	55	27	13.5	20	12.4	7.0	22	50	6.5	0.5	1
	4100S-A	●		5	100	67	32	-	45	14.4	8.0	32	50	6.5	0.7	2
	4100S-25.4-A			5	100	67	25.4	-	38	9.5	6.0	25	50	6.5	0.8	2
	4125S-A	●		6	125	80	40	-	56	16.4	9.0	30	63	6.5	1.3	2
	4125S-25.4-A			6	125	80	25.4	-	38	9.5	6.0	25	63	6.5	1.4	2
	4160S-A			8	160	107	40	-	70	16.4	9.0	30	63	6.5	2	2
	4200S-A			10	200	130	60	-	-	25.7	14	38	63	6.5	3.2	3
	4250S-A			12	250	180	60	-	-	25.7	14	38	63	6.5	5.2	3
	4315S-A			15	315	240	60	-	-	25.7	14	38	63	6.5	8.4	4

● : Stock item ○ : Under preparing for stock

● Parts

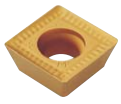
	Screw	Insert Wrench	Iocator Wrench	Locator	Chip cover	Screw for chipcover	Screw for locator
3063S-A	FTGA03508	TW15S	HW30L	LFMP3R-A	CFMP3R14R1-A	PXMA0306	DHA0624
3080S-A ~3100S-A	FTGA03508	TW15S	HW30L	LFMP3R-A	CFMP3R-A	PXMA0306	DHA0624
4063S-A ~4080S-A	FTNC04509	TW20S	HW40L	LFMP4R1-A	CFMP3R14R1-A	PXMA0306	DHA0825
4100S-A ~4315S-A	FTNC04509	TW20S	HW40L	LFMP4R-A	CFMP3R-A	PXMA0306	DHA0830

● Available Arbors

Designation		Ød	Arbors
FMPCM	3063S-□ 4063S-□	22	BT□□-FMC22-□□
	3080S-□ 4080S-□	27	BT□□-FMC27-□□
	3100S-□ 4100S-□	32	BT□□-FMC32-□□
	3125S-□ 4125S-□	40	BT□□-FMB40-□□
	4160S-□	40	BT□□-FMB40-□□
	4200S-□ 4250S-□ 4315S-□	60	BT□□-FMB60-□□

• Applicable inserts, see pages E17, E18
• Detail cutter spec. see pages E172~E174

● Available Inserts

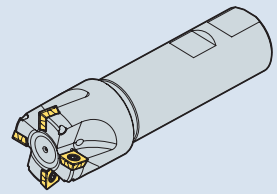
SDET-MA	SDET-MF	SDET-MM
SDXT-MF	**SDXT-MM**	**SDXT-MA**
		

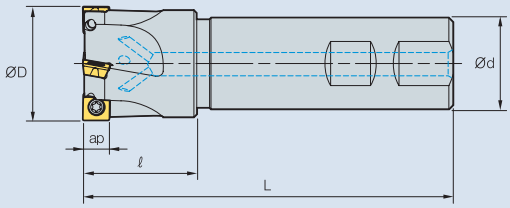
Designation		Coated NCM325	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PD2000	Uncoated H01	Type	Page
SDET	09M402R-MA								●	●	3000 Type	E17
	09M405R-MF											
	09M405R-MM											
SDXT	09M405R-MF	●		●		●	●					E18
	09M405L-MF											
	09M405R-MM	●	●	●		●	●	●				
	09M405L-MM											
	09M405R-MA									●		
SDET	130504R-MA										4000 Type	E17
	130508R-MF											
	130508R-MM											
SDXT	130508R-MF	●		●		●	●					E18
	130508R-MM	●	●	●	●	●	●	●				
	130538-MM											
	130508R-MA									●		

● : Stock item ○ : Under preparing for stock

FMPS3000/4000

AA 0°





(mm)

Designation		Stock R	Stock L	⊙	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
New	3040HS-S40			4	40	40	45	140	7	1.2
New	3040HS-S42			4	40	42	45	140	7	1.3
	3050HS	●		5	50	32	40	135	7	1
New	3050HS-S40			5	50	40	40	140	7	1.3
New	3050HS-S42			5	50	42	40	140	7	1.4
	3063HS	●		6	63	32	45	135	7	1.2
New	3063HS-S40			6	63	40	45	145	7	1.6
New	3063HS-S42			6	63	42	45	145	7	1.7
FMPS	4040HS	●		3	40	32	40	130	11	1
New	4040HS-S40			3	40	40	40	130	11	1.3
New	4040HS-S42			3	40	42	40	130	11	1.4
	4050HS	●		4	50	32	45	135	11	1.5
New	4050HS-S40			4	50	40	45	135	11	1.7
New	4050HS-S42			4	50	42	45	135	11	1.6
	4063HS	●		5	63	32	45	135	11	2.1
New	4063HS-S40			5	63	40	45	135	11	2.4
New	4063HS-S42			5	63	42	45	135	11	2.6

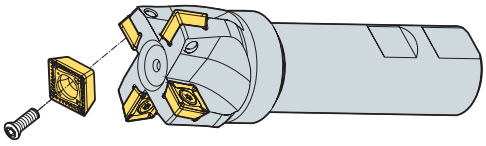
Note) Through coolant type between ø 25 ~ ø 63

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
3000 Type	FTGA03508	TW15S
4000 Type	FTNC04511	TW20S

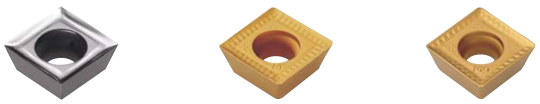
Assembling



• Applicable inserts, see pages E17, E18

● Available Inserts

SDET-MA SDET-MF SDET-MM

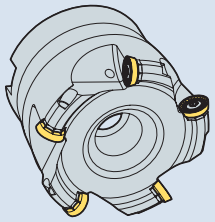


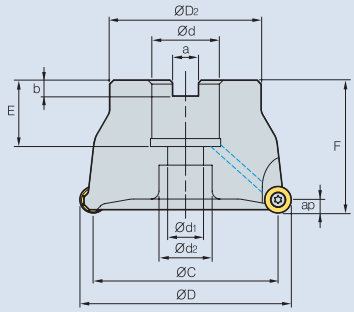
SDXT-MF SDXT-MM SDXT-MA

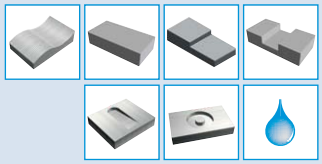
Designation		Coated NCM325	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	PD2000	Uncoated H01	Type	Page
SDET	09M402R-MA								●	●	3000 Type	E17
	09M405R-MF											
	09M405R-MM											
SDXT	09M405R-MF	●		●		●	●					E18
	09M405L-MF											
	09M405R-MM	●	●	●		●	●	●				
	09M405L-MM											
	09M405R-MA									●		
SDET	130504R-MA										4000 Type	E17
	130508R-MF											
	130508R-MM											
SDXT	130508R-MF	●		●		●	●					E18
	130508R-MM	●	●	●	●	●	●	●				
	130538-MM											
	130508R-MA									●		

● : Stock item ○ : Under preparing for stock

FMRCM3000/4000







(mm)

Designation		Stock R	Stock L		ØD	ØC	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	kg
FMRCM	3040HRD	●		3	40	30	36	16	8.4	5.0	20	40	9	14	5.0	0.2
	3040HRD-H	●		4	40	30	36	16	8.4	5.0	20	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	40	11	16.5	5.0	0.64
	3063HRD-H	●		6	63	53	49	22	10.4	6.3	20	40	11	16.5	5.0	0.64
	3080HRD	●		6	80	70	57	27	12.4	7.0	22	50	14	19	5.0	1.1
	3080HRD-H	●		7	80	70	57	27	12.4	7.0	22	50	14	19	5.0	1.1
	3100HRD	●		7	100	90	67	32	14.4	8.0	28	63	18	26	5.0	2.1
	3100HRD-H	●		8	100	90	67	32	14.4	8.0	28	63	18	26	5.0	2.1
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
	4080HRD	●		5	80	68	57	27	12.4	7.0	23	50	14	20	6.0	1.0
	4080HRD-M	●		6	80	68	57	27	12.4	7.0	23	50	14	20	6.0	1.0
	4100HRD	●		6	100	88	67	32	14.4	8.0	25	50	18	26	6.0	1.5
	4100HRD-M	●		7	100	88	67	32	14.4	8.0	25	50	18	26	6.0	1.5
	4125HRD	●		7	125	113	87	40	16.4	9.0	29	63	22	32	6.0	3.0
	4125HRD-M	●		8	125	113	87	40	16.4	9.	29	63	22	32	6.0	3.0

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
3000 Type	FTGA03508(Ø 21: FTGA03507)	TW15S
4000 Type	FTKA04510	TW15S

● Available Arbors

Designation		Arbors	Designation		Arbors
FMRCM	3040HRD 3040HRD-H	BT30 / BT40 / BT50 FMC 16	FMRCM	4050HRD 4063HRD 4063HRD-M	BT30 / BT40 / BT50 FMC 22
	3050HRD 3050HRD-H 3063HRD 3063HRD-H	BT30 / BT40 / BT50 FMC22		4080HRD 4080HRD-M	BT30 / BT40 / BT50 FMC27
	3080HRD 3080HRD-H	BT30 / BT40 / BT50 FMC27		4100HRD 4100HRD-M	BT40 / BT50 FMC32
	3100HRD 3100HRD-H	BT40 / BT50 FMC32		4125RD 4125RD-M	BT40 / BT50 FMB40

• Applicable inserts, see pages **E16**
• Detail cutter spec. see pages **E172~E174**

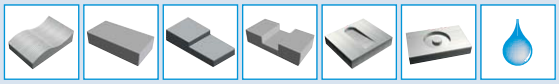
● Available Inserts

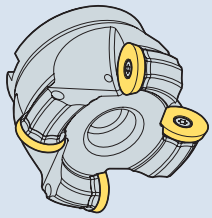
RDCT-MA	RDKT-MF	RDKT-MM

Designation		Coated NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	Uncoated H01	Type	Page
RDCT	10T3M0-MA									●	3000 Type	E16
RDKT	10T3M0-MF		●	●		●	●	●				
	10T3M0-MM	●	●	●	●	●		●	●			
RDCT	1204M0-MA									●	4000 Type	E16
RDKT	1204M0-MF		●	●		●	●	●				
	1204M0-MM	●	●	●	●	●		●	●			

● : Stock item ○ : Under preparing for stock

FMRCM5000/6000





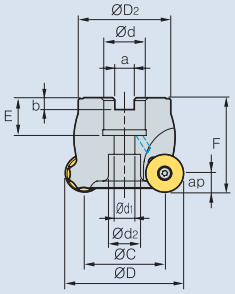


Fig. 1

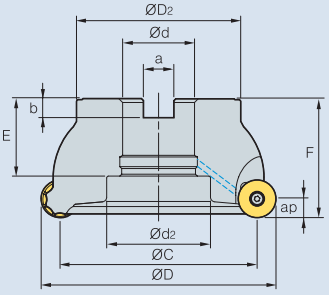


Fig. 2

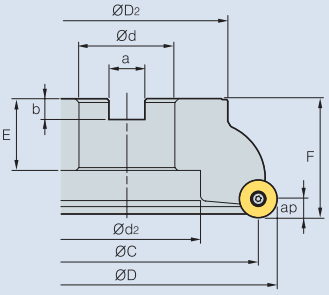


Fig. 3

(mm)

Designation		Stock	⊚	øD	øC	øD2	ød	a	b	E	F	ød1	ød2	ap	kg	Fig.
FMRCM	5050HRD		3	50	34	42	22	10.4	6.3	20	50	11	16.5	8.0	0.4	1
	5063HRD		4	63	47	49	22	10.4	6.3	20	50	11	18	8.0	0.6	1
	5063HRD-H		5	63	47	49	22	10.4	6.3	20	50	11	18	8.0	0.6	1
	5080HRD	●	5	80	64	57	27	12.4	7.0	23	50	14	20	8.0	0.9	1
	5080HRD-H		6	80	64	57	27	12.4	7.0	23	50	14	20	8.0	0.9	1
	5100HRD	●	6	100	84	67	32	14.4	8	25	50	18	26	8.0	1.4	1
	5100HRD-H		7	100	84	67	32	14.4	8	25	50	18	26	8.0	1.4	1
	5125HRD	●	7	125	109	87	40	16.4	9	29	63	22	32	8.0	3	1
	5125HRD-H		8	125	109	87	40	16.4	9	29	63	22	32	8.0	3	1
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
	6080HRD	●	4	80	60	57	27	12.4	7.0	22	50	14	20	10.0	0.8	1
	6080HRD-M		5	80	60	57	27	12.4	7.0	22	50	14	20	10.0	0.8	1
	6100HRD	●	5	100	80	67	32	14.4	8	28	63	18	26	10.0	1.6	1
	6100HRD-M		6	100	80	67	32	14.4	8	28	63	18	26	10.0	1.6	1
	6125HRD	●	6	125	105	87	40	16.4	9	29	63	22	32	10.0	2.9	1
	6125HRD-M		7	125	105	87	40	16.4	9	29	63	22	32	10.0	2.9	1
	6160RD	●	7	160	140	107	40	16.4	9	35	63	-	78	10.0	4.4	3
	6160RD-M		8	160	140	107	40	16.4	9	35	63	-	78	10.0	4.4	3

Note) ø 160 without through coolant type

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
5000 Type	FTGA0513-P	TW20S
6000 Type	FTGA0515-P	TW20S

● Available Arbors

Designation		Arbors	Designation		Arbors
FMRCM	5050HRD	BT30 / BT40 / BT50	FMRCM	6063HRD	BT30 / BT40 / BT50
	5063HRD	FMC 22		6063HRD-M	FMC 22
	5063HRD-H			6080HRD	BT30 / BT40 / BT50
	5080HRD	BT30 / BT40 / BT50		6080HRD-M	FMC27
	5080HRD-H	FMC27		6100HRD	BT40 / BT50
	5100HRD	BT40 / BT50		6100HRD-M	FMC32
	5100HRD-H	FMC32		6125HRD	BT40 / BT50
	5125HRD	BT40 / BT50		6125HRD-M	FMB40
	5125HRD-H	FMB40		6160RD	BT50
				6160RD-M	FMB40

• Applicable inserts, see pages **E16**
• Detail cutter spec. see pages **E172~E174**

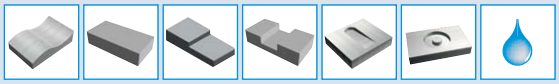
● Available Inserts

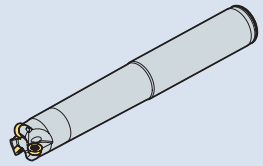
RDHW-E,F,S	RDKT-MM

Designation		Coated		Type	Page
		PC3535	PC3545		
RDHW	1605M0E			5000 Type	E16
	1605M0F				
	1605M0S				
RDKT	1605M0-MM	●	●		E16
RDHW	2006M0E			6000 Type	E16
	2006M0F				
	2006M0S				
RDKT	2006M0-MM	●	●		E16

● : Stock item ○ : Under preparing for stock

FMRS1000/1500/2000/2500





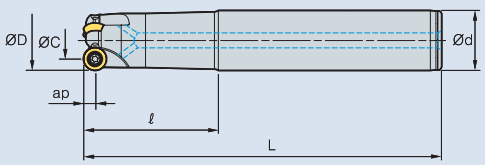


Fig. 1

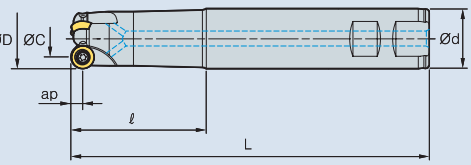


Fig. 2

(mm)

Designation		Stock		øD	øC	L	ød	ℓ	ap	kg	Fig.
FMRS	1008HRD-M		1	8	5.5	80	10	30	2.5	0.2	1
	1008HRD-L		1	8	5.5	100	10	50	2.5	0.2	1
	1010HRD-M		2	10	5	100	12	44	2.5	0.2	1
	1010HRD-L		2	10	5	120	12	64	2.5	0.2	1
	1012HRD-M	●	2	12	7	100	12	44	2.5	0.3	1
	1012HRD-L	●	2	12	7	160	16	80	2.5	0.3	1
	1015HRD-M		3	15	10	160	16	80	2.5	0.3	1
	1015HRD-L		3	15	10	200	16	100	2.5	0.4	1
FMRS	1510HRD-M		1	10	6	100	12	44	3.0	0.2	1
	1510HRD-L		1	10	6	120	12	64	3.0	0.2	1
	1512HRD-M	●	2	12	6	110	12	54	3.0	0.3	1
	1512HRD-L	●	2	12	6	160	16	80	3.0	0.3	1
	1516HRD-M		3	16	10	130	16	60	3.0	0.3	1
	1516HRD-L		3	16	10	180	20	90	3.0	0.4	1
	1520HRD-M		3	20	14	150	20	80	3.0	0.4	1
	1520HRD-L		3	20	14	200	20	90	3.0	0.5	1
FMRS	2015HRD-S		2	15	8	115	16	55	3.5	0.3	2
	2015HRD-M	●	2	15	8	150	20	80	3.5	0.4	2
	2015HRD-L	●	2	15	8	200	20	90	3.5	0.5	2
	2020HRD-S		3	20	14	125	20	65	3.5	0.3	2
	2020HRD-M		3	20	14	150	20	80	3.5	0.4	2
	2020HRD-L		3	20	14	200	25	90	3.5	0.5	2
FMRS	2516HRD-S		2	16	8	125	16	65	4.0	0.3	2
	2516HRD-M	●	2	16	8	150	16	80	4.0	0.4	2
	2516HRD-L	●	2	16	8	200	20	90	4.0	0.5	2
	2520HRD-S		2	20	12	125	20	65	4.0	0.4	2
	2520HRD-M		2	20	12	150	20	80	4.0	0.5	2
	2520HRD-L		2	20	12	200	25	90	4.0	0.6	2
	2525HRD-S		3	25	17	125	25	55	4.0	0.5	2
	2525HRD-M		3	25	17	200	25	90	4.0	0.6	2
	2525HRD-L		3	25	17	250	32	110	4.0	0.7	2

Note) Through coolant type between ø 8 ~ ø 25

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench	
1000 Type	FTNA0203	TW06P	-
1500 Type	FTNA02205	TW06P	-
2000 Type	FTKA02555	-	TW07S
2500 Type	FTNA0305	-	TW09S

● Available Inserts

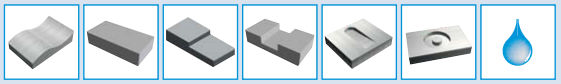
RDHW-E,F,S	RDKW

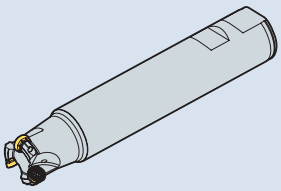
• Applicable inserts, see pages **E16, E17**

Designation	Coated		Type	Page
	PC3535	PC9530		
RDHW 0501M0E		●	1000 Type	E16
0501M0F				
0501M0S				
RDKW 0501M0E	●			E17
RDHW 06T1M0E		●	1500 Type	E16
06T1M0F				
06T1M0S				
RDKW 06T1M0E	●			E17
RDHW 0702M0E		●	2000 Type	E16
0702M0F				
0702M0S				
RDKW 0702M0E	●			E17
RDHW 0803M0E		●	2500 Type	E16
0803M0F				
0803M0S				
RDKW 0803M0E	●			E17

● : Stock item ○ : Under preparing for stock

FMRS3000/4000





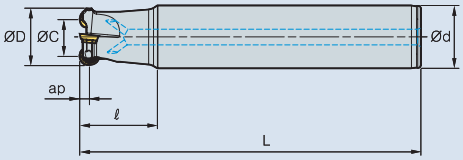


Fig. 1

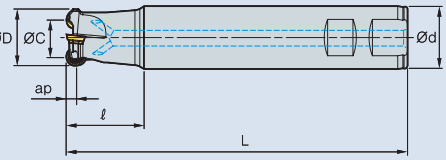


Fig. 2

(mm)

Designation		Stock		øD	øC	L	ød	ℓ	ap	kg	Fig.
FMRS	3021HRD-M	●	1	21	11	150	20	40	5	0.4	1
	3021HRD-M2	●	2	21	11	150	20	40	5	0.4	1
	3021HRD-L	●	1	21	11	200	20	50	5	0.6	1
	3021HRD-L2	●	2	21	11	200	20	50	5	0.6	1
	3025HRD-S	●	2	25	15	115	25	35	5	0.5	2
	3025HRD-M	●	2	25	15	200	25	70	5	0.7	1
	3025HRD-L	●	2	25	15	250	25	100	5	1	1
	3026HRD-M	●	2	26	16	200	25	70	5	0.65	1
	3026HRD-L	●	2	26	16	250	25	100	5	0.7	1
	3032HRD-S	●	3	32	22	125	32	40	5	1	2
	3032HRD-M	●	3	32	22	200	32	70	5	1.3	1
	3032HRD-L	●	3	32	22	300	32	150	5	1.6	1
	3040HRD-S	●	4	40	30	125	32	40	5	1.3	2
	3040HRD-M	●	4	40	30	200	32	70	5	1.5	1
	3040HRD-L	●	4	40	30	300	32	150	5	1.8	1
FMRS	4032HRD-S	●	2	32	20	125	32	40	6	0.8	2
	4032HRD-M	●	2	32	20	200	32	70	6	1.1	1
	4032HRD-L	●	2	32	20	300	32	150	6	1.6	1
	4033HRD-S	●	2	33	21	125	32	40	6	0.9	2
	4033HRD-M	●	2	33	21	200	32	70	6	1.1	1
	4033HRD-L	●	2	33	21	300	32	150	6	1.7	1
	4040RHD-S	●	3	40	28	125	32	40	6	1	2
	4040HRD-M	●	3	40	28	200	32	70	6	1.6	1
	4040HRD-L	●	3	40	28	300	32	150	6	1.8	1
New	4040RHD-S40		3	40	28	125	40	40	6	1.3	2
New	4040HRD-M40		3	40	28	200	40	70	6	2	1
New	4040HRD-L40		3	40	28	300	40	150	6	2.4	1
New	4040RHD-S42		3	40	28	125	42	40	6	1.6	2
New	4040HRD-M42		3	40	28	200	42	70	6	2.4	1
New	4040HRD-L42		3	40	28	300	42	150	6	2.8	1
	4050HRD-S	●	4	50	38	125	42	50	6	1.5	2
	4050HRD-M	●	4	50	38	200	42	50	6	2.1	1
	4050HRD-L	●	4	50	38	300	42	50	6	2.7	1
New	4050HRD-S40		4	50	38	125	40	50	6	2	2
New	4050HRD-M40		4	50	38	200	40	50	6	2.6	1
New	4050HRD-L40		4	50	38	300	40	50	6	3.2	1

Note) Through coolant type between ø 21 ~ ø 50

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
3000 Type	FTGA03508(07)	TW15S
4000 Type	FTKA0410	TW15S

• Applicable inserts, see pages E16

● Available Inserts

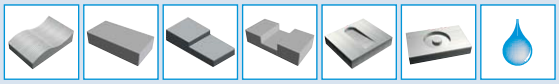
RDCT-MA	RDKT-MF	RDKT-MM

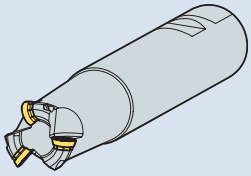
Designation		Coated								Uncoated	Type	Page
		NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	H01		
RDCT	10T3M0-MA									●	3000 Type	E16
RDKT	10T3M0-MF		●	●		●	●	●				
	10T3M0-MM	●	●	●	●	●		●	●			
RDCT	1204M0-MA									●	4000 Type	E16
RDKT	1204M0-MF		●	●		●	●	●				
	1204M0-MM	●	●	●	●	●		●	●			

● : Stock item ○ : Under preparing for stock

FMRS5000/6000

New





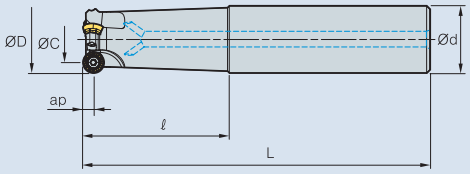


Fig. 1

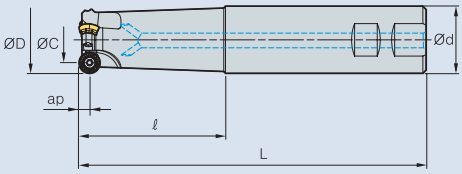


Fig. 2

(mm)

Designation		Stock		øD	øC	L	ød	ℓ	ap	kg	Fig.
FMRS	5040HRD-S		2	40	24	125	32	40	8	1.4	2
	5040HRD-M		2	40	24	200	32	70	8	1.8	1
	5040HRD-L		2	40	24	300	32	150	8	2.0	1
New	5040HRD-S40		2	40	24	125	40	40	8	1.6	2
New	5040HRD-M40		2	40	24	200	40	70	8	2.0	1
New	5040HRD-L40		2	40	24	300	40	150	8	2.4	1
New	5040HRD-S42		2	40	24	125	42	40	8	2.0	2
New	5040HRD-M42		2	40	24	200	42	70	8	2.4	1
New	5040HRD-L42		2	40	24	300	42	150	8	2.8	1
New	5050HRD-S40		3	50	34	150	40	50	8	2.0	2
New	5050HRD-M40		3	50	34	250	40	50	8	2.4	1
New	5050HRD-L40		3	50	34	300	40	50	8	2.6	1
	5050HRD-S		3	50	34	150	42	50	8	1.5	2
	5050HRD-M		3	50	34	250	42	50	8	1.8	1
	5050HRD-L		3	50	34	300	42	50	8	2.0	1
New	5063HRD-S40		4	63	47	150	40	50	8	1.7	2
New	5063HRD-M40		4	63	47	250	40	50	8	2.0	1
New	5063HRD-L40		4	63	47	300	40	50	8	2.3	1
	5063HRD-S		4	63	47	150	42	50	8	1.6	2
	5063HRD-M		4	63	47	250	42	50	8	1.8	1
	5063HRD-L		4	63	47	300	42	50	8	2.0	1
FMRS	6050HRD-S40		3	50	31	150	40	50	10	1.3	2
New	6050HRD-S42		3	50	31	150	42	50	10	1.4	2
	6050HRD-M40		3	50	31	250	40	50	10	2.2	1
	6050HRD-M42		3	50	31	250	42	50	10	2.4	1
	6050HRD-L40		3	50	31	300	40	50	10	2.7	1
	6050HRD-L42		3	50	31	300	42	50	10	3.0	1
	6063HRD-S40		4	63	44	150	40	50	10	1.5	2
	6063HRD-S42		4	63	44	150	42	50	10	1.6	2
	6063HRD-M40		4	63	44	250	40	50	10	2.5	1
	6063HRD-M42		4	63	44	250	42	50	10	2.7	1
	6063HRD-L40		4	63	44	300	40	50	10	3.0	1
	6063HRD-L42		4	63	44	300	42	50	10	3.2	1

(Note) Through coolant type between ø 40 ~ ø 63

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
5000 Type	FTGA0513-P	TW20S
6000 Type	FTGA0515-P	TW20S

• Applicable inserts, see pages E16

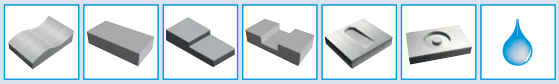
● Available Inserts

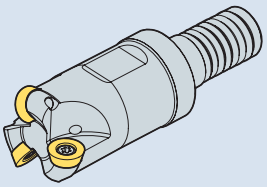
RDHW-E,F,S RDKT-MM

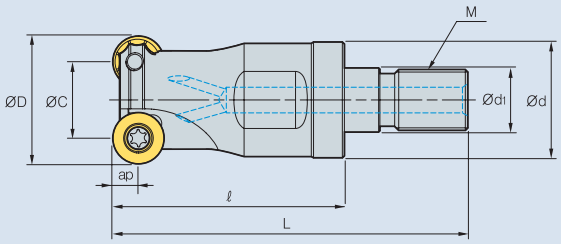
Designation		Coated PC3535	Coated PC3545	Type	Page
RDHW	1605M0E			5000 Type	E16
	1605M0F				
	1605M0S				
RDKT	1605M0-MM	●	●		E16
RDHW	2006M0E			6000 Type	E16
	2006M0F				
	2006M0S				
RDKT	2006M0-MM	●	●		E16

● : Stock item ○ : Under preparing for stock

FMRM1000/1500/2000/2500/ 3000/4000/5000







(mm)

Designation		Stock	⊙	øD	øC	ℓ	L	ød	ød1	M	ap	kg
FMRM	1008HRD-M06		1	8	5.5	25	40	9.5	6.5	M06	2.5	0.02
	1010HRD-M06		2	10	5	25	40	9.5	6.5	M06	2.5	0.02
	1012HRD-M06	●	2	12	7	25	40	11	6.5	M06	2.5	0.02
	1015HRD-M08		3	15	10	30	47	14.5	8.5	M08	2.5	0.04
FMRM	1510HRD-M06		1	10	7	25	40	9.5	6.5	M06	3.0	0.02
	1512HRD-M06	●	2	12	6	25	40	11	6.5	M06	3.0	0.02
	1516HRD-M08	●	3	16	10	30	47	14.5	8.5	M08	3.0	0.02
	1520HRD-M10	●	3	20	14	35	56	18	10.5	M10	3.0	0.07
FMRM	2015HRD-M08		2	15	8	30	47	14.5	8.5	M08	3.5	0.04
	2020HRD-M10		3	20	13	35	56	18	10.5	M10	3.5	0.07
FMRM	2516HRD-M08	●	2	16	8	30	47	14.5	8.5	M08	4.0	0.04
	2520HRD-M10	●	2	20	12	35	56	18	10.5	M10	4.0	0.07
	2525HRD-M12		3	25	17	45	69	22.5	12.5	M12	4.0	0.13
FMRM	3021HRD-M10		2	21	11	35	56	18	10.5	M10	5.0	0.1
	3025HRD-M12	●	2	25	15	45	69	22.5	12.5	M12	5.0	0.15
	3032HRD-M16		3	32	22	50	77	29	16.5	M16	5.0	0.2
	3042HRD-M16		4	42	32	50	77	29	16.5	M16	5.0	0.24
FMRM	4025HRD-M12		2	25	13	45	69	22.5	12.5	M12	6.0	0.12
	4032HRD-M16	●	2	32	20	50	77	29	17	M16	6.0	0.22
	4040HRD-M16	●	3	40	28	50	77	29	17	M16	6.0	0.23
	4042HRD-M16		4	42	28	50	77	29	17	M16	6.0	0.25
FMRM	5040HRD-M16		2	40	24	50	77	29	17	M16	8.0	0.25

(Note) Through coolant type between ø 8 ~ ø 42

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
1000/1500/2000/ 3000/4000/5000 Type	FTGA03508 (ø 21: FTGA03507) FTKA0410	TW15S TW15S

● Available Adaptors

Designation	Available Adaptor	Designation	Available Adaptor
FMRM 1008HRD-M06	MAT - M06	FMRM 2520HRD-M10	MAT - M10
1010HRD-M06	MAT - M06	2525HRD-M12	MAT - M12
1012HRD-M06	MAT - M06	3021HRD-M10	MAT - M10
1015HRD-M08	MAT - M08	3025HRD-M12	MAT - M12
1510HRD-M06	MAT - M06	3032HRD-M16	MAT - M16
1512HRD-M06	MAT - M06	3042HRD-M16	MAT - M16
1516HRD-M08	MAT - M08	4025HRD-M12	MAT - M12
1520HRD-M10	MAT - M10	4032HRD-M16	MAT - M16
2015HRD-M08	MAT - M08	4040HRD-M16	MAT - M16
2020HRD-M10	MAT - M10	4042HRD-M16	MAT - M16
2516HRD-M08	MAT - M08	5040HRD-M16	MAT - M16

Designation : FMRM1008RD - M06 = Designation of Shank : MAT-M06-020-S10S

Specification for Modular head thread part(M06) Specification for shank thread part(M06)

• Applicable inserts, see pages E16, E17
• Applicable adaptors, see pages E133~E134

● Available Inserts

RDHW-E,F,S RDKW RDCT-MA RDKT-MF RDKT-MM

Designation	Coated								Uncoated	Type	Page
	NCM325	PC3525	PC3535	NCM335	PC3545	PC8520	PC9530	PC6510	H01		
RDHW 0501M0E,F,S							●			1000Type	E16
RDKW 0501M0E			●								E17
RDHW 06T1M0E,F,S							●			1500Type	E16
RDKW 06T1M0E			●								E17
RDHW 0702M0E.F.S							●			2000Type	E16
RDKW 0702M0E			●								E17
RDHW 0803M0E,F,S							●			2500Type	E16
RDKW 0803M0E			●								E17
RDCT 10T3M0-MA									●	3000Type	E16
RDKT 10T3M0-MF		●	●		●	●	●				
10T3M0-MM	●	●	●	●	●		●	●			
RDCT 1204M0-MA									●	4000Type	E16
RDKT 1204M0-MF		●	●		●	●	●				
1204M0-MM	●	●	●	●	●		●	●			
RDHW 1605M0E,F,S										5000Type	E16
RDKT 1605M0-MM			●		●						

* Marked stock item is producted for RDHW☐☐☐M0E

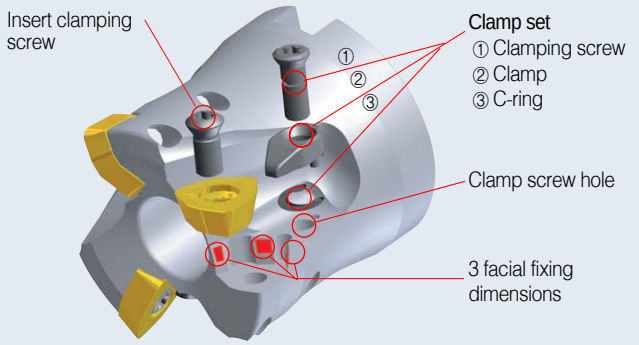
● : Stock item ○ : Under preparing for stock

Technical Information for HRM

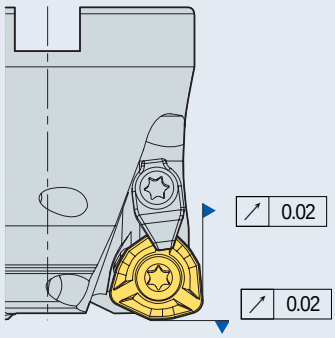
Features

- Powerful and economic milling tool with double clamping and 3 corners insert.
- Revolutionary design of the cutter and the special cutting edge of the insert make superb feed rate possible when compare with conventional tools. (Max. fz=3.5mm/tooth)
- Unique chip breaker makes smooth cutting and lower cutting load.
- HRM can cover various applications due to HRM insert size 08,10,13,15 line up.

Clamping system



HRM□08/10/13/15 Type

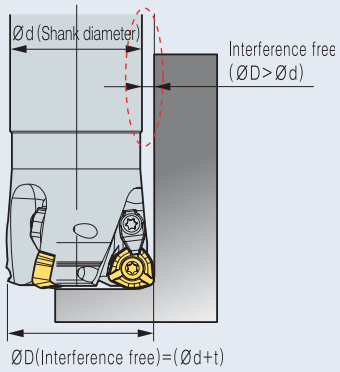


High tolerance of tip seat part prevents chattering and guarantees high quality surface roughness.

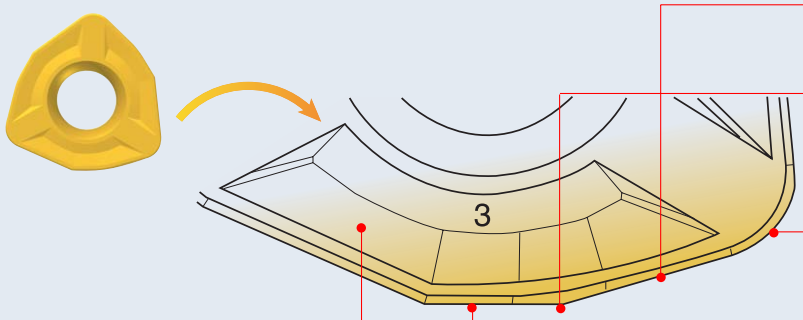
Interference prevent system

Designation	ØD(mm)	Ød(mm)	t(mm)
HRMS0821HR-2□20	21	20	1
HRMS1206HR-2□25	26	25	1
HRMS1333HR-2□32	33	32	1
HRMS1335HR-2□32	35	32	3
HRMS1340HR-3□32	40	32	8
HRMS1550HR-3□32	50	32	18
HRMS1550HR-3□40	50	40	10
HRMS1550HR-3□42	50	42	8
HRMS1563HR-3□32	63	32	31
HRMS1563HR-3□40	63	40	23
HRMS1563HR-3□42	63	42	21

• The side clearance prevents to interference between tool and workpiece even in deep hole machining.



Features of insert



• 1st major cutting edge
- Optimized chip flow.
- Reduce cutting load.

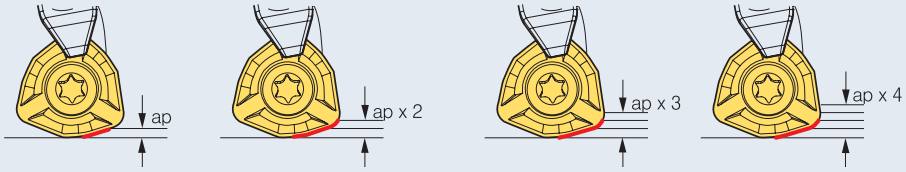
• 2nd major cutting edge
- Part for increase the cutting edge strength.
- High feed with low cutting load.
- Chip removal rate has been increased due to the 2nd cutting edge.

• Nose R
- Special design for good performance at taper machining.
- High feed R type cutting edge.

• Minor cutting edge
Excellent surface roughness at high feed.
Design for decreasing back force.

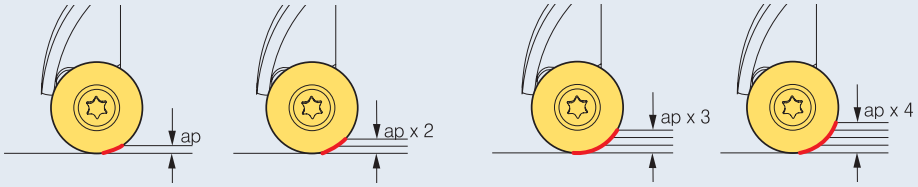
• Chip breaker
Optimize chip flow
Reduce cutting load

● HRM



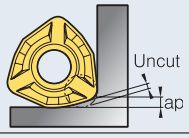
Deep depth of cut
➞ Stable cutting load

• Round insert

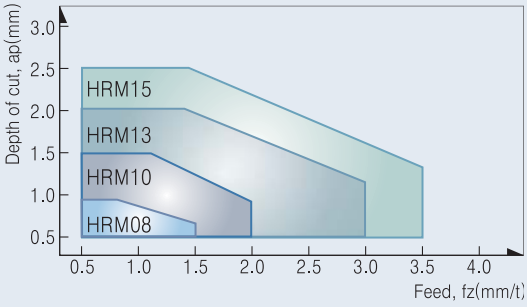


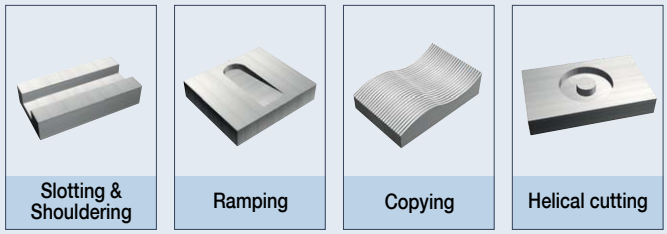
Deep depth of cut
➞ Increasing cutting load

■ Corner R programming

Designation	Condition		Approx, R (mm)		Configuration
	Max.ap(mm)	Max.fz(mm/t)	Input R	Uncut	
WDKT080316ZDSR-MH	1.0	1.5	2.0	0.38	
WDKT10T320ZDSR-MH	1.5	2.0	2.5	0.47	
WDKT130520ZDSR-MH	2.0	3.0	3.0	0.72	
WDKT150625ZDSR-MH	2.5	3.5	3.0	0.88	

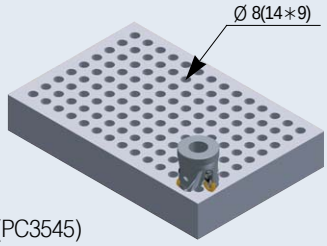
■ Application range





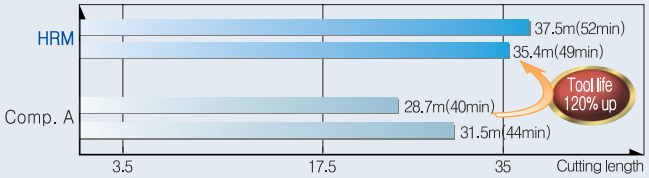
■ Application example

● Toughness test

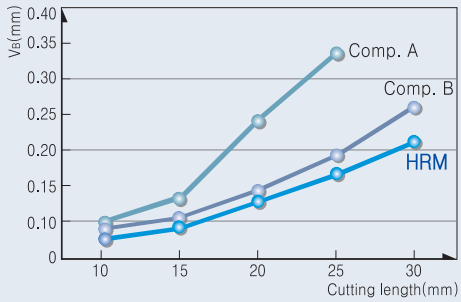


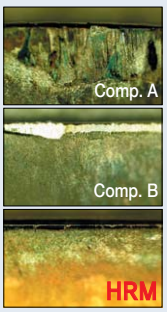
HRM cutter - Interrupted cutting

※ Cutting condition
- Tool : HRMCM13050HR-3
  WDKT130520ZDSR-MH(PC3545)
- Workpiece : SCM440 (HRC34)
- Cutting speed : vc = 180m/min
- Feed : fz = 1.8mm/t
- Axial depth : ap = 1.0mm
- Radial depth : ae = 30mm
- Dry down cut : 1 tooth cutting
- Workpiece size : 350 x 250 x 50(mm)



● Wear resistance test

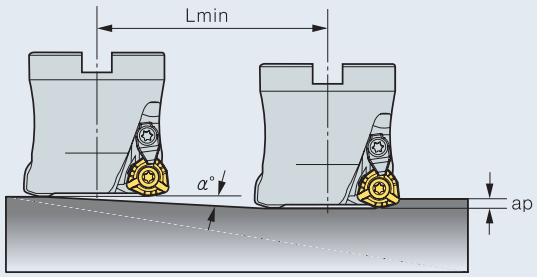




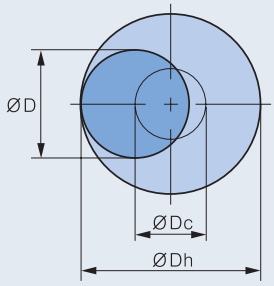
※ Cutting condition
- Tool : HRMCM13050HR-3
  WDKT130520ZDSR-MH(PC3525)
- Workpiece: STD11 (280HB)
- Cutting speed : vc = 200m/min
- Feed : fz = 2.5mm/t
- Axial depth : ap = 1.5mm
- Radial depth : ae = 30mm
- Dry down cut : 1 tooth cutting
- Workpiece size : 300 x 250 x 100(mm)

■ Technical data

● Ramping



● Helical cutting



● Tool pass diameter

$$Lmin = \frac{ap}{\tan \alpha^{\circ}} (mm)$$

$$ØDc = ØDh - ØD$$

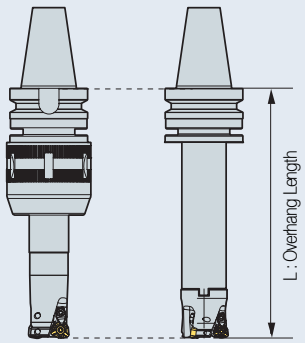
ØDc = Tool path of tool cente
ØDh = Desire hole diameter
ØD = Tool diameter

- 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		ØD Tool diameter (mm)	Valid cutting diameter (mm)	Ramping			Helical ramping	
				Max.ap (mm)	Max.angle α°	Cutting length (mm)	Min. machined diameter (mm)	Max. machined diameter (mm)
HRMCM	13050HR-□	50	38	2.0	2°	57.3	77	96
	13063HR-□	63	51	2.0	1°40′	68.6	103	122
	13080HR-□	80	68	2.0	1°30′	76.4	137	156
	15063HR-□	63	50	2.5	2°40′	53.7	101	121
	15080HR-□	80	67	2.5	2°	71.6	135	155
	15100HR-□	100	87	2.5	1°30′	95.5	175	195
	15125HR-□	125	112	2.5	50′	171.9	225	245
	15160R-□	160	147	2.5	30′	286.5	295	315
HRMS	0820HR-□□20	20	11.2	1.0	3°30′	16.3	28	36
	1025HR-□□25	25	14	1.5	4°	21.5	33	46
	1030HR-□□32	30	19	1.5	3°30′	24.5	43	56
	1332HR-□□32	32	20	2.0	4°	28.6	39	60
	1335HR-□□32	35	23	2.0	3°30′	32.7	45	66
	1340HR-□□□□	40	28	2.0	3°	38.2	55	76
	1550HR-□□□□	50	37	2.5	2°50′	50.5	75	95
	1563HR-□□□□	63	50	2.5	2°40′	53.7	101	121

■ Overhang length(L)

Shank type Cutter type



- L = Overhang Length
  (Read recommended cutting condition table)
- vc(m/min) = π x D x N / 1000 (Cutting speed)
- vf(mm/min) = fz x Z x N (Table feed)
- Q(㎤/min) = ap x ae x F / 1000
  (Chip removal rate)
- W(kw) = Q x Ks / 60 x 102 x η
  (Power requirement)
- H(hp) = W / 0.75 (Horse power)

※ Reference

fz	=	Feed per tooth(mm/t)
Z	=	Tooth, π = 3.14
D	=	Tool diameter(Ø)
n	=	rpm
ap	=	Axial cutting depth
ae	=	Radial cutting depth
Ks	=	Specific cutting force(kg/㎟)
η	=	Machine effeciency(%)

■ Instruction

1) Insert should be correctly clamped in seat part of cutter.
2) In case of noise from chattering, reduce L(overhang length) or decrease feed, spindle speed and axial depth of cut.
3) Reduce spindle speed or axial depth of cut if machine power is not enough.(70% of recommended cutting condition)
4) Use coolant or air for smooth of chip evacuation and long tool life.
5) Reduce axial depth of cut, spindle speed and feed approx.30-50% of recommendation in machining of high hardness material.(HRC50-60)
6) Overhang length written in "recommended cutting condition table" from page 10-11 is represent the length L from the picture "overhang length(L)" shown above.
7) Use recommended cutting condition for better tool life. Especially axial depth of cut should be kept.
8) Even during deep pocket milling, HRM tool remains constant cutting force due to the unique corner geometry of the insert.

■ Recommended cutting condition

	Workpiece	Hardness	Grade	vc (m/min)	fz (mm/t)	L Overhang (mm)	Ø20/21-2 inserts					Ø25-2 inserts				
							n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)	n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)
P	General structure steel (General structural steel Mild steel)	Under 200HB	PC3525	180(120~230)	1.0	150	2866	5732	1.0	115	3.5	2293	4586	1.1	126	3.8
			PC3525	160(120~200)	0.9	200	2548	4586	0.8	73	2.2	2038	3669	0.9	83	2.5
			PC3545	150(100~170)	0.7	250	2389	3344	0.6	40	1.2	1911	2675	0.7	47	1.4
	General carbon steel, Alloy steel (S50C, SCM440 etc)	Under 30HRC	PC3525	160(130~190)	1.0	150	2548	5096	0.8	82	2.5	2038	4076	0.9	92	2.8
			PC3525	150(130~180)	0.9	200	2389	4299	0.6	52	1.6	1911	3439	0.7	60	1.8
			PC3545	130(100~150)	0.7	250	2070	2898	0.5	29	0.9	1656	2318	0.6	35	1.1
	High carbon steel, Alloy steel (Carbon steel Alloy steel, SKD etc)	30~40 HRC	PC3525	110(90~130)	0.9	150	1752	3153	0.8	50	1.5	1401	2522	0.9	57	1.7
			PC3545	100(80~130)	0.7	200	1592	2229	0.6	27	0.8	1274	1783	0.7	31	0.9
			PC3545	90(80~120)	0.5	250	1433	1433	0.4	11	0.3	1146	1146	0.5	14	0.4
	Hardened steel (NAK80, PX-5 etc)	40~50 HRC	PC3525	100(70~120)	0.7	150	1592	2229	0.6	27	0.8	1274	1783	0.7	31	0.9
				80(70~120)	0.5	200	1274	1274	0.4	10	0.3	1019	1019	0.5	13	0.4
M	Stainless steel (STS304, 316 etc)	Under 270HB	PC9530 PC8520	120(70~160)	0.9	150	1911	3439	1.0	69	2.1	1529	2752	1.0	69	2.1
					0.7	200	1911	2675	0.8	43	1.3	1529	2140	0.8	43	1.3
K	Cast iron (GC300 etc)	Under 350N/mm²	PC6510	150(100~200)	1.3	150	2389	6210	1.0	124	3.8	1911	4968	1.0	124	3.8
					1.1	200	2389	5255	0.8	84	2.6	1911	4204	0.8	84	2.6

	Workpiece	Hardness	Grade	vc (m/min)	fz (mm/t)	L Overhang (mm)	Ø32-2 inserts					Ø40-3 inserts				
							n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)	n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)
P	General structure steel (General structural steel Mild steel)	Under 200HB	PC3525	180(120~230)	1.5	170	1791	5732	1.2	206	6.3	1433	6449	1.2	310	9.4
			PC3525	160(120~200)	1.3	220	1592	4586	1.0	132	4.0	1274	4968	1.0	199	6.0
			PC3545	150(100~170)	1.1	270	1493	3344	0.8	84	2.6	1194	3941	0.8	126	3.8
	General carbon steel, Alloy steel (S50C, SCM440 etc)	Under 30HRC	PC3525	160(130~190)	1.4	170	1592	5096	1.0	143	4.3	1274	5350	1.0	214	6.5
			PC3525	150(130~180)	1.2	220	1493	4299	0.8	92	2.8	1194	4299	0.8	138	4.2
			PC3545	130(100~150)	1.0	270	1294	2898	0.7	58	1.8	1035	3105	0.7	87	2.6
	High carbon steel, Alloy steel (Carbon steel Alloy steel, SKD etc)	30~40 HRC	PC3525	110(90~130)	1.3	170	1095	3153	1.0	91	2.8	876	3416	1.0	137	4.2
			PC3545	100(80~130)	1.1	220	995	2229	0.8	56	1.7	796	2627	0.8	84	2.6
			PC3545	90(80~120)	0.9	270	896	1433	0.6	31	0.9	717	1935	0.6	46	1.4
	Hardened steel (NAK80, PX-5 etc)	40~50 HRC	PC3525	100(70~120)	1.0	170	995	2229	0.8	51	1.5	796	2389	0.8	76	2.3
				80(70~120)	0.8	220	796	1274	0.6	24	0.7	637	1529	0.6	37	1.1
M	Stainless steel (STS304, 316 etc)	Under 270HB	PC9530 PC8520	120(70~160)	1.2	170	1194	3439	1.2	110	3.3	955	3439	1.2	165	5.0
					1.0	220	1194	2675	1.0	76	2.3	955	2866	1.0	115	3.5
K	Cast iron (GC300 etc)	Under 350N/mm²	PC6510	150(100~200)	1.7	170	1493	6210	1.2	195	5.9	1194	6091	1.2	292	8.9
					1.5	220	1493	5255	1.0	143	4.4	1194	5374	1.0	215	6.5

	Workpiece	Hardness	Grade	vc (m/min)	fz (mm/t)	L Overhang (mm)	Ø50-3 inserts					Ø63-4 inserts				
							n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)	n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)
P	General structure steel (General structural steel Mild steel)	Under 200HB	PC3525	180(120~230)	1.5	150	1146	5159	1.4	361	11	910	4095	1.4	361	11
			PC3525	160(120~200)	1.3	250	1019	3975	1.2	238	7	809	3154	1.2	238	7
			PC3545	150(100~170)	1.1	350	955	3153	1.0	158	5	758	2502	1.0	158	5
	General carbon steel, Alloy steel (S50C, SCM440 etc)	Under 30HRC	PC3525	160(130~190)	1.4	150	1019	4280	1.2	257	8	809	3397	1.2	257	8
			PC3525	150(130~180)	1.2	250	955	3439	1.0	172	5	758	2730	1.0	172	5
			PC3545	130(100~150)	1.0	350	828	2484	0.8	99	3	657	1971	0.8	99	3
	High carbon steel, Alloy steel (Carbon steel Alloy steel, SKD etc)	30~40 HRC	PC3525	110(90~130)	1.3	150	701	2732	1.2	164	5	556	2169	1.2	164	5
			PC3545	100(80~130)	1.1	250	637	2102	1.0	105	3	506	1668	1.0	105	3
			PC3545	90(80~120)	0.9	350	573	1548	0.8	62	2	455	1228	0.8	62	2
	Hardened steel (NAK80, PX-5 etc)	40~50 HRC	PC3525	100(70~120)	1.0	150	637	1911	1.0	96	3	506	1517	1.0	96	3
				80(70~120)	0.8	250	510	1223	0.8	49	1	404	971	0.8	49	1
M	Stainless steel (STS304, 316 etc)	Under 270HB	PC9530 PC8520	120(70~160)	1.2	150	764	2752	1.4	193	6	607	2184	1.4	193	6
					1.0	250	764	2293	1.2	138	4	607	1820	1.2	138	4
K	Cast iron (GC300 etc)	Under 350N/mm²	PC6510	150(100~200)	1.7	150	955	4873	1.4	341	10	758	3867	1.4	341	10
					1.5	250	955	4299	1.2	258	8	758	3412	1.2	258	8

■ Recommended cutting condition

	Workpiece	Hardness	Grade	vc (m/min)	fz (mm/t)	L Overhang (mm)	Ø50-3 inserts					Ø63-4 inserts				
							n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)	n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)
P	General structure steel (General structural steel Mild steel)	Under 200HB	PC3525	180(120~230)	1.5	150	1146	6879	1.4	482	15	910	5460	1.4	482	15
			PC3525	160(120~200)	1.3	250	1019	5299	1.2	318	10	809	4206	1.2	318	10
			PC3545	150(100~170)	1.1	350	955	4204	1.0	210	6	758	3336	1.0	210	6
	General carbon steel, Alloy steel (S50C, SCM440 etc)	Under 30HRC	PC3525	160(130~190)	1.4	150	1019	5707	1.2	342	10	809	4529	1.2	342	10
			PC3525	150(130~180)	1.2	250	955	4586	1.0	229	7	758	3640	1.0	229	7
			PC3545	130(100~150)	1.0	350	828	3312	0.8	132	4	657	2629	0.8	132	4
	High carbon steel, Alloy steel (Carbon steel Alloy steel, SKD etc)	30~40 HRC	PC3525	110(90~130)	1.3	150	701	3643	1.2	219	7	556	2892	1.2	219	7
			PC3545	100(80~130)	1.1	250	637	2803	1.0	140	4	506	2224	1.0	140	4
			PC3545	90(80~120)	0.9	350	573	2064	0.8	83	3	455	1638	0.8	83	3
	Hardened steel (NAK80, PX-5 etc)	40~50 HRC	PC3525	100(70~120)	1.0	150	637	2548	1.0	127	4	506	2022	1.0	127	4
				80(70~120)	0.8	250	510	1631	0.8	65	2	404	1294	0.8	65	2
M	Stainless steel (STS304, 316 etc)	Under 270HB	PC9530 PC8520	120(70~160)	1.2	150	764	3669	1.4	257	8	607	2912	1.4	257	8
					1.0	250	764	3057	1.2	183	6	607	2426	1.2	183	6
K	Cast iron (GC300 etc)	Under 350N/mm²	PC6510	150(100~200)	1.7	150	955	6497	1.4	455	14	758	5156	1.4	455	14
					1.5	250	955	5732	1.2	344	10	758	4550	1.2	344	10

	Workpiece	Hardness	Grade	vc (m/min)	fz (mm/t)	L Overhang (mm)	Ø80-5 inserts					Ø100-6 inserts				
							n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)	n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)
P	General structure steel (General structural steel Mild steel)	Under 200HB	PC3525	180(120~230)	1.5	150	717	5374	1.4	602	18.3	573	5159	1.4	722	21.9
			PC3525	160(120~200)	1.3	250	637	4140	1.2	397	12.1	510	3975	1.2	477	14.5
			PC3545	150(100~170)	1.0	350	597	2986	1.0	239	7.3	478	2866	1.0	287	8.7
	General carbon steel, Alloy steel (S50C, SCM440 etc)	Under 30HRC	PC3525	160(130~190)	1.5	150	637	4777	1.2	459	13.9	510	4586	1.2	550	16.7
			PC3525	150(130~180)	1.3	250	597	3881	1.0	311	9.4	478	3726	1.0	373	11.3
			PC3545	130(100~150)	1.0	350	518	2588	0.8	166	5.0	414	2484	0.8	199	6.0
	High carbon steel, Alloy steel (Carbon steel Alloy steel, SKD etc)	30~40 HRC	PC3525	110(90~130)	1.3	150	438	2846	1.2	273	8.3	350	2732	1.2	328	10.0
			PC3545	100(80~130)	1.1	250	398	2189	1.0	175	5.3	318	2102	1.0	210	6.4
			PC3545	90(80~120)	1.5	350	358	2687	0.8	172	5.2	287	2580	0.8	206	6.3
	Hardened steel (NAK80, PX-5 etc)	40~50 HRC	PC3525	100(70~120)	1.1	150	398	2189	1.0	175	5.3	318	2102	1.0	210	6.4
				80(70~120)	0.9	250	318	1433	0.8	92	2.8	255	1376	0.8	110	3.3
M	Stainless steel (STS304, 316 etc)	Under 270HB	PC9530 PC8520	120(70~160)	1.3	150	478	3105	1.4	348	10.6	382	2981	1.4	417	12.7
					1.1	250	478	2627	1.2	252	7.7	382	2522	1.2	303	9.2
K	Cast iron (GC300 etc)	Under 350N/mm²	PC6510	150(100~200)	1.7	150	597	5076	1.4	568	17.3	478	4873	1.4	682	20.7
					1.5	250	597	4479	1.2	430	13.1	478	4299	1.2	516	15.7

	Workpiece	Hardness	Grade	vc (m/min)	fz (mm/t)	L Overhang (mm)	Ø125-6 inserts					Ø160-7 inserts				
							n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)	n(min⁻¹)	vf(mm/min)	ap(mm)	Q(cm³/min)	Pc(kW)
P	General structure steel (General structural steel Mild steel)	Under 200HB	PC3525	180(120~230)	1.5	150	459	4127	1.4	722	21.9	358	3762	1.4	843	25.6
			PC3525	160(120~200)	1.3	250	408	3180	1.2	477	14.5	318	2898	1.2	556	16.9
			PC3545	150(100~170)	1.1	350	382	2522	1.0	315	9.6	299	2299	1.0	368	11.2
	General carbon steel, Alloy steel (S50C, SCM440 etc)	Under 30HRC	PC3525	160(130~190)	1.4	150	408	3424	1.2	514	15.6	318	3121	1.2	599	18.2
			PC3525	150(130~180)	1.2	250	382	2752	1.0	344	10.4	299	2508	1.0	401	12.2
			PC3545	130(100~150)	1.0	350	331	1987	0.8	199	6.0	259	1811	0.8	232	7.0
	High carbon steel, Alloy steel (Carbon steel Alloy steel, SKD etc)	30~40 HRC	PC3525	110(90~130)	1.3	150	280	2186	1.2	328	10.0	219	1992	1.2	383	11.6
			PC3545	100(80~130)	1.1	250	255	1682	1.0	210	6.4	199	1533	1.0	245	7.5
			PC3545	90(80~120)	0.9	350	229	1238	0.8	124	3.8	179	1129	0.8	144	4.4
	Hardened steel (NAK80, PX-5 etc)	40~50 HRC	PC3525	100(70~120)	1.0	150	255	1529	1.0	191	5.8	199	1393	1.0	223	6.8
				80(70~120)	0.8	250	204	978	0.8	98	3.0	159	892	0.8	114	3.5
M	Stainless steel (STS304, 316 etc)	Under 270HB	PC9530 PC8520	120(70~160)	1.2	150	306	2201	1.4	385	11.7	239	2006	1.4	449	13.7
					1.0	250	306	1834	1.2	275	8.4	239	1672	1.2	321	9.8
K	Cast iron (GC300 etc)	Under 350N/mm²	PC6510	150(100~200)	1.7	150	382	3898	1.4	682	20.7	299	3553	1.4	796	24.2
					1.5	250	382	3439	1.2	516	15.7	299	3135	1.2	602	18.3

HRM Applicable arbor

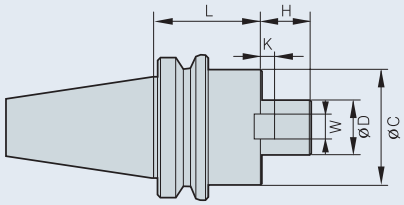


Fig. 1

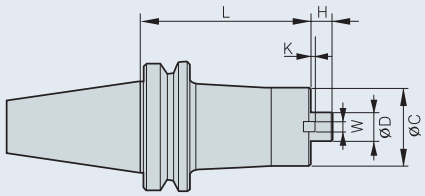


Fig. 2

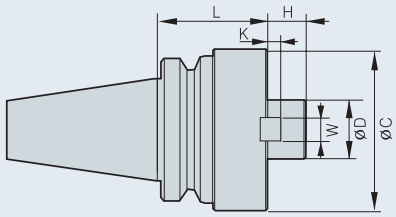


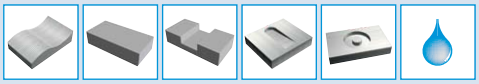
Fig. 3

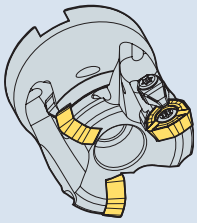
Designation		Applicable arbor	Stock	Fig.	Taper No.	Dimensions (mm)						kg	Bolt
						ØD	L	ØC	H	W	K		
HRMCM	13050HR-3 13050HR-4 13063HR-4 15063HR-3	BT30-FMC22-45	●	3	BT30	22	45	48	19	10	5.6	1.2	SB1035
		SK30-FMC22-50	●	3	SK30	22	50	48	19	10	5.6	1.2	
		BT40-FMC22-45	●	1	BT40	22	45	48	19	10	5.6	2.0	
		SK40-FMC22-55	●	1	BT50	22	55	48	19	10	5.6	2.0	
		BT50-FMC22-60	●	1	BT50	22	60	48	19	10	5.6	3.6	
		BT50-FMC22-200	●	2	BT50	22	200	48	19	10	5.6	6.5	
		BT50-FMC22-250	●	2	BT50	22	250	48	19	10	5.6	7.4	
		SK50-FMC22-55	●	1	SK50	22	55	48	19	10	5.6	3.6	
	13080HR-5 15080HR-4	SK30-FMC27-55	●	3	SK30	27	55	60	21	12	6.3	1.5	SB1245
		BT40-FMC27-60	●	3	BT40	27	60	60	21	12	6.3	2.5	
		SK40-FMC27-55	●	3	SK40	27	55	60	21	12	6.3	2.5	
		SK40-FMC27-90	●	3	SK40	27	90	60	21	12	6.3	3.4	
		BT50-FMC27-150	●	1	BT50	27	150	60	21	12	6.3	6.2	
		SK50-FMC27-55	●	1	SK50	27	55	60	21	12	6.3	2.5	
		SK50-FMC27-150	●	1	SK50	27	150	60	21	12	6.3	5.6	
	15100HR-5 15100HR-6	BT40-FMC32-60	●	3	BT40	32	60	78	24	14	7	3.4	SB1645
		SK40-FMC32-60	●	3	SK40	32	60	78	24	14	7	3.4	
		SK50-FMC32-50	●	1	SK50	32	50	78	24	14	7	4.2	
		SK50-FMC32-105	●	1	SK50	32	105	78	24	14	7	6.8	
	15125HR-6	SK50-FMC40-60	●	3	SK50	40	60	89	27	16	8	7.6	SB2040
	15160R-7												MBA-M20

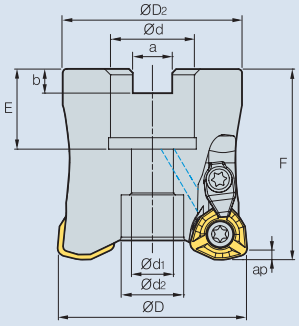
● : Stock item ○ : Under preparing for stock

HRMCM13/15

AA 75°







(mm)

Designation		Stock		øD	øD2	ød	a	b	E	F	ød1	ød2	ap	kg	Bolt	Fig.
HRMCM	13050HR-3	●	3	50	47	22	10.4	6.3	21	50	11	16.4	2.0	0.4	SB1035	1
	13050HR-4	●	4	50	47	22	10.4	6.3	21	50	11	16.4	2.0	0.4	SB1035	1
	13063HR-4	●	4	63	60	22	10.4	6.3	21	50	11	17	2.0	0.7	SB1035	1
	13080HR-5	●	5	80	76	27	12.4	7	23	70	13	20	2.0	1.6	SB1245	1
HRMCM	15063HR-3	●	3	63	60	22	10.4	6.3	21	50	11	17	2.5	0.7	SB1035	1
	15080HR-4	●	4	80	76	27	12.4	7	23	70	13	20	2.5	1.7	SB1245	1
	15100HR-5	●	5	100	96	32	14.4	8	26	70	18	26	2.5	2.8	SB1645	1
	15100HR-6	●	6	100	96	32	14.4	8	26	70	18	26	2.5	3.2	SB1645	1
	15125HR-6	○	6	125	98	40	16.4	9	29	63	22	32	2.5	3.3	SB2040	1
	15160R-7	○	7	160	100	40	16.4	9	35	63	-	72	2.5	4.3	MBA-M20	2

Note) Through coolant type between ø 50~ ø 125

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Clamp	Clamp Screw	C-Ring	Wrench
13 Type (Ø50,63,80)	FTGA0513-P	CHH4.5R1	CTX04513H	CR03	TW20-100
15Type (Ø63,80,100, 125, 160)	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20-100

● Available Arbors

Designation		Arbors
HRMCM	13050HR-3	BT30 / BT40 / BT50 FMC22
	13050HR-4	SK30 / SK40 / SK50 FMC22
	13063HR-4	
	13080HR-5	BT40 / BT50 / SK30 / SK40 / SK50 FMC27
HRMCM	15063HR-3	BT30 / BT40 / BT50 FMC22
	15080HR-4	SK30 / SK40 / SK50 FMC22
	15100HR-5	BT40 / BT50 / SK30 / SK40 / SK50 FMC27
	15100HR-6	BT40 / SK40 / SK50 FMC32
	15125HR-6	SK50 FMC40
	15160R-7	

• Applicable inserts, see pages E25
• Detail cutter spec. see pages E172~E174

● Available Inserts

WDKT-MH

Designation		Coated						Type	Page
		PC3525	PC3535	PC3545	PC8520	PC9530	PC6510		
WDKT	130520ZDSR-MH	●	●	●	●	●	●	13Type	E25
WDKT	150625ZDSR-MH	●	●	●	●	●	●	15Type	E25

● : Stock item ○ : Under preparing for stock

● Available bolt

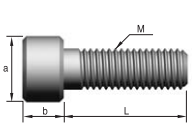


Fig. 1

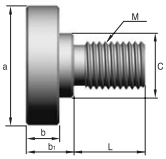
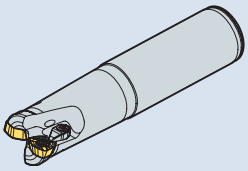


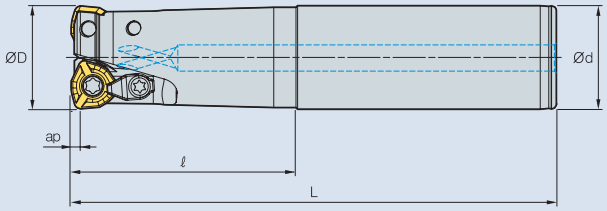
Fig. 2

Designation	Dimensions(mm)						
	a	b	b1	c	L	Pitch	Fig.
SB1035	16	10	-	-	35	1.5	1
SB1245	18	12	-	-	45	1.75	1
SB1645	24	16	-	-	45	2.0	1
SB2040	30	20	-	-	40	2.5	1
MBA-M20	50	14	20	27	30	2.5	2
MBA-M24	65	14	24	37	36	3.0	2

HRMS 08/10/13

AA 75°





(mm)

Designation		Stock		øD	ød	L	ℓ	ap	kg
HRMS	0820HR-2S20	●	2	20	20	130	50	1.0	0.3
	0820HR-2M20	●	2	20	20	180	100	1.0	0.4
	0820HR-2L20	●	2	20	20	250	130	1.0	0.5
	0821HR-2S20	●	2	21	20	130	50	1.0	0.3
	0821HR-2M20	●	2	21	20	180	50	1.0	0.4
	0821HR-2L20	●	2	21	20	250	50	1.0	0.5
HRMS	1025HR-2S25	●	2	25	25	140	60	1.5	0.4
	1025HR-2M25	●	2	25	25	200	120	1.5	0.6
	1025HR-2L25	●	2	25	25	300	180	1.5	0.9
	1026HR-2S25	●	2	26	25	140	60	1.5	0.4
	1026HR-2M25	●	2	26	25	200	60	1.5	0.6
	1026HR-2L25	●	2	26	25	300	60	1.5	1.0
	1030HR-2S32	●	2	30	32	150	70	1.5	0.8
	1030HR-2M32	●	2	30	32	200	120	1.5	1.0
	1030HR-2L32	●	2	30	32	300	180	1.5	1.5
HRMS	1332HR-2S32	●	2	32	32	150	70	2.0	0.8
	1332HR-2M32	●	2	32	32	200	120	2.0	1.0
	1332HR-2L32	●	2	32	32	300	180	2.0	1.6
	1333HR-2S32	●	2	33	32	150	70	2.0	0.8
	1333HR-2M32	●	2	33	32	200	70	2.0	1.1
	1333HR-2L32	●	2	33	32	300	70	2.0	1.7
	1335HR-2S32	●	2	35	32	150	50	2.0	0.8
	1335HR-2M32	●	2	35	32	200	50	2.0	1.1
	1335HR-2L32	●	2	35	32	300	50	2.0	1.7
	1340HR-3S32	●	3	40	32	150	50	2.0	0.8
	1340HR-3M32	●	3	40	32	250	50	2.0	1.4
	1340HR-3L32	●	3	40	32	300	50	2.0	1.7
New	1340HR-3S40	○	3	40	40	150	60	2.0	1.2
New	1340HR-3M40	○	3	40	40	250	130	2.0	2.1
New	1340HR-3L40	○	3	40	40	300	180	2.0	2.6
	1340HR-3S42	●	3	40	42	150	60	2.0	1.4
	1340HR-3M42	●	3	40	42	250	130	2.0	2.3
	1340HR-3L42	●	3	40	42	300	180	2.0	2.7

Note) Through coolant type between ø 20~ ø 40

● : Stock item ○ : Under preparing for stock

● Parts

		Screw	Clamp	Clamp Screw	C-Ring	Wrench	
						A	B
08 Type		FTNA0306	-	-	-	TW09P	A
10 Type		FTNA0408	CHH3.5R1	CTX03510	CR03	TW15S	B
13 Type	Ø32,33,35	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	TW20	
	Ø40	FTGA0512-P	CHH4.5R1	CTX04513H	CR03	TW20	

• Applicable inserts, see pages E25

● Available Inserts

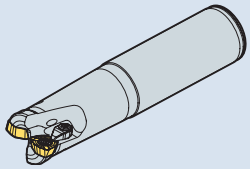
WDKT-MH

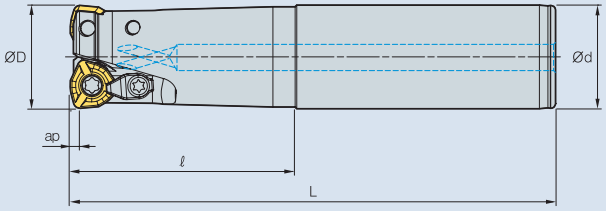
Designation	Coated						Type	Page
	PC3525	PC3535	PC3545	PC8520	PC9530	PC6510		
WDKT 080316ZDSR-MH	●	●	●	●	●	●	08 Type	E25
WDKT 10T320ZDSR-MH	●	●	●	●	●	●	10 Type	
WDKT 130520ZDSR-MH	●	●	●	●	●	●	13 Type	

● : Stock item ○ : Under preparing for stock

HRMS15

AA 75°





(mm)

Designation		Stock		øD	ød	L	ℓ	ap	kg
HRMS	1550HR-3S32 New	○	3	50	32	150	50	2.5	1.0
New	1550HR-3M32	○	3	50	32	250	50	2.5	1.6
New	1550HR-3L32	○	3	50	32	300	50	2.5	1.9
New	1550HR-3S40	○	3	50	40	150	50	2.5	1.4
New	1550HR-3M40	○	3	50	40	250	50	2.5	2.3
New	1550HR-3L40	○	3	50	40	300	50	2.5	2.8
	1550HR-3S42	●	3	50	42	150	50	2.5	1.5
	1550HR-3M42	●	3	50	42	250	50	2.5	2.5
	1550HR-3L42	●	3	50	42	300	50	2.5	3.0
New	1563HR-4S32	○	4	63	32	150	50	2.5	1.3
New	1563HR-4M32	○	4	63	32	250	50	2.5	1.9
New	1563HR-4L32	○	4	63	32	300	50	2.5	2.2
New	1563HR-4S40	○	4	63	40	150	50	2.5	1.7
New	1563HR-4M40	○	4	63	40	250	50	2.5	2.6
New	1563HR-4L40	○	4	63	40	300	50	2.5	3.1
	1563HR-4S42	●	4	63	42	150	50	2.5	1.8
	1563HR-4M42	●	4	63	42	250	50	2.5	2.8
	1563HR-4L42	●	4	63	42	300	50	2.5	3.3

Note) Through coolant type between ø50~ ø63

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Clamp	Clamp Screw	C-Ring	Wrench
Ø50,63	FTGA0513-P	CHH5.5R1	CTX0515	CR04	TW20

• Applicable inserts, see pages E25

● Available Inserts

WDKT-MH

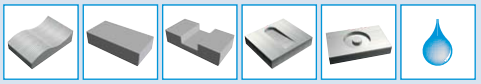
Designation	Coated						Page
	PC3525	PC3535	PC3545	PC8520	PC9530	PC6510	
WDKT 150625ZDSR-MH	●	●	●	●	●	●	E25

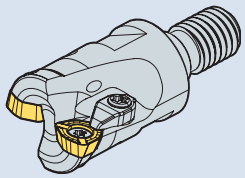
● : Stock item ○ : Under preparing for stock

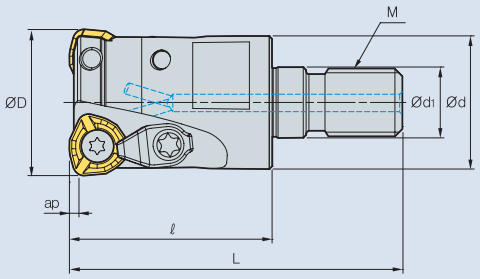
HRMM 08/10/13

New

AA 75°







(mm)

Designation		Stock	⊙	øD	ød	ød1	L	ℓ	M	ap	kg
HRMM	0820HR-M10	○	2	20	18	10.5	51	30	M10	1	0.06
	0821HR-M10	○	2	21	18	10.5	51	30	M10	1	0.06
	0825HR-M12	○	3	25	23	12.5	59	35	M12	1	0.11
	0826HR-M12	○	3	26	23	12.5	59	35	M12	1	0.11
	0828HR-M12	○	3	28	23	12.5	59	35	M12	1	0.12
	0832HR-M16	○	4	32	29	17	67	40	M16	1	0.21
	0833HR-M16	○	4	33	29	17	67	40	M16	1	0.21
	0835HR-M16	○	4	35	29	17	67	40	M16	1	0.23
	0840HR-M16	○	5	40	29	17	67	40	M16	1	0.25
HRMM	1025HR-M12	○	2	25	23	12.5	59	35	M12	1.5	0.1
	1026HR-M12	○	2	26	23	12.5	59	35	M12	1.5	0.1
	1030HR-M16	○	2	30	29	17	67	40	M16	1.5	0.2
	1032HR-M16	○	3	32	29	17	72	45	M16	1.5	0.26
	1035HR-M16	○	3	35	29	17	72	45	M16	1.5	0.23
	1040HR-M16	○	4	40	29	17	72	45	M16	1.5	0.27
HRMM	1332HR-M16	○	2	32	29	17	67	40	M16	2	0.17
	1333HR-M16	○	2	33	29	17	67	40	M16	2	0.17
	1335HR-M16	○	2	35	29	17	67	40	M16	2	0.19
	1340HR-M16	○	3	40	29	17	72	45	M16	2	0.24

Note) Through coolant type between ø 20~ ø 40

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Clamp	Clamp Screw	C-Ring	Wrench		
08 Type	FTNA0306	-	-	-	TW09P	-	-
10 Type	FTKA0408	CHH3.5R1	CTX03510	CR03	-	TW15S	-
13 Type (Ø 32,33,35)	FTGA0510-P	CHH4.5R1	CTX04513H	CR03	-	-	TW20
13 Type(Ø 40)	FTGA0512-P	CHH4.5R1	CTX04513H	CR03	-	-	TW20

● Available Adaptors

Designation		Available Adaptor	Designation		Available Adaptor
HRMM	0820HR-M10	MAT - M10	HRMM	1025HR-M12	MAT - M12
	0821HR-M10	MAT - M10		1026HR-M12	MAT - M12
	0825HR-M12	MAT - M12		1030HR-M16	MAT - M16
	0826HR-M12	MAT - M12		1032HR-M16	MAT - M16
	0828HR-M12	MAT - M12		1035HR-M16	MAT - M16
	0832HR-M16	MAT - M16		1040HR-M16	MAT - M16
	0833HR-M16	MAT - M16		1332HR-M16	MAT - M16
	0835HR-M16	MAT - M16		1333HR-M16	MAT - M16
	0840HR-M16	MAT - M16		1335HR-M16	MAT - M16
				1340HR-M16	MAT - M16

• Applicable inserts, see pages E25
• Applicable adaptor, see pages E133~E134

● Available Inserts

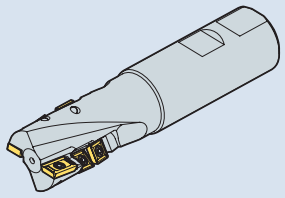
WDKT-MH

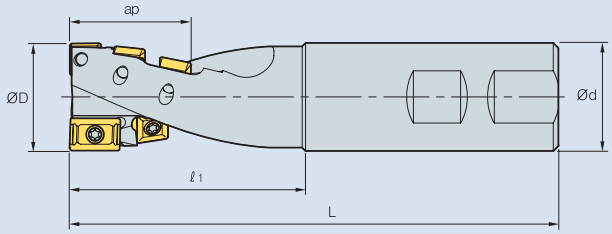
Designation		Coated						Type	Page
		PC3525	PC3535	PC3545	PC8520	PC9530	PC6510		
WDKT	080316ZDSR-MH	●	●	●	●	●	●	08 Type	E25
WDKT	10T320ZDSR-MH	●	●	●	●	●	●	10 Type	E25
WDKT	130520ZDSR-MH	●	●	●	●	●	●	13 Type	E25

● : Stock item ○ : Under preparing for stock

THE

AA 0°





(mm)

Designation		Stock R	Stock L	ØD	Ød	L	ℓ1	Available Inserts: Lower cutting edge	Available Inserts: External cutting edge	ap	No. of column	kg
THE	25R	●		25	25	120	55	APLT070304R 1z	SPMT060304 4z	25	2	0.4
	32R	●		32	32	145	70	ADLT150308R 1z	SDMT090308-MM 5z	40	2	0.5
	40R	●		40	42	175	88	ZPMT1504PPSR-MM 1z	SPMT120408-MM 5z	54	2	1.3
	50R	●		50	42	175	85	ZPMT1504PPSR-MM 2z	SPMT120408-MM 10z	54	4	1.4

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench	
THE 25R	ETNA02506	TW07P	-
32R	ETNA0408	-	TW15S
40R	ETNA0511	-	TW20S
50R	ETNA0511	-	TW20S

● Recommended Cutting Condition

- Grooving

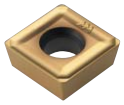
Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	60~120	0.06~0.2	NCM325
M	50 ~ 120	0.06~0.15	NCM325
K	60~120	0.1~0.2	NCM325

- Side cutting

Workpiece	Cutting Condition vc(m/min)	Cutting Condition fz(mm/t)	Grades
P	100 ~180	0.1 ~ 0.35	NCM325
M	80 ~ 180	0.1 ~ 0.3	NCM325
K	80 ~150	0.15~ 0.35	NCM325

• Applicable inserts, see pages E10, E11, E18, E23, E25

● Available Inserts

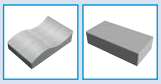
ADLT	APLT	SPMT-MM
		
SPMT	**SDMT-MM**	**ZPMT-MM**

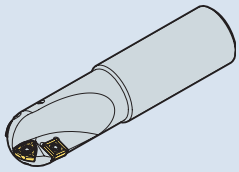
Designation	Coated NCM325	Coated PC3525	Coated PC3535	Coated PC3545	Coated PC6510	Page
SPMT 060304	●	○	●			E23
SDMT 090308-MM	○	○			○	E18
SPMT 120408-MM		○		○		E23
APLT 070304R	●	○				E11
ADLT 150308R	●					E10
ZPMT 1504PPSR-MM		○		○		E25

● : Stock item ○ : Under preparing for stock

BRE

• AR : 0~10°
• RR : -3~0°





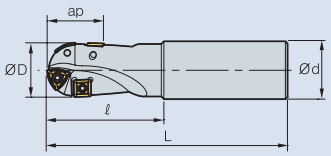


Fig. 1

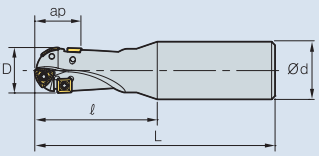


Fig. 2

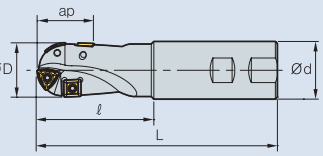


Fig. 3

(mm)

Designation		Stock	ØD	L	Ød	ℓ	ap	Available Inserts		Parts		h	Fig.	kg
								Lower cutting edge	External cutting edge	Screw	Wrench			
BRE	20R-S		20	125	20	75	20	ZDMT080310R-MM	SPMT060304	ETNA02506	TW07P	-	1	0.3
	20R-M	●	20	150	20	75	20					-	1	0.3
	20R-L		20	200	25	100	20					-	2	0.3
	20R-SL		20	125	25	60	20					18.2	3	0.3
	25R-S	●	25	150	25	80	23	ZDMT110312.5R-MM	SPMT060304	ETNA02506	TW07P	-	1	0.5
	25R-M	●	25	175	25	80	23					-	1	0.5
	25R-L		25	200	32	100	23					-	2	0.4
	25R-SL		25	135	25	60	23					23	3	0.4
	32R-S	●	32	175	32	90	31	ZDMT130416R-MM	SDMT090308-MM	ETNA0408	TW15S	-	1	0.9
	32R-M	●	32	200	32	100	31					-	1	0.9
	32R-L		32	250	32	100	31					-	1	0.7
	32R-SL		32	150	32	75	31					30	3	0.7
	40R-S	●	40	175	42	90	41	ZPMT160520R-MM	SPMT120408-MM	ETNA0511	TW20S	-	1	1.3
	40R-M	●	40	200	42	100	41					-	1	1.3
	40R-L		40	250	42	100	41					-	1	1.3
	40R-SL		40	160	42	80	41					40	3	1.3
	50R-S		50	200	42	100	45	ZPMT160525R-MM	SPMT120408-MM	ETNA0511	TW20S	-	1	2.6
	50R-L		50	300	42	200	45					-	1	2.6
	50R-SL	●	50	250	42	150	45					40	3	2.6
	63R-S		63	200	42	100	52	ZPMT160531.5R-MM	SPMT120408-MM	ETNA0511	TW20S	-	1	3.0
	63R-L		63	300	42	200	52					-	1	3.0
	63R-SL		63	250	42	150	52					40	3	3.0

● : Stock item ○ : Under preparing for stock

● Recommended Cutting Condition

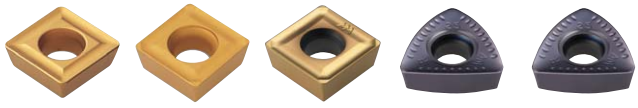
Machining • Slotting-A • Shouldering(general cutting edge)-B • Shouldering(long cutting edge)-C

Workpiece		Hardness	Cutting Condition		Mach-ining
			vc(m/min)	fz(mm/t)	
P	Carbon steel, Alloy steel (S50, SCM440)	180 ~ 280HB	260(180 ~ 310)	0.125(0.1 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			240(160 ~ 290)	0.1(0.05 ~ 0.15)	C
		280 ~ 380HB	190(130 ~ 230)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			170(120 ~ 200)	0.1(0.05 ~ 0.15)	C
	Pre-Hardened (NAK55)	35 ~ 45H_RC	170(110 ~ 190)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			160(110 ~ 180)	0.1(0.05 ~ 0.15)	C
	High alloy steel (STD, STT)	≤300HB	190(130 ~ 230)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			170(120 ~ 200)	0.1(0.05 ~ 0.15)	C
M	Stainless steel (STS4202J)	≤260HB	260(180 ~ 310)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			240(160 ~ 290)	0.1(0.05 ~ 0.15)	C
K	General cast iron (GC250)	Tensile strength ≤350MPa	260(180 ~ 310)	0.15(0.1 ~ 0.2)	A
				0.15(0.1 ~ 0.2)	B
			240(160 ~ 290)	0.1(0.05 ~ 0.15)	C
	Ductile cast iron (GCD450)	Tensile strength 360~500MPa	200(140 ~ 240)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			190(130 ~ 230)	0.1(0.05 ~ 0.15)	C
	Ductile cast iron (GCD450)	Tensile strength 500~800MPa	170(100 ~ 200)	0.1(0.05 ~ 0.15)	A
				0.15(0.1 ~ 0.2)	B
			150(110 ~ 180)	0.1(0.05 ~ 0.15)	C
H	Hardened steel (STD, STT)	45 ~ 60H_RC	110(70 ~ 130)	0.15(0.1 ~ 0.2)	A
				0.15(0.1 ~ 0.2)	B
			100(60 ~ 120)	0.1(0.05 ~ 0.15)	C

• Applicable inserts, see pages **E18, E23, E25**

● Available Inserts

SDMT-MM	SPMT	SPMT-MM	ZDMT-MM	ZPMT-R-MM



Designation		Coated				Page
		NCM325	PC3525	PC3545	PC6510	
SDMT	090308-MM	○	○		○	E18
SPMT	060304	●				E23
	120408-MM					
ZDMT	080310R-MM		○	○		E25
	110312.5R-MM		○	○		
	130416R-MM		○	○		
ZPMT	160520R-MM		○	○		E25
	160525R-MM		○	○		
	160531.5R-MM		○	○		

● : Stock item ○ : Under preparing for stock

● Parts

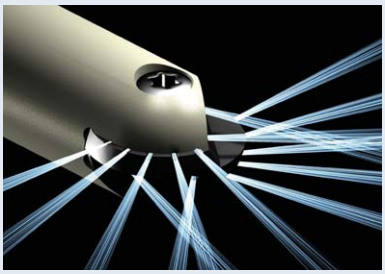
Screw	Wrench	
ETNA02506*, ETNA0408**, ETNA0511	TW15S**, TW20S	TW07P*

* for BRE20, BRE25 **for BRE 32

Technical Information for Laser Mill

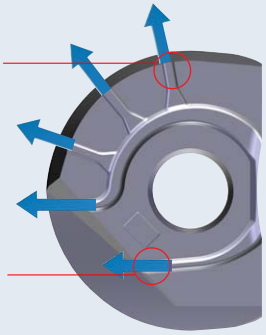
■ Features

- Long tool life has been achieved due to the excellent cutting performance of the grade.
- Optimum machining of mold has been achieved due to 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.



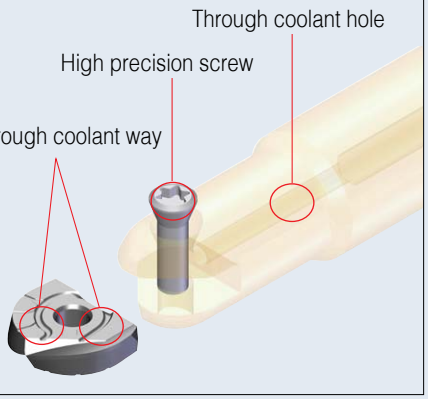
- Environmental friendly system
- Decreased coolant cost
- Lubrication of cutting edge
- Improved chip control property
- Increased tool life & improved surface quality

■ Features



- Sub coolant way
- Main coolant way

- High tolerance insert
  - Run-out: under 0.02mm
  - R form accuracy : under 0.01mm
- Through coolant system

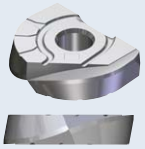


■ Features

LBE

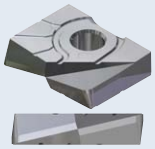
- Six types of inserts are available with one holder
- Single screw for clamping of insert : easy clamping system
- Various types holders like Steel, Carbide, Modular types
- MQL applicable - suitable for longer tool life & improving surface quality

LBH-Ball



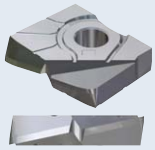
- Helical cutting edge.
- Suitable for hard material and high feed rate.

LRH-Corner radius



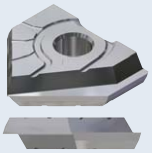
- Helical cutting edge.
- Various nose R.

LFH-High feed



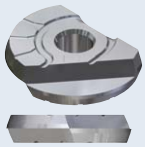
- Helical cutting edge.
- Suitable for high feed rate.

LCF-Chamfer



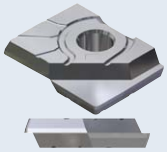
- Straight cutting edge.
- Center drilling and chamfering.

LBS-Ball type



- Straight cutting edge.
- Suitable for precise carving.

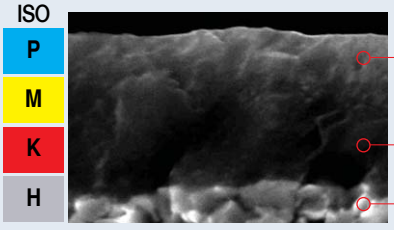
LR-Corner R type



- Straight cutting edge.
- Various nose R.

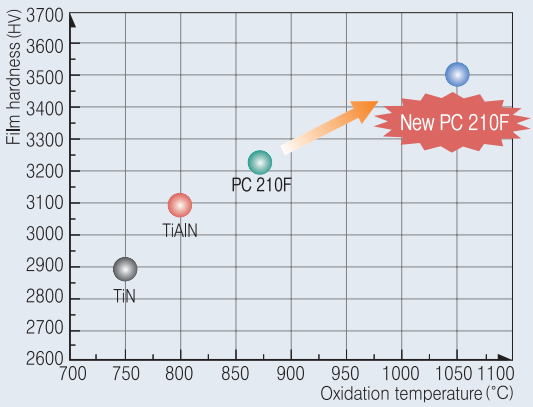
LBS, LR order-made items

■ New PC210F



- Improvement of hardness and oxidation resistance.
- Improvement of adhesion and chipping resistance.
- Ultra fine substrate.

- Due to the ultra fine carbide, toughness of cutting edge has been increased
- Special coating has been applied for high-speed machining & hardened workpiece.
- High quality of machined surface due to the excellent lubrication property of the film.



■ Cutting condition formula for milling

• Cutting speed

$$vc = \frac{\pi \times D \times n}{1000} (m/min)$$

• RPM

$$n = \frac{vc \times 1000}{\pi \times D} (min^{-1})$$

• Feed per tooth

$$fz = \frac{vf}{n \times z} (mm/t)$$

• Feed per minute

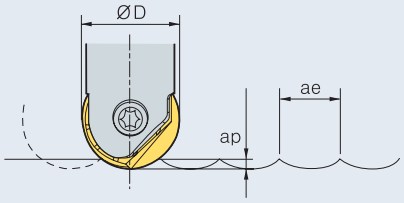
$$vf = fz \times n \times z (mm/min)$$

• Chip removal amount

$$Q = \frac{ap \times ae \times vf}{1000} (cm^3/min)$$

• Power requirement

$$Pc = \frac{Q \times kc}{1000} (kW) \qquad H = \frac{Pc}{0.75} (kW)$$



vc = Cutting speed(m/min)
n = Revolution per Minute(min^{-1})
Dc = Cutting diameter(mm)
vf = Feed per a minute(mm/min)
fz = Feed per tooth(mm/t)
z = Number of tooth

W = Power requirement(kw)
H = Horsepower requirement(Hp)
Q = Chip removal amount(cm^3/min)
ap = Depth of cut(mm)
ae = Width of cut(mm)
Ks = Specific cutting resistance(kg/mm^2)
η = Mechanical efficiency(%)

■ Recommended cutting condition

Workpiece	Recommended grade	Hardness	vc (m/min)	fz (mm/t)	ap	ae
					ap(mm)	ae(mm)
Carbon steel, Alloy steel	PC210F	Under HRC30	100~250	0.2~0.3	0.07D	0.07D
Carbon steel, Alloy steel	PC210F	HRC 30~40	80~150	0.1~0.3	0.07D	0.07D
Die steel	PC210F	HRC 30~40	80~150	0.1~0.2	0.05D	0.05D
Cast iron	PC210F	-	100~200	0.3~0.35	0.07D	0.07D
Hardened steel	PC210F	HRC 50~60	100~150	0.1~0.3	0.03D	0.03D
Stainless steel	PC210F	-	80~150	0.1~0.3	0.05D	0.05D
Aluminum alloy	PC210F	-	200~300	0.15~0.4	0.15D	0.15D

- Practical cutting speed calculation formulas

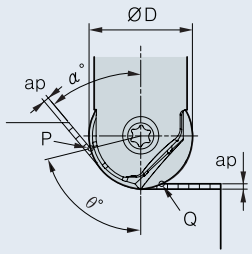
1. θ ° Using : Calculating cutting speed at P point
(Cutting speed according to depth of cut when ramping)
• Formula : Practical cutting speed

$$vc = \frac{\pi \times Dsin \times \theta n}{1000} (m/min)$$

$$\theta = \cos -1\left(\frac{D - 2ap}{D}\right) + 90 - \alpha°$$

2. In case of using ap : Calculating cutting speed at Q point
• Formula : Practical cutting speed

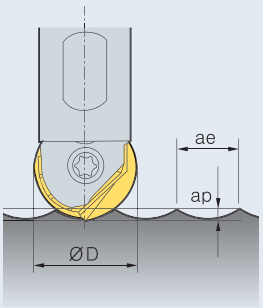
$$vc = \frac{2\pi n\sqrt{ap(D-ap)}}{1000}$$



■ Practical cutting speed calculation formulas

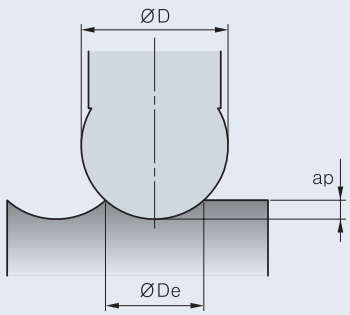
ae(mm) / R(mm)	h(surface roughness) (μm)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5	0.3	1.0	2.3	4.0	6.3	9.0	12.3	16.0	20.3	25.0
6	0.2	0.8	1.9	3.3	5.2	7.5	10.2	13.3	16.9	20.8
8	0.2	0.6	1.4	2.5	3.9	5.6	7.7	10.0	12.7	15.6
10	0.1	0.5	1.1	2.0	3.1	4.5	6.1	8.0	10.1	12.5
12.5	0.1	0.4	0.9	1.6	2.5	3.6	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 : $h(\text{surface finish}) = \frac{(ae)^2}{8R} \times 1000(\mu m)$



■ 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

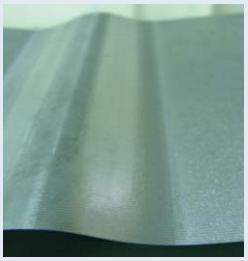
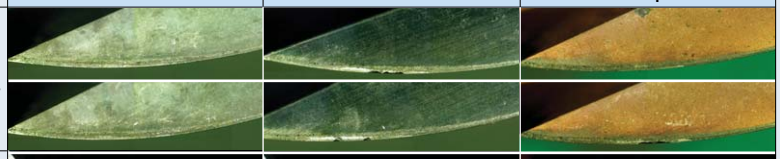
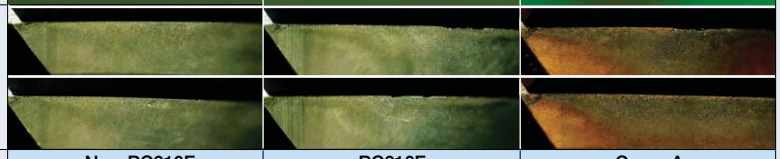
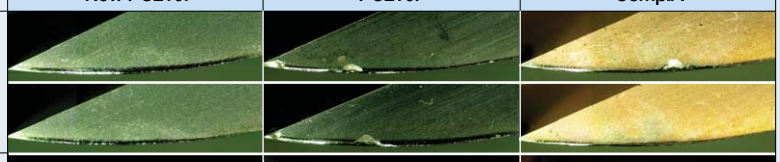
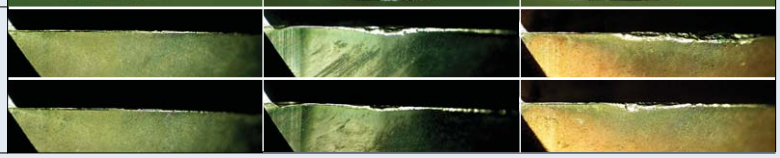


• Formula of actual diameter

$$De = 2\sqrt{ap(D-ap)}$$

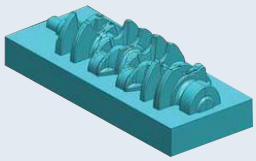
Technical Information for Laser Mill

■ Wear resistance test

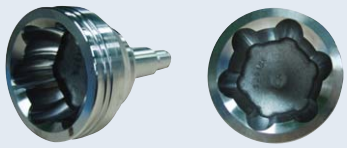
Test conditions		Pictures			
 Cutting time : 15 hours	NAK80(HRC30), Air vc(m/min) = 376 fz(mm/t) = 0.33 ap(mm) = 0.5 ae(mm) = 0.5 vf(mm/min) = 4,000 n(min^{-1}) = 6,000		New PC210F	PC210F	Comp.A
		Front, back view			
		Top view			
Cutting time : 8 hours	SKD11(HRC50~65), Air vc(m/min) = 251 fz(mm/t) = 0.38 ap(mm) = 0.5 ae(mm) = 0.3 vf(m/min) = 3,000 n(min^{-1}) = 4,000		New PC210F	PC210F	Comp.A
		Front, back view			
		Top view			

■ Machining example

● Crank Shaft

	Specifications	Workpiece
Holder	LBE200115T-S25	
Insert	LBH200 (PC210F)	
Workpiece	SCM440 (HRC 40)	
cutting condition	vc(m/min) = 376 / fz(mm/t) = 0.25 / ap(mm) = 0.5 ae(mm) = 0.2 / n(min^{-1}) = 6000 / vf(mm/min) = 3000 / MQL	

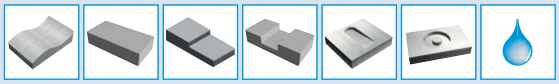
● CV-Joint

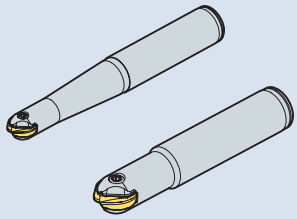
	Specifications	Workpiece
Holder	LBE230-HSKC63	
Insert	LBH230 (PC210F)	
Workpiece	S53C(HRC 35)	
cutting condition	vc(m/min) = 200 / fz(mm/t) = 0.25 / ap(mm) = 0.5~2.0 ae(mm) = 0.5~1.0 / n(min^{-1}) = 3000 / vf(mm/min) = 1500 / Air	

● Car Bumper Mold

	Specifications	Workpiece
Holder	LBE250170S-S25C	
Insert	LBH250 (PC210F)	
Workpiece	KP4MA (HRC30~35)	
cutting condition	vc(m/min) = 700 / fz(mm/t) = 0.25 / ap(mm) = 0.5 ae(mm) = 0.2 / n(min^{-1}) = 9000 / vf(mm/min) = 4500 / Air	

LBE 08/10/12/16
20/25/30/32(Steel shank)





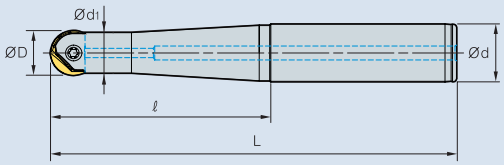


Fig.2

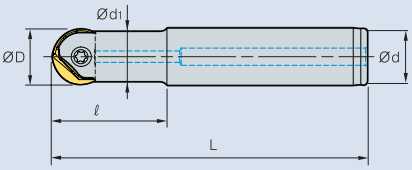


Fig.1

(mm)

Designation		Stock R	Stock L	øD	ℓ	L	ød	ød1	Parts: Clamp Screw	Parts: Wrench	Available Inserts(Ø)	Fig.
LBE	080035T-S12	●		8	35	91	12	7.2	ETND02506F	TWP07S	8	1
	080055T-S12	●		8	55	111	12	7.2				1
	080075T-S12	●		8	75	131	12	7.2				1
	100035T-S12	●		10	35	91	12	9	ETND0307F	TWP08S	10	1
	100055T-S12	●		10	55	111	12	9				1
	100075T-S12	●		10	75	131	12	9				1
	120035S-S12	●		12	35	91	12	10.4	ETND03509	TWP10S	12	2
	120055T-S12	●		12	55	111	12	10.4				1
	120085T-S16	●		12	85	145	16	10.4				1
	160035S-S16	●		16	35	95	16	14	ETND0413	TWP15S	16	2
	160065T-S16	●		16	65	125	16	14				1
	160100T-S20	●		16	100	170	20	14				1
	200040S-S20	●		20	40	110	20	17.5	ETKD0516	TWP20	20	2
	200075T-S20	●		20	75	145	20	17.5				1
	200115T-S25	●		20	115	195	25	17.5				1
	250045S-S25	●		25	40	125	25	22	ETKD0620	TWP25	25	2
	250090T-S25	●		25	90	170	25	22				1
	250135T-S32	●		25	135	225	32	22				1
	300055S-S32	●		30	55	145	32	27	ETGD0825	TWP40	30	2
	300105T-S32	●		30	105	195	32	27				1
	300160T-S32	●		30	160	250	32	27				1
	320055S-S32	●		32	55	145	32	29	ETGD0825	TWP40	35	2
	320105T-S32	●		32	105	195	32	29				1
	320160T-S32	●		32	160	250	32	29				1

• Applicable inserts, see pages **E13, E14**

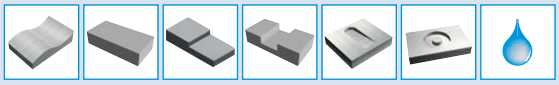
• T stands for taper type, S stands for straight type

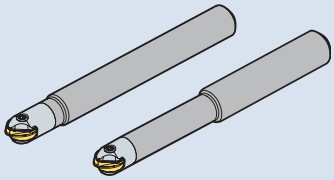
● : Stock item ○ : Under preparing for stock

■ Applicable inserts

Available 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				LBS080	
LBE100	LBH100	LRH100-R05 LRH100-R10 LRH100-R20	LFH100		LBS100	LR100-R05 LR100-R10 LR100-R20
LBE120	LBH120	LRH120-R05 LRH120-R10 LRH120-R20	LFH120		LBS120	LR120-R05 LR120-R10 LR120-R20
LBE160	LBH160	LRH160-R05 LRH160-R10 LRH160-R20 LRH160-R30	LFH100	LCF160-D90	LBS160	LR160-R05 LR160-R10 LR160-R20 LR160-R30
LBE200	LBH200	LRH200-R05 LRH200-R10 LRH200-R20 LRH200-R30	LFH200	LCF200-D90	LBS200	LR200-R05 LR200-R10 LR200-R20 LR200-R30
LBE250	LBH250	LRH250-R05 LRH250-R10 LRH250-R20 LRH250-R30	LFH250	LCF250-D90	LBS250	LR250-R05 LR250-R10 LR250-R20 LR250-R30
LBE300	LBH300	LRH300-R10 LRH300-R20 LRH300-R30	LFH300		LBS300	LR300-R10 LR300-R20 LR300-R30
LBE320	LBH320	LRH320-R10 LRH320-R20 LRH320-R30	LFH320		LBS320	LR320-R10 LR320-R20 LR320-R30

LBE08-C/10-C/12-C/16-C C/25-C/30-C/32-C(Carbide shank)





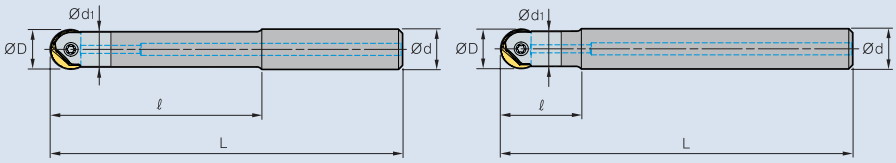


Fig.1 Fig.2

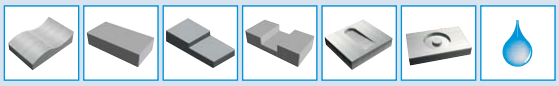
(mm)

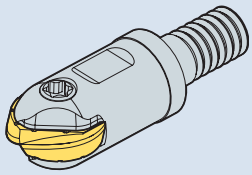
Designation		Parts	øD	ℓ	L	ød	ød1	Parts		Available Inserts(Ø)	Fig.
								Clamp Screw	Wrench		
LBE	080080S-S08C	●	08	80	136	8	7.2	ETND02506F	TWP07S	8	1
	080100S-S08C	●	08	100	156	8	7.2				1
New	080020S-S08C-130	●	08	20	130	8	7.2	ETND02506F	TWP07S	8	2
New	080020S-S08C-150	●	08	20	150	8	7.2				2
	100080S-S10C	●	10	80	136	10	09	ETND0307F	TWP08S	10	1
	100120S-S10C	●	10	120	176	10	09				1
New	100023S-S10C-130	●	10	23	130	10	09	ETND0307F	TWP08S	10	2
New	100023S-S10C-170	●	10	23	170	10	09				2
	120100S-S12C	●	12	100	156	12	10.4	ETND03509	TWP10S	12	1
	120150S-S12C	●	12	150	206	12	10.4				1
New	120025S-S12C-150	●	12	25	150	12	10.4	ETND03509	TWP10S	12	2
New	120025S-S12C-200	●	12	25	200	12	10.4				2
	160100S-S16C	●	16	120	160	16	14	ETND0413	TWP15S	16	1
	160150S-S16C	●	16	170	210	16	14				1
New	160030S-S16C-160	●	16	30	160	16	14	ETND0413	TWP15S	16	2
New	160030S-S16C-210	●	16	30	210	16	14				2
	200120S-S20C	●	20	140	190	20	17.5	ETKD0516	TWP20	20	1
	200170S-S20C	●	20	170	240	20	17.5				1
New	200035S-S20C-190	●	20	35	190	20	17.5	ETKD0516	TWP20	20	2
New	200035S-S20C-240	●	20	35	240	20	17.5				2
	200140S-S25C	●	25	140	220	25	22	ETKD0620	TWP25	25	1
	200170S-S25C	●	25	170	250	25	22				1
New	250040S-S25C-220	●	25	40	220	25	22	ETKD0620	TWP25	25	2
New	250040S-S25C-250	●	25	40	250	25	22				2
	300140S-S32C	●	30	140	230	32	27	ETGD0825	TWP40	30	1
	300170S-S32C	●	30	170	260	32	27				1
New	300050S-S32C-230	●	30	50	230	32	27	ETGD0825	TWP40	30	2
New	300050S-S32C-260	●	30	50	260	32	27				2
	320140S-S32C	●	32	140	230	32	29	ETGD0825	TWP40	32	1
	320170S-S32C	●	32	170	260	32	29				1
New	320050S-S32C-230	●	32	50	230	32	29	ETGD0825	TWP40	32	2
New	320050S-S32C-260	●	32	50	260	32	29				2

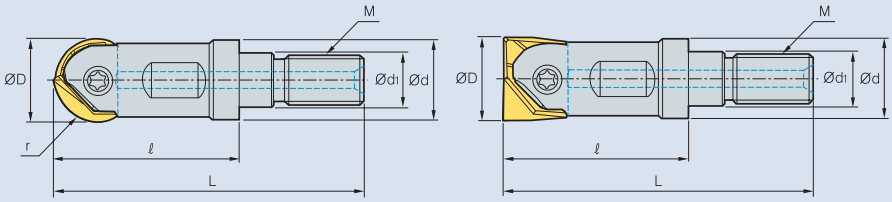
• Applicable inserts, see pages E13, E14, E117

● : Stock item ○ : Under preparing for stock

LBE-MHD







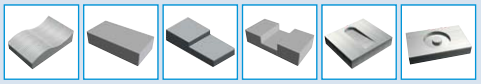
(mm)

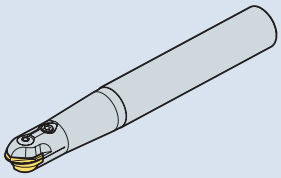
Designation	Stock	M	Ø D	r	L	ℓ	Ø d	Ø d1	Parts		Inserts(Ø)
									Clamp Screw	Wrench	
LBE100-MHD-M06	●	M06	10	5	40	25	9.5	6.5	ETND0307F	TWP08S	10
LBE120-MHD-M06	●	M06	12	6	40	25	11	6.5	ETND03509	TWP10S	12
LBE160-MHD-M08	●	M08	16	8	47	30	14.5	8.5	ETND0413	TWP15S	16
LBE200-MHD-M10	●	M10	20	10	56	35	18	10.5	ETKD0516	TWP20	20
LBE250-MHD-M12	●	M12	25	12.5	69	45	22.5	12.5	ETKD0620	TWP25	25
LBE300-MHD-M16	●	M16	30	15	77	50	28	17	ETGD0825	TWP40	30
LBE320-MHD-M16	●	M16	32	16	77	50	29	17	ETGD0825	TWP40	32

• Applicable inserts, see pages E13, E14, E117
• Applicable adaptors, see pages E133~E134

● : Stock item ○ : Under preparing for stock

BFE





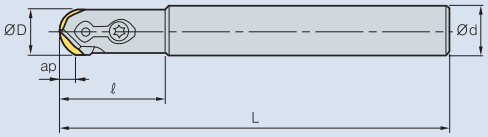


Fig.1

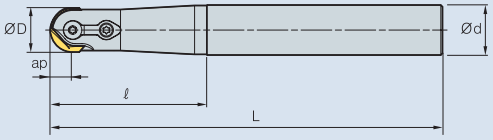


Fig.2

(mm)

Designation		Stock	øD	ℓ	L	ød	ap	kg	Fig.	Inserts(Ø)
BFE	16-S	●	16	36	140	16	8.0	0.2	1	RC16
	16-M	●	16	65	170	20	8.0	0.3	2	
	16-L	●	16	65	200	25	8.0	0.5	2	
	20-S	●	20	45	160	20	10.0	0.4	1	RC20
	20-M	●	20	80	200	25	10.0	0.6	2	
	20-L	●	20	80	250	25	10.0	0.8	2	
	25-S		25	45	160	25	12.5	0.7	1	RC25
	25-M	●	25	90	210	32	12.5	1.1	2	
	25-L	●	25	90	300	32	12.5	1.7	2	
	30-S		30	65	175	32	15.0	0.9	2	RC30
	30-M		30	100	250	32	15.0	1.4	2	
	30-L		30	100	350	32	15.0	2.0	2	
	32-S		32	56	175	32	16.0	0.9	1	RC32
	32-M	●	32	100	250	32	16.0	1.4	1	
	32-L	●	32	100	350	32	16.0	2.0	1	

• Applicable inserts, see pages E16

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Clamp	Clamp Screw	Stopper Ring	Wrench
R16	FTGA0513	CBH4.5R1	CTX04513	ER03	TW20
R20	FTGA0517	CBH4.5R2	CTX04513	ER03	TW20
R25	FTGA0621	CBH5R1	CTX0517	ER04	TW20
R30, 32	FTGA0826	CBH6R1	CTX0621	ER05	TW25

● Recommended Cutting Condition

Workpiece	Cutting Condition	
	vc(m/min)	fz(mm/t)
General steel(SS41, SM25C) Over HB180	150 ~ 250	0.1 ~ 0.3
Alloy steel(SM55C, SCM) Under HB300	100 ~ 200	0.1 ~ 0.2
Cast iron Under HB300	100 ~ 200	0.1 ~ 0.3

• Applicable inserts, see pages E16

● Available Inserts

RC

Designation		Coated PC210F	Page
RC	16	●	E16
	20	●	
	25	●	
	30	●	
	32	●	

● : Stock item ○ : Under preparing for stock

Technical Information for Chamfer Tools

■ Features

- All application for chamfer.
- Chamfer angle 15°, 30°, 45°, 60° for various customer's needs.
- he long cutting edge provides a wide chamfering range.

■ Code system

① Chamfer endmills	② Chamfer angle (45°)	③ Available insert 11 : SPMT110408-KC 12 : SPMN120308 31 : XCET310404ER-KC

CE	45	-	11	25	R	-	S	20
①	②		③	④	⑤		⑥	⑦

④ Min. machined diameter (ø 25)	⑤ Hand of tool R : Right L : Left	⑥ Shank type S : Standard M : Middle L : Long	⑦ Shank diameter(ø 20)

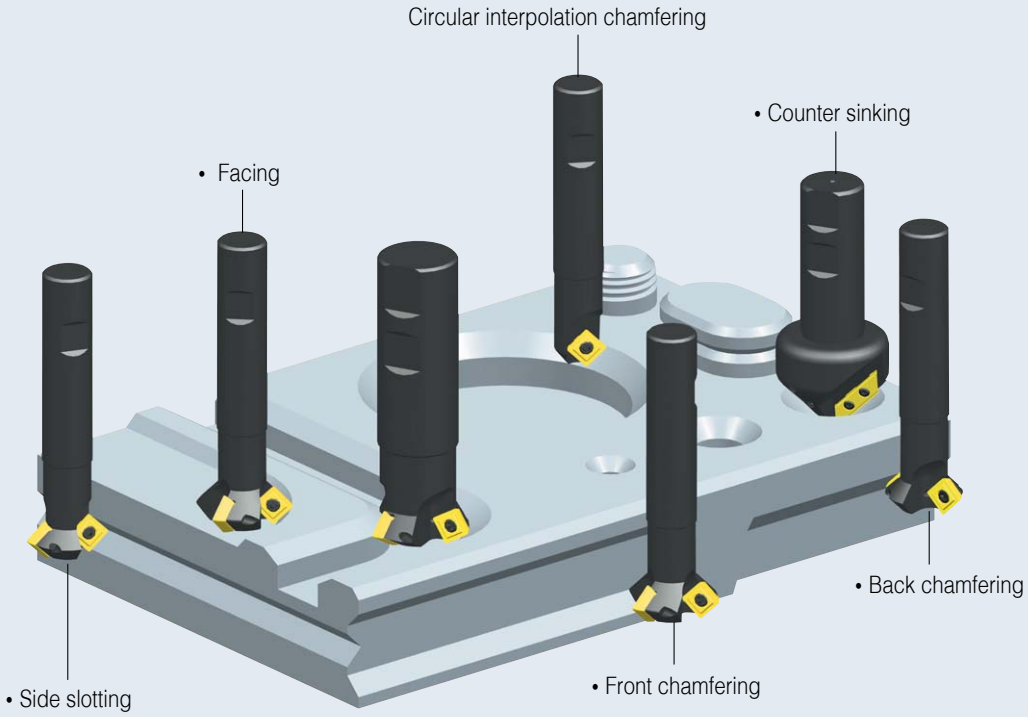
• Back & Front Chamfer Tools

• Long Chamfer Tools

■ Recommended cutting condition

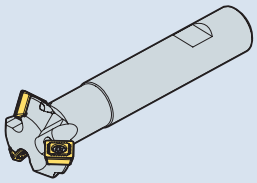
Workpiece	Chamfering		Facing		Grade
	vc (m/min)	fz (mm/t)	vc (m/min)	fz (mm/t)	
P	100~160	0.2~0.5	100~160	0.05~0.25	PC230 PC3525 PC3545 ST30A
M	90~120	0.1~0.3	90~120	0.05~0.15	PC3545
K	100~160	0.2~0.6	100~160	0.05~0.25	PC6510 G10

■ Application example



CE(Back & Front)

New



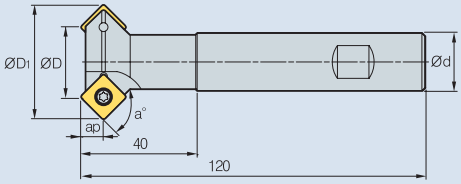


Fig.1

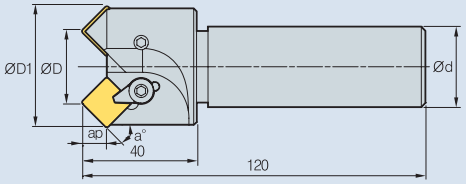


Fig.2

(mm)

Designation		Stock	⊚	øD	øD1	ød	ap	The number of tooth	Available Inserts	a° (Chamfer angle)		Application range (Min~Max)	Uses
										Front	Back		
CE	15-1125R-S20	●	2	25	30.5	20	9.5	1	SPMT110408 - KC	15°	-	ø 25~ ø 30	Front chamfering
	30-1125R-S20	●	2	25	35.5	20	8.5	1		30°	60°	ø 25~ ø 35	Back & Front Chamfering
	45-1107R-S20	●	1	7	21.9	20	7.0	1		45°	-	ø 7~ ø 21	Front chamfering
	45-1119R-S20	●	2	19	33.9	20	7.0	1		45°	45°	ø 19~ ø 33	Back & Front Chamfering
	45-1125R-S20	●	3	25	39.9	20	7.0	1		45°	45°	ø 25~ ø 39	Back & Front Chamfering
	60-1125R-S32	●	3	25	43.3	32	5.0	1		60°	30°	ø 25~ ø 42	Back & Front Chamfering
CE	45-1207R-S32	●	1	7	23.3	32	7.8	2	SPMN120308	45°	-	ø 7~ ø 22	Front chamfering
	45-1220R-S32	●	2	20	37.3	32	7.8	2		45°	-	ø 21~ ø 36	Front chamfering
	45-1225R-S32	○	2	25	42.3	32	7.8	2		45°	-	ø 26~ ø 41	Front chamfering
	45-1235R-S32	●	2	35	52.3	32	7.8	2		45°	-	ø 36~ ø 51	Front chamfering

● : Stock item ○ : Under preparing for stock

● Parts

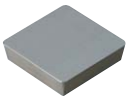
	Screw	Clamp	C-Ring	Wrench
CE□□-11□□R-S□□	FTKA0408	-	-	TW15S
CE□□-12□□R-S□□	CHX0617L	CH6R2	CR05	HW30L

• Applicable inserts, see pages E23

● Available Inserts

SPMT-KC

SPMN

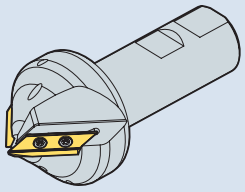


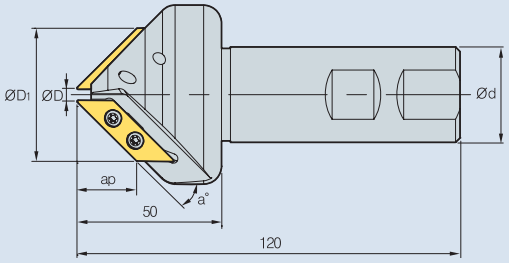
Designation	Coated	Uncoated		Page
	PC230	ST30A	G10	
SPMT 110408-KC	●	●	●	E23
SPMN 120308		●		E23

● : Stock item ○ : Under preparing for stock

CE(Long Champer)

New





(mm)

Designation		Stock		ØD	ØD1	Ød	ap	Available Inserts	a° (Chamfer angle)	Application range (Min~Max)	Uses
CE	30-3105R-S32	●	1	5	35	32	26.4	XCET310404ER-KC	30°	Ø5~Ø35	Front chamfering
	45-3105R-S32	●	2	5	48	32	21.5		45°	Ø5~Ø48	Front chamfering
	60-3105R-S32	●	2	5	57.7	32	15.2		60°	Ø5~Ø57.7	Front chamfering

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
CE□□-31□□R-S□□	FTKA03510	TW15S

• Applicable inserts, see pages E25

● Available Inserts

XCET-KC

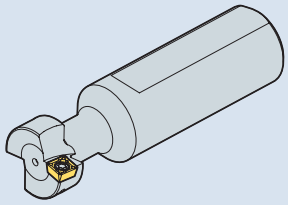
Designation	Coated	Uncoated		Page
	PC230	ST30A	G10	
XCET 310404ER-KC	●	●	●	E25

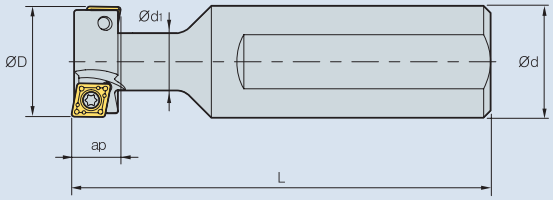
● : Stock item ○ : Under preparing for stock

TFE

New

AA 0°





(mm)

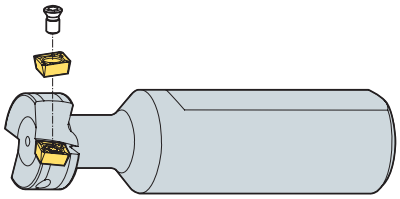
Designation		Stock R	Stock L	⊙	øD	ød	ød1	ap	L
TFE	2125R/L	○		2	21	25	10.5	9	109
	2525R/L	○		2	25	25	12.5	11	112
	3232R/L	○		2	32	32	16.5	14	120
	4032R/L	○		2	40	32	20.5	18	130
	5032R/L	○		4	50	32	26.5	22	140

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
2125R/L	FTNA02555	TW08S
2525R/L	FTNA0306	TW09S
3232R/L	FTNA0407	TW15S
4032R/L	PTMA0511A	TW15S
5032R/L	PTMA0511A	TW15S

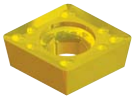
Assembling



• Applicable inserts, see pages **E12**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

CPMT, CPMH



Designation		Coated PC3525	Page
CPMT	060204-MF	○	E12
	080308-MF	○	
	09T308-MF	○	
CPMH	120408-MM	○	E12

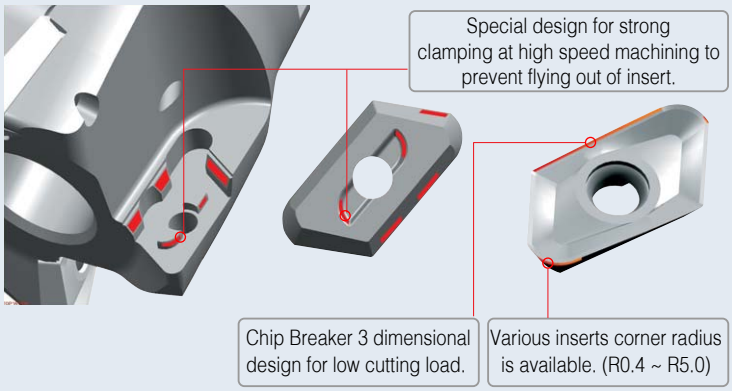
● : Stock item ○ : Under preparing for stock

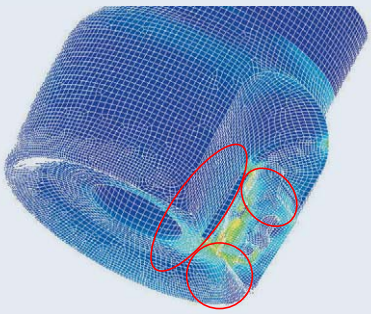
Technical Information for Pro-X Mill

■ Features

- Strong clamping due to the concave part of insert bottom side.
- Good chip flow and less build up edge have been acquired due to 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.

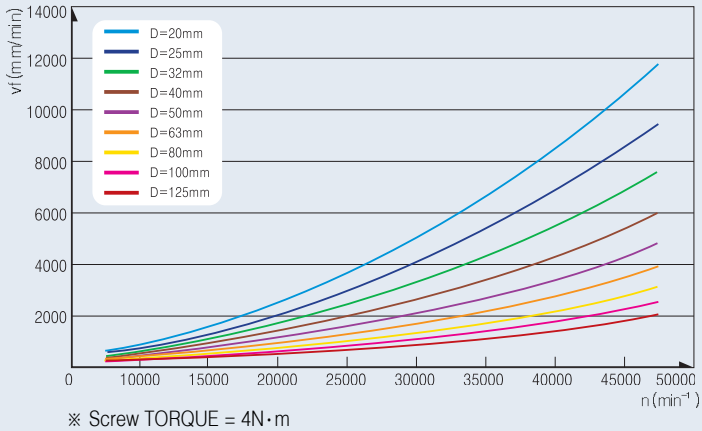
■ Clamping system for high speed





- Clamping design as per FEM analysis.
- Strong clamping of insert.

■ Centrifugal force as per RPM



※ Screw TORQUE = 4N·m
※ Indexabl insert : 6.8g

Marking [• Designation • Max. RPM]

■ Max. RPM as per cutting diameter

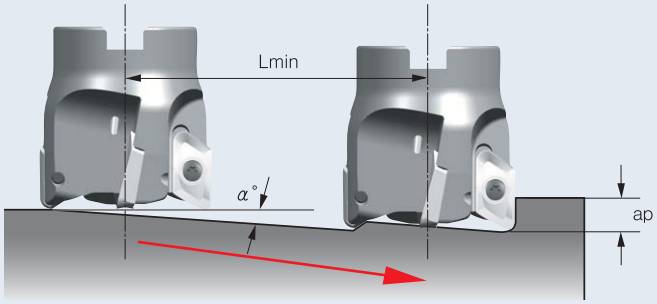
Machined diameter ØD(mm)		Max. RPM	
5000 type	6000 type	n(min⁻¹)	vc(m/min)
20	-	15000	940
25	25	32600	2559
32	32	28800	2894
40	40	25800	3240
50	50	23000	3611
63	63	20500	4055
80	80	18200	4572
100	100	16300	5118
125	125	14600	5731

※ 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	Rm < 280 MPa Rm > 280 MPa	1200 1000	0.3 0.25
Copper alloy Thermo plastic	Long chipping -	400 350	0.2 0.15
Aluminum alloy	Si < 12% Si ≥12%	1000 -	0.25 -
Copper alloy	Short chipping	500	0.2
Magnesium alloy	-	450	0.2
Duroplastics	-	200	0.15

■ Ramping



$$Lmin = \frac{ap}{\tan\alpha^\circ} (mm)$$

※ Lmin : Minimum inclination cutting length
α° : Max. ramping angle
ap : Depth of cut

• PAXCM 5000

Tool diameter(Ø)	α° (max.)	Lmin(mm)
40	11.31	50
50	7.24	78
63	5.1	112
80	3.86	148
100	3.94	145
125	2.14	267

• PAXCM 6000

Tool diameter(Ø)	α° (max.)	Lmin(mm)
40	17	32
50	9.5	60
63	7	81
80	5	114
100	4	143
125	3	190

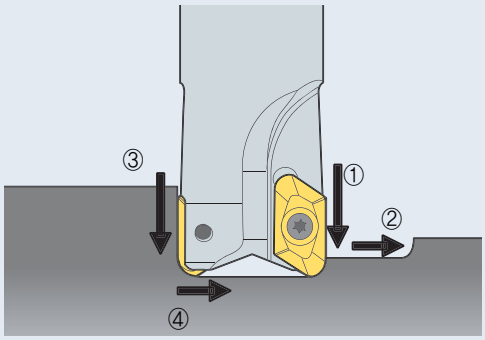
• PAXS 5000

Tool diameter(Ø)	α° (max.)	Lmin(mm)
20	8.3	68
25	17.95	31
32	12.6	45
40	9.9	57
-		
-		

• PAXS 6000

Tool diameter(Ø)	α° (max.)	Lmin(mm)
20	-	-
25	9	63
32	7	81
40	17	32
-		
-		

■ Plunging, Slotting, Drilling technical data



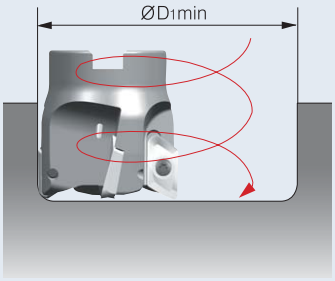
• Cutting condition for drilling

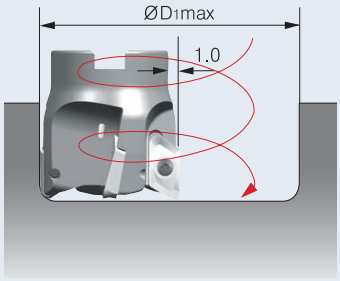
Holder	ap(mm)	
	5000 Type	6000 Type
Ø 20	8	-
Ø 25	4	11
Ø 32	4	6
Ø 40~125	4	6

Insert	ap(mm)
XETK19	4
XETK25	6

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.

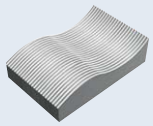
■ Helical ramping technical data





ØD(Tool diameter)	ØD1 min	ØD1 max	Designation
20	22	33	XEKT19M532FR-MA
25	29	43	
32	43	57	
40	59	73	
50	79	93	
63	105	119	
80	139	153	
100	179	193	
125	229	243	

■ Machining example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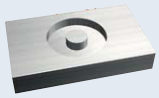
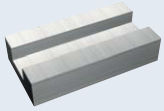
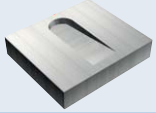
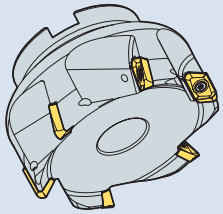

Helical cutting

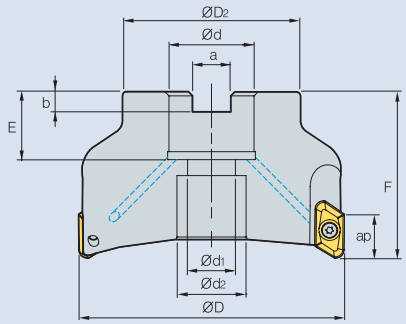

Slotting & Shouldering

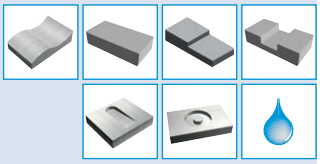

Ramping

PAXCM5000/6000

AA 0°







(mm)

Designation		Stock A	Stock B	⌀	øD	øD2	ød	ød1	ød2	a	b	E	F	AR°	RR°	α° (max)	Max rpm	ap	kg
PAXCM	5040HR-A,B	●	●	3	40	34	16	9	14	8.4	5.6	19	40	8°	-5°	11.31	25800	17	0.15
	5050HR-A,B	●	●	4	50	42	22	11	18	10.4	6.3	21	50	11°	-6°	7.24	23000	17	0.3
	5063HR-A,B	●	●	4	63	49	22	11	18	10.4	6.3	21	50	10°	-6°	5.1	20500	17	0.56
	5080HR-A,B	●	●	5	80	57	27	14	20	12.4	7	23	50	12°	-6°	3.86	18200	17	1.0
	5100HR-A,B	●	●	6	100	67	32	18	26	14.4	8	26	63	13°	-5°	3.94	16300	17	2.2
	5125HR-A,B	●	●	7	125	87	40	22	32	16.4	9	29	63	13°	-5°	2.14	14600	17	3.5
PAXCM	6050HR-A,B	○	○	2	50	42	22	11	18	10.4	6.3	18	50	11.5°	-9.5°	9.5	23000	23	0.37
New	6063HR-A,B	○	○	3	63	49	22	11	18	10.4	6.3	21	50	13°	-8.5°	7.0	20500	23	0.63
	6080HR-A,B	○	○	4	80	57	27	14	20	12.4	7	23	50	14.5°	-8°	5.0	18200	23	1.1
	6100HR-A,B	○	○	5	100	67	32	18	26	14.4	8	26	63	16°	-7°	4.0	16300	23	2.3
	6125HR-A,B	○	○	6	125	87	40	22	32	16.4	9	29	63	17.5°	-6.5°	3.0	14600	23	3.6

• Type A : Insert NoseR 0.4 ~ 3.2 Type B : Insert NoseR 4.0 ~5.0
Note) Through coolant type between Ø40~Ø125

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
5000 Type	PTKA0408	TW 15S
6000 Type	FTGA0513	TW 20S

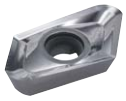
● Available Arborss

Designation		Ø d	Arbors
PAXCM	5040HR-A,B	16	BT□□-FMC16-□□
	5050HR-A,B	22	BT□□-FMC22-□□
	5063HR-A,B	22	BT□□-FMC22-□□
	5080HR-A,B	27	BT□□-FMC27-□□
	5100HR-A,B	32	BT□□-FMC32-□□
	5125HR-A,B	40	BT□□-FMB40-□□
PAXCM	6050HR-A,B	22	BT□□-FMC22-□□
	6063HR-A,B	22	BT□□-FMC22-□□
	6080HR-A,B	27	BT□□-FMC27-□□
	6100HR-A,B	32	BT□□-FMC32-□□
	6125HR-A,B	40	BT□□-FMB40-□□

• Applicable inserts, see pages **E25**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

XEKT

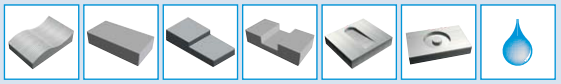


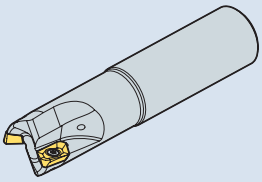
Designation		Coated PD2000	Uncoated H01	Type	Page
XEKT	19M504FR-MA	●	●	5000 Type	E25
	19M508FR-MA	●	●		
	19M512FR-MA	●	●		
	19M516FR-MA	●	●		
	19M518FR-MA	●	●		
	19M520FR-MA	●	●		
	19M530FR-MA	●	●		
	19M532FR-MA	●	●		
	19M540FR-MA	●	●		
	19M550FR-MA	●	●		
XEKT	250608FR-MA	○	○	6000 Type	E25
	250640FR-MA	○	○		

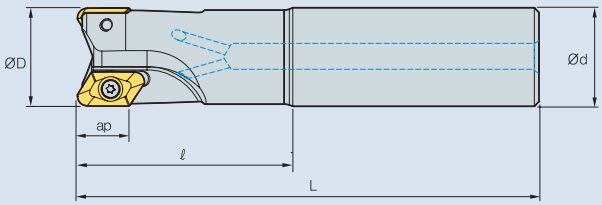
● : Stock item ○ : Under preparing for stock

PAXS5000/6000

AA 0°







(mm)

Designation		Stock A	Stock B		øD	ød	ℓ	L	AR°	RR°	α° (max)	Max rpm	ap	kg
PAXS	5020HR-A,B	●	●	1	20	20	60	130	5°	-11°	8.3	15,000	17	0.24
	5025HR-A,B	●	●	2	25	25	60	140	6°	-6°	17.95	32,600	17	0.4
	5032HR-A,B	●	●	2	32	32	70	150	8°	-7°	12.6	28,800	17	0.74
New	5040HR-A,B-S32	○	○	3	40	32	70	160	8°	-5°	9.91	25,800	17	1.0
New	5040HR-A,B-S40	○	○	3	40	40	70	160	8°	-5°	9.91	25,800	17	1.3
New	5040HR-A,B-S42	○	○	3	40	42	70	160	8°	-5°	9.91	25,800	17	1.4
PAXS	6025HR-A,B	○	○	1	25	25	60	140	9°	-14°	9.0	32,600	23	0.42
New	6032HR-A,B	○	○	1	32	32	70	150	9.5°	-12°	7.0	28,800	23	0.76
	6040HR-A,B-S32	○	○	2	40	32	70	160	10°	-10.5°	17.0	25,800	23	1.2
	6040HR-A,B-S40	○	○	2	40	40	70	160	10°	-10.5°	17.0	25,800	23	1.5
	6040HR-A,B-S42	○	○	2	40	42	70	160	10°	-10.5°	17.0	25,800	23	1.6

• Type A : Insert NoseR 0.4 ~ 3.2 Type B : Insert NoseR 4.0 ~5.0
Note) Through coolant type between Ø20~Ø40

● : Stock item ○ : Under preparing for stock

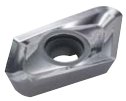
● Parts

	Screw	Wrench
5000 Type	PTKA0407 / PTKA0408	TW 15S
6000 Type	FTGA0513	TW 20S

• Applicable inserts, see pages **E25**

● Available Inserts

XEKT-MA



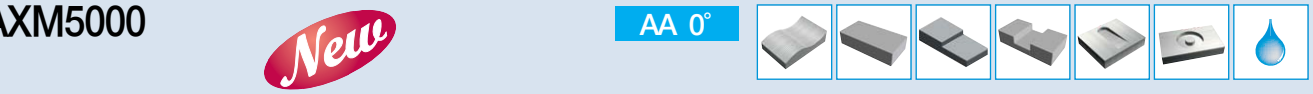
Designation		Coated PD2000	Uncoated H01	Type	Page
XEKT	19M504FR-MA	●	●	5000 Type	E25
	19M508FR-MA	●	●		
	19M512FR-MA	●	●		
	19M516FR-MA	●	●		
	19M518FR-MA	●	●		
	19M520FR-MA	●	●		
	19M530FR-MA	●	●		
	19M532FR-MA	●	●		
	19M540FR-MA	●	●		
	19M550FR-MA	●	●		
XEKT	250608FR-MA	○	○	6000 Type	E25
	250640FR-MA	○	○		

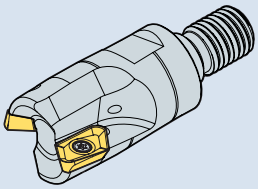
● : Stock item ○ : Under preparing for stock

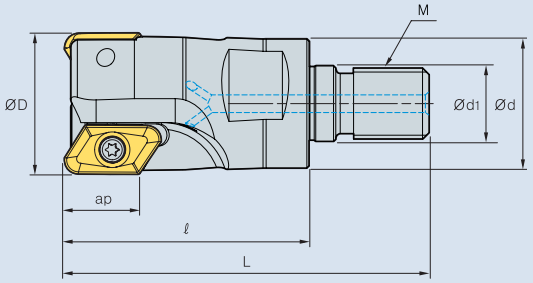
PAXM5000

New

AA 0°







(mm)

Designation		Stock R	Stock L		øD	ød	ød1	L	ℓ	M	ap	kg
PAXM	5025HR-A,B-M12	○		2	25	23	12.5	76	55	M12	23	0.12
	5032HR-A,B-M16	○		2	32	29	17.0	79	55	M16	23	0.2
	5040HR-A,B-M16	○		3	40	29	17.0	82	55	M16	23	0.4

• Type A : Insert NoseR 0.4 ~ 3.2 Type B : Insert NoseR 4.0 ~5.0
Note) Through coolant type between Ø25~Ø40

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
PTKA0408	TW 15S

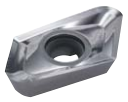
● Available Adaptors

Designation		Adaptors
PAXM	5025HR-A,B-M12	MAT - M12
	5032HR-A,B-M16	MAT - M16
	5040HR-A,B-M16	MAT - M16

• Applicable inserts, see pages E25
• Applicable adaptors, see pages E133~E134

● Available Inserts

XEKT-MA



Designation		Coated PD2000	Uncoated H01	Type	Page
XEKT	19M504FR-MA	●	●	5000 Type	E25
	19M508FR-MA	●	●		
	19M512FR-MA	●	●		
	19M516FR-MA	●	●		
	19M518FR-MA	●	●		
	19M520FR-MA	●	●		
	19M530FR-MA	●	●		
	19M532FR-MA	●	●		
	19M540FR-MA	●	●		
	19M550FR-MA	●	●		

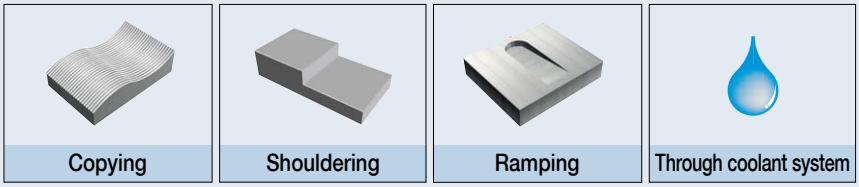
● : Stock item ○ : Under preparing for stock

Technical Information for Pro-A Mill

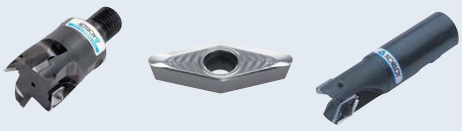
■ Features

Buffed on top face of insert ensure 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 effect and chip control by through coolant system even deep pocket machining.



■ Pro-A mill series

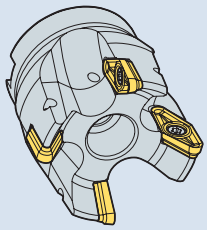
Ramping	Series	Pro-A mill			Through coolant system
Small size Al workpiece	Pro-A 2000			• Modular : Ø12~Ø42 • Shank : Ø12~Ø42 • Insert : VDKT11T210N-MA	O
General Al workpiece	Pro-A 4000			• cutter : Ø40~Ø100 • Shank : Ø32~Ø40 • Insert : VCKT220530N-MA	O

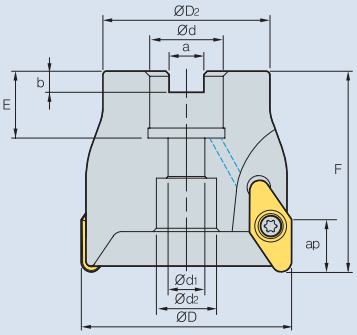
■ Recommended cutting condition

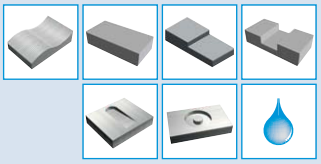
Workpiece		Cutting speed vc(m/min)
Aluminum alloy	Rm < 280 MPa Rm > 280 MPa	1000 800
Copper alloy	Long chip	250
Thermo plastic	-	300
Aluminum alloy	Si < 12%	800
Copper alloy	Short chip	400
Magnesium alloy	-	400
Duroplastics	-	150

PACM4000

AA 0°







(mm)

Designation		Stock R	Stock L	⊚	ØD	ØD2	Ød	Ød1	Ød2	a	b	E	F	ap	kg
PACM	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

Note) Through coolant type between Ø40~Ø100

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
PTNC04511	TW 20S

● Available Arbors

Designation		ø d	Arbors
PACM	4040HS	16	BT□□-FMC16-□□
	4050HS	22	BT□□-FMC22-□□
	4063HS	22	BT□□-FMC22-□□
	4080HS	27	BT□□-FMC27-□□
	4100HS	32	BT□□-FMC32-□□

• Applicable inserts, see pages **E25**
• Detail cutter spec. see pages **E172~E174**

● Available Inserts

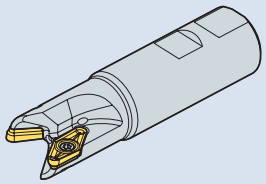
VCKT-MA

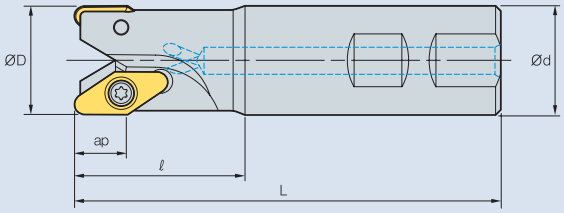
Designation	Uncoated H01	Page
VCKT 220530N-MA	●	E25

● : Stock item ○ : Under preparing for stock

PAS2000/4000

AA 0°





(mm)

Designation		Stock R	Stock L	⊚	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
	2020HR	●		2	20	20	30	100	8	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
PAS	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

Note) Through coolant type between Ø12~Ø40

● : Stock item ○ : Under preparing for stock

● Parts

	Screw	Wrench
2000 Type	ETNA02505, ETNA02506	TW 07S
4000 Type	FTNC04509	TW 20S

• Applicable inserts, see pages **E25**

● Available Inserts

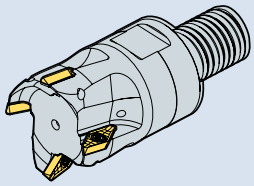
VDKT-MA	VCKT-MA

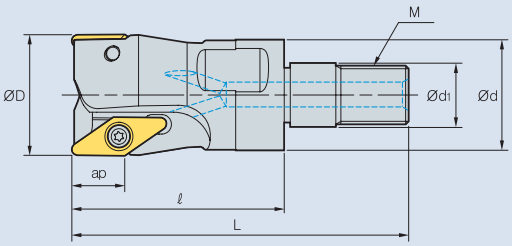
Designation		Uncoated H01	Type	Page
VDKT	11T210N-MA	●	2000 Type	E25
VCKT	220530N-MA	●	4000 Type	E25

● : Stock item ○ : Under preparing for stock

PAM2000

AA 0°





(mm)

Designation		Stock		øD	ød	ød1	ℓ	L	M	ap	kg
PAM	2012HR-M06	●	1	12	11.0	6.5	33	47.5	M06	8.5	0.02
	2016HR-M08	●	2	16	14.5	8.5	36	53.5	M08	8.5	0.04
	2020HR-M10	●	2	20	18.0	10.5	36	56.0	M10	8.5	0.06
	2025HR-M12	●	3	25	22.5	12.5	41	63.0	M12	8.5	0.1
	2032HR-M16		4	32	28.5	17.0	45	69.0	M16	8.5	0.18
	2042HR-M16		5	42	28.5	17.0	45	69.0	M16	8.5	0.27

Note) Through coolant type between Ø12~Ø40

● : Stock item ○ : Under preparing for stock

● Parts

Screw	Wrench
ETNA02505, ETNA02506	TW 07S

● Available Adaptors

Designation		Adaptor
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

• Applicable inserts, see pages E25
• Applicable adaptors, see pages E133~E134

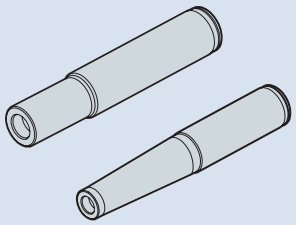
● Available Inserts

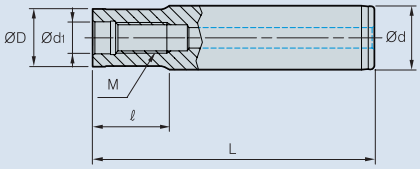
VCKT

Designation		Uncoated H01	Page
VDKT	11T210N-MA	●	E22

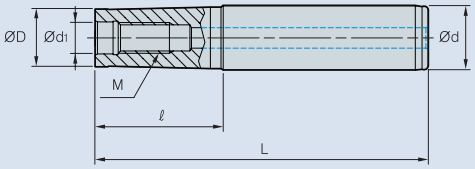
● : Stock item ○ : Under preparing for stock

MAT(Steel shank)





Fig,1



Fig,2

(mm)

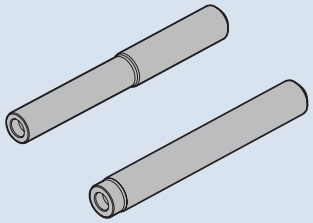
	Designation	Stock	M	øD	ød	ød1	ℓ	L	Fig.
MAT	M06-020-S10S	●	M06	9.5	10	6.5	18	70	1
	M6B-020-S12S	●	M06	9.5	12	6.5	18	76	1
	M6B-040-S12S	●	M06	11.0	12	6.5	18	96	1
	M08-020-S16S	●	M08	14.5	16	8.5	20	80	1
	M10-030-S20S	●	M10	18.0	20	10.5	25	100	1
	M12-030-S25S	●	M12	22.5	25	12.5	29	110	1
	M16-035-S32S	●	M16	28.5	32	17.0	32	125	1
	M06-040-S12T	●	M06	9.5	12	6.5	40	96	2
	M06-065-S16T	●	M06	11.0	16	6.5	65	125	2
	M6B-065-S16T	●	M06	11.0	16	6.5	65	125	2
	M6B-080-S16T	●	M06	11.0	16	6.5	80	160	2
	M08-040-S16T	●	M08	14.5	16	8.5	40	100	2
	M08-065-S16T	●	M08	14.5	16	8.5	65	125	2
	M08-080-S20T	●	M08	14.5	20	8.5	80	150	2
	M08-110-S25T	●	M08	14.5	25	8.5	110	190	2
	M10-050-S20T	●	M10	18.0	20	10.5	50	120	2
	M10-070-S20T	●	M10	18.0	20	10.5	70	140	2
	M10-090-S25T	●	M10	18.0	25	10.5	90	170	2
	M10-110-S25T	●	M10	18.0	25	10.5	110	190	2
	M10-130-S32T	●	M10	18.0	32	10.5	130	220	2
	M12-050-S25T	●	M12	22.5	25	12.5	50	130	2
	M12-070-S25T	●	M12	22.5	25	12.5	70	150	2
	M12-090-S25T	●	M12	22.5	25	12.5	90	170	2
	M12-110-S32T	●	M12	22.5	32	12.5	110	200	2
	M12-175-S40T	●	M12	22.5	40	12.5	175	300	2
	M16-055-S32T	●	M16	28.5	32	17.0	55	145	2
	M16-080-S32T	●	M16	28.5	32	17.0	80	170	2
	M16-120-S32T	●	M16	28.5	32	17.0	120	210	2
	M16-175-S40T	●	M16	28.5	40	17.0	175	300	2

• Applicable Modular, see pages **E32** (FMRM, LBE, PAM, AMM, RM4PM, HRMM, PAXM)

• S : Straight neck adaptor
• T : Taper neck adaptor

● : Stock item ○ : Under preparing for stock

MAT-C(Cemented carbide shank)



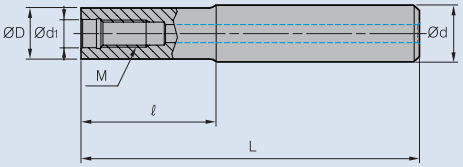


Fig.1

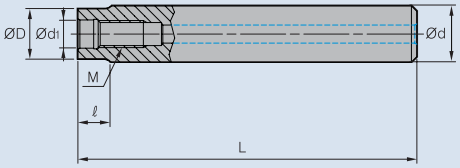


Fig.2

(mm)

Designation	Stock	M	øD	ød	ød1	ℓ	L	Fig.
MAT M08-080-S16S-C	●	M08	14.5	16	8.5	80	150	1
M08-110-S16S-C	●	M08	14.5	16	8.5	110	180	1
M08-150-S16S-C	●	M08	14.5	16	8.5	150	250	1
New M08-010-S16S-C-150	●	M08	14.5	16	8.5	10	150	2
New M08-010-S16S-C-180	●	M08	14.5	16	8.5	10	180	2
New M08-010-S16S-C-250	●	M08	14.5	16	8.5	10	250	2
M10-090-S20S-C	●	M10	18.0	20	10.5	90	170	1
M10-110-S20S-C	●	M10	18.0	20	10.5	110	200	1
M10-175-S20S-C	●	M10	18.0	20	10.5	175	300	1
New M10-010-S20S-C-170	●	M10	18.0	20	10.5	10	170	2
New M10-010-S20S-C-200	●	M10	18.0	20	10.5	10	200	2
New M10-010-S20S-C-300	●	M10	18.0	20	10.5	10	300	2
M12-090-S25S-C	●	M12	22.5	25	12.5	90	170	1
M12-110-S25S-C	●	M12	22.5	25	12.5	110	200	1
M12-175-S25S-C	●	M12	22.5	25	12.5	175	300	1
New M12-015-S25S-C-170	●	M12	22.5	25	12.5	15	170	2
New M12-015-S25S-C-200	●	M12	22.5	25	12.5	15	200	2
New M12-015-S25S-C-300	●	M12	22.5	25	12.5	15	300	2
M16-090-S32S-C	●	M16	28.5	32	17.0	90	180	1
M16-120-S32S-C	●	M16	28.5	32	17.0	120	210	1
M16-175-S32S-C	●	M16	28.5	32	17.0	175	300	1
New M16-020-S32S-C-180	●	M16	28.5	32	17.0	20	180	2
New M16-020-S32S-C-210	●	M16	28.5	32	17.0	20	210	2
New M16-020-S32S-C-300	●	M16	28.5	32	17.0	20	300	2

• Applicable Modular, see pages **E32** (FMRM, LBE, PAM, AMM, RM4PM, HRMM, PAXM)

● : Stock item ○ : Under preparing for stock

Thread Milling Insert Code System

TM 2 I 16 – 1.5 ISO
1 2 3 4 5 6

1 TM 2 I 16 – 1.5 ISO
Insert Style

Thread Milling Insert

2 TM 2 I 16 – 1.5 ISO
Cutting Edge

None : 1 cutting edge
2 : 2 cutting edge

3 TM 2 I 16 – 1.5 ISO
Type of Insert

E : External
I : Inernal
EI : External & Internal

4 TM 2 I 16 – 1.5 ISO
Insert Size

10 : 10.4mm
11 : 11mm
16 : 16mm
22 : 22mm
27 : 27mm
38 : 38.5mm

5 TM 2 I 16 – 1.5 ISO
Pitch

mm : 0.5 - 6.0
tpi : 48 - 6

6 TM 2 I 16 – 1.5 ISO
Standard

ISO : ISO Metric
UN : American UN
UNJ : UNJ
W : Whitworth for BSW, BSP
NPT : NPT
NPTF : NPTF
BSPT : British Standard Pipe Thread

Thread Milling Holder Code System

TM S R L 25 – 11
1 2 3 4 5 6

1 TM S R L 25 – 11
Insert Style

Thread Milling Holder

2 TM S R L 25 – 11
Clamping System

S : Shank type

3 TM S R L 25 – 11
Hand of Tool

R : Right Hand
L : Left Hand

4 TM S R L 25 – 11
None : Standard

L : Long type
T : Tapered Type

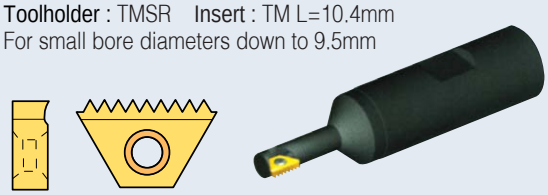
5 TM S R L 25 – 11
Shank Dia

6 TM S R L 25 – 11
Insert Size

10 : 10.4mm
11 : 11mm
16 : 16mm
22 : 22mm
27 : 27mm
38 : 38.5mm

The right Tool for the Job

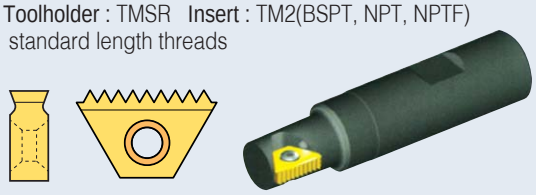
Toolholder : TMSR **Insert** : TM L=10.4mm
For small bore diameters down to 9.5mm



Toolholder : TMSR **Insert** : TM2
For standard length threads

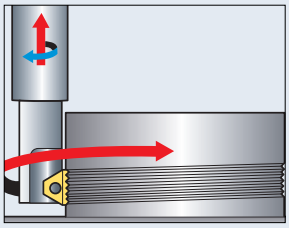
Toolholder : TMSR **Insert** : TM2
For long or remote therads

Toolholder : TMSR **Insert** : TM2(BSPT, NPT, NPTF)
standard length threads

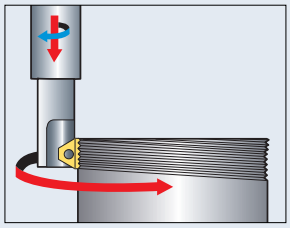


Thread milling methods

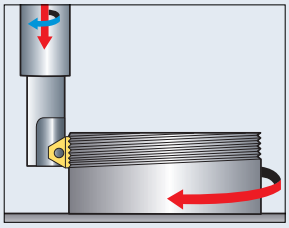
External threading



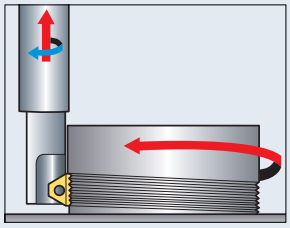
Right Hand Thread -
Conventional Milling.



Left Hand Thread -
Conventional Milling.

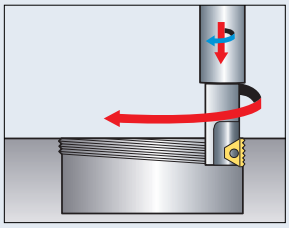


Right Hand Thread -
Conventional Milling.

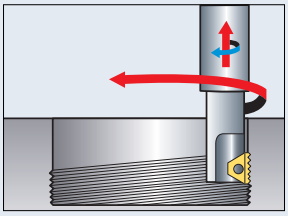


Left Hand Thread -
Conventional Milling.

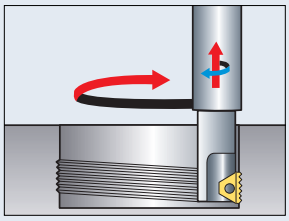
Internal threading



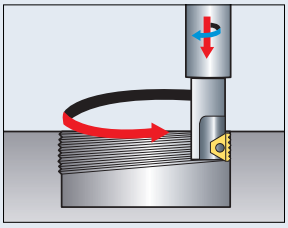
Right Hand Thread -
Conventional Milling.



Left Hand Thread -
Conventional Milling.



Right Hand Thread -
Conventional Milling.



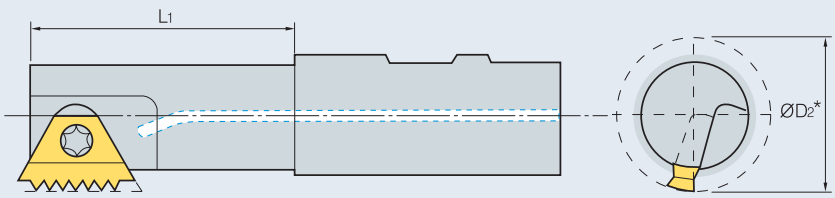
Left Hand Thread -
Conventional Milling.

Tooling recommendation* for given INTERNAL thread specification

■ ISO

Pitch	Nominal Dia.	Holder	Insert	L1-Toolholder	D2-Tool	Min.Thread Depth
mm	mm			overhang	cutting dia.*	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 -381.25ISO	12.0	9.0	0.72
1.5	14-15	TMSR 12-10	TM2I 38-1.5ISO	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

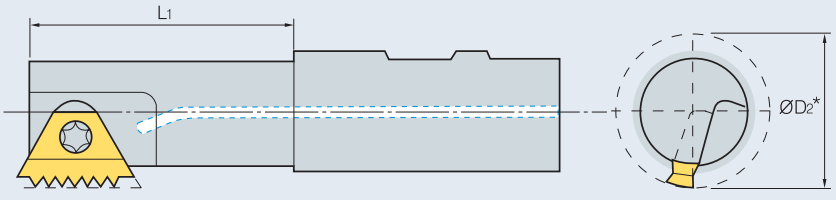
- The recommended holder is the largest for the given thread specification.
* Holder with smaller or equal cutting diameters (D2) can also be used.



■ UN

Pitch	Nominal Dia.	Holder	Insert	L1-Toolholder	D2-Tool	Min.Thread Depth
tpi	inch			overhang	cutting dia.*	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 2I-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 (D_2) can also be used.



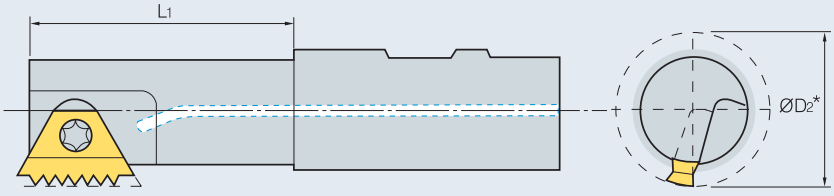
■ UNJ

Pitch	Nominal Dia.	Holder	Insert	L1-Toolholder	D2-Tool	Min.Thread Depth
tpi	inch			overhang	cutting dia.*	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	Nominal Dia.	Holder	Insert	L1-Toolholder	D2-Tool	Min.Thread Depth
tpi	inch			overhang	cutting dia.*	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 1/81 1/4 1.4-1	TMSRL 25-16	TM2EI 16-16W	25.0	22.0	
	5/8	TMSR 25-27	TM2EI 27-16W	52.0	30.0	
	1 3/4-1.	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 (D_2) can also be used.



Technical Information for Thread Milling

■ BSPT

Pitch	Nominal Dia.	Holder	Insert	L1-Toolholder	D2-Tool	Min.Thread Depth
tpi	inch			overhang	cutting dia.*	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	

• The recommended holder is the largest for the given thread specification.
* Holder with smaller or equal cutting diameters (D2) can also be used.

■ NPT

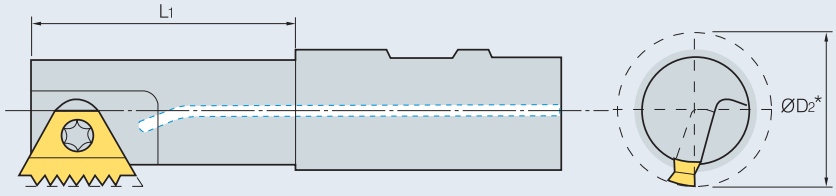
Pitch	Nominal Dia.	Holder	Insert	L1-Toolholder	D2-Tool	Min.Thread Depth
tpi	inch			overhang	cutting dia.*	Profile depth
14	1/2	TMSRT 16-16	TM2EI 16-14 NPT	22.0	15.5	1.33
	3/4	TMSRT 20-16	TM2EI 16-14 NPT	23.0	19.0	
11.5	1	TMSRT 20-16	TM2EI 16-11.5 NPT	23.0	19.0	1.64
	1 1/4	TMSR 25-27	TM2EI 27-11.5 NPT	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	

• The recommended holder is the largest for the given thread specification.
* Holder with smaller or equal cutting diameters (D2) can also be used.

■ NPTF

Pitch	Nominal Dia.	Holder	Insert	L1-Toolholder	D2-Tool	Min.Thread Depth
tpi	inch			overhang	cutting dia.*	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	mm	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	-
Pitch	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
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

About Thread Milling

In order to perform a thread milling operation, a milling machine with three-axis control capable 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 simulataneous 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 movemint in the xy plane with a linear dispalcement in the z direction.
On most CNC systems this function can be execyted in two different ways:

GO2 : Heilcal interpolation in a colckwise direction.
GO3 : Helical interpolation in a counter-clockwise direction.

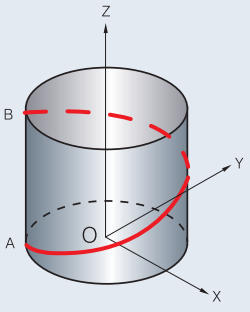


Fig. A

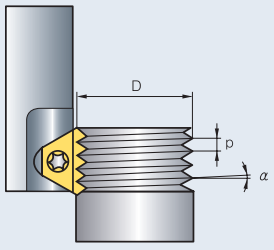


Fig. B

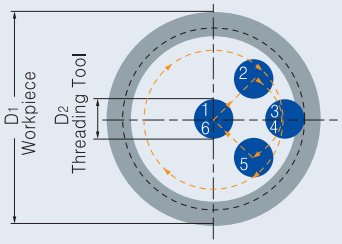
The thread milling operation (Fig. B) consists of circular rotation of fhe tool around its own axis togerther with an orbiting motion along the bore or workpiece circumference. During one such orbit, the tool will shift vertically one pitch length. These movements combined with the insert geometry create 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

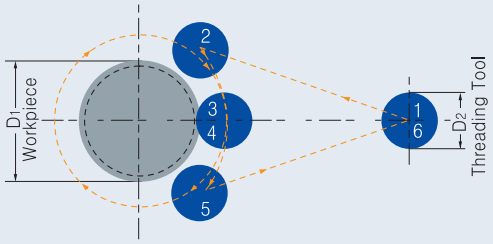
■ Tangential Arc Approach

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



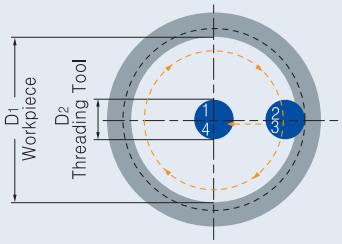
1-2 : rapid approach.
2-3 : tool entry along tangential arc, with simultaneous feed along z-axis.
3-4 : helical movement during one full orbit (360°).
4-5 : tool exit along tangential arc, with continuing feed along z-axis.
5-6 : rapid return.

■ Radial Approach

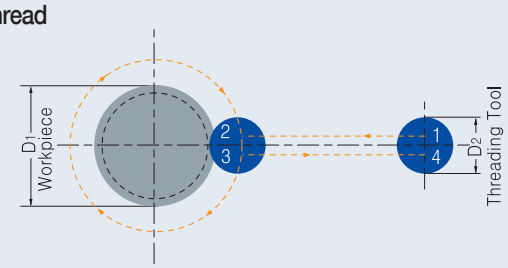
This is the simplest method. There are two characteristics worth nothing about the radial approach:
A. a small vertical mark may be lift at the entry (and exit) point. This is of no significance to the thread itself.
B. when using this method with very hard materials, there may be a tendency of the tool 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

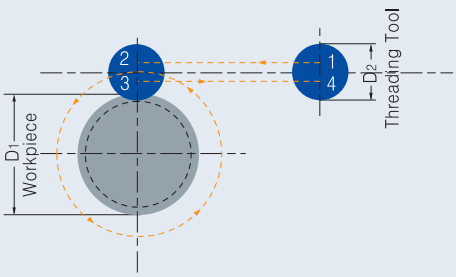


1-2 : radial entry.
2-3 : helical movement during one full orbit (360°).
3-4 : radial exit.

■ 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

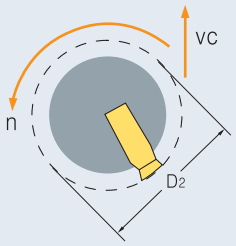
1. Calculation of Rotational Velocity and Feed at the Cutting Edge

$$n = \frac{1000 \times vc}{\pi \times D_2}$$

$$vc = \frac{n \times \pi \times D_2}{1000}$$

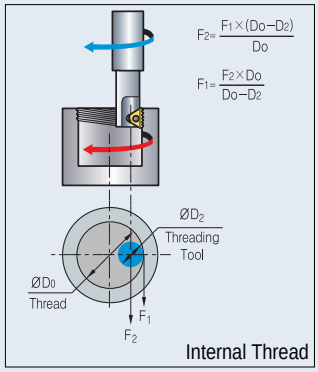
$$F_1 = n \times z \times fn$$

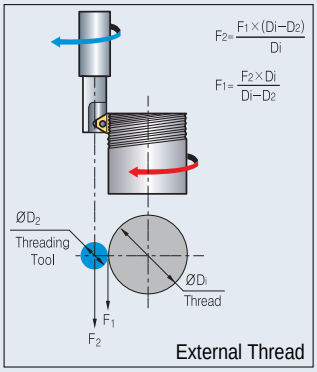
n - Rotational Velocity [R.P.M]
vc - Cutting Speed [m/min]
D_2 - Toolholder Cutting Dia. [mm]
F_1 - Real Feed rate at the Cutting edges [mm/min]
z - No. of Cutting Edges
fn - Feed per Rooth per Rotation [mm/rev]



2. 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 movemint such is not the case.
The equations define the relationship between feed rates at the cutting edge and at the tool center line.

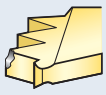
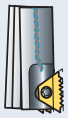
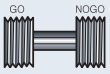




Grades and Applications

Grade	Application	Figure
PC9570T	First Choice for steel and cast iron. A tough sub-micron substrate with TiCN coating. Provides good fracture toughness and excellent wear resistance.	
PC3030T	First Choice for stainless steel. A tough sub-micron sub strate with TiAN coating. Provides good fracture toughness excellent wear resistance.	

■ Trouble shooting

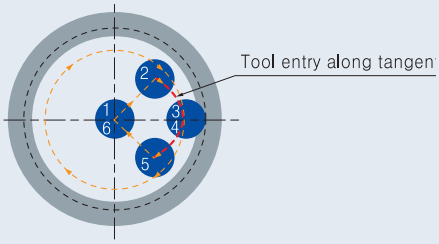
Problem		Possible	Solution
	Increased insert flank wear	Cutting speed too high Chip is too thin Insufficient coolant	Reduce cutting speed/use coated insert. Increase feed rate. Increase coolant flow rate.
	Chipping of cutting edge	Chip is too thick Vibration	Redyce feed rate / Use the tangential arc method/ Increase RPM. Check stability.
	Material Build up on the cutting edge	Incorrect cutting speed Unsuitable carbide grade	Change cutting speed. Use a coated carbide grade.
	Chatter / Vibartion	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.
	Insyfficient thread accuracy	Tool deflection	Reduce feed rate / Execute a “zero” cut.

Recommended cutting condition

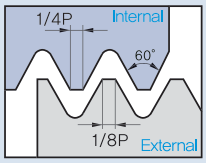
	Material		Hardness Brinell HB	vc[m/min] Inserts Grade PC9570T	vc[m/min] Inserts Grade PC3030T	Feed fz[mm/t] *
P	Unalloyed steel	Low carbon(C+0.1-0.25%)	125	100-210	90-180	0.05-0.3
		Medium carbon(C=0.25-0.55%)	150	100-180	90-170	0.05-0.25
		High carbon (C=0.55-0.85%)	170	100-170	90-160	0.05-0.2
	Low alloy steel (alloying elements≤5%)	Non hardened	180	90-160	90-155	0.05-0.25
		Hardened	275	80-150	80-160	0.05-0.2
		Hardened	350	70-140	70-150	0.05-0.15
	High alloy steel	Annealed	200	60-130	70-115	0.05-0.2
		Hardened	325	70-110	60-100	0.05-0.1
	Cast steel	Low alloy (alloying elements<5%)	200	100-170	100-170	0.05-0.15
		High alloy(alloying elements>5%)	225	70-120	70-130	0.05-0.1
M	Stainless steel Feritic	Non hardened	200	100-170	120-180	0.05-0.15
		Hardened	330	100-170	120-180	0.05-0.1
	Stainless steel Austenitic	Austentic	180	70-140	100-140	0.05-0.15
		Super austenitic	200	70-140	100-140	0.05-0.1
	stainlesssteel Cast feritic	Non hardened	200	70-140	100-140	0.05-0.15
		hardened	330	70-140	100-140	0.05-0.1
	Stainless steel Cast austenitic	Austenitic	200	70-120	100-120	0.05-0.15
		hardened	330	70-120	100-120	0.05-0.1
	High eimperature alloys	Annealed (Iron based)	200	20-45	20-40	0.05-0.1
		Aged (Iron based)	280	20-30	20-30	0.02-0.05
		Annealed(Nickel or Cobalt based)	250	15-20	15-20	0.02-0.05
		Aged (Nickel or Cobalt based)	350	10-15	10-15	0.02-0.05
	Titanium alloys	Pure 99.5 Ti	400Rm	70-140	70-120	0.02-0.05
		α+βalloys	1050Rm	20-50	20-50	0.02-0.05
K	Extra hard steel	Hardened & tempered	55HRC	20-45	20-45	0.01-0.03
	Malleable cast iron	Ferritic (short chips)	130	60-130	100-120	0.02-0.08
		Pearlitic (long chips)	230	60-120	80-100	0.02-0.05
	Grey cast iron	Low tensile strength	180	60-130	80-100	0.05-0.15
		High tensile strength	260	60-100	80-100	0.05-0.1
	Nodular SG iron	Feritic	160	60-125	80-100	0.05-0.15
		Pearlitic	260	50-90	60-90	0.05-0.1
	Aluminum alloys Wrought	non aging	60	100-250		0.1-0.4
		Aged	100	100-180		0.1-0.3
	Aluminum alloys	Cast	75	150-400		0.1-0.3
		Cast & aged	90	150-280		0.05-0.25
	Aluminum alloys	Cast Si 13-22%	130	80-150		0.1-0.3
	Copper and copper alloys	Brass	90	120-210	100-200	0.1-0.3
		Bronze and mom leaded copper	100	120-210	100-200	0.05-0.25

■ **Recommendation :**
At tool entry, set the Feed f [mm/tooth] to 70% lower than the threading Feed.

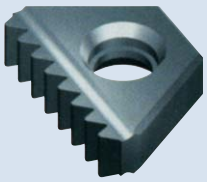
■ **Example :**
Threading Feed: 0.3[mm/t]
Tool entry Feed: 0.09[mm/t]

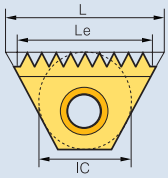


ISO Metric (External / Internal)



Defined by : R262 (DIN 13)
Tolerance class : 6g/6H





Standard TM

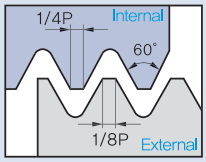
Insert Size		Pitch	Ordering Code		Le	Tooth	Toolholder
IC	L mm	tpi	External	Internal	mm		
6.0	10.4	0.5	-	TMI10-0.5ISO	10.0	20	TMSR□□ - 10
		0.75	-	TMI10-0.75ISO	9.75	13	
		1.0	-	TMI10-1.0ISO	9.0	9	
		1.25	-	TMI10-1.25ISO	8.75	7	
		1.5	-	TMI10-1.5ISO	9.0	6	
6.35	11	0.5	-	TM2I11-0.5ISO	10.0	20	TMSR□□ - 11
		0.75	TM2E11-0.75ISO	TM2I11-0.75ISO	10.5	14	
		1.0	TM2E11-1.0ISO	TM2I11-1.0ISO	10.0	10	
		1.25	TM2E11-1.25ISO	-	10.0	8	
		1.25	-	TM2I11-1.25ISO	8.75	7	
		1.5	TM2E11-1.5ISO	-	9.0	6	
9.525	16	1.5	-	TM2I11-1.5ISO	10.5	7	TMSR□□ - 16
		0.5	-	TM2I16-0.5ISO	15.0	30	
		0.75	TM2E16-0.75ISO	TM2I16-0.75ISO	15.0	20	
		0.8	-	TM2I16-0.8ISO	14.4	18	
		1.0	TM2E16-1.0ISO	-	14.0	14	
		1.0	-	TM2I16-1.0ISO	15.0	15	
		1.25	TM2E16-1.25ISO	TM2I16-1.25SO	15.0	12	
		1.5	TM2E16-1.5ISO	TM2I16-1.5ISO	15.0	10	
		1.75	TM2E16-1.75ISO	TM2I16-1.75ISO	14.0	8	
		2.0	TM2E16-2.0ISO	TM2I16-2.0ISO	14.0	7	
9.525B	22	1.0	TM2E22-1.0ISO	TM2I22-1.0ISO	22.0	22	TMSR□□ - 22
		1.25	TM2E22-1.25ISO	TM2I22-1.25ISO	21.25	17	
		1.5	TM2E22-1.5ISO	TM2I22-1.5ISO	21.0	14	
		1.75	TM2E22-1.75ISO	TM2I22-1.75ISO	21.0	12	
		2.0	TM2E22-2.0ISO	TM2I22-2.0ISO	22.0	11	
15.875	27	1.0	TM2E27-1.0ISO	TM2I27-1.0ISO	26.0	26	TMSR□□ - 27
		1.25	TM2E27-1.25ISO	TM2I27-1.25ISO	25.0	20	
		1.5	TM2E27-1.5ISO	TM2I27-1.5ISO	25.5	17	
		1.75	TM2E27-1.75ISO	TM2I27-1.75ISO	24.5	14	
		2.0	TM2E27-2.0ISO	TM2I27-2.0ISO	24.0	12	
		2.5	TM2E27-2.5ISO	TM2I27-2.5ISO	25.0	10	
		3.0	TM2E27-3.0ISO	TM2I27-3.0ISO	24.0	8	
		3.5	TM2E27-3.5ISO	TM2I27-3.5ISO	24.5	7	
		4.0	TM2E27-4.0ISO	TM2I27-4.0ISO	24.0	6	
		4.5	TM2E27-4.5ISO	TM2I27-4.5ISO	22.5	5	
19.05B	38.5	1.5	TM2E38-1.5ISO	TM2I38-1.5ISO	36.0	24	TMSR□□ - 38
		2.0	TM2E38-2.0ISO	TM2I38-2.0ISO	36.0	18	
		3.0	TM2E38-3.0ISO	TM2I38-3.0ISO	36.0	12	
		4.0	TM2E38-4.0ISO	TM2I38-4.0ISO	32.0	8	
		4.5	TM2E38-4.5ISO	TM2I38-4.5ISO	31.5	7	
		5.0	TM2E38-5.0ISO	TM2I38-5.0ISO	30.0	6	
		5.5	TM2E38-5.5ISO	TM2I38-5.5ISO	33.0	6	
		6.0	TM2E38-6.0ISO	TM2I38-6.0ISO	30.0	5	

• Applicable Holder, see pages **E150**

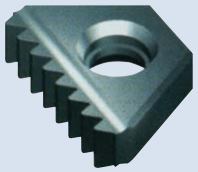
* All inserts except TMI10 code have 2 cutting edges.

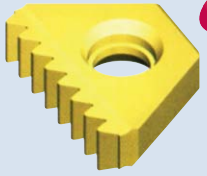
Thread Milling Inserts

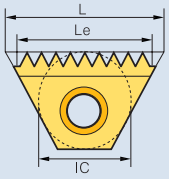
American UN (External / Internal)



Defined by : ANSI B1.1.74
Tolerance class : Class 2A/2B







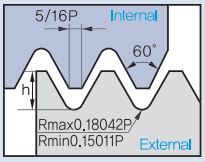
Standard TM

Insert Size		Pitch	Ordering Code		Le	Tooth	Toolholder
IC	L mm	tpi	External	Internal	mm		
6.0	10.4	32	-	TMI10-32UN	9.53	12	TMSR□□ - 10
		28	-	TMI10-28UN	9.07	10	
		24	-	TMI10-24UN	9.53	9	
		20	-	TMI10-20UN	8.89	7	
		18	-	TMI10-18UN	8.47	6	
		16	-	TMI10-16UN	7.94	5	
6.35	11	48	-	TM2I11-48UN	10.05	19	TMSR□□ - 11
		40	-	TM2I11-40UN	10.16	16	
		32	-	TM2I11-32UN	10.32	13	
		28	TM2E11-28UN	TM2I11-28UN	9.98	11	
		27	TM2E11-27UN	TM2I11-27UN	10.35	11	
		24	TM2E11-24UN	TM2I11-24UN	9.53	9	
		20	TM2E11-20UN	TM2I11-20UN	10.16	8	
		18	TM2E11-18UN	TM2I11-18UN	9.88	7	
		16	TM2E11-16UN	TM2I11-16UN	9.53	6	
		14	TM2E11-14UN	TM2I11-14UN	9.07	5	
9.525	16	40	-	TM2I16-40UN	14.61	40	TMSR□□ - 16
		32	-	TM2I16-32UN	15.08	32	
		28	TM2E16-28UN	TM2I16-28UN	14.51	28	
		27	TM2E16-27UN	TM2I16-27UN	14.11	27	
		24	TM2E16-24UN	TM2I16-24UN	14.82	24	
		20	TM2E16-20UN	TM2I16-20UN	13.97	20	
		18	TM2E16-18UN	TM2I16-18UN	14.11	18	
		16	TM2E16-16UN	TM2I16-16UN	14.29	16	
		14	TM2E16-14UN	TM2I16-14UN	14.51	14	
		13	TM2E16-13UN	TM2I16-13UN	13.68	13	
		12	TM2E16-12UN	TM2I16-12UN	14.82	12	
		11.5	TM2E16-11.5UN	TM2I16-11.5UN	13.25	11.5	
9.525B	22	24	TM2E22-24UN	TM2I22-24UN	21.16	20	TMSR□□ - 22
		20	TM2E22-20UN	TM2I22-20UN	21.59	17	
		18	TM2E22-18UN	TM2I22-18UN	21.17	15	
		16	TM2E22-16UN	TM2I22-16UN	20.64	13	
		14	TM2E22-14UN	TM2I22-14UN	21.77	12	
		13	TM2E22-13UN	TM2I22-13UN	21.49	11	
		12	TM2E22-12UN	TM2I22-12UN	21.17	10	
15.875	27	24	TM2E27-24UN	TM2I27-24UN	25.40	24	TMSR□□ - 27
		20	TM2E27-20UN	TM2I27-20UN	25.40	20	
		18	TM2E27-18UN	TM2I27-18UN	25.40	18	
		16	TM2E27-16UN	TM2I27-16UN	25.40	16	
		14	TM2E27-14UN	TM2I27-14UN	25.40	14	
		13	TM2E27-13UN	TM2I27-13UN	25.40	13	
		12	TM2E27-12UN	TM2I27-12UN	25.40	12	
		11.5	TM2E27-11.5UN	TM2I27-11.5UN	24.30	11	
		11	TM2E27-11UN	TM2I27-11UN	25.40	11	
		10	TM2E27-10UN	-	22.86	9	
		10	-	TM2I27-10UN	25.40	10	
		9	TM2E27-9UN	TM2I27-9UN	22.58	8	
		8	TM2E27-8UN	TM2I27-8UN	22.23	7	
		7	TM2E27-7UN	-	21.77	6	
		7	-	TM2I27-7UN	25.40	7	
		6	TM2E27-6UN	-	21.17	5	
		6	-	TM2I27-6UN	25.40	6	
19.05B	38.5	6	TM2E38-6UN	TM2I38-6UN	38.87	8	TMSR□□ - 38
		5	TM2E38-5UN	TM2I38-5UN	30.48	6	
		4.5	TM2E38-4.5UN	TM2I38-4.5UN	33.87	6	
		4	TM2E38-4UN	TM2I38-4UN	31.75	5	

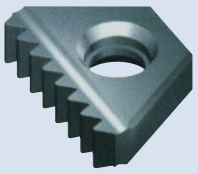
• Applicable Holder, see pages E150

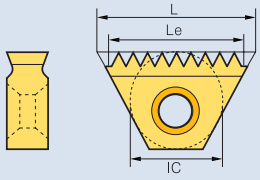
* All inserts except TMI10 code have 2 cutting edges.

UNJ (External / Internal)



Defined by : MIL-S-8879C
Tolerance class : 3A/3B





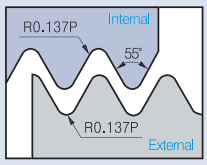
Standard TM

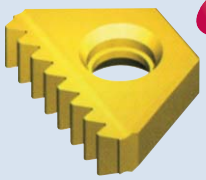
Insert Size		Pitch	Ordering Code		Le	Tooth	Toolholder
IC	L mm	tpi	External	Internal	mm		
6.0	10.4	24	-	TMI10-24UNJ	9.53	-	TMSR□□ - 10
		20	-	TMI10-20UNJ	8.89	-	
		18	-	TMI10-18UNJ	8.47	-	
		16	-	TMI10-16UNJ	9.53	-	
6.35	11	24	TM2E11-24UNJ	TM2I11-24UNJ	9.53	-	TMS□□ - 11
		20	TM2E11-20UNJ	TM2I11-20UNJ	10.16	-	
		18	-	TM2I11-18UNJ	9.88	-	
		16	TM2E11-16UNJ	TM2I11-16UNJ	9.53	-	
		14	TM2E11-14UNJ	TM2I11-14UNJ	9.07	-	
9.525	16	24	TM2E16-24UNJ	TM2I16-24UNJ	14.82	-	TMSR□□ - 16
		20	TM2E16-20UNJ	TM2I16-20UNJ	13.97	-	
		18	TM2E16-18UNJ	TM2I16-18UNJ	14.11	-	
		16	TM2E16-16UNJ	TM2I16-16UNJ	14.29	-	
		14	TM2E16-14UNJ	TM2I16-14UNJ	14.51	-	
		13	TM2E16-13UNJ	-	13.68	-	
		12	TM2E16-12UNJ	TM2I16-12UNJ	14.82	-	
15.875	27	16	TM2E27-16UNJ	TM2I27-16UNJ	25.40	-	TMSR□□ - 27
		12	TM2E27-12UNJ	TM2I27-12UNJ	25.40	-	
		11	TM2E27-11UNJ	TM2I27-11UNJ	25.40	-	

• Applicable Holder, see pages **E150**

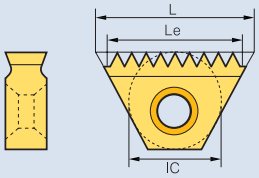
* All inserts except TMI10 code have 2 cutting edges.

Whithworth (External / Internal)





New



Standard TM

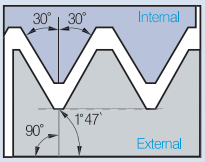
BSW Defined by : B.S.84:1956, DIN 259, ISO228/1:1982
BSP Defind by : B.S.2779:1956
Tolerance class : BSW-Medium class A, BSP-Medium class

Insert Size		Pitch	Ordering Code	Le	Tooth	Toolholder
IC	L mm	tpi	External + Internal	mm		
6.0	10.4	28	TMEI10-28W	9.07	10	TMSR□□ - 10
		26	TMEI10-26W	8.79	9	
		24	TMEI10-24W	9.53	9	
		20	TMEI10-20W	8.89	7	
		19	TMEI10-19W	9.36	7	
6.35	11	28	TM2EI11-28W	9.98	11	TMSR□□ - 11
		26	TM2EI11-26W	9.77	10	
		24	TM2EI11-24W	9.53	9	
		20	TM2EI11-20W	10.16	8	
		19	TM2EI11-19W	9.36	7	
		14	TM2EI11-14W	9.07	5	
9.525	16	26	TM2EI16-26W	14.65	15	TMSR□□ - 16
		24	TM2EI16-24W	14.82	14	
		20	TM2EI16-20W	13.97	11	
		19	TM2EI16-19W	14.71	11	
		18	TM2EI16-18W	14.11	10	
		16	TM2EI16-16W	14.29	9	
		14	TM2EI16-14W	14.51	8	
		12	TM2EI16-12W	14.82	7	
		11	TM2EI16-11W	13.85	6	
9.525B	22	24	TM2EI22-24W	21.17	20	TMSR□□ - 22
		20	TM2EI22-20W	21.59	17	
		19	TM2EI22-19W	21.39	16	
		18	TM2EI22-18W	21.17	15	
		16	TM2EI22-16W	20.64	13	
		14	TM2EI22-14W	21.77	12	
		12	TM2EI22-12W	21.17	10	
		11	TM2EI22-11W	20.78	9	
15.875	27	16	TM2EI27-16W	25.4	16	TMSR□□ - 27
		14	TM2EI27-14W	25.4	14	
		12	TM2EI27-12W	23.28	11	
		11	TM2EI27-11W	23.09	10	
		10	TM2EI27-10W	25.40	10	
		9	TM2EI27-9W	22.58	8	
		8	TM2EI27-8W	22.23	7	
		7	TM2EI27-7W	21.77	6	
		6	TM2EI27-6W	21.17	5	
19.05B	38.5	11	TM2EI38-11W	34.64	15	TMSR□□ - 38
		6	TM2EI38-6W	33.87	8	
		5	TM2EI38-5W	30.48	6	
		4.5	TM2EI38-4.5W	33.87	6	
			TM2EI38-15W	-	-	

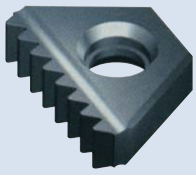
• Applicable Holder, see pages E150

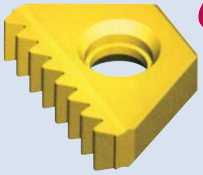
* All inserts except TMEI10 code have 2 cutting edges.

NPT (External / Internal)

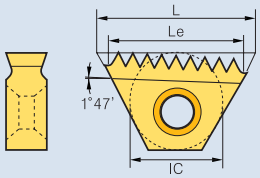


Defined by : USAS B2.1:1968
Tolerance class : Standard NPT





New



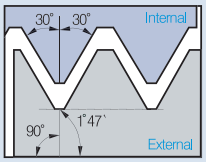
Standard TM

Insert Size		Pitch	Ordering Code	Le	Tooth	Toolholder	
IC	L mm	tpi	External + Internal	mm		RH	LH
9.525	16	18	TM2E16-18NPT *	14.11	10	TMSRT□□ - 16	TMSLT□□ - 16
		14	TM2EI16-14NPT	14.51	8		
		11.5	TM2EI16-11.5NPT	13.25	6		
9.525B	22	14	TM2EI22-14NPT	21.77	12	TMSRT□□ - 22	TMSLT□□ - 22
15.875	27	11.5	TM2EI27-11.5NPT	24.30	11	TMSR□□□ - 27	TMSL□□□ - 27
		8	TM2EI27-8NPT	22.23	7		
19.05B	38.5	11.5	TM2EI38-11.5NPT	35.34	16	TMSR□□ - 38	TMSL□□ - 38
		8	TM2EI38-8NPT	31.75	10		

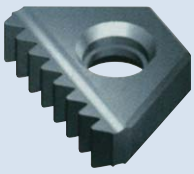
• Applicable Holder, see pages E150

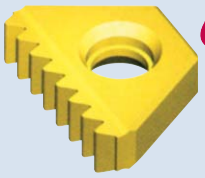
* TM2E16-18NPT is for external threading

NPTF (External / Internal)

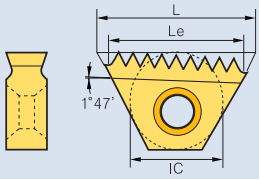


Defined by : ANSI 1.20.3-1976
Tolerance class : Standard NPTF





New

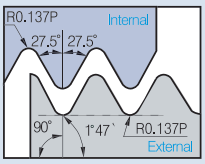


Standard TM

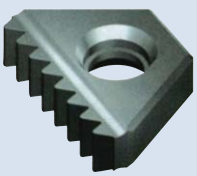
Insert Size		Pitch	Ordering Code	Le	Tooth	Toolholder	
IC	L mm	tpi	External + Internal	mm		RH	LH
9.525	16	14	TM2EI16-14NPTF	14.51	8	TMSRT□□ - 16	TMSLT□□ - 16
		11.5	TM2EI16-11.5NPTF	13.25	6		
9.525B	22	14	TM2EI22-14NPTF	21.77	12	TMSRT□□ - 22	TMSLT□□ - 22
		11.5	TM2EI22-11.5NPTF	19.88	9		
15.875	27	11.5	TM2EI27-11.5NPTF	24.30	11	TMSR□□□ - 27	TMSL□□□ - 27
		8	TM2EI27-8NPTF	22.23	7		
19.05B	38.5	11.5	TM2EI38-11.5NPTF	35.34	16	TMSR□□ - 38	TMSL□□ - 38
		8	TM2EI38-8NPTF	31.75	10		

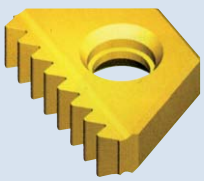
• Applicable Holder, see pages E150

BSPT (External / Internal)

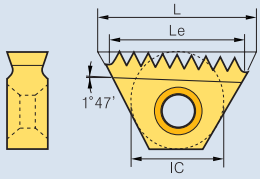


Defined by : B.S 21:1985
Tolerance class : Standard BSPT





New



Standard TM

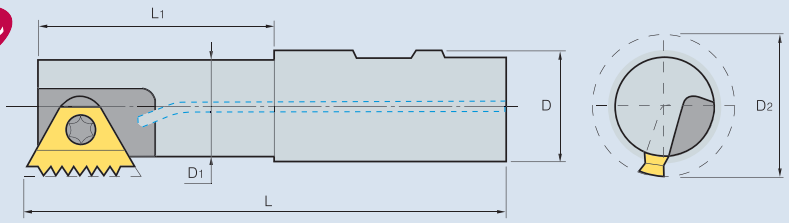
Insert Size		Pitch	Ordering Code	Le	Tooth	Toolholder	
IC	L mm	tpi	External + Internal	mm		RH	LH
6.35	11	19	TM2EI11-19BSPT	9.36	7	TMSR□□ - 10	TMSL□□ - 10
9.525	16	14	TM2EI16-14BSPT	14.51	8	TMSRT□□ - 16	TMSLT□□ - 16
		11	TM2EI16-11BSPT	13.85	6		
15.875	27	11	TM2EI27-11BSPT	23.09	10	TMSR□□□ - 27	TMSL□□ - 27

• Applicable Holder, see pages E150

Thread Milling Holder

Standard Type

New

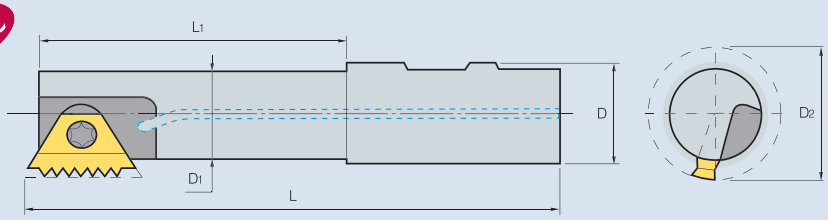


Insert Size IC	Ordering Code	Dimensions (mm) L	L1	D	D1	D2	Screw	Wrench
6.0	TMSR12-10	69.0	12.0	12	6.8	9.0	STM10	TW07P
	TMSR20-10	84.0	17.0	20	6.8	9.0		
6.35	TMSR12-11	70.0	12.0	12	8.9	11.5	STM11	TW08P
	TMSR20-11	85.0	20.0	20	8.9	11.5		
9.525	TMSR16-16	90.0	22.0	16	13.6	17.0	STM1622	TW10P
	TMSR20-16	95.0	43.0	20	16.6	20.0		
9.525B	TMSR16-22	79.5	29.0	16	13.5	17.0	STM1622	TW10P
	TMSR20-22	81.4	29.0	20	15.5	19.0		
	TMSR25-22	92.3	30.0	25	15.5	19.0		
	TMSRW25-22	90.8	30.0	25	18.5	22.0		
15.875	TMSR25-27	110.0	52.0	25	24.0	30.0	STM27	TW25L
	TMSL25-27	110.0	52.0	25	24.0	30.0		
	TMSR32-27	120.0	58.0	32	31.0	37.0		
19.05B	TMSR32-38	115.0	53.0	32	27.0	35.0	STM38	TW30L
	TMSR40-38	135.0	63.0	40	38.0	46.0		

• Applicable inserts, see pages E145 ~ E149

Long Type

New

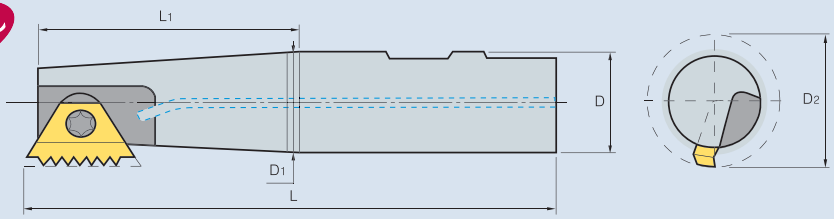


Insert Size IC	Ordering Code	Dimensions (mm) L	L1	D	D1	D2	Screw	Wrench
6.35	TMSRL25-11	125.0	25.0	225	18.6	22.0	STM11	TW08P
9.525B	TMSRL25-16	125.0	63.5	25	18.6	22.0	STM1622	TW10P
9.525B	TMSRL20-22	96.5	44.0	20	15.5	19.0	STM1622	TW10P
	TMSRL25-22	125.0	63.5	25	18.6	22.0		
15.875	TMSRL25-27	150.0	92.0	25	24.0	30.0	STM27	TW25L
	TMSRL32-27	160.0	98.0	32	31.0	37.0		
19.05B	TMSRL40-38	168.0	93.0	40	38.0	46.0	STM38	TW30L

• Applicable inserts, see pages E145 ~ E149

Tapered Type

New



Insert Size IC	Ordering Code	Dimensions (mm) L	L1	D	D1	D2	Screw	Wrench
9.525	TMSRT16-16	90.0	22.0	16	12.5	15.5	STM1622	TW10P
	TMSRT20-16	85.0	23.0	20	15.0	19.0	STMT16	
9.525B	TMSRT16-22	79.5	29.0	16	13.5	17.0	STM1622	TW10P
	TMSRT20-22	81.5	29.0	20	15.5	19.0		
15.875	TMSRT32-27	120.0	58.0	32	31.0	37.0	STM27	TW25L

• Applicable inserts, see pages E145 ~ E149

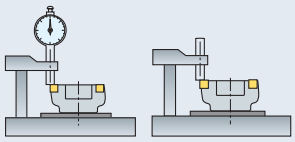
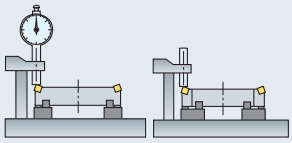
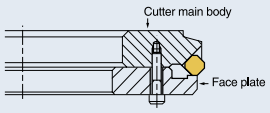
Technical Information for High feed Cutter

■ Features

- High feed cutter employs extra pitch for cast iron and light alloy steel.
- Quick change type for reduction of cutter change time.
- Cutting edge chattering is excellent.
- 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.

Type	Adaptor type	Roller type	Plate type
Shape			
Features	- Mainly under Ø160 diameter is used in 1piece type. - Available for fixed size of cutter and assembling & checking can be done at the same time .	- Mainly over Ø200 diameter is used in 2piece type. - Due to 3 adjustable guide roller, variety size of cutter can be assembled.	- Suitable for small size cutter due to the simple tructure. - 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.

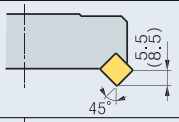
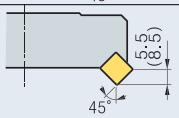
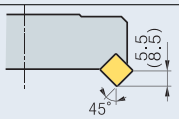
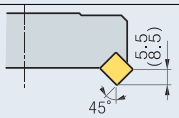
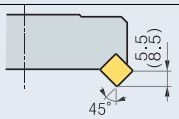
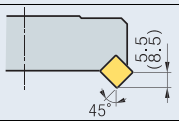
• Guide of insert setting in adaptor/roller type

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.

• Notice

- When you clamp wedge too tighten, run-out is getting worse to cutter distortion.
- When you clamp wedge, you should use torque wrench to set more precisely.

■ 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	Ø 100~Ø 450	Cast iron Roughing	25Z		-5 °	-6 °	SNCN1204ENN SNCN1504ENN
CDH4000 CDH5000	Ø 100~Ø 450	Cast iron Roughing Finishing	18Z		+10 °	+5 °	SDCN42R SDCN53R
DEH5000	Ø 100~Ø 450	Al alloy Roughing	20Z		+14 °	+6 °	HECN090408FN
DPH5000	Ø 100~Ø 450	Cast iron Roughing Finishing	12Z		+5 °	-3 °	HPEN090408 HPEN090408-WC
PNH4000 PNH5000	Ø 125~Ø 450	Cast iron Finishing	12Z		-5 °	-6 °	SNEF435 SNEF535
PPH4000	Ø 125~Ø 450	Cast iron Finishing	12Z		+5 °	-5 °	SPEN120416-WC

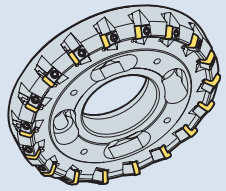
■ Recommended cutting condition

Workpiece	Cutting condition		Grade	Remark
	vc(m/min)	fz(mm/t)		
Cast iron	100~230	0.05~0.2	**PC6510**	PVD Coated
	80~150	0.05~0.2	**H01, G10**	Uncoated
Al alloy	500~	0.05~0.2	**PC6510**	PVD Coated
	500~	0.05~0.2	**H01, G10**	Uncoated

High feed Cutter for Cast iron

ANH4000/5000

AA 45°



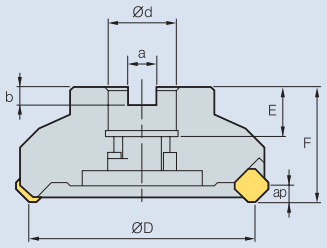


Fig. 1

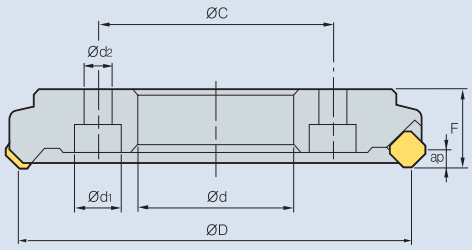


Fig. 2

(mm)

Designation			ØD	Ød	a	b	E	F	Ød1	Ød2	ØC	ap	kg	Fig.
ANH	4100R/L	8	100	31.75	12.7	8	22	50	-	-	-	5.5	2.5	1
	4125R/L	10	125	38.1	15.9	10	27	63	-	-	-	5.5	4.7	1
	4160R/L	14	160	50.8	19.0	11	27	63	-	-	-	5.5	7.3	1
	4200R/L	18	200	80	-	-	-	40	24	14	120	5.5	7	2
	4250R/L	24	250	120	-	-	-	40	30	18	170	5.5	9.6	2
	4315R/L	30	315	180	-	-	-	40	30	18	230	5.5	12.9	2
	4355R/L	34	355	220	-	-	-	40	30	18	270	5.5	15.5	2
	4400R/L	38	400	250	-	-	-	40	30	18	300	5.5	18.8	2
	4450R/L	44	450	300	-	-	-	40	30	18	350	5.5	22.2	2
ANH	5100R/L	8	100	31.75	12.7	8	22	50	-	-	-	8	2.6	1
	5125R/L	10	125	38.1	15.9	10	27	63	-	-	-	8	5	1
	5160R/L	14	160	50.8	19.0	11	27	63	-	-	-	8	7.5	1
	5200R/L	18	200	80	-	-	-	40	24	14	120	8	7	2
	5250R/L	24	250	120	-	-	-	40	30	18	170	8	9.6	2
	5315R/L	30	315	180	-	-	-	40	30	18	230	8	12.9	2
	5355R/L	34	355	220	-	-	-	40	30	18	270	8	15.5	2
	5400R/L	38	400	250	-	-	-	40	30	18	300	8	18.8	2
	5450R/L	44	450	300	-	-	-	40	30	18	350	8	22.2	2

● : Stock item ○ : Under preparing for stock

● Parts

	Wedge	Wedge Screw	Wrench
4000 Type	WANH4N	DHA0821F	HW40
5000 Type	WANH5N	DHA0821F	HW40

● Available Arbors

Designation		Arbors
ANH	☐100R/L	-
	☐125R/L	-
	☐160R/L	-
	☐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	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	PC6510 H01,G10

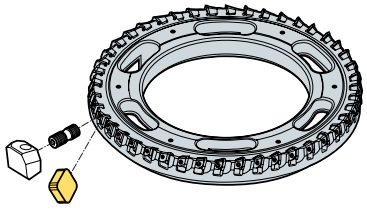
● Available Inserts

SNCN	SNKN

Designation		Coated		Uncoated			Type	Page
		NCM325	PC6510	ST30A	H01	G10		
SNCN	1204ENN	●	○	●	●	●	4000 Type	E21
SNKN	1204ENN		●					
SNCN	1504ENN			●		○	5000 Type	E21
SNKN	1504ENN	●	○					

● : Stock item ○ : Under preparing for stock

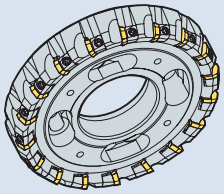
Assembling



• Applicable inserts, see pages E21
• Detail cutter spec. see pages E172~E174

CDH4000/5000

AA 25°



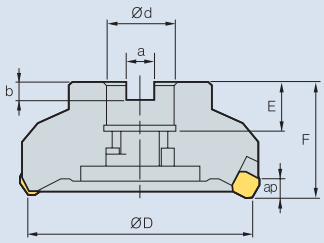


Fig. 1

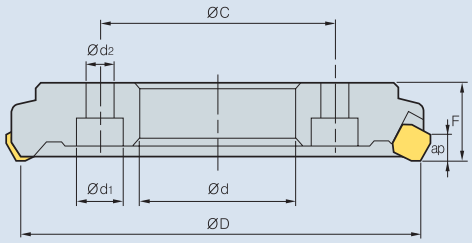


Fig. 2

(mm)

Designation			ØD	ød	a	b	E	F	ød1	ød2	ØC	ap	kg	Fig.
CDH	4100R/L	8	100	31.75	12.7	8	22	50	-	-	-	6	2.3	1
	4125R/L	10	125	38.1	15.9	10	27	63	-	-	-	6	4.4	1
	4160R/L	14	160	50.8	19.0	11	27	63	-	-	-	6	6.8	1
	4200R/L	18	200	80	-	-	-	40	24	14	120	6	6.7	2
	4250R/L	24	250	120	-	-	-	40	30	18	170	6	9.1	2
	4315R/L	30	315	180	-	-	-	40	30	18	230	6	12.3	2
	4355R/L	34	355	220	-	-	-	40	30	18	270	6	14.8	2
	4400R/L	38	400	250	-	-	-	40	30	18	300	6	18.1	2
	4450R/L	44	450	300	-	-	-	40	30	18	350	6	21.3	2
CDH	5100R/L	08	100	31.75	12.7	8	22	50	-	-	-	7	2.3	1
	5125R/L	10	125	38.1	15.9	10	27	63	-	-	-	7	4.4	1
	5160R/L	14	160	50.8	19.0	11	27	63	-	-	-	7	6.8	1
	5200R/L	18	200	80	-	-	-	40	24	14	120	7	6.6	2
	5250R/L	24	250	120	-	-	-	40	30	18	170	7	9.1	2
	5315R/L	30	315	180	-	-	-	40	30	18	230	7	12.2	2
	5355R/L	34	355	220	-	-	-	40	30	18	270	7	14.7	2
	5400R/L	38	400	250	-	-	-	40	30	18	300	7	18	2
	5450R/L	44	450	300	-	-	-	40	30	18	350	7	21.2	2

● : Stock item ○ : Under preparing for stock

● Parts

	Wedge	Wedge Screw	Wrench
4000Type	WCDH4R1/L1(Ø 100-Ø 160) WCDH4R/L(Ø 200-Ø 450)	DHA0821F	HW40
5000Type	WCDH5R1/L1(Ø 100-Ø 160) WCDH5R/L(Ø 200-Ø 450)	DHA0821F	HW40

● Available Arbors

Designation		Arbors
CDH	☐100R/L	-
	☐125R/L	-
	☐160R/L	-
	☐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	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	PC6510 H01,G10

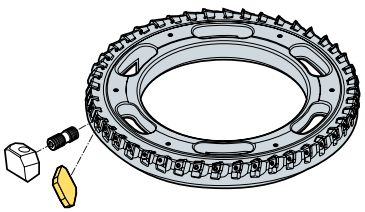
● Available Inserts

SDCN

Designation		Coated		Uncoated			Type	Page
		NCM325	PC6510	ST30A	H01	G10		
SDCN	42R						4000 Type	E17
	42L				●			
SDCN	53R						5000 Type	E17
	53L							

● : Stock item ○ : Under preparing for stock

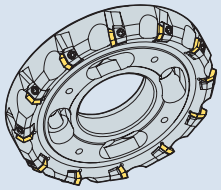
Assembling



• Applicable inserts, see pages **E17**
• Detail cutter spec. see pages **E172~E174**

DEH5000

AA 30°



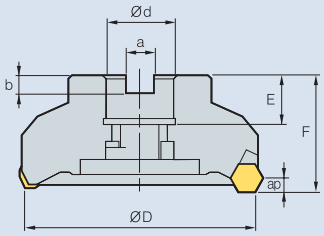


Fig. 1

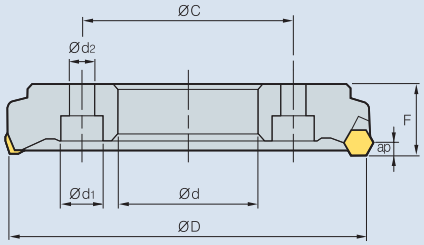


Fig. 2

(mm)

Designation			ØD	Ød	a	b	E	F	Ød1	Ød2	ØC	ap	kg	Fig.
DEH	5100R/L	6	100	31.75	12.7	8	22	50	-	-	-	7	2.3	1
	5125R/L	7	125	38.1	15.9	10	27	63	-	-	-	7	4.4	1
	5160R/L	8	160	50.8	19.0	11	27	63	-	-	-	7	6.3	1
	5200R/L	12	200	80	-	-	-	40	24	14	120	7	6.5	2
	5250R/L	14	250	120	-	-	-	40	30	18	170	7	9.1	2
	5315R/L	18	315	180	-	-	-	40	30	18	230	7	12.1	2
	5355R/L	20	355	220	-	-	-	40	30	18	270	7	14.8	2
	5400R/L	24	400	250	-	-	-	40	30	18	300	7	17.8	2
	5450R/L	28	450	300	-	-	-	40	30	18	350	7	21	2

● : Stock item ○ : Under preparing for stock

● Parts

Wedge	Wedge Screw	Wrench
WDEHR-1/L-1(Ø 100 - Ø 200) WDEHR/L(Ø 250 - Ø 450)	DHA0821F	HW40

● Available Arbors

Designation		Arbors
DEH	5100R/L	-
	5125R/L	-
	5160R/L	-
	5200R/L	APR200
	5250R/L	APR250
	5315R/L	APR315
	5355R/L	APR355
	5400R/L	APR400
	5450R/L	APR450

● Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	PC6510 H01,G10

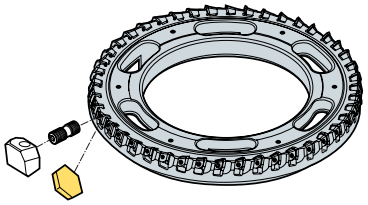
● Available Inserts

HECN

Designation		Coated		Uncoated			Page
		NCM325	PC6510	ST30A	H10	G10	
HECN	090408FN						E13
	090408SN						
	090408TN						

● : Stock item ○ : Under preparing for stock

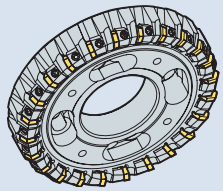
Assembling



• Applicable inserts, see pages E13
• Detail cutter spec. see pages E172~E174

DPH5000

AA 30°



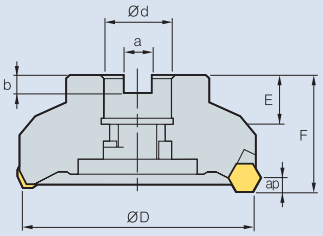


Fig. 1

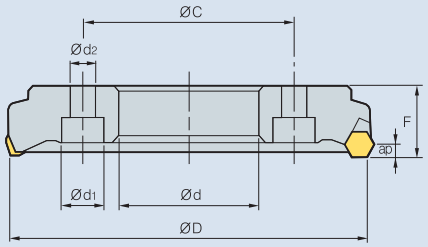


Fig. 2

(mm)

Designation		⚙	øD	ød	a	b	E	F	ød1	ød2	øC	ap	kg	Fig.
DPH	5100R/L	8	100	31.75	12.7	8	22	50	-	-	-	7	2.3	1
	5125R/L	10	125	38.1	15.9	10	27	63	-	-	-	7	4.4	1
	5160R/L	14	160	50.8	19.0	11	27	63	-	-	-	7	6.7	1
	5200R/L	18	200	80	-	-	-	40	24	14	120	7	6.5	2
	5250R/L	24	250	120	-	-	-	40	30	18	170	7	9	2
	5315R/L	30	315	180	-	-	-	40	30	18	230	7	12	2
	5355R/L	34	355	220	-	-	-	40	30	18	270	7	14.5	2
	5400R/L	38	400	250	-	-	-	40	30	18	300	7	17.7	2
	5450R/L	44	450	300	-	-	-	40	30	18	350	7	21	2

● : Stock item ○ : Under preparing for stock

● Parts

Wedge	Wedge Screw	Wrench
WDPH5R/L	DHA0821F	HW40

● Available Arbors

Designation		Arbors
DPH	5100R/L	-
	5125R/L	-
	5160R/L	-
	5200R/L	APR200
	5250R/L	APR250
	5315R/L	APR315
	5355R/L	APR355
	5400R/L	APR400
	5450R/L	APR450

● Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	PC6510 H01,G10

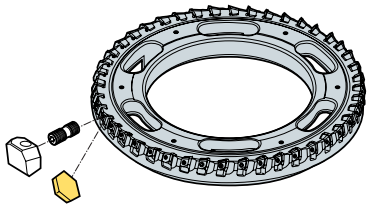
● Available Inserts

HPEN	HPEN-WC

Designation		Coated		Uncoated			Page
		NCM325	PC6510	ST30A	H10	G10	
HPEN	090408FN						E13
	090408SN						
	090408EN						
	090408-WC						E13

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages **E13**
• Detail cutter spec. see pages **E172~E174**

High feed Cutter for Cast iron

PNH4000/5000

AA 0°

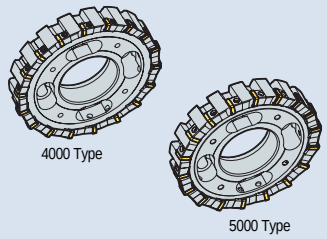


Fig. 1

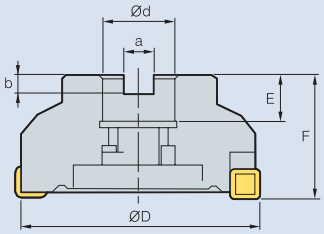
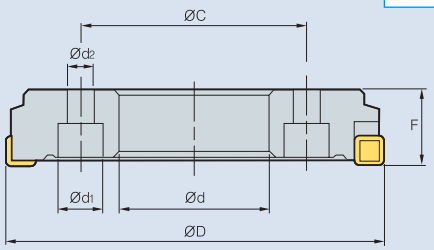


Fig. 2



(mm)

Designation			ØD	Ød	a	b	E	F	Ød1	Ød2	ØC	kg	Fig.
PNH	4125R/L	10	125	38.1	15.9	10	27	63	-	-	-	3.4	1
	4160R/L	14	160	50.8	19.0	11	27	63	-	-	-	5.5	1
	4200R/L	18	200	80	-	-	-	40	24	14	120	5.5	2
	4250R/L	24	250	120	-	-	-	40	30	18	170	7.7	2
	4315R/L	30	315	180	-	-	-	40	30	18	230	10.5	2
	4355R/L	34	355	220	-	-	-	40	30	18	270	12.9	2
	4400R/L	38	400	250	-	-	-	40	30	18	300	16.1	2
	4450R/L	44	450	300	-	-	-	40	30	18	350	19.1	2
PNH	5125R/L	10	125	38.1	15.9	10	27	63	-	-	-	3.4	1
	5160R/L	14	160	50.8	19.0	11	27	63	-	-	-	5.3	1
	5200R/L	18	200	80	-	-	-	40	24	14	120	5.4	2
	5250R/L	24	250	120	-	-	-	40	30	18	170	7.6	2
	5315R/L	30	315	180	-	-	-	40	30	18	230	10.4	2
	5355R/L	34	355	220	-	-	-	40	30	18	270	12.8	2
	5400R/L	38	400	250	-	-	-	40	30	18	300	15.9	2
	5450R/L	44	450	300	-	-	-	40	30	18	350	18.9	2

● : Stock item ○ : Under preparing for stock

● Parts

	Wedge	Wedge Screw	Wrench
4000 Type	WANH4N	DHA0821F	HW40
5000 Type	WANH5N	DHA0821F	HW40

● Available Arbors

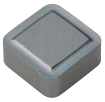
Designation		Arbors
PNH	□125R/L	-
	□160R/L	-
	□200R/L	APR200
	□250R/L	APR250
	□315R/L	APR315
	□355R/L	APR355
	□400R/L	APR400
	□450R/L	APR450

● Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
K	100 ~ 200	0.05 ~ 0.30	PC6510
	80 ~ 150	0.10 ~ 0.30	H01,G10

● Available Inserts

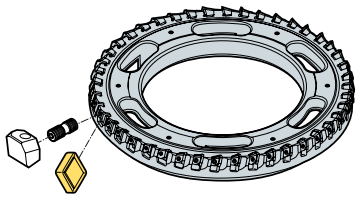
SNEF



Designation	Coated		Uncoated			Type	Page
	NCM325	PC6510	ST30A	H01	G10		
SNEF 435		●				4000 Type	E21
SNEF 535						5000 Type	E21

● : Stock item ○ : Under preparing for stock

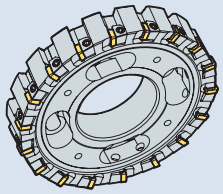
Assembling



• Applicable inserts, see pages E21
• Detail cutter spec. see pages E172~E174

PPH4000

AA 0°



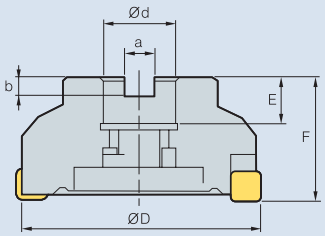


Fig. 1

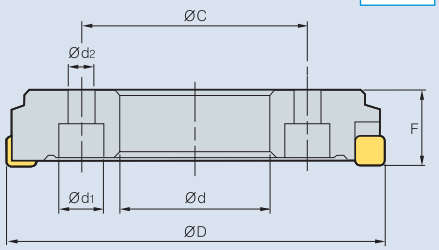


Fig. 2

(mm)

Designation		⊙	øD	ød	a	b	E	F	ød1	ød2	øC	kg	Fig.
PPH	4125R/L	10	125	38.1	15.9	10	27	63	-	-	-	3.4	1
	4160R/L	14	160	50.8	19.0	11	27	63	-	-	-	5.3	1
	4200R/L	18	200	80	-	-	-	40	24	14	120	5.5	2
	4250R/L	24	250	120	-	-	-	40	24	14	170	7.7	2
	4315R/L	30	315	180	-	-	-	40	30	18	230	10.5	2
	4355R/L	34	355	220	-	-	-	40	30	18	270	13	2
	4400R/L	38	400	250	-	-	-	40	30	18	300	16	2
	4450R/L	44	450	300	-	-	-	40	30	18	350	19	2

● : Stock item ○ : Under preparing for stock

● Parts

Wedge	Wedge Screw	Wrench
WPPH4R/L	DHA0821F	HW40

● Available Arbors

Designation		Arbors
PPH	4125R/L	-
	4160R/L	-
	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	100 ~ 200 80 ~ 150	0.05 ~ 0.30 0.10 ~ 0.30	**PC6510** **H01,G10**

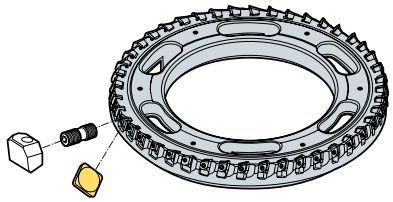
● Available Inserts

SPEN-WC

Designation	Coated		Uncoated			Page
	NCM325	PC6510	ST30A	H10	G10	
SPEN 120416-WC						E22

● : Stock item ○ : Under preparing for stock

Assembling



• Applicable inserts, see pages **E22**
• Detail cutter spec. see pages **E172~E174**

Cube Mill

Special features

- Special Korloy's cutter for cast iron roughing.
- 8 corner using insert. (maximum 16 corner available with 2 cutter, R/L cutter)
- Excellent cutting performance due to the positive rake angle made by 3 dimensional chip breaker.
- Excellent tool life by combination of variety of grades and chip breakers as per working conditions.
- 2 different type of inserts(chamfer / nose R) are available with 1 type cutter.

Roughing for cast iron

Code system

① Cutter	② Approach angle	③ Arbor type	④ Insert I/C
CBM : CUBE MILL	Q : 2° F : 5° E : 15° C : 25° A : 45°	M : Metric A : Inch	3 : 9.525mm 4 : 12.7mm

CBM	E	M	3	250	R	(2)	-	28Z
①	②	③	④	⑤	⑥	⑦		⑧

⑤ Cutter diameter	⑥ Hand of tool	⑦ Cutter shape	⑧ Number of tooth
ISO : mm ASA : inch	R : Right hand L : Left hand	Unmarked : Normal type 2 : Quick change type (2 pieces type)	-□□Z

Insert (R/L type)

- Low cutting load & good chip flow have been achieved due to the 3 dimensional chip breaker.
- Excellent tool life has been guaranteed by matching of variety of grades as per working conditions.
- 8 corner insert. (cost effective)

<Chamfer type>

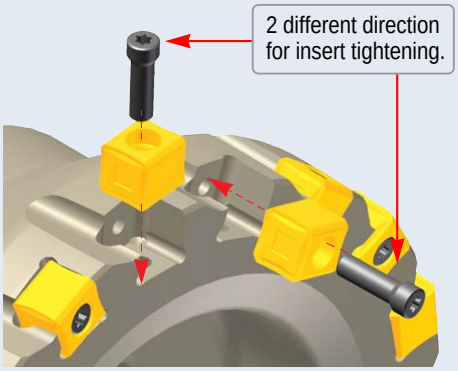
<Nose R type>

Cutter body

		General	Quick change
Cutter diameter	Metric	80~315 mm	200~450 mm

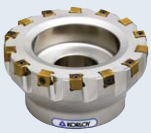
Approach angle : 2°, 5°, 15°, 25°, 45°

Clamping of insert



Cutter body

Parts

	Screw	Wrench
		
Cube mill 3000	FTGA0417CBM	TW15 - 100
Cube mill 4000	ETGA0520CBM	TW20 - 100

Storm Mill

Special features

- Conventional cutter with wide coverage
- Using 4 corners (Maximum 8 corner avaiable with R/L type cutter)
- Effective on big depth of cut application due to the long cutting edge
- Excellent tool life guaranted by matching of variety of grades as per working conditions.
- 2 different type of inserts(chamfer / nose R) are available with 1 type of cutter.

Roughing for cast iron

Code system

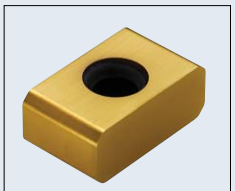
① Cutter	② Approach angle	ⓐ Relief angle of insert	③ Arbor type	④ Insert I/C
S : STORM MILL	Q : 2° F : 5° E : 15° C : 25° A : 45°	N : Negative (0°)	M : Metric A : Inch	3 : 9.525mm 4 : 12.7mm

S	Q	N	M	3	250	R	(2)	–	28Z
①	②	ⓐ	③	④	⑤	⑥	⑦		⑧

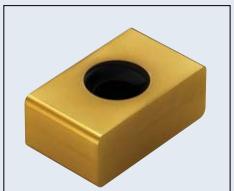
⑤ Cutter diameter	⑥ Hand of tool	⑦ Cutter shape	⑧ Number of tooth
ISO : mm ASA : inch	R : Right hand L : Left hand	Unmarked : Normal type 2 : Quick change type (2 pieces type)	-□□Z

Insert (R/L type)

- Excellent tool life guaranted by matching of variety of grades as per working conditions.
- Alternative corner of cutting edge as per application



<Chamfer type>



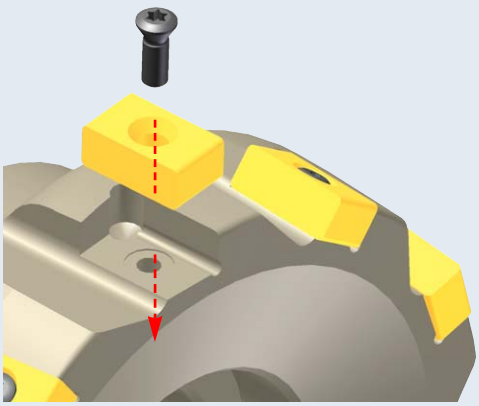
<Nose R type>

Cutter body

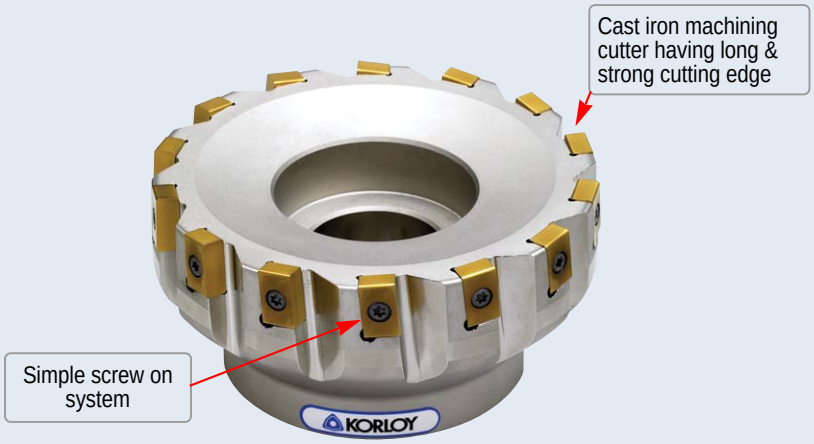
		General	Quick change
Cutter diameter	Metric	80~315 mm	200~450 mm

Approach angle : 2°, 5°, 15°, 45°

Clamping of insert



Cutter body



Parts

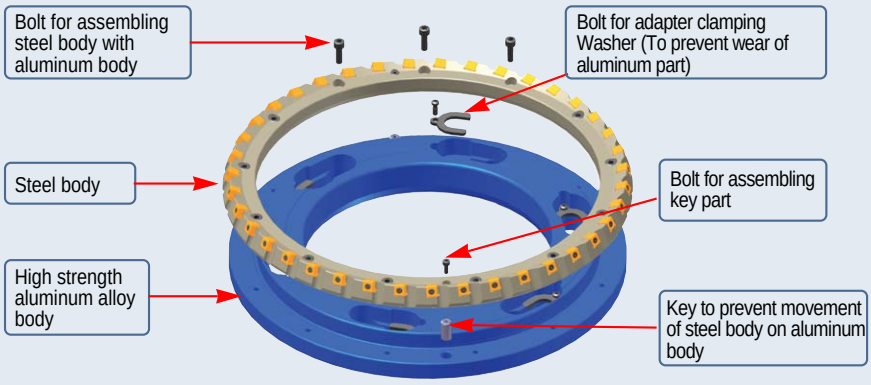
	Screw	Wrench
Storm mill	FTNA0411	TW15S

Couple Mill

Special features

- Ideal combination of Aluminum body with cast iron high feed cutter.
- Since the weight of cutter has been reduced down to 50% of steel cutter, it is very easy to handle and very effectiveness to prevent accident at the field.
- Application for Cube mill, Storm mill.

Assembling structure



CUBE-COUPLE Code system

① Cutter	② Approach angle	③ Arbor type	④ Insert I/C
CBM : CUBE MILL	Q : 2° F : 5° E : 15° C : 25° A : 45°	M : Metric A : Inch	3 : 9.525mm 4 : 12.7mm

CBM	E	M	3	355	R	28Z	-	CP
①	②	③	④	⑤	⑥	⑦		⑧

⑤ Cutter diameter	⑥ Hand of tool	⑦ Number of tooth	⑧ Couple Mill
ISO : mm ASA : inch	R : Right hand L : Left hand	-□□Z	

STORM-COUPLE Code system

① Storm Mill	② Approach angle	ⓐ Relief angle of insert	③ Arbor type	④ Insert I/C
	Q : 2° F : 5° E : 15° A : 45°	N : Negative (0°)	M : Metric A : Inch	3 : 9.525mm 4 : 12.7mm

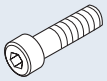
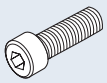
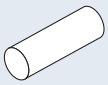
S	Q	N	M	3	355	R	-	28Z	-	CP
①	②	ⓐ	③	④	⑤	⑥		⑦		⑧

⑤ Cutter diameter	⑥ Hand of tool	⑦ Number of tooth	⑧ Couple Mill
ISO : mm ASA : inch	R : Right hand L : Left hand	-□□Z	

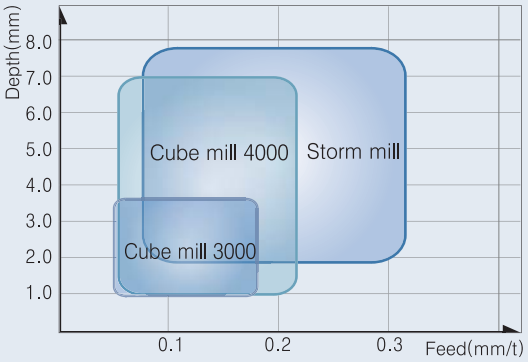
Cutter body

		Quick change
Cutter diameter	Metric	355~450mm

Parts

	Screw	Wrench		Bolt for body	Bolt for key	Key for body
						
CUBE-COUPLE 3000 Type 4000 Type	FTGA0417CBM ETGA0520CBM	TW15-100 TW20-100	-	BHA0616 BHA0620	MHBO410	PN1019-DRV
STORM-COUPLE 3000Type	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
	PC215K	120 ~ 210	0.05 ~ 0.18	80 ~ 150	0.05 ~ 0.18
Uncoated	G10	90 ~ 120	0.05 ~ 0.18	60 ~ 130	0.05 ~ 0.18

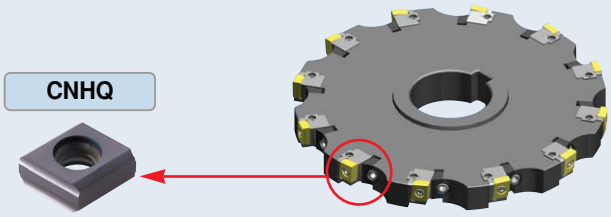
STORM MILL		Gray cast iron		Ductile cast iron	
		vc(m/min)	fz(mm/t)	vc(m/min)	fz(mm/t)
PVD	PC6510	150 ~ 300	0.10 ~ 0.23	100 ~ 200	0.10 ~ 0.23
	PC215K	120 ~ 210	0.08 ~ 0.23	80 ~ 150	0.08 ~ 0.23
Uncoated	H01	100 ~ 200	0.08 ~ 0.20	70 ~ 140	0.08 ~ 0.20
	G10	90 ~ 120	0.08 ~ 0.23	60 ~ 130	0.08 ~ 0.23

■ Available Arbors and Adaptors

Designation		Available Arbors and Adaptors	
		Arbors	Adaptor
CBMQM	3080R/L -00Z	BT□□-FMC27-□□	
(CBMFM)	3100R/L -00Z	BT□□-FMC32-□□	
(CBMEM)	3125R/L -00Z	BT□□-FMB40-□□	
(CBMCM)	3160R/L -00Z	BT□□-FMB40-□□	
(CBMAM)	3200R/L -00Z	BT□□-FMB60-□□	
	3250R/L -00Z	BT□□-FMB60-□□	
	3315R/L -00Z		
	3200R/L2 -00Z		APR200
	3250R/L2 -00Z		APR250
	3315R/L2 -00Z		APR315
	3355R/L2 -00Z		APR355
	3400R/L2 -00Z		APR400
	3450R/L2 -00Z		APR450
SQNM	3080R/L -00Z	BT□□-FMC27-□□	
(SFNM)	3100R/L -00Z	BT□□-FMC32-□□	
(SENM)	3125R/L -00Z	BT□□-FMB40-□□	
(SANM)	3160R/L -00Z	BT□□-FMB40-□□	
	3200R/L -00Z	BT□□-FMB60-□□	
	3250R/L -00Z	BT□□-FMB60-□□	
	3315R/L -00Z		
	3200R/L2 -00Z		APR200
	3250R/L2 -00Z		APR250
	3315R/L2 -00Z		APR315
	3355R/L2 -00Z		APR355
	3400R/L2 -00Z		APR400
	3450R/L2 -00Z		APR450

Adjusting side cutter

■ Tangential Type (High rigidity)



- 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.

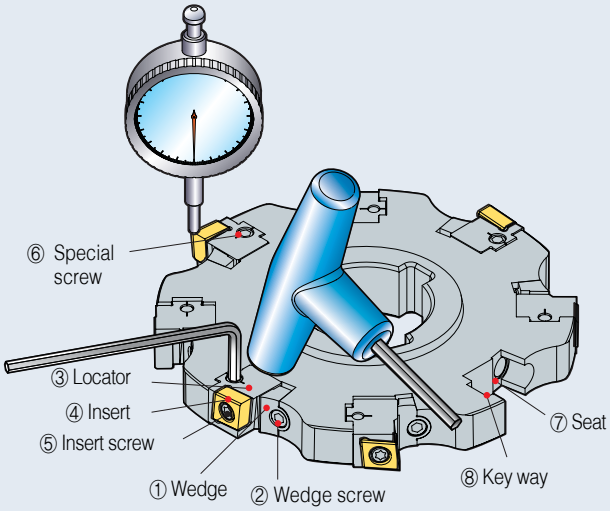
■ Radial Type (Low cutting load)

- 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.

■ 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 big width of cutting operation.
- 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 ∗

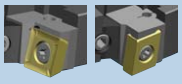
1. Clamp ①wedge slightly on ⑦locator-wedge pocket by using ②wedge screw.
2. Put ③locator on ⑦locator-wedge pocket along with the ⑧key-way.
3. Tighten the ⑥taper screw little bit to set proper position of locator.
4. Tighten the ②wedge screw tightly by using 70~80N.m torque.
5. After put the ④insert on 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.

■ Korloy code system (mm)

① Insert clamping way
R : Radial type Using SDXT
T : Tangential type Using CNHQ



② Adjusting
A : Adjusting side cutter

③ Insert configuration
FC : Full side cutter
HC : Half side cutter

R	A	FC	B	M	125	14	18	R
①	②	③	④	⑤	⑥	⑦	⑧	⑨

④ Cutter type
P : Plane type
B : Boss type

⑤ Arbor type
M : Metric
A : Inch

⑥ Cutter diameter (Ø)

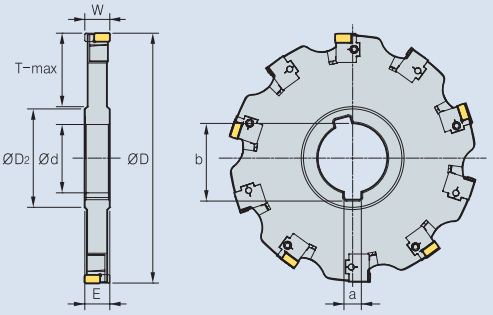
⑦ Minimum width of the cutter/
⑧ Maximum width of the cutter
For half side cutter, minimum width of the cutter will be written only.

⑨ Hand of tool

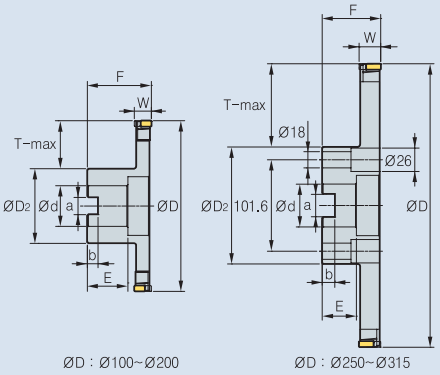
Unmarked	R	L
Neutral	Right	Left
Full side cutter Plane type	Half side cutter Boss type	

Tangential type (Full side cutter)

New



• TAFCPM



• TAFCBM

Designation		Ød	E	ØD2	a	b	T-Max
TAFCPM	1001418	32	14	48	8	34.8	24
	1251418	40	14	56	10	43.5	32
	1601418	40	14	56	10	43.5	50
	2001418	50	14	72	12	53.5	61
	2501418	50	14	72	12	53.5	86
	3151418	50	14	72	12	53.5	118
TAFCPM	1001821	32	18	48	8	34.8	24
	1251821	40	18	56	10	43.5	32
	1601821	40	18	56	10	43.5	50
	2001821	50	18	72	12	53.5	61
	2501821	50	18	72	12	53.5	86
	3151821	50	18	72	12	53.5	118
TAFCPM	1002124	32	21	48	8	34.8	24
	1252124	40	21	56	10	43.5	32
	1602124	40	21	56	10	43.5	50
	2002124	50	21	72	12	53.5	61
	2502124	50	21	72	12	53.5	86
	3152124	50	21	72	12	53.5	118
TAFCPM	1252427	40	24	56	10	43.5	32
	1602427	40	24	56	10	43.5	50
	2002427	50	24	72	12	53.5	61
	2502427	50	24	72	12	53.5	86
	3152427	50	24	72	12	53.5	118
TAFCPM	1252730	40	27	56	10	43.5	32
	1602730	40	27	56	10	43.5	50
	2002730	50	27	72	12	53.5	61
	2502730	50	27	72	12	53.5	86
	3152730	50	27	72	12	53.5	118

Designation		Ød	F	ØD2	a	b	E	T-Max	Dimensions (mm) ØD	W	No. of tooth
TAFCBM	1001418R/L	32	50	54	14.4	8	28	21	100	14-18	6
	1251418R/L	40	60	70	16.4	9	30	25	125	14-18	8
	1601418R/L	40	60	70	16.4	9	30	43	160	14-18	10
	2001418R/L	40	65	90	16.4	9	30	53	200	14-18	12
	2501418R/L	60	65	130	25.7	14	38	58	250	14-18	16
	3151418R/L	60	65	130	25.7	14	38	90	315	14-18	20
TAFCBM	1001821R/L	32	50	50	14.4	8	28	21	100	18-21	6
	1251821R/L	40	60	70	16.4	9	30	25	125	18-21	8
	1601821R/L	40	60	70	16.4	9	30	43	160	18-21	10
	2001821R/L	40	65	90	16.4	9	30	53	200	18-21	12
	2501821R/L	60	65	130	25.7	14	38	58	250	18-21	16
	3151821R/L	60	65	130	25.7	14	38	90	315	18-21	20
TAFCBM	1002124R/L	32	50	54	14.4	8	28	21	100	21-24	6
	1252124R/L	40	60	70	16.4	9	30	25	125	21-24	8
	1602124R/L	40	60	70	16.4	9	30	43	160	21-24	10
	2002124R/L	40	65	90	16.4	9	30	53	200	21-24	12
	2502124R/L	60	65	130	25.7	14	38	58	250	21-24	16
	3152124R/L	60	65	130	25.7	14	38	90	315	21-24	20
TAFCBM	1252427R/L	40	60	70	16.4	9	30	25	125	24-27	8
	1602427R/L	40	60	70	16.4	9	30	43	160	24-27	10
	2002427R/L	40	65	90	16.4	9	30	53	200	24-27	12
	2502427R/L	60	65	130	25.7	14	38	58	250	24-27	16
	3152427R/L	60	65	130	25.7	14	38	90	315	24-27	20
TAFCBM	1252730R/L	40	60	70	16.4	9	30	25	125	27-30	8
	1602730R/L	40	60	70	16.4	9	30	43	160	27-30	10
	2002730R/L	40	65	90	16.4	9	30	53	200	27-30	12
	2502730R/L	60	65	130	25.7	14	38	58	250	27-30	16
	3152730R/L	60	65	130	25.7	14	38	90	315	27-30	20

• The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

• See the page **E167** for applicable insert and recommended cutting condition

• Order - made item

● Available Insert & Parts

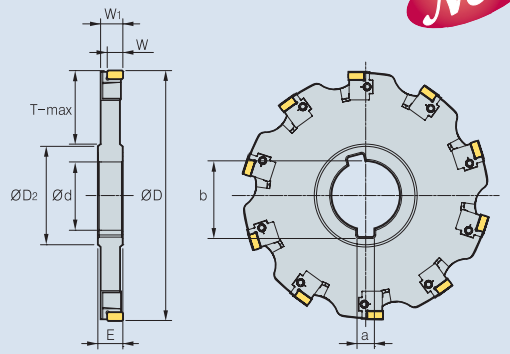
Edge width (TAFCPM) (TAFCBM)	Insert	Locator	Wedge	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Wedge)	Wrench (Locator)
□□□1418R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□1821R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	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

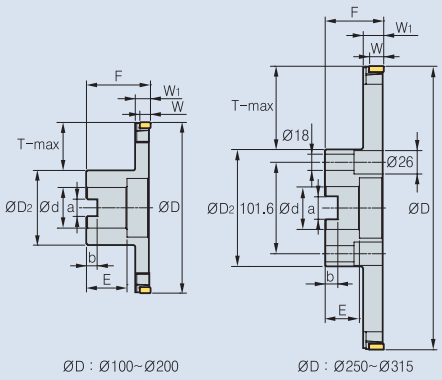
Adjustable Side Cutter

Tangential type (Half side cutter)

New



• TAHCPM



• TAHCBM

Designation		Ød	E	ØD2	a	b	T-Max
TAHCPM	10014R/L	32	14	48	8	34.8	24
	12514R/L	40	14	56	10	43.5	32
	16014R/L	40	14	56	10	43.5	50
	20014R/L	50	14	72	12	53.5	61
	25014R/L	50	14	72	12	53.5	86
	31514R/L	50	14	72	12	53.5	118
TAHCPM	10018R/L	32	18	48	8	34.8	24
	12518R/L	40	18	56	10	43.5	32
	16018R/L	40	18	56	10	43.5	50
	20018R/L	50	18	72	12	53.5	61
	25018R/L	50	18	72	12	53.5	86
	31518R/L	50	18	72	12	53.5	118
TAHCPM	10021R/L	32	21	48	8	34.8	24
	12521R/L	40	21	56	10	43.5	32
	16021R/L	40	21	56	10	43.5	50
	20021R/L	50	21	72	12	53.5	61
	25021R/L	50	21	72	12	53.5	86
	31521R/L	50	21	72	12	53.5	118
TAHCPM	12524R/L	40	24	56	10	43.5	32
	16024R/L	40	24	56	10	43.5	50
	20024R/L	50	24	72	12	53.5	61
	25024R/L	50	24	72	12	53.5	86
	31524R/L	50	24	72	12	53.5	118
TAHCPM	12527R/L	40	27	56	10	43.5	32
	16027R/L	40	27	56	10	43.5	50
	20027R/L	50	27	72	12	53.5	61
	25027R/L	50	27	72	12	53.5	86
	31527R/L	50	27	72	12	53.5	118

Designation		Ød	F	ØD2	a	b	E	T-Max	Dimensions (mm) ØD	W	W1	No. of tooth
TAHCBM	10014R/L	32	50	54	14.4	8	28	21	100	9	13.25	6
	12514R/L	40	60	70	16.4	9	30	25	125	9	13.25	8
	16014R/L	40	60	70	16.4	9	30	43	160	9	13.25	10
	20014R/L	40	65	90	16.4	9	30	53	200	9	13.25	12
	25014R/L	60	65	130	25.7	14	38	58	250	9	13.25	16
	31514R/L	60	65	130	25.7	14	38	90	315	9	13.25	20
TAHCBM	10018R/L	32	50	54	14.4	8	28	21	100	12	16.75	6
	12518R/L	40	60	70	16.4	9	30	25	125	12	16.75	8
	16018R/L	40	60	70	16.4	9	30	43	160	12	16.75	10
	20018R/L	40	65	90	16.4	9	30	53	200	12	16.75	12
	25018R/L	60	65	130	25.7	14	38	58	250	12	16.75	16
	31518R/L	60	65	130	25.7	14	38	90	315	12	16.75	20
TAHCBM	10021R/L	32	50	54	14.4	8	28	21	100	12	19.75	6
	12521R/L	40	60	70	16.4	9	30	25	125	12	19.75	8
	16021R/L	40	60	70	16.4	9	30	43	160	12	19.75	10
	20021R/L	40	65	90	16.4	9	30	53	200	12	19.75	12
	25021R/L	60	65	130	25.7	14	38	58	250	12	19.75	16
	31521R/L	60	65	130	25.7	14	38	90	315	12	19.75	20
TAHCBM	12524R/L	40	60	70	16.4	9	30	25	125	15	22.75	8
	16024R/L	40	60	70	16.4	9	30	43	160	15	22.75	10
	20024R/L	40	65	90	16.4	9	30	53	200	15	22.75	12
	25024R/L	60	65	130	25.7	14	38	78	250	15	22.75	16
	31524R/L	60	65	130	25.7	14	38	90	315	15	22.75	20
TAHCBM	12527R/L	40	60	70	16.4	9	30	25	125	15	25.75	8
	16027R/L	40	60	70	16.4	9	30	43	160	15	25.75	10
	20027R/L	40	65	90	16.4	9	30	53	200	15	25.75	12
	25027R/L	60	65	130	25.7	14	38	58	250	15	25.75	16
	31527R/L	60	65	130	25.7	14	38	90	315	15	25.75	20

• The ap (Maximum width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

• See the page **E167** for applicable insert and recommended cutting condition

• Order - made item

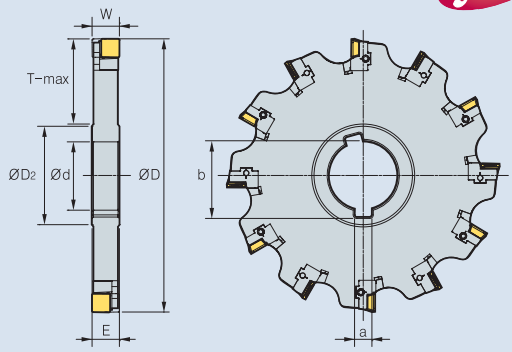
● Available Insert & Parts

Edge width (TAHCPM) (TAHCBM)	Insert	Locator	Wedge	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Wedge)	Wrench (Locator)
□□□14R/L	CNHQ1005-□□□	LSA-CH10R/L	WSA10N	FTKA0410	DHA0617	SHGA0411	TW15S	HW30	-
□□□18R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□21R/L	CNHQ1305-□□□	LSA-CH13R/L	WSA13N	FTKA0410	DHA0821F	SHGA0411	TW15S	HW40	HW30L
□□□24R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L
□□□27R/L	CNHQ1606-□□□	LSA-CH16R/L	WSA13N	FTGA0513-P	DHA0821F	SHGA0411	TW20S	HW40	HW30L

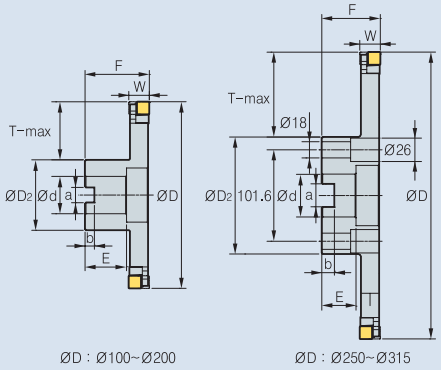
• Note) The Wedge screw for 10018, 10021 cutter is DHA0818F

Radial type (Full side cutter)

New



• RAFCPM



• RAFCBM

Designation		ød	E	øD2	a	b	T-Max
RAFCPM	1001214	32	12	48	8	34.8	24
	1251214	40	12	56	10	43.5	32
	1601214	40	12	56	10	43.5	50
	2001214	50	12	72	12	53.5	61
	2501214	50	12	72	12	53.5	86
	3151214	50	12	72	12	53.5	118
RAFCPM	1001416	32	14	48	8	34.8	24
	1251416	40	14	56	10	43.5	32
	1601416	40	14	56	10	43.5	50
	2001416	50	14	72	12	53.5	61
	2501416	50	14	72	12	53.5	86
	3151416	50	14	72	12	53.5	118
RAFCPM	1251618	40	16	56	10	43.5	32
	1601618	40	16	56	10	43.5	50
	2001618	50	16	72	12	53.5	61
	2501618	50	16	72	12	53.5	86
	3151618	50	16	72	12	53.5	118
RAFCPM	1251820	40	18	56	10	43.5	32
	1601820	40	18	56	10	43.5	50
	2001820	50	18	72	12	53.5	61
	2501820	50	18	72	12	53.5	86
	3151820	50	18	72	12	53.5	118
RAFCPM	1252022	40	20	56	10	43.5	32
	1602022	40	20	56	10	43.5	50
	2002022	50	20	72	12	53.5	61
	2502022	50	20	72	12	53.5	86
	3152022	50	20	72	12	53.5	118
RAFCPM	1252224	40	22	56	10	43.5	32
	1602224	40	22	56	10	43.5	50
	2002224	50	22	72	12	53.5	61
	2502224	50	22	72	12	53.5	86
	3152224	50	22	72	12	53.5	118

Designation		ød	F	øD2	a	b	E	T-Max	Dimensions (mm) øD	W	No. of tooth
RAFCBM	1001214R/L	32	50	54	14.4	8	28	21	100	12-14	6
	1251214R/L	40	60	70	16.4	9	30	25	125	12-14	8
	1601214R/L	40	60	70	16.4	9	30	43	160	12-14	10
	2001214R/L	40	65	90	16.4	9	30	53	200	12-14	12
	2501214R/L	60	65	130	25.7	14	38	58	250	12-14	16
	3151214R/L	60	65	130	25.7	14	38	90	315	12-14	20
RAFCBM	1001416R/L	32	50	50	14.4	8	28	21	100	14-16	6
	1251416R/L	40	60	70	16.4	9	30	25	125	14-16	8
	1601416R/L	40	60	70	16.4	9	30	43	160	14-16	10
	2001416R/L	40	65	90	16.4	9	30	53	200	14-16	12
	2501416R/L	60	65	130	25.7	14	38	58	250	14-16	16
	3151416R/L	60	65	130	25.7	14	38	90	315	14-16	20
RAFCBM	1251618R/L	40	60	70	16.4	9	30	25	125	16-18	8
	1601618R/L	40	60	70	16.4	9	30	43	160	16-18	10
	2001618R/L	40	65	90	16.4	9	30	53	200	16-18	12
	2501618R/L	60	65	130	25.7	14	38	58	250	16-18	16
	3151618R/L	60	65	130	25.7	14	38	90	315	16-18	20
RAFCBM	1251820R/L	40	60	70	16.4	9	30	25	125	18-20	8
	1601820R/L	40	60	70	16.4	9	30	43	160	18-20	10
	2001820R/L	40	65	90	16.4	9	30	53	200	18-20	12
	2501820R/L	60	65	130	25.7	14	38	58	250	18-20	16
	3151820R/L	60	65	130	25.7	14	38	90	315	18-20	20
RAFCBM	1252022R/L	40	60	70	16.4	9	30	25	125	20-22	8
	1602022R/L	40	60	70	16.4	9	30	43	160	20-22	10
	2002022R/L	40	65	90	16.4	9	30	53	200	20-22	12
	2502022R/L	60	65	130	25.7	14	38	58	250	20-22	16
RAFCBM	3152022R/L	60	65	130	25.7	14	38	90	315	20-22	20
	1252224R/L	40	60	70	16.4	9	30	25	125	22-24	8
	1602224R/L	40	60	70	16.4	9	30	43	160	22-24	10
	2002224R/L	40	65	90	16.4	9	30	53	200	22-24	12
	2502224R/L	60	65	130	25.7	14	38	58	250	22-24	16
	3152224R/L	60	65	130	25.7	14	38	90	315	22-24	20

• The ap (Maximium width of cutter) size written above is the number when using insert having corner size C0.5 or R0.5

• See the page **E167** for applicable insert and recommended cutting condition

• Order - made item

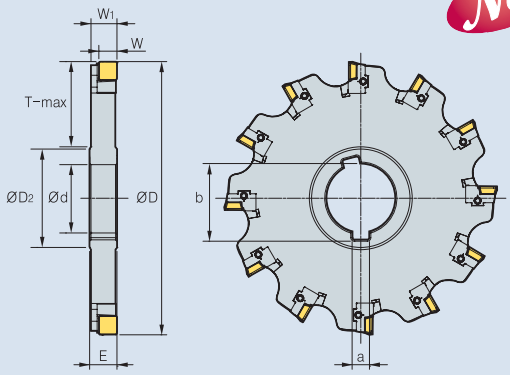
● Available Insert & Parts

Edge width (RAFCPM) (RAFCBM)	Insert	Locator	Wedge WSD09N	Wedge WSA10N	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Locator, Wedge)
□□□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

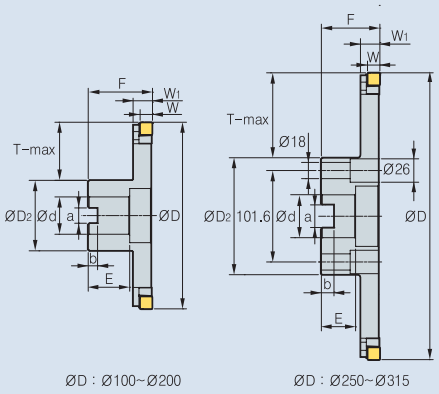
Adjustable Side Cutter

Radial type (Half side cutter)

New



• RAHCPM



ØD : Ø100~Ø200 ØD : Ø250~Ø315

• RAHCBM

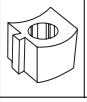
Designation		ød	E	øD2	a	b	T-Max
RAHCPM	10012R/L	32	12	48	8	34.8	24
	12512R/L	40	12	56	10	43.5	32
	16012R/L	40	12	56	10	43.5	50
	20012R/L	50	12	72	12	53.5	61
	25012R/L	50	12	72	12	53.5	86
	31512R/L	50	12	72	12	53.5	118
RAHCPM	10014R/L	32	14	48	8	34.8	24
	12514R/L	40	14	56	10	43.5	32
	16014R/L	40	14	56	10	43.5	50
	20014R/L	50	14	72	12	53.5	61
	25014R/L	50	14	72	12	53.5	86
	31514R/L	50	14	72	12	53.5	118
RAHCPM	12516R/L	40	16	56	10	43.5	32
	16016R/L	40	16	56	10	43.5	50
	20016R/L	50	16	72	12	53.5	61
	25016R/L	50	16	72	12	53.5	86
	31516R/L	50	16	72	12	53.5	118
RAHCPM	12518R/L	40	18	56	10	43.5	32
	16018R/L	40	18	56	10	43.5	50
	20018R/L	50	18	72	12	53.5	61
	25018R/L	50	18	72	12	53.5	86
	31518R/L	50	18	72	12	53.5	118
RAHCPM	12520R/L	40	20	56	10	43.5	32
	16020R/L	40	20	56	10	43.5	50
	20020R/L	50	20	72	12	53.5	61
	25020R/L	50	20	72	12	53.5	86
	31520R/L	50	20	72	12	53.5	118
RAHCPM	12522R/L	40	22	56	10	43.5	32
	16022R/L	40	22	56	10	43.5	50
	20022R/L	50	22	72	12	53.5	61
	25022R/L	50	22	72	12	53.5	86
	31522R/L	50	22	72	12	53.5	118

Designation		ød	F	øD2	a	b	E	T-Max	Dimensions (mm) øD	W	W1	No. of tooth
RAHCBM	10012R/L	32	50	54	14.4	8	28	21	100	8	11.1	6
	12512R/L	40	60	70	16.4	9	30	25	125	8	11.1	8
	16012R/L	40	60	70	16.4	9	30	43	160	8	11.1	10
	20012R/L	40	65	90	16.4	9	30	53	200	8	11.1	12
	25012R/L	60	65	130	25.7	14	38	58	250	8	11.1	16
	31512R/L	60	65	130	25.7	14	38	90	315	8	11.1	20
RAHCBM	10014R/L	32	50	50	14.4	8	28	21	100	8	13.1	6
	12514R/L	40	60	70	16.4	9	30	25	125	8	13.1	8
	16014R/L	40	60	70	16.4	9	30	43	160	8	13.1	10
	20014R/L	40	65	90	16.4	9	30	53	200	8	13.1	12
	25014R/L	60	65	130	25.7	14	38	58	250	8	13.1	16
	31514R/L	60	65	130	25.7	14	38	90	315	8	13.1	20
RAHCBM	12516R/L	40	60	70	16.4	9	30	25	125	10.5	15	8
	16016R/L	40	60	70	16.4	9	30	43	160	10.5	15	10
	20016R/L	40	65	90	16.4	9	30	53	200	10.5	15	12
	25016R/L	60	65	130	25.7	14	38	58	250	10.5	15	16
	31516R/L	60	65	130	25.7	14	38	90	315	10.5	15	20
RAHCBM	12518R/L	40	60	70	16.4	9	30	25	125	10.5	17	8
	16018R/L	40	60	70	16.4	9	30	43	160	10.5	17	10
	20018R/L	40	65	90	16.4	9	30	53	200	10.5	17	12
	25018R/L	60	65	130	25.7	14	38	58	250	10.5	17	16
	31518R/L	60	65	130	25.7	14	38	90	315	10.5	17	20
RAHCBM	12520R/L	40	60	70	16.4	9	30	25	125	10.5	19	8
	16020R/L	40	60	70	16.4	9	30	43	160	10.5	19	10
	20020R/L	40	65	90	16.4	9	30	53	200	10.5	19	12
	25020R/L	60	65	130	25.7	14	38	58	250	10.5	19	16
	31520R/L	60	65	130	25.7	14	38	90	315	10.5	19	20
RAHCBM	12522R/L	40	60	70	16.4	9	30	25	125	10.5	21	8
	16022R/L	40	60	70	16.4	9	30	43	160	10.5	21	10
	20022R/L	40	65	90	16.4	9	30	53	200	10.5	21	12
	25022R/L	60	65	130	25.7	14	38	58	250	10.5	21	16
	31522R/L	60	65	130	25.7	14	38	90	315	10.5	21	20

• 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

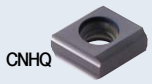
• See the page **E167** for applicable insert and recommended cutting condition
• Order - made item

● Available Insert & Parts

Edge width (RAHCPM) (RAHCBM)	Insert	Locator	Wedge WSD09N	Wedge WSA10N	Screw (Insert)	Screw (Wedge)	Screw (Locator)	Wrench (Insert)	Wrench (Locator, Wedge)
									
□□□12R/L	SDXT09M40□R/L	LSD09R/L	WSD09N		FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□14R/L	SDXT09M40□R/L	LSD09R/L	WSD09N		FTGA03508	DHA0617	SHGA0409	TW15S	HW30
□□□16R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□18R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□20R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30
□□□22R/L	SDXT13050□R/L	LSD13R/L	WSA10N		FTNC04509	DHA0617	SHGA0411	TW20S	HW30

Tangential type

■ Cutting width as per insert & type of cutter



Designation	Coated		Cutting width for half side cutter (W)	Cutting width for full side cutter (W)	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							

● : Stock item ○ : Under preparing for stock

• Applicable cutter, see pages E163, E164 • Detail cutter spec. see page E172~E174

■ Recommended cutting condition

ISO	Grades	vc(m/min)	fz(mm/t)
P	NCM325	150~300	0.1~0.3
	PC3535	100~300	
M	PC9530	100~180	0.1~0.3
	NCM335	120~200	
K	PC215K	150~250	0.1~0.3
	PC6510	150~300	

Radial type

■ Cutting width as per insert & type of cutter

Designation	Coated							Uncoated	Cutting width for half side cutter (W)	Cutting width for full side cutter (W)	d	t
	NCM325	NCM335	PC3535	PC3545	PC9530	PC6510	PC8520	H01				
SDXT09M405R-MA								●	8	12~14 14~16	9.525	4
SDXT09M405L-MA												
SDXT09M405R-MF	●	●	○		●	○	●					
SDXT09M405L-MF												
SDXT09M405R-MM	●	●	●		●	●	●					
SDXT09M405L-MM	○					○						
SDXT130508R-MA								●	10.5	16~18 18~20 20~22 22~24	13.5	5.56
SDXT130508L-MA												
SDXT130508R-MF	●	●	○		●	○	●					
SDXT130508L-MF												
SDXT130508R-MM	●	●	●	●	●	●	●					
SDXT130508L-MM	○						○					

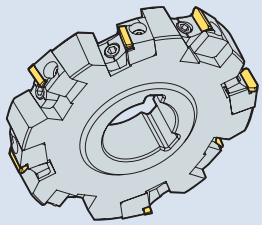
● : Stock item ○ : Under preparing for stock

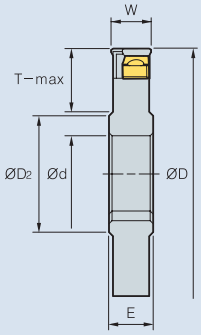
• Applicable cutter, see pages E165, E166 • Detail cutter spec. see page E172~E174

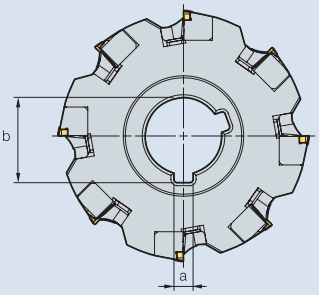
■ Recommended cutting condition

ISO	Grades	vc(m/min)	fz(mm/t)
P	NCM325	120~250	0.08~0.3
	NCM335	120~220	0.08~0.25
	PC3535	100~220	0.1~0.25
M	PC9530	80~180	0.1~0.25
	NCM335		
K	PC8520	150~230	0.1~0.25
	PC6510	180~250	

FCM (Full side cutter)







(mm)

Designation			øD	W	T-max	ød	E	a	b	øD2	Insert
FCM	08010	6	80	10	17.0	27	12	7	29.8	41.5	TPCN1103PPN
	10012	8	100	12	24.0	32	14	8	34.8	48	TPCN1103PPN
	12512	10	125	12	31.5	40	14	10	43.5	58	TPCN1103PPN
	12520	8	125	20	31.5	40	22	10	43.5	58	TPCN1603PPN
	16012	12	160	12	49.0	40	14	10	43.5	58	TPCN1103PPN
	16016	12	160	16	49.0	40	18	10	43.5	58	TPCN1103PPN
	16018	10	10	18	49.0	40	20	10	43.5	58	TPCN1603PPN
	16020	10	10	20	49.0	40	22	10	43.5	58	TPCN1603PPN
	20022	12	200	22	61.0	50	24	12	53.5	72	TPCN1603PPN
	25024	16	250	24	81.0	50	26	12	53.5	84	TPCN1603PPN
	31524	16	315	24	113.5	50	26	12	53.5	84	TPCN1603PPN

● Parts

Locator	Wedge	Screw	Locator Screw	Wrench
LFC2R/L · LFC3R/L *LFC2R/L-1	WFC2N · WFC3N *WFC2N-1	DHA0617 DHA0815	MHB0310 MHB410	HW30L HW40L

* FC08010

● Available Arbors

Designation		Arbors	
FCM	08010	BT40-SCA27-75/120	BT50-SCA27-90/135
	10012	BT40-SCA32-105	BT50-SCA32-90/135
	12512	-	BT50-SCA40-90/135
	12520	-	BT50-SCA40-90/135
	16012	-	BT50-SCA40-90/135
	16018	-	BT50-SCA40-90/135
	16020	-	BT50-SCA40-90/135
	20022	-	-
	25024	-	-
	31524	-	-

● Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250 120 ~ 200 100 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	NCM325 PC3525 ST30A
M	80 ~ 180 80 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30	PC9530 ST30A
K	130 ~ 200 100 ~ 150	0.10 ~ 0.35 0.10 ~ 0.40	PC6510 G10

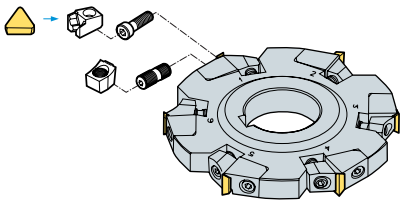
● Available Inserts

TPCN

Designation		Coated		Cermet	Uncoated			Page
		NCM325	PC6510	CN30	ST20	St30A	G10	
TPCN	1103PPN			●	●	●	●	E24
	1603PPN	●	●	●			●	

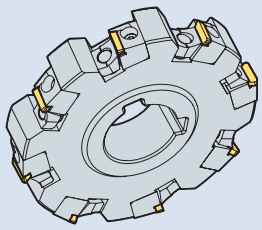
● : Stock item ○ : Under preparing for stock

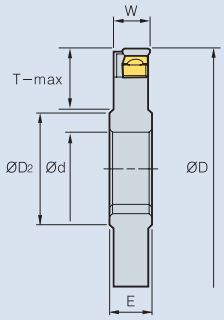
Assembling

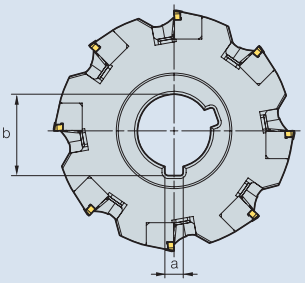


• Applicable inserts, see pages E24
• Detail cutter spec. see pages E172~E174

HCM (Half side cutter)







(mm)

Designation			øD	W	T-max	ød	E	a	b	øD2	Insert
HCM	10024R/L	6	100	24	24.0	32	27	8	34.8	48	TPCN1603PPN
	12524R/L	8	125	24	31.5	40	27	10	43.5	58	TPCN1603PPN
	16024R/L	10	160	24	49.0	40	27	10	43.5	58	TPCN1603PPN
	20024R/L	12	200	24	62.0	50	27	12	53.5	72	TPCN1603PPN
	25024R/L	16	250	24	81.0	50	27	12	53.5	84	TPCN1603PPN
	31524R/L	20	315	24	113.5	50	27	12	53.5	84	TPCN1603PPN

● Parts

Locator	Wedge	Screw	Locator Screw	Wrench
LFC3R/L	WFC3N	DHA0815	MHB0410	HW40L

● Available Arbors

Designation		Arbors	
HCM	10024R/L	BT40-SCA32-105	BT50-SCA32-90/135
	12524R/L	-	BT50-SCA40-90/135
	16024R/L	-	BT50-SCA40-90/135
	20024R/L	-	-
	25024R/L	-	-
	31524R/L	-	-

● Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250 120 ~ 200 100 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	NCM325 PC3525 ST30A
M	80 ~ 180 80 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30	PC9530 ST30A
K	130 ~ 200 100 ~ 150	0.10 ~ 0.35 0.10 ~ 0.40	PC6510 G10

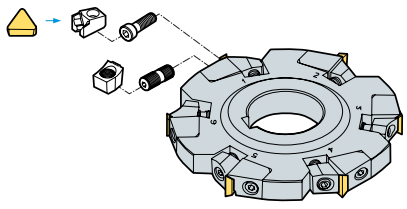
● Available Inserts

TPCN

Designation	Coated		Cermet	Uncoated	Page
	NCM325	PC6510	CN30	G10	
TPCN 1603PPN	●	●	●	●	E24

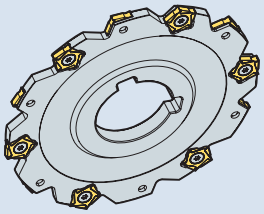
● : Stock item ○ : Under preparing for stock

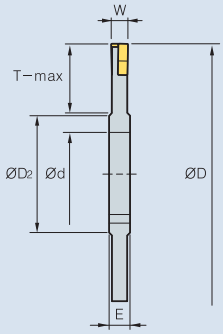
Assembling

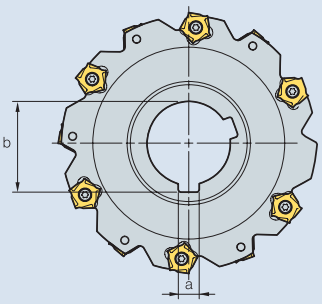


• Applicable inserts, see pages E24
• Detail cutter spec. see pages E172~E174

SPPM







(mm)

Designation		⊙	øD	W	T-max	ød	a	b	E	øD2	Insert	Screw	Wrench
SPPM	080-04	8	80	4	20	27	7	29.8	8	40	PNEJ1223N	PTMA0403F	TW15S
	080-05	8	80	5	20	27	7	29.8	8	40	PNEJ1230N	PTMA0404F	TW15S
	080-06	8	80	6	20	27	7	29.8	8	40	PNEJ1235N	PTMA0405F	TW15S
	100-04	10	100	4	24	32	8	34.8	8	47	PNEJ1223N	PTMA0403F	TW15S
	100-05	10	100	5	24	32	8	34.8	8	47	PNEJ1230N	PTMA0404F	TW15S
	100-06	10	100	6	25	32	8	34.8	8	47	PNEJ1235N	PTMA0405F	TW15S
	100-07	10	100	7	25	32	8	34.8	10	47	PNEJ1240N	PTMA0406F	TW15S
	100-08	10	100	8	25	32	8	34.8	10	47	PNEJ1245N	PTMA0407F	TW15S
	100-09	10	100	9	25	32	8	34.8	12	47	PNEJ1250N	PTMA0408F	TW15S
	100-10	10	100	10	25	32	8	34.8	12	47	PNEJ1255N	PTMA0409F	TW15S
	125-04	12	125	4	30	40	10	43.5	8	56	PNEJ1223N	PTMA0403F	TW15S
	125-05	12	125	5	32	40	10	43.5	8	56	PNEJ1230N	PTMA0404F	TW15S
	125-06	12	125	6	32	40	10	43.5	8	56	PNEJ1235N	PTMA0405F	TW15S
	125-07	12	125	7	32	40	10	43.5	10	56	PNEJ1240N	PTMA0406F	TW15S
	125-08	12	125	8	32	40	10	43.5	10	56	PNEJ1245N	PTMA0407F	TW15S
	125-09	12	125	9	32	40	10	43.5	12	56	PNEJ1250N	PTMA0408F	TW15S
	125-10	12	125	10	32	40)	10	43.5	12	56	PNEJ1255N	PTMA0409F	TW15S
	160-04	16	160	4	45	40	10	43.5	8	66	PNEJ1223N	PTMA0403F	TW15S
	160-05	16	160	5	45	40	10	43.5	8	66	PNEJ1230N	PTMA0404F	TW15S
	160-06	16	160	6	45	40	10	43.5	8	66	PNEJ1235N	PTMA0405F	TW15S
	160-07	16	160	7	45	40	10	43.5	10	66	PNEJ1240N	PTMA0406F	TW15S
	160-08	16	160	8	45	40	10	43.5	10	66	PNEJ1245N	PTMA0407F	TW15S
	160-09	16	160	9	45	40	10	43.5	12	66	PNEJ1250N	PTMA0408F	TW15S
	160-10	16	160	10	45	40	10	43.5	12	66	PNEJ1255N	PTMA0409F	TW15S
	160-11	16	160	11	45	40	10	43.5	14	66	PNEJ1260N	PTMA0410F	TW15S
	160-12	16	160	12	45	40	10	43.5	14	66	PNEJ1265N	PTMA0411F	TW15S
	160-13	16	160	13	45	40	10	43.5	16	66	PNEJ1270N	PTMA0412F	TW15S
	160-14	16	160	14	45	40	10	43.5	16	66	PNEJ1275N	PTMA0413F	TW15S
	200-06	18	200	6	60	50	12	53.5	8	70	PNEJ1235N	PTMA0405F	TW15S
	200-07	18	200	7	60	50	12	53.5	10	70	PNEJ1240N	PTMA0406F	TW15S
	200-08	18	200	8	60	50	12	53.5	10	70	PNEJ1245N	PTMA0407F	TW15S
	200-09	18	200	9	60	50	12	53.5	12	70	PNEJ1250N	PTMA0408F	TW15S
	200-10	18	200	10	60	50	12	53.5	12	70	PNEJ1255N	PTMA0409F	TW15S
	200-11	18	200	11	60	50	12	53.5	14	70	PNEJ1260N	PTMA0410F	TW15S
	200-12	18	200	12	60	50	12	53.5	14	70	PNEJ1265N	PTMA0411F	TW15S
	200-13	18	200	13	60	50	12	53.5	16	70	PNEJ1270N	PTMA0412F	TW15S
	200-14	18	200	14	60	50	12	53.5	16	70	PNEJ1275N	PTMA0413F	TW15S

● Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250	0.10 ~ 0.25	NCM325
	120 ~ 200	0.10 ~ 0.30	PC3525
	100 ~ 150	0.10 ~ 0.30	ST30A
M	80 ~ 180	0.10 ~ 0.25	PC9530
	80 ~ 150	0.10 ~ 0.30	ST30A
K	130 ~ 200	0.10 ~ 0.35	PC6510
	100 ~ 150	0.10 ~ 0.40	G10

● Available Inserts

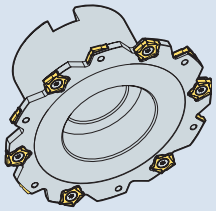
Designation	Arbors		
	BT30	BT40	BT50
SPPM 080-04~06	-	BT40-SCA27-75/120	BT50-SCA27-90/135
100-04~10	-	BT40-SCA32-105	BT50-SCA32-90/135
125-04~09	-	-	BT50-SCA40-90/135
160-04~14	-	-	BT50-SCA40-90/135
200-06~14	-	-	-

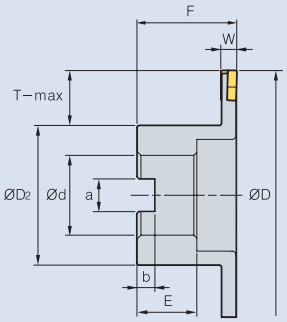
• Applicable inserts, see pages **E16**
• Detail cutter spec. see pages **E172~E174**

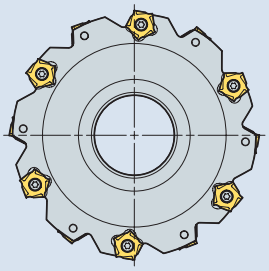
∗ Code system : S P P M 160 - 06 R

- S ⇒ Cutter use(Side cutter)
- P ⇒ Insert Shape(Pentagonal Insert)
- P ⇒ Cutter type(Plane type, Boss type)
- M ⇒ Arbor type
- 160 ⇒ Cutter diameter(Ø D)
- 06 ⇒ Width of cut(W)
- R ⇒ Hand of tool(R/L)

SPBM







(mm)

Designation		⊙	øD	W	T-max	øD2	Ød	a	b	F	E	Insert	Screw	Wrench
SPBM	080-04R/L	8	80	4	18	40	27	12.4	7	50	22	PNEJ1223N	PTMA0403F	TW15S
	080-05R/L	8	80	5	18	40	27	12.4	7	50	22	PNEJ1230N	PTMA0404F	TW15S
	080-06R/L	8	80	6	18	40	27	12.4	7	50	22	PNEJ1235N	PTMA0405F	TW15S
	100-04R/L	10	100	4	21	54	32	14.4	8	50	28	PNEJ1223N	PTMA0403F	TW15S
	100-05R/L	10	100	5	21	54	32	14.4	8	50	28	PNEJ1230N	PTMA0404F	TW15S
	100-06R/L	10	100	6	21	54	32	14.4	8	50	28	PNEJ1235N	PTMA0405F	TW15S
	100-07R/L	10	100	7	21	54	32	14.4	8	50	28	PNEJ1240N	PTMA0406F	TW15S
	100-08R/L	10	100	8	21	54	32	14.4	8	50	28	PNEJ1245N	PTMA0407F	TW15S
	100-09R/L	10	100	9	21	54	32	14.4	8	50	28	PNEJ1250N	PTMA0408F	TW15S
	100-10R/L	10	100	10	21	54	32	14.4	8	50	28	PNEJ1255N	PTMA0409F	TW15S
	125-04R/L	12	125	4	25	70	40	16.4	9	50	30	PNEJ1223N	PTMA0403F	TW15S
	125-05R/L	12	125	5	25	70	40	16.4	9	50	30	PNEJ1230N	PTMA0404F	TW15S
	125-06R/L	12	125	6	25	70	40	16.4	9	50	30	PNEJ1235N	PTMA0405F	TW15S
	125-07R/L	12	125	7	25	70	40	16.4	9	50	30	PNEJ1240N	PTMA0406F	TW15S
	125-08R/L	12	125	8	25	70	40	16.4	9	50	30	PNEJ1245N	PTMA0407F	TW15S
	125-09R/L	12	125	9	25	70	40	16.4	9	50	30	PNEJ1250N	PTMA0408F	TW15S
	125-10R/L	12	125	10	25	70	40	16.4	9	50	30	PNEJ1255N	PTMA0409F	TW15S
	160-04R/L	16	160	4	43	70	40	16.4	9	50	30	PNEJ1223N	PTMA0403F	TW15S
	160-05R/L	16	160	5	43	70	40	16.4	9	50	30	PNEJ1230N	PTMA0404F	TW15S
	160-06R/L	16	160	6	43	70	40	16.4	9	50	30	PNEJ1235N	PTMA0405F	TW15S
	160-07R/L	16	160	7	43	70	40	16.4	9	50	30	PNEJ1240N	PTMA0406F	TW15S
	160-08R/L	16	160	8	43	70	40	16.4	9	50	30	PNEJ1245N	PTMA0407F	TW15S
	160-09R/L	16	160	9	43	70	40	16.4	9	50	30	PNEJ1250N	PTMA0408F	TW15S
	160-10R/L	16	160	10	43	70	40	16.4	9	50	30	PNEJ1255N	PTMA0409F	TW15S
	160-11R/L	16	160	11	43	70	40	16.4	9	50	30	PNEJ1260N	PTMA0410F	TW15S
	160-12R/L	16	160	12	43	70	40	16.4	9	50	30	PNEJ1265N	PTMA0411F	TW15S
	160-13R/L	16	160	13	43	70	40	16.4	9	50	30	PNEJ1270N	PTMA0412F	TW15S
	160-14R/L	16	160	14	43	70	40	16.4	9	50	30	PNEJ1275N	PTMA0413F	TW15S
	200-06R/L	18	200	6	53	90	40	16.4	9	65	30	PNEJ1235N	PTMA0405F	TW15S
	200-07R/L	18	200	7	53	90	40	16.4	9	65	30	PNEJ1240N	PTMA0406F	TW15S
	200-08R/L	18	200	8	53	90	40	16.4	9	65	30	PNEJ1245N	PTMA0407F	TW15S
	200-09R/L	18	200	9	53	90	40	16.4	9	65	30	PNEJ1250N	PTMA0408F	TW15S
	200-10R/L	18	200	10	53	90	40	16.4	9	65	30	PNEJ1255N	PTMA0409F	TW15S
	200-11R/L	18	200	11	53	90	40	16.4	9	65	30	PNEJ1260N	PTMA0410F	TW15S
	200-12R/L	18	200	12	53	90	40	16.4	9	65	30	PNEJ1265N	PTMA0411F	TW15S
	200-13R/L	18	200	13	53	90	40	16.4	9	65	30	PNEJ1270N	PTMA0412F	TW15S
	200-14R/L	18	200	14	53	90	40	16.4	9	65	30	PNEJ1275N	PTMA0413F	TW15S

● Recommended Cutting Condition

Workpiece	Cutting Condition		Grades
	vc(m/min)	fz(mm/t)	
P	150 ~ 250 120 ~ 200 100 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30 0.10 ~ 0.30	NCM325 PC3525 ST30A
M	80 ~ 180 80 ~ 150	0.10 ~ 0.25 0.10 ~ 0.30	PC9530 ST30A
K	130 ~ 200 100 ~ 150	0.10 ~ 0.35 0.10 ~ 0.40	PC6510 G10

• Applicable inserts, see pages **E16**
• Detail cutter spec. see pages **E172~E174**

● Notice(When mounting inserts)

- Insert chip breaker should be faced chip pocket of cutter
- Fasten screw after insert contacts surely on its seat part
- If there is a gap between insert and its seat part after mounting it may cause tool troubles

Actual Designations of Milling Cutter and Arbor

Inch

■ Actual designations of milling cutter

Fig. 1

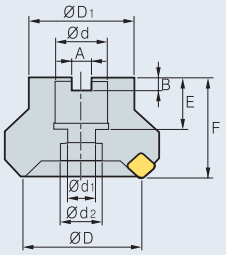


Fig. 2

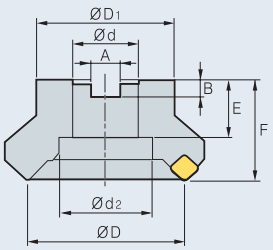


Fig. 3

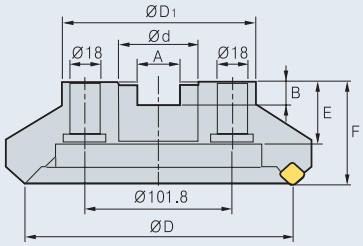
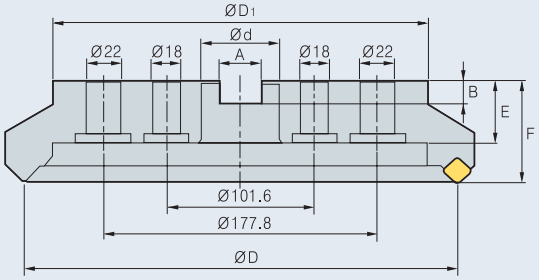


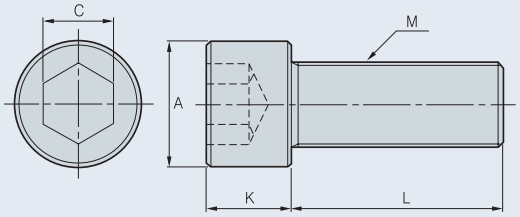
Fig. 4



■ Inch type

Dimensions (inch)									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	-

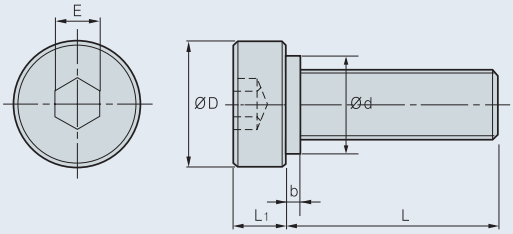
■ Wrench bolt



Designation	A	C	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	M6 × 2.0	Ø80, Ø100(HRM)
SB2040	30	17	20	40	M20 × 2.5	Ø125

• Detail spec. for HRM : see pages E107

■ Clamp bolt



Specifications	Dimensions (inch)						Cutter size
	D	L	L1	E	b	d	
M8 X 1.25	20	20	7	6	-	-	Ø40
M10 X 1.5	28	24	9	8	-	-	Ø50 , Ø63
M12 X1.75	33	28	10	10	2	23	Ø80
M16 X 2	40	32	10	14	5	23	Ø100
M20 X 2.5	50	40	14	17	5	27	Ø125
M24 X 3	64	46	14	19	9	37	Ø160

Metric

■ Clamping part of milling cutter

Fig. 1

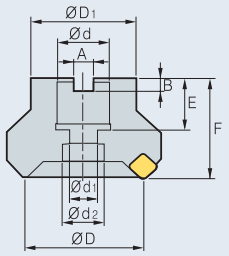


Fig. 2

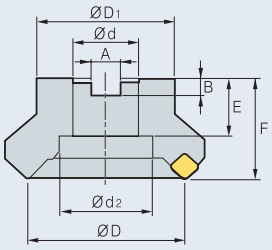


Fig. 3

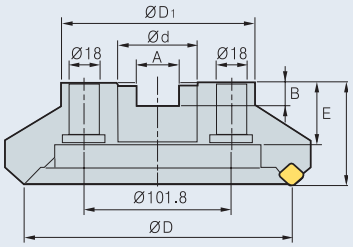
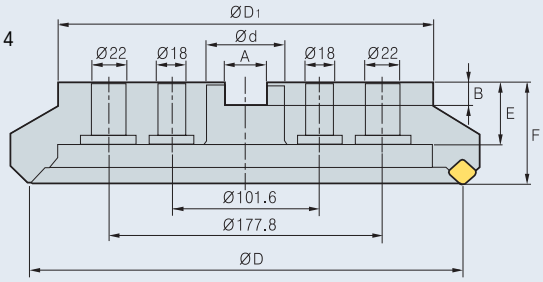


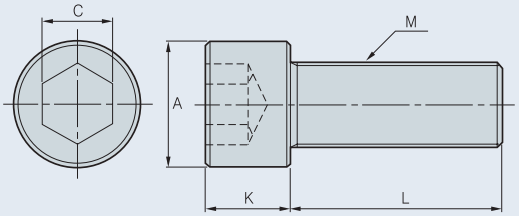
Fig. 4



■ 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	-

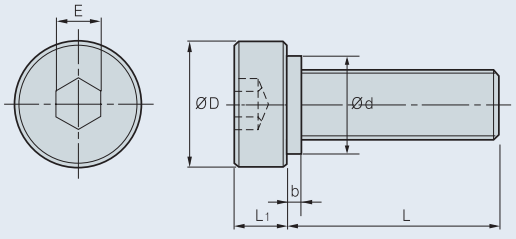
■ Wrench bolt



Designation	A	C	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	M6 × 2.0	Ø100(HRM)
SB2040	30	17	20	40	M20 × 2.5	Ø125

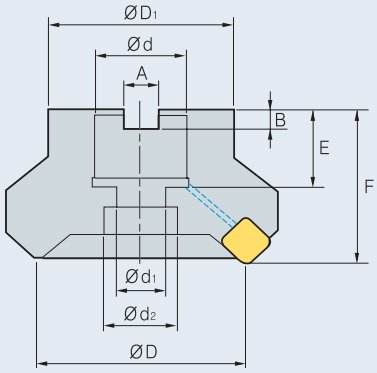
• Detail spec. for HRM : see pages **E107**

■ Clamp bolt



Specifications	Dimensions (mm)						Cutter size
	D	L	L1	E	b	d	
M12 X1.75	33	28	10	10	2	23	Ø80
M16 X 2	40	32	10	14	5	23	Ø100
M20 X2.5	50	40	14	17	5	27	Ø125 , Ø160

Clamping part of milling cutter(Oil-Hole)



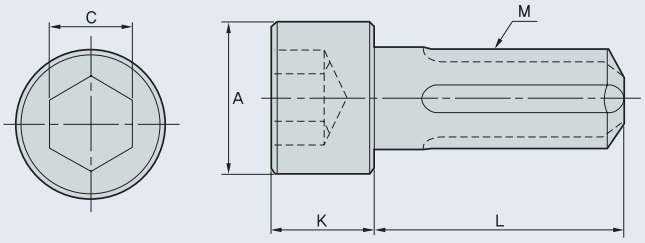
■ Inch type

Dimensions (inch)									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,FMC38.1
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

■ Wrench bolt



Designation	A	C	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

• Detail spec. for HRM : see pages **E107**

Endmills F

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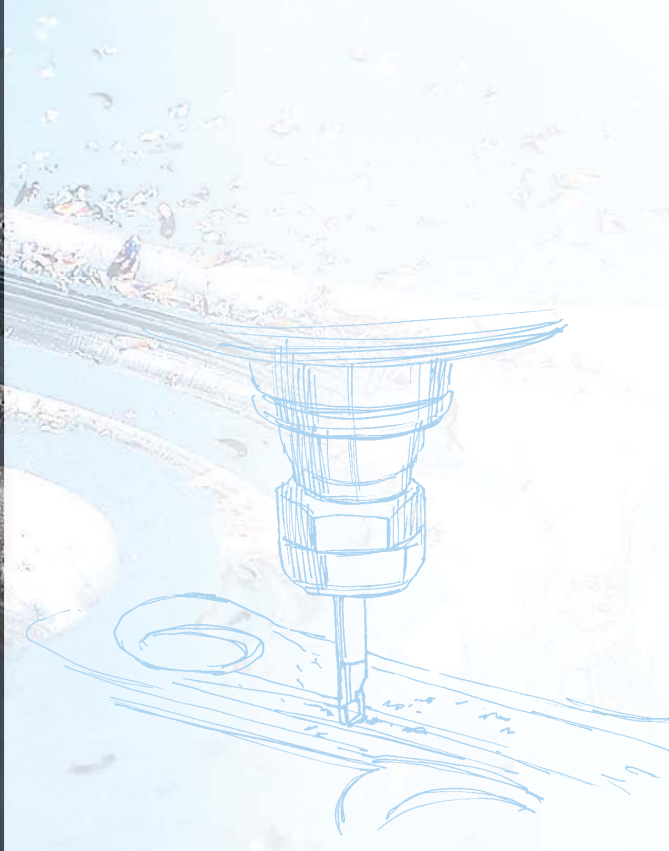
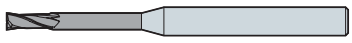
Brazed Endmills ---------- F25

Special Endmills Order Form

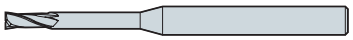
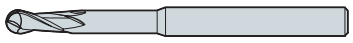
Special Endmills Order Form --------- F27



Endmills Index

Type	Shape	Designation	Sub-strate	Figure	Coated	Uses	No. of flute	Size MIN	Size MAX	Coolant mode	Workpiece P	Workpiece M	Workpiece K	Workpiece N	Workpiece S	Workpiece H	page
H-Max Series	Ball	HPBE2000	FS03		○	High speed High hardness	2	1	20	outer					◎	◎	F10
		HPBE2000T	FS03		○	High speed High hardness	2	1	20	outer					◎	◎	F10
	Radius	HPRE2000	FS03		○	High speed High hardness	2	3	16	outer					◎	◎	F10
		HPRE4000	FS03		○	High speed High hardness	4	3	16	outer					◎	◎	F10
		HPRE2000T	FS03		○	High speed High hardness	2	3	16	outer					◎	◎	F10
		HPRE4000T	FS03		○	High speed High hardness	4	3	16	outer					◎	◎	F10
Z-Max Series	Square	HSE2000	FE15		○	High speed High hardness	2	1	8	outer					◎	○	F11
	Square	HSE4000	FE15		○	High speed High hardness	4	4	10	outer					◎	○	F11
	Square	HSE6000	FE15		○	High speed High hardness	6	6	12	outer					◎	○	F11
	Square	HSE8000	FE15		○	High speed High hardness	8	10	20	outer					◎	○	F11
	Radius	HSRE4000	FE15		○	High speed High hardness	4	3	16	outer					◎	○	F11
	Ball	HSBE2000	FE15		○	High speed High hardness	2	1	20	outer					◎	○	F12
	Ball	HSBE4000	FE15		○	High speed High hardness	4	8	20	outer					◎	○	F12
Q-Max Series	Square	SSE2000-Q	FA1		○	General	2	1	20	outer	◎		○				F12
	Square	SSE3000-Q	FA1		○	General	3	2	20	outer	◎		○				F12
	Square	SSE4000-Q	FA1		○	General	4	3	20	outer	◎		○				F12
	Long Square	LSSE2000-Q	FA1		○	General	2	1	20	outer	◎		○				F13
	Taper Square	SSTE2000-Q	FA1		○	General	2	2	20	outer	◎		○				F13
	Ball	SSBE2000-Q	FA1		○	General	2	1	20	outer	◎		○				F14
	Ball	SSBE4000-Q	FA1		○	General	4	3	20	outer	◎						F14
	Long Ball	LSBE2000-Q	FA1		○	General	2	1	20	outer	◎		○				F14
	Taper Ball	STBE2000-Q	FA1		○	General	2	2	20	outer	◎		○				F15
Solid endmill for difficult-to-cut material	Square	SSES3000-Q	FS1		○	For STS	3	3	20	outer		◎					F15
Micro Endmills	Square	MSE2000	FE15		○	High speed	2	0.4	1	outer					◎	○	F16
	Ball	MSBE2000	FE15		○	High speed	2	0.4	1	outer					◎	○	F16

◎ : Excellent ○ : Good

Type	Shape	Designation	Sub-strate	Figure	Coated	Uses	No. of flute	Size MIN	Size MAX	Coolant mode	Workpiece P	Workpiece M	Workpiece K	Workpiece N	Workpiece S	Workpiece H	page
Rib Endmills	Ball	HRB	FS03		○	High speed	2	0.1	6	outer					◎	○	F17
	Square	HRF	FS03		○	High speed	2	0.1	6	outer					◎	○	F18
	Corner Radius	HRNR	FS03		○	High speed	2	1	6	outer					◎	○	F19
	Taper Neck Ball	HRTNB	FS03		○	High speed	2	1	12	outer					◎	○	F20
Carbide Endmills	Square	SSE2000	FA1		-	For Cast iron, Steel	2	1	20	outer	◎		○				F21
	Square	SSE3000	FA1		-	For Cast iron, Steel	3	2	20	outer	◎		○				F21
	Square	SSE4000	FA1		-	For Cast iron, Steel	4	3	20	outer	◎		○				F21
	Long Square	LSSE2000	FA1		-	For Cast iron, Steel	2	1	20	outer	◎		○				F21
	Taper Square	SSTE2000	FA1		-	For Cast iron, Steel	2	2	20	outer	◎		○				F22
	Ball	SSBE2000	FA1		-	For Cast iron, Steel	2	1	20	outer	◎		○				F22
	Ball	SSBE4000	FA1		-	For Cast iron, Steel	4	3	20	outer	◎		○				F22
	Long Ball	LSBE2000	FA1		-	For Cast iron, Steel	2	1	20	outer	◎		○				F23
	Taper Ball	STBE2000	FA1		-	For Cast iron, Steel	2	2	20	outer	◎		○				F23
Solid Endmills for Aluminum	Square	SSEA2000	H01		-	For Aluminum	2	1	20	outer				◎			F24
	Square	SSEA3000	H01		-	For Aluminum	3	2	20	outer				◎			F24
	Ball	SSBEA2000	H01		-	For Aluminum	2	1	20	outer				◎			F24
Brazed Endmills	Square	ZSE200	FCC		-	For Cast iron, Steel	2	14	50	outer	◎	○	◎		○		F25
	Square	ZSE300	FCC		-	For Cast iron, Steel	3	14	50	outer	◎	○	◎		○		F25
	Square	ZSE400	FCC		-	For Cast iron, Steel	4	14	50	outer	◎	○	◎		○		F25
	Square	ZSE600	FCC		-	For Cast iron, Steel	6	14	50	outer	◎	○	◎		○		F26
	Square	ZSEA200	FCC		-	For Cast iron, Steel	2	15	50	outer	◎	○	◎		○		F26
	Square	ZSEL200	FCC		-	For Cast iron, Steel	2	14	40	outer	◎	○	◎		○		F26
	Square	ZSEL400	FCC		-	For Cast iron, Steel	4	16	40	outer	◎	○	◎		○		F26
	Square	ZSEXL200	FCC		-	For Cast iron, Steel	2	14	40	outer	◎	○	◎		○		F26
	Ball	ZSBE200	FCC		-	For Cast iron, Steel	2	13	50	outer	◎	○	◎		○		F26

◎ : Excellent ○ : Good

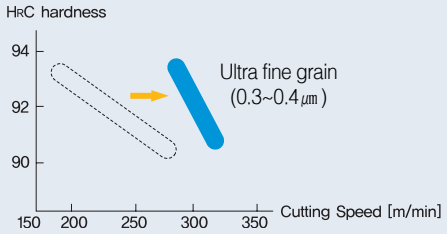
Endmills grades and Features

■ Ultra fine grain cemented carbide

Ultra fine grade has better toughness than general cemented carbide with same hardness.
These properties allow it to replace High Speed Steel.

It is achieved through a high oxidation temperature(1200℃) with high hardness, and provides superb performance for high speed cutting and dry cutting.

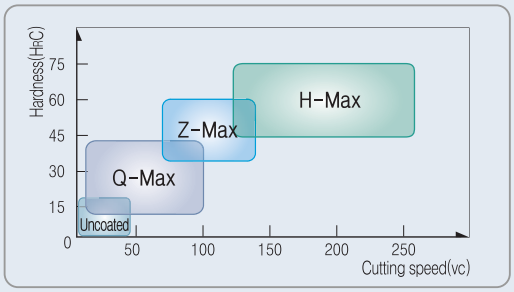
■ Features and Application range of Ultra fine grades



• Increasing TRS, Cutting speed by applying ultra fine grain

■ Features of Korloy endmills

Index	Grade	Coating	Features
H-max	PC203F	TiAlN	High hardened steel cutting(HRC65).
Z-max	PC215F	TiAlN	Medium high speed, High hardened steel(~HRC53).
Q-max	PC220F	TiAlN	General purpose Endmills(~HRC45).
SSES-Q	PC210F	TiAlN	Stainless steel, Non-ferrous metal.
Solid endmills (uncoated)	FA1, FA2, FG2, FCC		Uncoated endmills, Suitable for general machining due to excellent wear resistance and toughness.
SSEA	H01		For aluminum, aluminum alloys, non-ferrous metal.



● **H-max (for high speed, high hardened steel)**
New design for high hardened steel cutting. Special sphere tool geometry provides increased tool life and enables higher speed and feed operations.
TiAlN coating increases tool life.

● **Z-max (for medium high speed, high hardened steel)**
An optimal design of cutting edge guarantees good performance in high speed to moderate speed machining.

● **Q-max (for general purpose endmills)**
Q-max endmills are made of an ultra fine grade and employs TiAlN coating.
TiAlN coatings are made to perform normal speed cutting and general steel cutting.

● **Micro endmills**
Small size endmills for various micro machining has strengthen neck part for protection against fracture in high speed.

● **Carbide endmills**
Normal carbide endmills employs micro grain size carbide for general purpose such as slotting, side cutting. It has special designed geometry with high rigidity cutting edge.

● **Carbide endmills for aluminum alloy(SSEA, SSBEA)**
It is suitable for high speed machining in aluminum and other non-ferrous materials.
It can be accomplished excellent surface finishing, superior chip removal in high feed rate.

● **Coated endmills for stainless steel(SSES)**
Sharp cutting edge and high rake angle with streamline chip pocket show good cutting performance in stainless steel machining where work hardening makes tool troubles.

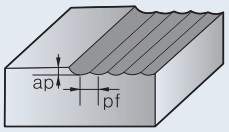
Workpiece	P						M				K				N			S			H		
Type	General steel, Alloy steel						Stainless steel				Cast iron				Al, Al alloy			Heat resistant alloy			Hardened steel		
	High speed	Medium speed		Low speed roughing	Interrupted heavy machining		High speed	Medium speed		Low speed roughing	High speed	Medium speed		Low speed roughing	High speed	Medium speed	Low speed	High speed	Medium speed	Low speed	High speed	Medium speed	Low speed
ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	N01	N10	N20	S01	S10	S20	H01	H10	H20
Coated Cemented Carbide	PC203F	PC210F	PC215F	PC220F	PC225F		PC210F	PC220F	PC225F		PC203F	PC215F	PC225F					PC210F			PC210F	PC203F	PC220F
Micro grain Cemented Carbide	FG2	FS1	FA2	FA1	FCC		FS1				FG2	FA1			FG2	H01	FA2				FG2		

Recommended cutting condition

HPBE2000 (Endmills for high speed, High hardened steel) H-max

Workpiece	Hardened steel			Hardened steel			Hardened steel		
	NAK, STD61			STD11, STS420			STH, etc		
	~HRC50			HRC50~55			HRC60~65		
D (mm)	n (min⁻¹)	vf (mm/min)	ap (mm)	n (min⁻¹)	vf (mm/min)	ap (mm)	n (min⁻¹)	vf (mm/min)	ap (mm)
1	40,000	4,800	0.06	40,000	3,360	0.05	40,000	2,160	0.04
2	40,000	5,760	0.11	40,000	4,800	0.10	24,000	2,280	0.07
3	40,000	7,200	0.13	32,000	4,620	0.12	16,000	1,920	0.09
4	32,000	6,528	0.15	24,000	1,920	0.13	12,000	1,440	0.10
6	21,000	5,040	0.25	16,000	2,880	0.20	8,000	1,020	0.11
8	16,000	3,840	0.30	12,000	2,160	0.20	6,000	840	0.11
10	13,000	3,120	0.50	10,000	1,920	0.20	4,800	660	0.12
12	9,000	2,160	0.50	7,000	1,320	0.30	3,600	516	0.12
16	6,000	1,440	0.50	5,000	960	0.30	2,500	390	0.15

■ Depth of cut



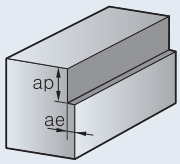
• pf≤0.1D (under HRC65)

1. Use a tool with rigid machine or high speed machine.
2. Needed rigid set up of workpiece when chatter occurs, reduce the revolution speed and feed rate at the same ratio.
3. Cutting condition in above table based on Z-step operation.
4. Cutting condition can be changed by cutting depth in the Z- direction and pick feed during profiling.
5. When chatter occurs, reduce the revolution speed and feed at the same ratio.
6. Use generally air-blow or oil mist coolant.

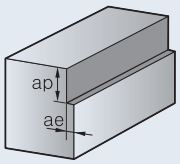
HPRE4000 (Radius Endmills for high hardened steel) H-max

Workpiece	Hardened steel			Hardened steel			Hardened steel		
	NAK, STD61			STD11, STS420			STH, etc		
	~HRC50			HRC50~55			HRC60~65		
D (mm)	n (min⁻¹)	vf (mm/min)	ap (mm)	n (min⁻¹)	vf (mm/min)	ap (mm)	n (min⁻¹)	vf (mm/min)	ap (mm)
1	40,000	720	0.1	40,000	480	0.03	32,000	300	0.02
2	40,000	1.200	0.1	24,000	600	0.05	16,000	360	0.05
3	32,000	2.280	0.2	16,000	1,140	0.1	11,000	720	0.05
4	24,000	2.640	0.3	12,000	1,320	0.1	8,000	780	0.05
6	16,000	3.480	0.4	8,000	1,740	0.2	5,300	1,080	0.1
8	12,000	3.480	0.5	6,000	1,740	0.2	4,000	1,080	0.1
10	9,600	3.480	0.6	4,800	1,740	0.3	3,200	1,080	0.2
12	8,000	2.880	0.8	4,000	1,440	0.3	2,700	900	0.2
16	6,000	2.160	1.0	3,000	1,080	0.5	2,000	660	0.3
20	4,800	1.740	1.0	2,400	840	0.5	1,600	528	0.3

■ Depth of cut



• ap≤1.5D (under HRC55)



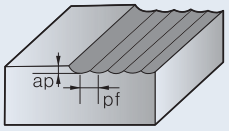
• ap≤1.0D (over HRC55)

1. Needed rigid set up of workpiece when chatter occurs, reduce the revolution speed and feed at the same ratio.

HSBE2000 (Ball Endmills for high speed, high hardened steel) Z-Max

Index	Finishing				Roughing			
Workpiece	STD61, STD11, NAK		STD61, etc		STD61, STD11, NAK		STD61, etc	
	~HRC45		HRC45~50		~HRC45		HRC45~50	
D (mm)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)
0.6	40,000	1,000	40,000	850	40,000	340	35,000	200
0.8	40,000	1,500	40,000	1,300	40,000	510	30,000	260
1	40,000	2,000	40,000	1,500	35,000	600	27,000	310
2	35,000	2,400	40,000	1,500	25,000	600	18,000	360
3	30,000	2,500	36,000	1,500	20,000	800	14,000	400
4	25,000	2,600	32,000	1,500	18,500	930	11,000	440
6	20,000	2,600	21,000	1,500	13,000	1,000	7,700	480
8	15,000	2,700	10,000	1,500	10,000	1,250	6,000	600
10	12,000	2,700	8,000	1,500	8,000	1,250	4,800	600
12	10,000	2,500	6,600	1,400	6,600	1,150	4,000	560
16	7,500	2,400	5,000	1,200	5,000	1,150	3,000	540

■ Depth of cut



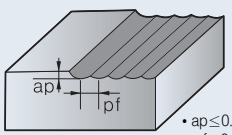
• ap≤0.03D
-pf≤0.05D
(under HRC50)

1. Use 4-flute type endmills for over HRC55.
2. Needed rigid set up of workpiece when chatter occurs, reduce the revolution speed and feed at the same ratio.
3. Cutting condition in above table based on Z-step operation.
4. Cutting condition can be changed by cutting depth in the Z- direction and pick feed during profiling.
5. When chatter occurs, reduce the revolution speed and feed at the same ratio.
6. Use generally air-blow or oil mist coolant.

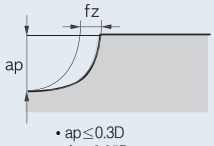
HSBE4000 (Ball endmills for high speed,high hardened steel) Z-Max

Workpiece	Alloy steel, Tool steel		Hardened steel		Hardened steel	
	SCM, STD61, STD11, NAK		STD11, STS420		SRD11, STH, STS	
	~HRC45		HRC45~55		HRC55~62	
D (mm)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)
1	40,000	1,520~3,840	35,000	1,040~2,880	21,000	480~880
2	35,000	1,600~4,800	25,000	1,040~2,880	16,000	640~1,200
3	33,000	1,600~4,800	20,000	960~2,720	13,000	640~1,200
4	25,000	1,600~4,800	17,000	960~2,720	10,000	640~1,200
6	20,000	1,440~4,400	13,000	960~2,960	8,300	560~1,200
8	15,000	1,760~4,000	10,000	1,120~2,720	6,200	560~1,040
10	12,000	1,840~3,680	8,000	1,200~2,400	5,000	640~960
12	10,000	1,520~3,280	6,600	1,040~2,160	4,100	560~800
16	7,500	1,280~2,560	5,000	880~2,160	3,100	480~640
20	6,000	1,040~2,080	4,000	720~1,360	2,500	400~560

■ Depth of cut



• ap≤0.05D(Max.:0.5mm)
-pf≤0.3D
(under HRC55)



• ap≤0.3D
-fz≤0.05D
(over HRC55)

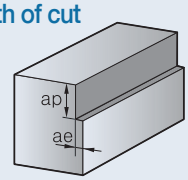
1. Use a tool with rigid machine or high speed machine.
2. Needed rigid set up of workpiece when chatter occurs, reduce the revolution speed and feed rate at the same ratio.
3. Cutting condition in above table based on Z-step operation.
4. Cutting condition can be changed by cutting depth in the Z- direction and pick feed during profiling.
5. When chatter occurs, reduce the revolution speed and feed at the same ratio.
6. Use generally air-blow or oil mist coolant.

Technical Information for Endmills

HSE4000 (Square endmills for high speed, high hardened steel) Z-Max

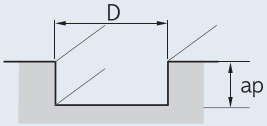
Workpiece	Aluminum alloy (except pure aluminum) ~HRC50			Carbon·Alloy·Tool steel SM50C, SCM, etc HRC45			Alloy steel·Tool steel STD61, STAVAX, etc HRC45~55		
D (mm)	n (min⁻¹)	vf (mm/min)	ae (mm)	n (min⁻¹)	vf (mm/min)	ae (mm)	n (min⁻¹)	vf (mm/min)	ae (mm)
3	20,000	3,360	0.6	20,000	2,800	0.3	16,000	2,160	0.15
4	15,000	2,880	0.8	15,000	2,400	0.4	12,000	1,920	0.20
5	12,000	2,320	1.0	12,000	1,920	0.5	9,000	1,440	0.25
6	10,000	2,080	1.2	10,000	1,680	0.6	7,000	1,176	0.30
8	8,000	1,440	1.6	8,000	1,200	0.8	5,600	840	0.40
10	6,400	1,360	2.0	6,400	1,120	1.0	4,500	760	0.50
12	5,400	1,200	2.0	5,400	960	1.0	3,800	688	0.50

■ Depth of cut



• ap≤D

• ap≤D



• If cutting depth is over D≥3, increase revolution speed to 50-70% and reduce feed to 40-60%
• For slotting ap≤ cutting depth

1. Needed rigid set up of workpiece when chatter occurs, reduce the revolution speed and feed at the same ratio.
2. When it is used in perpendicular feed direction, reduce feed to 1/5 in the table.
3. When revolution speed is low, reduce revolution speed and feed at the same ratio.

SSE2000-Q (2-flute, slotting) Q-Max

Workpiece / Cutting condition / D (mm)	General steel·Alloy steel (Under HRC20)		General steel·Alloy steel (HRC20~30)		General steel·Alloy steel (HRC30~40)		General steel·Alloy steel (Over HRC40)		Normal cast iron Special cast iron		Stainless steel Titanium alloy	
	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)
1	37,500	185	31,300	150	25,400	130	19,500	80	39,700	370	16,000	45
2	18,800	190	15,800	230	12,700	180	9,700	80	19,800	450	8,000	65
3	12,600	310	10,600	260	8,200	190	6,400	80	12,900	450	5,300	65
4	9,500	310	7,900	260	6,400	190	4,800	80	9,800	450	4,000	65
5	7,500	310	6,300	260	5,400	190	3,900	80	7,600	450	3,200	65
6	6,500	310	5,300	260	4,100	190	3,000	80	7,800	660	2,600	65
8	4,800	310	4,000	260	3,200	190	2,500	80	6,000	710	2,000	65
10	3,700	310	3,100	260	2,600	190	1,900	80	4,800	740	1,600	65
12	3,100	310	2,600	260	2,100	190	1,600	80	3,700	780	1,300	65
14	2,700	310	2,300	260	1,800	190	1,400	80	3,400	820	1,100	65
16	2,400	340	2,000	280	1,500	240	1,200	90	3,000	830	1,000	75
18	2,000	340	1,700	280	1,400	240	1,000	100	2,600	890	880	80
20	1,900	340	1,600	280	1,300	240	900	100	2,400	890	800	80
25	1,600	340	1,300	280	1,100	240	190	100	1,800	970	640	80

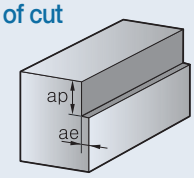
SSE4000-Q (4-flute, side milling) Q-Max

Workpiece / Cutting condition / D (mm)	General steel·Alloy steel (Under HRC20)		General steel·Alloy steel (HRC20~30)		General steel·Alloy steel (HRC30~40)		General steel·Alloy steel (Over HRC40)		Normal cast iron Special cast iron		Stainless steel Titanium alloy	
	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)
3	12,600	920	10,600	790	8,200	580	6,400	220	12,900	1,370	5,300	200
4	9,500	920	7,900	790	6,400	580	4,800	220	9,800	1,370	4,000	200
5	7,500	920	6,300	790	5,100	580	3,900	220	7,600	1,370	3,200	200
6	6,100	920	5,300	790	4,100	580	3,000	220	7,800	2,000	2,600	200
8	4,800	920	4,000	790	3,200	580	2,500	220	6,000	2,120	2,000	200
10	3,700	920	3,100	790	2,600	580	1,900	220	4,800	2,230	1,600	200
12	3,100	920	2,600	790	2,100	580	1,600	220	3,700	2,340	1,300	200
14	2,700	920	2,300	790	1,800	580	1,400	220	3,400	2,450	1,100	200
16	2,400	1020	2,000	860	1,500	690	1,200	270	3,000	2,520	1,000	225
18	2,000	1020	1,700	860	1,400	690	1,000	340	2,600	2,680	880	240
20	1,900	1020	1,600	860	1,300	690	900	340	2,400	2,680	800	240
25	1,600	1020	1,300	860	1,100	690	190	340	1,800	2,890	640	240

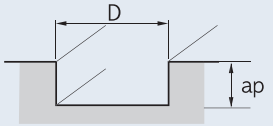
MSE2000 (Micro square endmills) Micro endmill

Workpiece	Carbon steel·Alloy steel·Tool steel SM50C, SCM, STD ~ HRC45			Alloy steel·Tool steel STD61, STAVAX HRC45 ~ 55		
D (mm)	n (min⁻¹)	vf (mm/min)	ae (mm)	n (min⁻¹)	vf (mm/min)	ae (mm)
0.4	40,000	640	0,01	40,000	640	0.01
0.5	40,000	800	0,015	40,000	800	0.02
0.6	40,000	960	0,02	40,000	960	0.02
0.7	40,000	1,120	0,02	40,000	1,120	0.02
0.8	40,000	1,280	0,03	40,000	1,280	0.03
0.9	40,000	1,440	0,04	40,000	1,280	0.04
1	40,000	1,600	0,06	40,000	1,280	0.06

■ Depth of cut



• ap≤depth of cut (ae of table)



• If cutting depth is over D≥3, increase revolution speed to 50-70% and reduce feed to 40-60%
• For slotting ap≤ cutting depth(ae in the table)

1. Needed rigid set up of workpiece when chatter occurs, reduce the revolution speed and feed at the same ratio.
2. When it is used in perpendicular feed direction, reduce feed to 1/3 in the table.
3. When revolution speed is low, reduce revolution speed and feed at the same ratio.

SSE2000 (2-flute, Slotting)

Workpiece / Cutting condition / D(mm)	General steel · Alloy steel (Under HRC20)		General steel · Alloy steel (HRC20~30)		General steel · Alloy steel (HRC30~40)		Stainless steel Titanium alloy		Normal cast iron Special cast iron		Aluminum alloy		Copper and Non-ferrous metal	
	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)
1	11,000	55	9,500	45	8,000	40	16,000	45	13,000	120	32,000	300	24,000	240
2	5,500	80	4,800	70	4,000	55	8,000	65	6,500	150	16,000	320	12,000	240
3	3,700	90	3,200	80	2,600	60	5,300	65	4,200	150	11,000	320	8,000	240
4	2,800	90	2,400	80	2,000	60	4,000	65	3,200	150	8,000	320	6,000	240
5	2,200	90	1,900	80	1,600	60	3,200	65	2,500	150	6,400	320	4,800	240
6	1,800	90	1,600	80	1,000	60	2,600	65	2,100	180	5,300	340	4,000	260
8	1,400	90	1,200	80	1,000	60	1,300	65	1,600	190	4,000	340	3,000	260
10	1,100	90	950	80	800	60	2,000	65	1,300	200	3,200	340	2,400	260
12	900	90	800	80	660	60	1,600	65	1,000	210	2,600	340	2,000	260
14	800	90	700	80	570	60	1,100	65	900	220	2,300	340	1,700	260
16	700	100	600	85	500	75	1,000	75	800	225	2,000	340	1,500	260
18	600	100	530	85	440	75	880	80	700	240	1,800	340	1,300	260
20	550	100	480	85	400	75	800	80	640	240	1,600	340	1,200	260
25	450	100	380	85	320	75	640	80	500	260	1,300	340	1,000	260

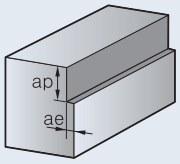
SSE4000 (4-flute, Side milling)

Workpiece / Cutting condition / D(mm)	General steel · Alloy steel (Under HRC20)		General steel · Alloy steel (HRC20~30)		General steel · Alloy steel (HRC30~40)		Stainless steel Titanium alloy		Normal cast iron Special cast iron		Aluminum alloy		Copper and Non-ferrous metal	
	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)	n(min⁻¹)	vf(mm/min)
3	3,700	270	3,200	240	2,600	180	5,300	200	4,200	450	11,000	960	8,000	720
4	2,800	270	2,400	240	2,000	180	4,000	200	3,200	450	8,000	960	6,000	720
5	2,200	270	1,900	240	1,600	180	3,200	200	2,500	450	6,400	960	4,800	720
6	1,800	270	1,600	240	1,300	180	2,600	200	2,100	540	5,300	1,020	4,000	780
8	1,400	270	1,200	240	1,000	180	2,000	200	1,600	570	4,000	1,020	3,000	780
10	1,100	270	950	240	800	180	1,600	200	1,300	600	3,200	1,020	2,400	780
12	900	270	800	240	660	180	1,300	200	1,000	630	2,600	1,020	2,000	780
14	800	270	700	240	570	180	1,100	200	900	660	2,300	1,020	1,700	780
16	700	300	600	260	500	220	1,000	225	800	680	2,000	1,020	1,500	780
18	600	300	530	260	440	220	880	240	700	720	1,800	1,020	1,300	780
20	550	300	480	260	400	220	800	240	640	720	1,600	1,020	1,200	780
25	450	300	380	260	320	220	640	240	500	780	1,300	1,020	1,000	780

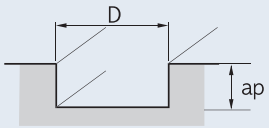
SSEA2000 (Endmills for Aluminum)

Index	Side milling				Slotting			
Workpiece	Aluminum alloy A7075		Cast aluminum alloy AC4B		Aluminum alloy A7075		Cast aluminum alloy AC4B	
D (mm)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	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

■ Depth of cut



Side milling
- ae≤0.2D(D<3)
- ae≤0.5D(D≥3)



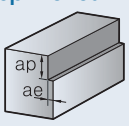
Slotting
- ap≤D(Max:12mm)

1. Needed rigid set up of workpiece when chatter occurs, reduce the revolution speed and feed at the same ratio.

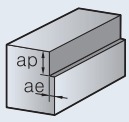
SSEA3000-Q (Endmills for stainless steel)

Index	Carbon · Alloy steel		Stainless steel		Hardened steel		HRSA	
Workpiece	S50C, SS400, SCM ~HRC45		STS304, STS316 Titanium alloy		STD61 HRC45~55		Inconel -	
D (mm)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)
3	5,300	104	4,400	80	2,400	40	1,500	20
4	4,400	176	3,700	128	2,000	64	1,300	32
5	3,600	208	3,000	152	1,700	80	1,100	40
6	3,200	224	2,700	160	1,500	80	1,000	40
8	2,400	240	2,000	168	1,200	88	800	36
10	1,900	232	1,600	168	960	92	640	36
12	1,600	200	1,300	136	800	76	530	32

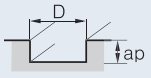
■ Depth of cut



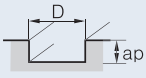
Side milling
- ap≤1.5D
- -ae≤0.2D



Side milling
- ap≤1D
- -ae≤0.05D



Slotting
- ap≤0.5D(D≤Ø18)
- -ap≤0.3D(D>Ø18)



Slotting
- ap≤0.05D

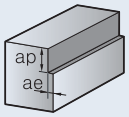
1. Above table based on side cutting. for slotting reduce revolution speed to 80-100%, feed to 60-80% in the table.
2. For stainless steel and heat resistant alloy, please use cutting fluid.

Technical Information for Endmills

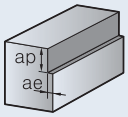
ZSE200 Brazed Endmill

Workpiece	Carbon · Alloy steel, Cast iron		Alloy steel · Tool steel		Hardened steel	
	~HRC30		HRC30~45		HRC45~55	
	SM50C, SCM, GC		STD61, STD11		STD61	
D (mm)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	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

■ Depth of cut



Side milling
• ap≤1.5D
-ae≤0.1D
(under HRC45)



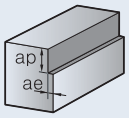
Side milling
• ap≤1D(Max: 1mm)
(over HRC45)

1. Above table based on side milling, when it enters to ae direction, you should use reduced cutting condition.
2. When it enters to ae direction, for finishing you should increase revolution speed, feed in the table.

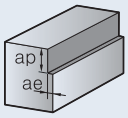
ZSE400 Brazed Endmill

Workpiece	Carbon · Alloy steel, Cast iron		Alloy steel · Tool steel		Hardened steel	
	~HRC30		HRC30~45		HRC45~55	
	SM50C, SCM, GC		STD61, STD11		STD61	
D (mm)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	vf (mm/min)	n (min⁻¹)	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

■ Depth of cut



Side milling
• ap≤1.5D
-ae≤0.1D
(under HRC45)



Side milling
• ap≤1D(Max: 1mm)
(over HRC45)

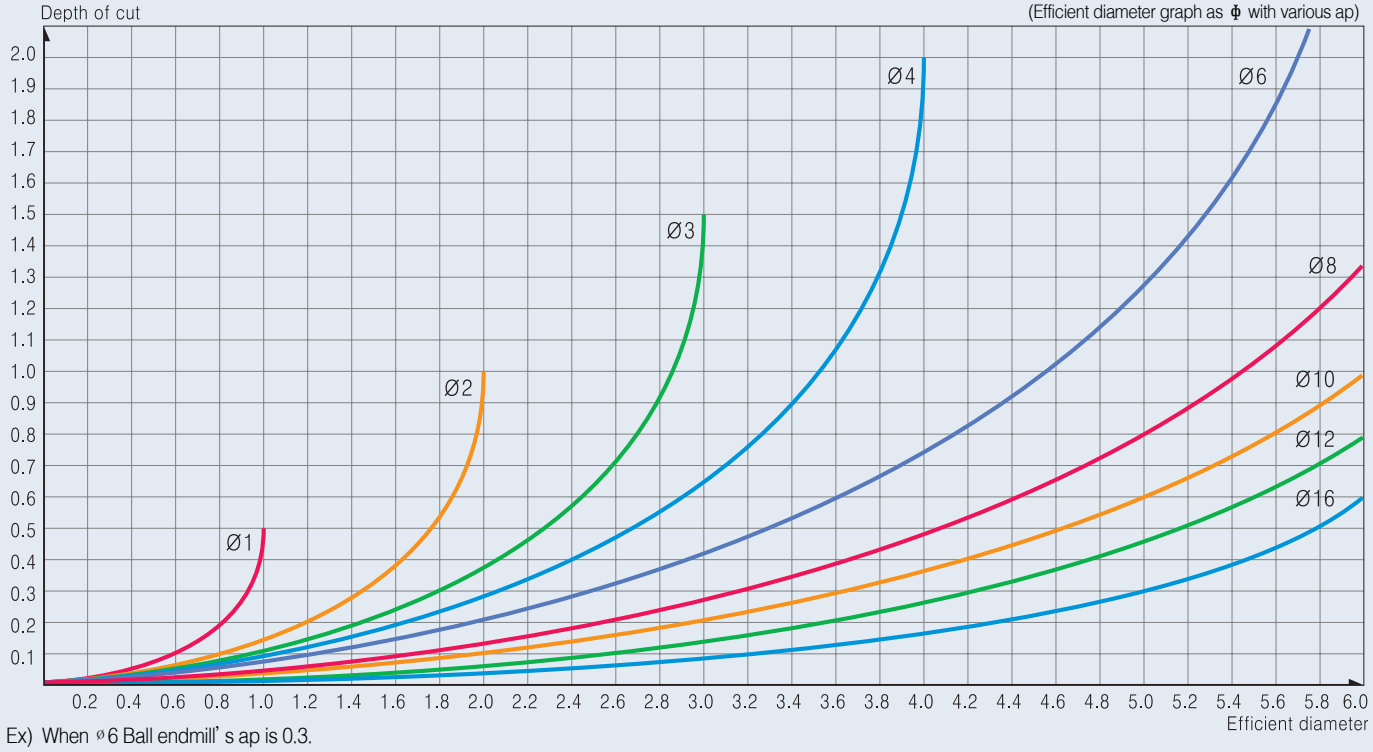
1. Above table based on side milling, when it enters to ae direction, you should use reduced cutting condition.
2. When it enters to ae direction, for finishing you should increase revolution speed, feed in the table.

Cutting speed formulas

- Efficient cutting speed Veff = π × Deff × n/1000 (n = min⁻¹)
- When slope increasing, Deff also increasing.
- Efficient diameter Deff calculation formula : Deff = $(2\sqrt{ap(D-ap)} \times \alpha)$
  D = ø(Tool 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 θ = 0°
	α = 1.2	Slope θ = 7°
	α = 1.5	Slope θ = 15°
	α = 1.7	Slope θ = 30°
	α = 2.17	Slope θ = 45°
	α = 2.3	Slope θ = 60°

Graph for efficient diameter calculation



Ex) When ø6 Ball endmill's ap is 0.3.
Efficient diameter Deff becomes 2.6.
Therefore, when n is 14,000 efficient cutting speed, Veff, becomes 113.7[m/min].
The graph above is relation between axial depth of 1~16ø ball endmills and efficient diameter.

Table of efficient cutting speed as cutting depth (for H-Max)

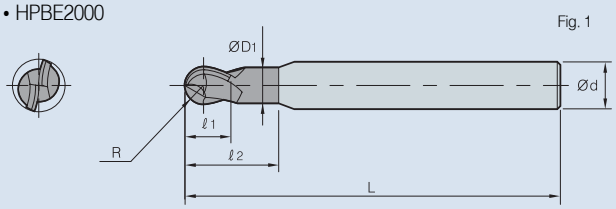
Specification		HRC 45~55	Maximum speed	Efficient diameter cutting speed as cutting depth(Z-STEP = ap) 0~15°														
Diameter	Ball R	Recommended RPM	Depth	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
0.6	0.3	40,000	75	56	71	75	71	56										
0.8	0.4	37,000	93	61	80	90	93	90	80	61								
1	0.5	35,000	110	66	88	101	108	110	108	101	88	66						
1.5	0.75	32,000	151	75	102	121	133	142	148	150	150	148	142	133	121	102	75	0
2	1	30,000	188	82	113	135	151	163	173	180	185	187	188	187	285	180	173	163
2.5	1.25	28,000	220	86	119	143	161	176	188	197	205	211	215	218	220	220	218	215
3	1.5	26,000	245	88	122	147	167	183	196	207	217	224	231	236	240	243	244	245
4	2	22,000	276	86	120	146	166	183	197	210	221	231	239	247	253	259	264	268
5	2.5	20,000	314	88	123	149	170	188	204	218	230	241	251	260	268	275	282	288
6	3	18,000	339	87	122	148	169	187	203	218	231	242	253	262	271	279	287	294
7	3.5	15,000	330	78	110	134	153	170	185	198	210	221	231	240	249	256	264	271
8	4	13,500	339	75	106	129	148	164	179	192	203	214	224	234	242	250	258	265
9	4.5	12,000	339	71	100	122	140	155	169	182	193	203	213	222	231	238	246	253
10	5	11,000	345	69	97	118	135	151	164	176	187	198	207	216	224	232	240	247
11	5.5	10,000	345	66	92	113	129	144	157	169	179	189	199	207	215	223	230	237
12	6	9,200	347	63	89	108	124	139	151	162	173	183	192	200	208	215	223	229
13	6.5	8,500	347	61	85	104	120	133	146	157	167	176	185	193	201	208	215	222
14	7	7,900	347	58	82	101	116	129	141	151	161	170	179	187	194	202	208	215
15	7.5	7,400	349	57	80	98	112	125	137	147	157	166	174	182	189	196	203	209
16	8	6,900	347	55	77	94	108	121	132	142	151	160	168	175	183	189	196	202
17	8.5	6,500	347	53	75	91	105	117	128	138	147	155	163	171	178	184	191	197
18	9	6,100	345	51	72	88	102	113	124	133	142	150	158	165	172	178	185	191
19	9.5	5,800	346	50	71	86	99	111	121	130	139	147	155	162	168	175	181	187
20	10	5,500	345	49	69	84	97	108	118	127	135	143	151	157	164	170	176	182

Specification		HRC 55~60	Maximum speed	Efficient diameter cutting speed as cutting depth(Z-STEP = ap)														
Diameter	Ball R	Recommended RPM	Depth	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
0.6	0.3	40,000	75	56	71	75	71	56										
0.8	0.4	37,000	93	61	80	90	93	90	80	61								
1	0.5	35,000	110	66	88	101	108	110	108	101	88	66						
1.5	0.75	28,000	132	66	90	106	117	124	129	132	132	129	124	117	106	90	66	
2	1	26,000	163	71	98	117	131	141	150	156	160	162	163	162	160	156	150	141
2.5	1.25	24,000	188	74	102	122	138	151	161	169	176	181	185	187	188	188	187	185
3	1.5	22,000	207	74	103	124	141	154	166	175	183	190	195	200	203	205	207	207
4	2	18,500	232	73	101	122	139	154	166	177	186	194	201	208	213	218	222	225
5	2.5	16,500	259	73	102	123	141	155	168	180	190	199	207	215	221	227	233	237
6	3	15,000	283	72	101	123	141	156	170	181	192	202	211	219	226	233	239	245
7	3.5	15,000	330	78	110	134	153	170	185	198	210	221	231	240	249	256	264	271
8	4	12,000	301	67	94	115	131	146	159	170	181	190	199	208	215	222	229	235
9	4.5	10,650	301	63	89	108	124	138	150	161	171	181	189	197	205	212	218	224
10	5	9,600	301	30	84	103	118	131	143	154	164	173	181	189	196	203	209	215
11	5.5	8,700	300	57	80	98	113	125	136	147	156	165	173	180	187	194	200	206
12	6	8,000	301	55	77	94	108	120	131	141	150	159	167	174	181	187	194	199
13	6.5	7,373	301	53	74	90	104	116	126	136	145	153	160	168	174	181	187	192
14	7	6,800	299	50	71	87	110	111	121	130	139	147	154	161	167	174	179	185
15	7.5	6,300	297	48	68	83	96	107	116	125	133	141	148	155	161	167	173	178
16	8	5,900	296	47	66	80	93	103	113	121	129	137	144	150	156	162	168	173
17	8.5	5,600	299	46	64	79	91	101	110	119	127	134	141	147	153	159	164	170
18	9	5,300	300	45	63	77	88	98	108	116	123	131	137	144	149	155	160	166
19	9.5	5,000	298	43	61	74	86	95	104	112	120	127	133	139	145	151	156	161
20	10	4,700	295	42	59	72	83	92	101	108	116	122	129	135	140	146	151	155

HPBE(Ball) New

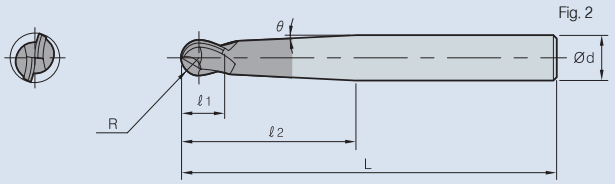
• HPBE2000

Fig. 1



• HPBE2000T

Fig. 2



Ø D	Tolerance of Endmill diameter	R tolerance
0.6 ~ 6	0 ~ - 0.02	±0.005
7 ~ 16	0 ~ - 0.025	±0.010

2 | TiAlN | Helix Angle 30°

(mm)

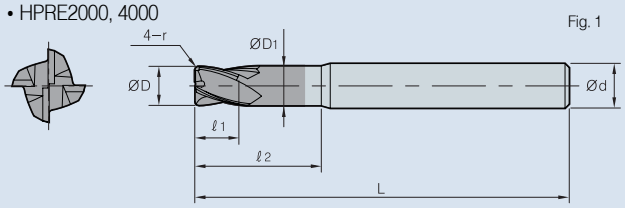
Designation		Stock	R	ød	ℓ_1	L	θ°	Fig.
HPBE 2	2006		0.3	6	0.6	50	0	1
	2008		0.4	6	0.8	50	0	1
	2010	●	0.5	6	2	50	0	1
	2020	●	1	6	3	50	0	1
	2030	●	1.5	6	4	50	0	1
	2040	●	2	6	5	60	0	1
	2050		2.5	6	6	60	0	1
	2060	●	3	6	7	60	0	1
	2060L		3	6	8	90	0	1
	2070		3.5	8	8	80	0	1
	2070L		3.5	8	9	100	0	1
	2080	●	4	8	9	80	0	1
	2080L		4	8	10	100	0	1
	2090		4.5	10	10	80	0	1
	2090L		4.5	10	11	100	0	1
	2100	●	5	10	11	80	0	1
	2100L		5	10	12	100	0	1
	2110		5.5	12	12	90	0	1
	2120	●	6	12	13	90	0	1
	2140		7	16	15	90	0	1
	2160		8	16	17	100	0	1
	2010-T4-16	●	0.5	6	2	50	2	2
	2010-T2-26		0.5	6	2	70	1	2
	2020-T4-29	●	1	6	3	60	2	2
	2020-T2-41		1	6	3	80	1	2
	2030-T4-29	●	1.5	6	4	60	2	2
	2030-T2-51		1.5	6	4	90	1	2
	2040-T4-34	●	2	6	5	70	2	2
	2040-T2-61		2	6	5	90	1	2
	2060-T4-35	●	3	8	7	90	2	2
	2060-T2-63		3	8	7	120	1	2
	2080-T4-39	●	4	10	11	100	2	2
	2080-T2-67		4	10	11	120	1	2
	2100-T4-41	●	5	14	13	120	2	2
	2100-T2-69		5	14	13	140	1	2
	2120-T4-43		6	16	15	130	2	2
	2120-T2-71		6	16	15	160	1	2

● : Stock item ○ : Under preparing for stock

HPRE(Corner radius) New

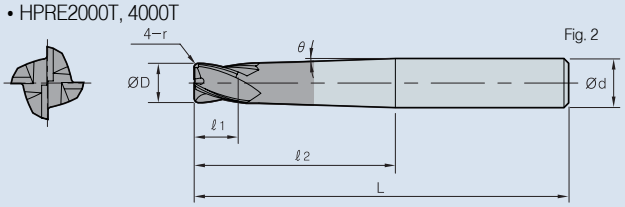
• HPRE2000, 4000

Fig. 1



• HPRE2000T, 4000T

Fig. 2



Ø D	Tolerance of Endmill diameter	R tolerance
0.6 ~ 6	0 ~ - 0.02	±0.005
7 ~ 16	0 ~ - 0.025	±0.010

2 4 | TiAlN | Helix Angle 30°

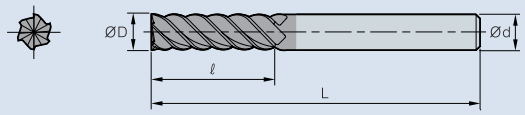
(mm)

Designation		Stock	øD	ød	ℓ_1	L	r	θ°	Fig.
HPRE 2	2020-R0.5		2	6	3	60	0.5	0	1
	2020-R0.5-T4-13	●	3	6	4	60	0.5	2	2
	2020-R0.5-T2-18	●	4	6	5	60	0.5	1	2
HPRE 4	4030-R0.5	●	6	6	7	60	0.5	0	1
	4040-R0.5	●	8	8	9	83	0.5	0	1
	4060-R1.0	●	10	10	11	90	1.0	0	1
	4080-R2.0	●	12	12	13	100	2.0	0	1
	4100-R2.0	●	16	16	17	100	2.0	0	1
	4120-R2.0		2	6	3	60	2.0	0	1
	4160-R2.0		2	6	3	80	2.0	0	2
	4020-R0.5-T4-18		2	6	3	60	0.5	2	2
	4020-R0.5-T2-23		2	6	3	80	0.5	1	2
	4030-R0.5-T4-19	●	3	6	4	60	0.5	2	2
	4030-R0.5-T2-24		3	6	4	80	0.5	1	2
	4040-R0.5-T4-34	●	4	6	5	70	0.5	2	2
	4040-R0.5-T2-61		4	6	5	90	0.5	1	2
	4060-R1.0-T4-36		6	8	7	90	1.0	2	2
	4060-R1.0-T2-63		6	8	7	120	1.0	1	2
	4080-R2.0-T4-37		8	10	9	100	2.0	2	2
	4080-R2.0-T2-65		8	10	9	120	2.0	1	2
	4100-R2.0-T4-40		10	12	11	120	2.0	2	2
	4100-R2.0-T2-69		10	12	11	140	2.0	1	2
	4120-R2.0-T4-42		12	14	13	130	2.0	2	2
	4120-R2.0-T2-71		12	14	13	160	2.0	1	2
	4160-R2.0-T4-45		16	18	17	130	2.0	2	2
	4160-R2.0-T2-73		16	18	17	160	2.0	1	2

● : Stock item ○ : Under preparing for stock

HSE2000/4000/6000/8000(Square)

Z-Max coated endmills for high-speed cutting



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

2 4 6 8 TiAlN Helix Angle 45°

(mm)

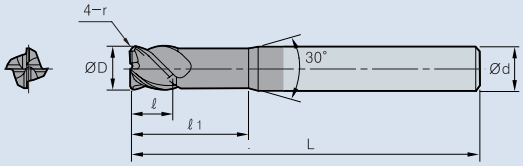
Designation		Stock	øD	ød	ℓ	L	Remark
HSE 2	2010		1.0	6	4	45	
	2015		1.5	6	4	45	
	2020		2.0	6	6	45	
	2025		2.5	6	6	45	
	2030		3.0	6	8	50	
	2035		3.5	6	8	50	
	2040		4.0	6	10	50	
	2045		4.5	6	10	50	
	2050		5.0	6	12	50	
	2055		5.5	6	12	50	
	2060		6.0	6	12	50	
	2065		6.5	8	12	50	
	2070		7.0	8	16	60	
	2080		8.0	8	16	60	
HSE 4	4030	●	3.0	6	8	50	
	4035		3.5	6	8	50	
	4040	●	4.0	6	10	50	
	4045		4.5	6	10	50	
	4050	●	5.0	6	12	50	
	4055		5.5	6	12	50	
	4060		6.0	6	12	50	
	4065		6.5	8	12	50	
	4070		7.0	8	16	60	
	4080		8.0	8	16	60	
	4090		9.0	10	20	70	
	4100		10.0	10	20	70	
HSE 6	6060	●	6.0	6	12	50	
	6065		6.5	8	12	50	
	6070		7.0	8	16	60	
	6075		7.5	8	16	60	
	6080	●	8.0	8	16	60	
	6085		8.5	10	20	70	
	6090		9.0	10	20	70	
	6100	●	10.0	10	20	70	
	6110		11.0	12	24	75	
	6120	●	12.0	12	24	75	
HSE 8	8100		10.0	10	20	70	
	8110		11.0	12	24	75	
	8120		12.0	12	24	75	
	8130		13.0	16	28	80	
	8140		14.0	16	28	80	
	8150		15.0	16	32	90	
	8160	●	16.0	16	32	90	
	8180		18.0	18	35	105	
	8200		20.0	20	40	105	

● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : HSE◎◎◎◎ ∗ Flute length ∗ Overall length L
Ex.1) 6Flutes, Cutting edge diameter : 6.3, Flute length : 15, Overall length : 60
➞ HSE6063 ∗ 15 ∗ 60L
Ex.2) 6Flutes, Cutting edge diameter : 6.3, Standard type ➞ HSE6063

HSRE4000(Corner radius)

Z-Max corner radius endmills for high-speed cutting



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

4 TiAlN Helix Angle 30°

(mm)

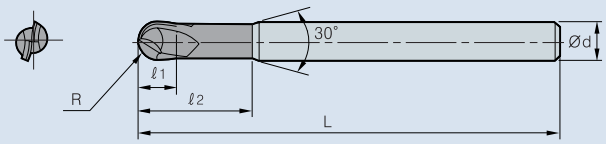
Designation		Stock	øD	ød	ℓ	ℓ1	L	r
HSRE 4	4030	●	3.0	6	4	9	60	1.0
	4035		3.5	6	5	10	65	1.0
	4040	●	4.0	6	5	10	65	1.0
	4045		4.5	6	6	13	65	1.0
	4050	●	5.0	6	6	13	65	1.0
	4055		5.5	6	7	15	75	1.5
	4060	●	6.0	6	7	15	75	1.5
	4065		6.5	8	7	15	75	1.5
	4070		7.0	8	8	15	75	2.0
	4075		7.5	8	8	15	75	2.0
	4080	●	8.0	8	9	20	75	2.0
	4085		8.5	10	9	20	75	2.0
	4090		9.0	10	10	20	80	2.5
	4095		9.5	10	10	20	80	2.5
	4100	●	10.0	10	11	25	80	2.5
	4105		10.5	12	11	25	85	2.5
	4110		11.0	12	11	25	85	3.0
	4115		11.5	12	13	25	90	3.0
	4120	●	12.0	12	13	25	90	3.0
	4125		12.5	16	13	25	90	3.0
	4130		13.0	16	14	25	95	3.5
	4135		13.5	16	14	25	95	3.5
	4140		14.0	16	14	25	95	3.5
	4145		14.5	16	16	25	95	4.0
	4150		15.0	16	16	25	100	4.0
	4155		15.5	16	17	32	100	4.0
	4160	●	16.0	16	17	32	100	4.0
	4165		16.5	18	17	32	105	4.0
	4170		17.0	18	17	32	105	4.5
	4175		17.5	18	18	32	105	4.5
	4180		18.0	18	18	32	110	5.0
	4185		18.5	20	20	32	110	5.0
	4190		19.0	20	20	32	110	5.5
	4195		19.5	20	20	32	115	5.5
	4200		20.0	20	25	32	115	6.0

● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : HSRE4◎◎◎-R Size ∗ Flute length ∗ Overall length L
Ex.1) 4Flutes, Cutting edge diameter : 6.3, Corner Radius:0.5, Flute length : 15, Overall length : 60
➞ HSRE4063-R0.5 ∗ 15 ∗ 60L
Ex.2) 4Flutes, Cutting edge diameter : 6.3, Standard type ➞ HSRE4063

HSBE2000/4000(Ball)

Z-Max ball endmills for high-speed cutting



Ø D	Tolerance of Endmill diameter
All items	0 ~ - 0.03

2 4 TiAlN Helix Angle 30°

(mm)

Designation		Stock	R	ℓ1	ℓ2	L	ød	Remark
HSBE 2	2010	●	0.5	1	2	60	6	
	2015		0.75	2	4	60	6	
	2020	●	1	2.5	4	60	6	
	2025		1.25	4	6	60	6	
	2030	●	1.5	4	6	60	6	
	2035		1.75	5	8	65	6	
	2040	●	2	5	8	65	6	
	2045		2.25	6	10	65	6	
	2050	●	2.5	6	10	65	6	
	2055		2.75	7	12	75	6	
	2060	●	3	7	12	75	6	
	2065		3.25	7	15	75	8	
	2070		3.5	8	20	75	8	
	2080	●	4	9	25	75	8	
	2090		4.5	10	30	80	10	
	2100	●	5	11	30	80	10	
	2110		5.5	12	35	85	12	
	2120	●	6	12	36	90	12	
	2130		6.5	14	36	90	16	
	2140		7	14	36	90	16	
	2150		7.5	16	36	90	16	
	2160	●	8	16	36	100	16	
	2170		8.5	18	45	100	20	
	2180		9	18	45	100	20	
	2190		9.5	20	53	110	20	
	2200		10	20	53	110	20	
HSBE 4	4080		4	9	25	75	8	
	4090		4.5	10	30	80	10	
	4100		5	11	30	80	10	
	4120		6	12	36	90	12	
	4130		6.5	14	36	90	16	
	4140		7	14	36	90	16	
	4150		7.5	16	36	90	16	
	4160		8	16	36	100	16	
	4170		8.5	18	45	100	20	
	4180		9	18	45	100	20	
	4190		9.5	20	53	110	20	
	4200		10	20	53	110	20	

● : Stock item ○ : Under preparing for stock

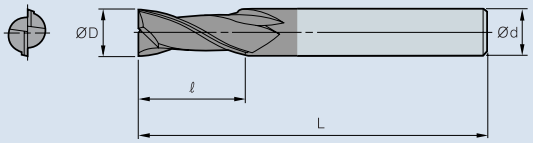
∗ Ordering code for special item : HSBE◎◎◎◎ ∗ Flute length ∗ Overall length L
Ex.1) 2Flutes, Cutting edge diameter : 6.3, Flute length : 10, Overall length : 60
➞ HSBE2063 ∗ 10 ∗ 60L
Ex.2) 2Flutes, Cutting edge diameter : 6.3, Standard type ➞ HSBE2063

• SSE2000 ∗ Q
∗ Ordering code for special item : Coated ; SSE2◎◎◎-Q ∗ Flute length ∗ Overall length L
Non-coated ; SSE2◎◎◎ ∗ Flute length ∗ Overall length L
Ex.1) General use, Coating, Square, 2Flutes, Cutting edge diameter : 6.3, Flute length : 16, Overall length : 90
➞ SSE2063-Q ∗ 16 ∗ 90L
Ex.2) General use, Coating, Square, 2Flutes, Cutting edge diameter : 6.3, Standard type ➞ SSE2063-Q

• SSE3000-Q/4000-Q
∗ Ordering code for special item : Coated ; SSE◎◎◎◎-Q ∗ Flute length ∗ Overall length L
Non-coated ; SSE◎◎◎◎ ∗ Flute length ∗ Overall length L
Ex.1) General use, Coating, Square, 3Flutes, Cutting edge diameter : 6.3, Flute length : 16, Overall length : 90
➞ SSE3063-Q ∗ 16 ∗ 90L
Ex.2) General use, Coating, Square, 3Flutes, Cutting edge diameter : 6.3, Standard type ➞ SSE3063-Q

SSE2000-Q/3000-Q/4000-Q(Square)

Q-Max coated solid endmills



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

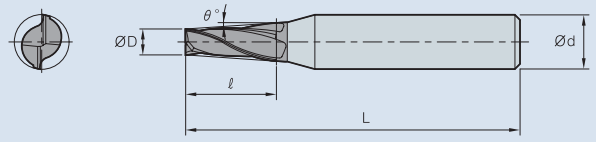
2 3 4 TiAlN Helix Angle 30°

(mm)

Designation		Stock	øD	ød	ℓ	L	Remark
SSE 2	2010-Q	●	1.0	6	3	40	
	2015-Q	●	1.2	6	4	40	
	2020-Q	●	2.0	6	6	40	
	2025-Q	●	2.5	6	8	40	
	2030-Q	●	3.0	6	10	45	
	2035-Q	●	3.5	6	10	45	
	2040-Q	●	4.0	6	12	45	
	2045-Q	●	4.5	6	12	45	
	2050-Q	●	5.0	6	15	50	
	2055-Q	●	5.5	6	15	50	
	2060-Q	●	6.0	6	15	50	
	2065-Q	●	6.5	8	20	60	
	2070-Q	●	7.0	8	20	60	
	2075-Q	●	7.5	8	20	60	
	2080-Q	●	8.0	8	20	60	
	2085-Q	●	8.5	10	20	70	
	2090-Q	●	9.0	10	20	70	
	2095-Q	●	9.5	10	20	70	
	2100-Q	●	10.0	10	25	70	
	2105-Q	●	10.5	12	25	75	
	2110-Q	●	11.0	12	25	75	
	2115-Q	●	11.5	12	25	75	
	2120-Q	●	12.0	12	30	75	
	2130-Q	●	13.0	16	30	90	
	2140-Q	●	14.0	16	35	90	
	2150-Q	●	15.0	16	40	90	
	2160-Q	●	16.0	16	40	90	
	2180-Q		18.0	20	45	105	
	2200-Q	●	20.0	20	45	106	
SSE 3	3020-Q		2.0	6	6	40	
	3030-Q		3.0	6	10	45	
	3035-Q		3.5	6	10	45	
	3040-Q		4.0	6	12	45	
	3050-Q		5.0	6	15	50	
	3060-Q		6.0	6	15	50	
	3070-Q		7.0	8	20	60	
	3080-Q		8.0	8	20	60	
	3090-Q		9.0	10	20	70	
	3100-Q		10.0	10	25	70	
	3110-Q		11.0	12	25	75	
	3120-Q		12.0	12	30	75	
	3130-Q		13.0	16	30	90	
	3140-Q		14.0	16	35	90	
	3150-Q		15.0	16	40	90	
SSE 4	4025-Q		2.5	6	8	40	
	4030-Q	●	3.0	6	10	45	
	4040-Q	●	4.0	6	12	45	
	4050-Q	●	5.0	6	15	50	
	4060-Q	●	6.0	6	15	50	
	4070-Q	●	7.0	8	20	60	
	4080-Q	●	8.0	8	20	60	
	4085-Q		8.5	10	20	70	
	4090-Q	●	9.0	10	20	70	
	4100-Q	●	10.0	10	25	70	
	4110-Q	●	11.0	12	25	75	
	4120-Q	●	12.0	12	30	75	
	4130-Q	●	13.0	16	30	90	
	4140-Q		14.0	16	35	90	
	4150-Q		15.0	16	40	90	
	4160-Q		16.0	16	40	90	
	4180-Q		18.0	20	45	105	
	4200-Q		20.0	20	45	105	

● : Stock item ○ : Under preparing for stock

SSTE2000-Q(Taper square)



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

2 | TiAlN | Helix Angle 30°

(mm)

Designation		Stock	øD	ød	θ°	ℓ	L	Remark
SSTE 2	2030-05-Q		3.0	6	0.5°	10	45	
	2030-10-Q		3.0	6	1.0°	10	45	
	2030-15-Q		3.0	6	1.5°	10	45	
	2030-20-Q		3.0	6	2.0°	10	45	
	2030-25-Q		3.0	6	2.5°	10	45	
	2030-30-Q		3.0	6	3.0°	10	45	
	2040-05-Q		4.0	6	0.5°	12	45	
	2040-10-Q		4.0	6	1.0°	12	45	
	2040-15-Q		4.0	6	1.5°	12	45	
	2040-20-Q		4.0	6	2.0°	12	45	
	2040-25-Q		4.0	6	2.5°	12	45	
	2040-30-Q		4.0	6	3.0°	12	45	
	2050-05-Q		5.0	6	0.5°	15	50	
	2050-10-Q		5.0	6	1.0°	15	50	
	2050-15-Q		5.0	6	1.5°	15	50	
	2050-20-Q		5.0	6	2.0°	15	50	
	2050-25-Q		5.0	6	2.5°	15	50	
	2050-30-Q		5.0	6	3.0°	15	50	
	2060-05-Q		6.0	6	0.5°	15	50	
	2060-10-Q		6.0	6	1.0°	15	50	
	2060-15-Q		6.0	6	1.5°	15	50	
	2060-20-Q		6.0	6	2.0°	15	50	
	2060-25-Q		6.0	6	2.5°	15	50	
	2060-30-Q		6.0	6	3.0°	15	50	
	2080-05-Q		8.0	8	0.5°	20	60	
	2080-10-Q		8.0	8	1.0°	20	60	
	2080-15-Q		8.0	8	1.5°	20	60	
	2080-20-Q		8.0	8	2.0°	20	60	
	2080-25-Q		8.0	8	2.5°	20	60	
	2080-30-Q		8.0	8	3.0°	20	60	
	2100-05-Q		10.0	10	0.5°	25	70	
	2100-10-Q		10.0	10	1.0°	25	70	
	2100-15-Q		10.0	10	1.5°	25	70	
	2100-20-Q		10.0	10	2.0°	25	70	
	2100-25-Q		10.0	10	2.5°	25	70	
	2100-30-Q		10.0	10	3.0°	25	70	
	2110-05-Q		11.0	12	0.5°	25	70	
	2110-10-Q		11.0	12	1.0°	25	70	
	2110-15-Q		11.0	12	1.5°	25	70	
	2110-20-Q		11.0	12	2.0°	25	70	
	2110-25-Q		11.0	12	2.5°	25	70	
	2110-30-Q		11.0	12	3.0°	25	70	
	2120-05-Q		12.0	12	0.5°	30	75	
	2120-10-Q		12.0	12	1.0°	30	75	
	2120-15-Q		12.0	12	1.5°	30	75	
	2120-20-Q		12.0	12	2.0°	30	75	
	2120-25-Q		12.0	12	2.5°	30	75	
	2120-30-Q		12.0	12	3.0°	30	75	
	2130-05-Q		13.0	14	0.5°	30	75	
	2130-10-Q		13.0	14	1.0°	30	75	
	2130-15-Q		13.0	14	1.5°	30	75	
	2130-20-Q		13.0	14	2.0°	30	75	
	2130-25-Q		13.0	14	2.5°	30	75	
	2130-30-Q		13.0	14	3.0°	30	75	

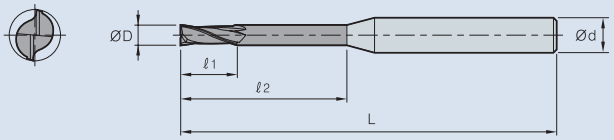
● : Stock item ○ : Under preparing for stock

(mm)

Designation		Stock	øD	ød	θ°	ℓ	L	Remark
SSTE 2	2140-05-Q		14.0	14	0.5°	35	80	
	2140-10-Q		14.0	14	1.0°	35	80	
	2140-15-Q		14.0	14	1.5°	35	80	
	2140-20-Q		14.0	14	2.0°	35	80	
	2140-25-Q		14.0	14	2.5°	35	80	
	2140-30-Q		14.0	14	3.0°	35	80	
	2150-05-Q		15.0	16	0.5°	35	80	
	2150-10-Q		15.0	16	1.0°	35	80	
	2150-15-Q		15.0	16	1.5°	35	80	
	2150-20-Q		15.0	16	2.0°	35	80	
	2150-25-Q		15.0	16	2.5°	35	80	
	2150-30-Q		15.0	16	3.0°	35	80	
	2160-05-Q		16.0	16	0.5°	40	90	
	2160-10-Q		16.0	16	1.0°	40	90	
	2160-15-Q		16.0	16	1.5°	40	90	
	2160-20-Q		16.0	16	2.0°	40	90	
	2160-25-Q		16.0	16	2.5°	40	90	
	2160-30-Q		16.0	16	3.0°	40	90	

● : Stock item ○ : Under preparing for stock

LSSE2000-Q(Long square)



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

2 | TiAlN | Helix Angle 30°

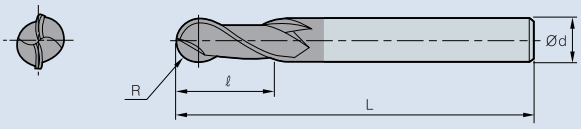
(mm)

Designation		Stock	øD	ød	ℓ1	ℓ2	L	Remark
LSSE 2	2030-Q		3	6	4	35	100	
	2040-Q		4	6	6	35	100	
	2050-Q		5	8	7	40	115	
	2060-Q		6	8	8	45	115	
	2070-Q		7	10	10	45	125	
	2080-Q		8	10	12	55	125	
	2090-Q		9	12	15	65	140	
	2100-Q		10	12	15	65	140	
	2110-Q		11	16	20	75	150	
	2120-Q		12	16	28	75	150	
	2130-Q		13	16	32	75	155	
	2140-Q		14	16	32	75	155	
	2150-Q		15	16	36	75	155	
	2160-Q		16	16	36	75	155	
	2180-Q		17	20	40	75	155	
	2200-Q		20	20	46	75	160	
	2220-Q		22	25	50	80	165	
	2230-Q		23	25	50	80	165	
	2240-Q		24	25	55	85	170	
	2250-Q		25	25	55	85	170	

● : Stock item ○ : Under preparing for stock

SSBE2000-Q/4000-Q(Ball)

Q-Max coated solid endmills



Ø D	Tolerance of Endmill diameter
3 ~ 16	0 ~ - 0.03

2 | 4 | TiAlN | Helix Angle 30°

(mm)

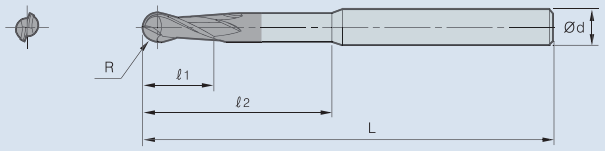
Designation		Stock	R	ℓ	L	ød	Remark
SSBE 2	2010-Q	●	0.5	3	70	6	
	2013-Q		0.65	4	70	6	
	2015-Q	●	0.75	4	70	6	
	2020-Q	●	1.0	6	70	6	
	2025-Q	●	1.25	8	70	6	
	2030-Q	●	1.5	10	70	6	
	2035-Q	●	1.75	10	70	6	
	2040-Q	●	2.0	12	70	6	
	2050-Q	●	2.5	15	80	6	
	2060-Q	●	3.0	15	80	6	
	2070-Q	●	3.5	20	90	8	
	2080-Q	●	4.0	20	90	8	
	2090-Q	●	4.5	25	100	10	
	2100-Q	●	5.0	25	100	10	
	2110-Q	●	5.5	30	110	12	
	2120-Q	●	6.0	30	110	12	
	2130-Q		6.5	35	120	16	
	2140-Q		7.0	35	120	16	
	2150-Q		7.5	40	120	16	
	2160-Q		8.0	40	120	16	
	2180-Q		9.0	45	130	20	
	2200-Q		10.0	45	130	20	
SSBE 4	4060-Q		3.0	15	80	6	
	4070-Q		3.5	20	90	8	
	4080-Q		4.0	20	90	8	
	4090-Q		4.5	25	100	10	
	4100-Q		5.0	25	100	10	
	4110-Q		5.5	30	110	12	
	4120-Q		6.0	30	110	12	
	4130-Q		6.5	35	120	16	
	4140-Q		7.0	35	120	16	
	4150-Q		7.5	40	120	16	
	4160-Q		8.0	40	120	16	
	4180-Q		9.0	45	130	20	
	4200-Q		10.0	45	130	20	

● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : Coated ; SSBE◎◎◎◎-Q ∗ Flute length ∗ Overall length L
Non-coated ; SSBE◎◎◎◎ ∗ Flute length ∗ Overall length L
Ex.1) General use, Coating, Ball, 3Flutes, Cutting edge diameter : 6.3, Flute length:16, Overall length : 90 ➡ SSBE3063-Q ∗ 16 ∗ 90L
Ex.2) General use, Coating, Ball, 3Flutes, Cutting edge diameter : 6.3, Standard type ➡ SSBE3063-Q

LSBE2000-Q(Long ball)

Q-Max coated solid long endmills



Ø D	Tolerance of Endmill diameter
All items	0 ~ - 0.03

2 | TiAlN | Helix Angle 30°

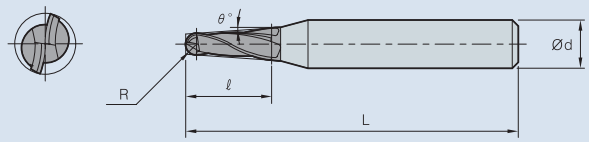
(mm)

Designation		Stock	R	ℓ1	ℓ2	L	ød	Remark
LSBE 2	2030-Q		1.5	4	35	100	6	
	2040-Q		2.0	6	35	100	6	
	2050-Q		2.5	7	40	115	8	
	2060-Q		3.0	8	45	115	8	
	2070-Q		3.5	10	45	125	10	
	2080-Q		4.0	12	55	125	10	
	2090-Q		4.5	15	65	140	12	
	2100-Q		5.0	15	65	140	12	
	2110-Q		5.5	20	75	150	16	
	2120-Q		6.0	28	75	150	16	
	2130-Q		6.5	32	75	155	16	
	2140-Q		7.0	32	75	155	16	
	2150-Q		7.5	36	75	155	16	
	2160-Q		8.0	36	75	155	16	
	2180-Q		9.0	40	75	155	20	
	2200-Q		10.0	46	75	160	20	
	2220-Q		11.0	50	80	165	25	
	2230-Q		11.5	50	80	165	25	
	2240-Q		12.0	55	85	170	25	
	2250-Q		12.5	55	85	170	25	

● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : Coated; LSBE2000-Q ∗ Flute length-Neck lengthN ∗ Overall length L
Non-coated; LSBE2000 ∗ Flute length-Neck lengthN ∗ Overall length L
Ex.1) Coating, Ball, 2Flutes, Cutting edge diameter : 8.3, Flute length : 13, Neck length : 60, Overall length : 130 ➡ LSBE2083-Q ∗ 13-60N ∗ 130L
Ex.2) Coating, Ball, 2Flutes, Cutting edge diameter : 8.3, Standard type ➡ LSBE2083-Q

STBE2000-Q(Taper ball)



Ø D	Tolerance of Endmill diameter
3 ~ 16	0 ~ - 0.03

2 | TiAlN | Helix Angle 30°

(mm)

Designation		Stock	R	ℓ	L	θ°	ød	Remark
STBE 2	2030-05-Q		1.5	10	45	0.5°	6	
	2030-10-Q		1.5	10	45	1.0°	6	
	2030-15-Q		1.5	10	45	1.5°	6	
	2030-20-Q		1.5	10	45	2.0°	6	
	2030-25-Q		1.5	10	45	2.5°	6	
	2030-30-Q		1.5	10	45	3.0°	6	
	2040-05-Q		2.0	12	45	0.5°	6	
	2040-10-Q		2.0	12	45	1.0°	6	
	2040-15-Q		2.0	12	45	1.5°	6	
	2040-20-Q		2.0	12	45	2.0°	6	
	2040-25-Q		2.0	12	45	2.5°	6	
	2040-30-Q		2.0	12	45	3.0°	6	
	2050-05-Q		2.5	15	50	0.5°	6	
	2050-10-Q		2.5	15	50	1.0°	6	
	2050-15-Q		2.5	15	50	1.5°	6	
	2050-20-Q		2.5	15	50	2.0°	6	
	2050-25-Q		2.5	15	50	2.5°	6	
	2050-30-Q		2.5	15	50	3.0°	6	
	2060-05-Q		3.0	15	50	0.5°	6	
	2060-10-Q		3.0	15	50	1.0°	6	
	2060-15-Q		3.0	15	50	1.5°	6	
	2060-20-Q		3.0	15	50	2.0°	6	
	2060-25-Q		3.0	15	50	2.5°	6	
	2060-30-Q		3.0	15	50	3.0°	6	
	2080-05-Q		4.0	20	60	0.5°	8	
	2080-10-Q		4.0	20	60	1.0°	8	
	2080-15-Q		4.0	20	60	1.5°	8	
	2080-20-Q		4.0	20	60	2.0°	8	
	2080-25-Q		4.0	20	60	2.5°	8	
	2080-30-Q		4.0	20	60	3.0°	8	
	2100-05-Q		5.0	25	70	0.5°	10	
	2100-10-Q		5.0	25	70	1.0°	10	
	2100-15-Q		5.0	25	70	1.5°	10	
	2100-20-Q		5.0	25	70	2.0°	10	
	2100-25-Q		5.0	25	70	2.5°	10	
	2100-30-Q		5.0	25	70	3.0°	10	
	2110-05-Q		5.5	25	70	0.5°	12	
	2110-10-Q		5.5	25	70	1.0°	12	
	2110-15-Q		5.5	25	70	1.5°	12	
	2110-20-Q		5.5	25	70	2.0°	12	
	2110-25-Q		5.5	25	70	2.5°	12	
	2110-30-Q		5.5	25	70	3.0°	12	
	2120-05-Q		6.0	30	75	0.5°	12	
	2120-10-Q		6.0	30	75	1.0°	12	
	2120-15-Q		6.0	30	75	1.5°	12	
	2120-20-Q		6.0	30	75	2.0°	12	
	2120-25-Q		6.0	30	75	2.5°	12	
	2120-30-Q		6.0	30	75	3.0°	12	
	2130-05-Q		6.5	30	75	0.5°	14	
	2130-10-Q		6.5	30	75	1.0°	14	
	2130-15-Q		6.5	30	75	1.5°	14	
	2130-20-Q		6.5	30	75	2.0°	14	
	2130-25-Q		6.5	30	75	2.5°	14	
	2130-30-Q		6.5	30	75	3.0°	14	

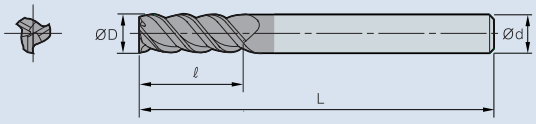
(mm)

Designation		Stock	ød	θ°	ℓ	L	R	Remark
STBE 2	2140-05-Q		14	0.5°	35	80	7.0	
	2140-10-Q		14	1.0°	35	80	7.0	
	2140-15-Q		14	1.5°	35	80	7.0	
	2140-20-Q		14	2.0°	35	80	7.0	
	2140-25-Q		14	2.5°	35	80	7.0	
	2140-30-Q		14	3.0°	35	80	7.0	
	2150-05-Q		16	0.5°	35	80	7.5	
	2150-10-Q		16	1.0°	35	80	7.5	
	2150-15-Q		16	1.5°	35	80	7.5	
	2150-20-Q		16	2.0°	35	80	7.5	
	2150-25-Q		16	2.5°	35	80	7.5	
	2150-30-Q		16	3.0°	35	80	7.5	
	2160-05-Q		16	0.5°	40	90	8.0	
	2160-10-Q		16	1.0°	40	90	8.0	
	2160-15-Q		16	1.5°	40	90	8.0	
	2160-20-Q		16	2.0°	40	90	8.0	
	2160-25-Q		16	2.5°	40	90	8.0	
	2160-30-Q		16	3.0°	40	90	8.0	

● : Stock item ○ : Under preparing for stock

SSES3000-Q(Square)

Solid endmills for difficult-to-cut material(STS)



Ø D	Tolerance of Endmill diameter
1 ~ 6	-0.01 ~ - 0.03
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.05

3 | TiAlN | Helix Angle 30°

(mm)

Designation		Stock	ØD	θ°	ℓ	L	Remark
SSES 3	3030-Q	○	3.0	6	10	45	
	3035-Q	○	3.5	6	10	45	
	3040-Q	○	4.0	6	12	45	
	3045-Q	○	4.5	6	12	45	
	3050-Q	○	5.0	6	15	50	
	3055-Q	○	5.5	6	15	50	
	3060-Q	○	6.0	6	15	50	
	3065-Q	○	6.5	8	20	60	
	3070-Q	○	7.0	8	20	60	
	3075-Q	○	7.5	8	20	60	
	3080-Q	○	8.0	8	20	60	
	3085-Q	○	8.5	10	20	70	
	3090-Q	○	9.0	10	20	70	
	3095-Q	○	9.5	10	20	70	
	3100-Q	○	10.0	10	25	70	
	3110-Q	○	11.0	12	25	75	
	3120-Q	○	12.0	12	30	75	
	3130-Q	○	13.0	16	30	90	
	3140-Q	○	14.0	16	35	90	
	3150-Q	○	15.0	16	40	90	
	3160-Q	○	16.0	16	40	90	
	3170-Q		17.0	20	40	100	
	3180-Q		18.0	20	45	100	
	3190-Q		19.0	20	45	110	
	3200-Q		20.0	20	45	110	

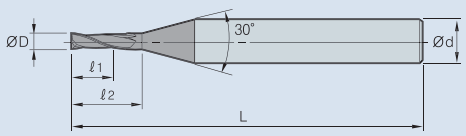
● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : SSES3◎◎◎-Q ∗ Flute length ∗ Overall length L
Ex.1) 3Flutes, Cutting edge diameter : 6.3, Flute length : 17, Overall length : 60 ➞ SSES3063-Q ∗ 17 ∗ 60L
Ex.2) 3Flutes, Cutting edge diameter : 6.3, Standard type ➞ SSES3063-Q

▪ Features of Korloy endmills for stainless steel
1. Side cutting and grooving : High rake angle with streamline shape chip pocket controls chip flow. Sharp cutting edge prevents work hardening

MSE2000(Square)

Micro coated carbide solid endmills



Ø D	Tolerance of Endmill diameter
2 ~ 10	0 ~ - 0.02

2 Helix Angle 30°

(mm)

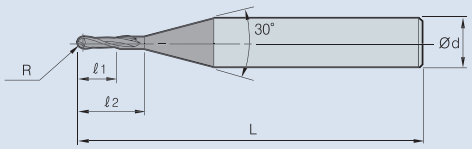
Designation		Stock	ØD	ød	ℓ1	ℓ2	L	Remark
MSE 2	2004	●	0.4	6.0	0.8	1.2	50	
	2004-S	●	0.4	3.0	0.8	1.2	45	
	2005	●	0.5	6.0	1.0	1.5	50	
	2005-S	●	0.5	3.0	1.0	1.5	45	
	2006	●	0.6	6.0	1.2	1.8	50	
	2006-S	●	0.6	3.0	1.2	1.8	45	
	2007	●	0.7	6.0	14	2.1	50	
	2007-S	●	0.7	3.0	1.4	2.1	45	
	2008	●	0.8	6.0	1.6	2.4	50	
	2008-S	●	0.8	3.0	1.6	2.4	45	
	2009	●	0.9	6.0	1.8	2.7	50	
	2009-S	●	0.9	3.0	1.8	2.7	45	
	2010	●	1.0	6.0	2.0	3.0	50	
	2010-S	●	1.0	3.0	2.0	3.0	45	

● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : MSE ; MSE20◎◎ ∗ Flute length ∗ Overall length L
MSBE ; MSBE20◎◎ ∗ Flute length ∗ Overall length L
Ex.1) Cutting edge diameter : 0.45, Flute length : 1.2, Overall length : 50 ➞ MSE20045 ∗ 1.2 ∗ 55L
Ex.2) Ball R0.225(ø 0.45), Flute length : 1.2, Overall length : 55 ➞ MSBE20045 ∗ 1.2 ∗ 55L
∗ MSE,MSBE is available for under ø 1.0mm endmill diameter.
For bigger cutting edge diameter see SSE-Q, SSBE-Q pages.

MSBE2000(Ball)

Micro coated carbide solid ball endmills



Ø D	Tolerance of Endmill diameter
2 ~ 10	+0.01 ~ - 0.01

2 Helix Angle 30°

(mm)

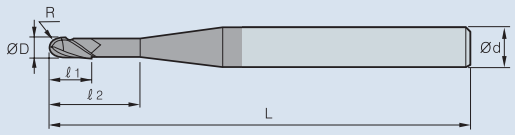
Designation		Stock	R	ℓ1	ℓ2	L	ød	Remark
MSBE 2	2004	●	0.2	0.8	1.2	50	6.0	
	2004-S	●	0.2	0.8	1.2	45	3.0	
	2005		0.25	1.0	1.5	50	6.0	
	2005-S		0.25	1.0	1.5	45	3.0	
	2006	●	0.3	1.2	1.8	50	6.0	
	2006-S	●	0.3	1.2	1.8	45	3.0	
	2007	●	0.35	1.4	2.1	50	6.0	
	2007-S	●	0.35	1.4	2.1	45	3.0	
	2008	●	0.4	1.6	2.4	50	6.0	
	2008-S	●	0.4	1.6	2.4	45	3.0	
	2009	●	0.45	1.8	2.7	50	6.0	
	2009-S	●	0.45	1.8	2.7	45	3.0	
	2010	●	0.5	2.0	3.0	50	6.0	
	2010-S	●	0.5	2.0	3.0	45	3.0	

● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : MSE ; MSE20◎◎ ∗ Flute length ∗ Overall length L
MSBE ; MSBE20◎◎ ∗ Flute length ∗ Overall length L
Ex.1) Cutting edge diameter : 0.45, Flute length : 1.2, Overall length : 50 ➞ MSE20045 ∗ 1.2 ∗ 55L
Ex.2) Ball R0.225(ø 0.45), Flute length : 1.2, Overall length : 55 ➞ MSBE20045 ∗ 1.2 ∗ 55L
∗ MSE,MSBE is available for under ø 1.0mm endmill diameter.
For bigger cutting edge diameter see SSE-Q, SSBE-Q pages.

HRB New

Rib processing endmills



R	ØD	Ød
0 -0.005	0 -0.005	-0.004 -0.008

HRB

Rib Ball endmills (V-Type)

Shows excellent wear resistance in high speed machining for high hardness (hardness HRC 65) workpiece. 2-flute ball endmills(long neck endmills) for high speed machining can be useful for precision machining in the wider range of automotive, mobile phone, electronic molds, and semiconductor parts. Special cutting edge design for chipping resistance is strong enough for grooving, deep radius machining of molds in high efficient and high quality machining.

2

- PC220G : For general, ~HRC55
- PC203G : For high hardness, ~HRC65
- PD3000 : For copper electrode

(mm)

Designation		Stock PC220G	Stock PC203G	Stock PD3000	R	ØD	ℓ1	ℓ2	L	Ød
HRB 2	001L01	○	○		0.05	0.1	0.12	1	50	4
	001L02	○	○					2	50	4
	002L01	○	○		0.10	0.2	0.25	1	50	4
	002L02	○	○					2	50	4
	003L01	○	○		0.15	0.3	0.4	1	50	4
	003L02	○	○					2	50	4
	003L03	○	○					3	50	4
	004L01	○	○		0.20	0.4	0.5	1	50	4
	004L02	○	○					2	50	4
	004L03	○	○					3	50	4
	004L04	○	○					4	50	4
	004L05	○	○					5	50	4
	005L02	○	○	○	0.25	0.5	0.6	2	50	4
	005L03	○	○					3	50	4
	005L04	○	○	○				4	50	4
	005L05	○	○					5	50	4
	005L06	○	○	○				6	50	4
	005L08	○	○	○				8	50	4
	005L10	○	○	○				10	50	4
	006L02	○	○	○	0.30	0.6	0.7	2	50	4
	006L03	○	○					3	50	4
	006L04	○	○	○				4	50	4
	006L05	○	○					5	50	4
	006L06	○	○	○				6	50	4
	006L08	○	○	○				8	50	4
	006L10	○	○	○				10	50	4
	007L02	○	○		0.35	0.7	0.8	2	50	4
	007L03	○	○					3	50	4
	007L04	○	○					4	50	4
	007L05	○	○					5	50	4
	007L06	○	○					6	50	4
	007L08	○	○					8	50	4
	007L10	○	○					10	50	4
	008L02	○	○	○	0.40	0.8	0.9	2	50	4
	008L03	○	○					3	50	4
	008L04	○	○	○				4	50	4
	008L05	○	○					5	50	4
	008L06	○	○	○				6	50	4
	008L08	○	○	○				8	50	4
	008L10	○	○	○				10	50	4
	009L03	○	○		0.45	0.9	1.0	3	50	4
	009L04	○	○					4	50	4
	009L05	○	○					5	50	4
	009L06	○	○					6	50	4
	009L08	○	○					8	50	4
	009L10	○	○					10	50	4
	010L02	○	○		0.5	1.0	1.2	2	50	4
	010L03	○	○					3	50	4
	010L04	○	○	○				4	50	4
	010L05	○	○					5	50	4
	010L06	○	○	○				6	50	4
	010L08	○	○	○				8	50	4
	010L10	○	○	○				10	50	4
	010L12	○	○					12	50	4
	010L14	○	○	○				14	50	4
	010L16	○	○					15	60	4
	010L18	○	○					18	60	4
	010L20	○	○					20	60	4
	012L03	○	○		0.6	1.2	1.4	3	50	4
	012L04	○	○	○				4	50	4
	012L05	○	○					5	50	4
	012L06	○	○	○				6	50	4
	012L08	○	○	○				8	50	4
	012L10	○	○	○				10	50	4
	012L12	○	○	○				12	50	4
	012L14	○	○					14	50	4
	012L16	○	○	○				16	60	4
	014L04	○	○		0.7	1.4	1.7	4	50	4
	014L05	○	○					5	50	4
	014L06	○	○					6	50	4
	014L08	○	○					8	50	4
	014L10	○	○					10	50	4

● : Stock item ○ : Under preparing for stock

(mm)

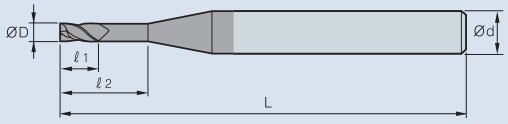
Designation		Stock PC220G	Stock PC203G	Stock PD3000	R	ØD	ℓ1	ℓ2	L	Ød
HRB 2	014L12	○	○		0.7	1.4	1.7	12	50	4
	015L04	○	○	○	0.75	1.5	1.8	4	50	4
	015L05	○	○					5	50	4
	015L06	○	○	○				6	50	4
	015L08	○	○	○				8	50	4
	015L10	○	○	○				10	50	4
	015L12	○	○	○				12	50	4
	015L14	○	○					14	50	4
	015L16	○	○	○				16	60	4
	015L18	○	○					18	60	4
	015L20	○	○					20	60	4
	016L04	○	○		0.8	1.6	1.9	4	50	4
	016L05	○	○					5	50	4
	016L06	○	○					6	50	4
	016L08	○	○					8	50	4
	016L10	○	○					10	50	4
	016L12	○	○					12	50	4
	016L14	○	○					14	50	4
	016L16	○	○					16	60	4
	016L18	○	○					18	60	4
	016L20	○	○					20	60	4
	020L04	○	○	○	1.0	2.0	2.2	4	60	4
	020L06	○	○	○				6	60	4
	020L08	○	○	○				8	60	4
	020L10	○	○	○				10	60	4
	020L12	○	○	○				12	60	4
	020L14	○	○	○				14	50	4
	020L16	○	○	○				16	60	4
	020L18	○	○					18	60	4
	020L20	○	○	○				20	60	4
	020L22	○	○					22	60	4
	020L25	○	○					25	70	4
	020L30	○	○					30	70	4
	025L10	○	○		1.25	2.5	3	10	50	6
	025L12	○	○					12	50	6
	025L14	○	○					14	60	6
	025L16	○	○					16	60	6
	025L20	○	○					20	60	6
	025L25	○	○					25	70	6
	030L06	○	○	○	1.5	3.0	3.6	6	50	6
	030L08	○	○	○				8	50	6
	030L10	○	○	○				10	50	6
	030L12	○	○	○				12	50	6
	030L14	○	○					14	60	6
	030L16	○	○	○				16	60	6
	030L18	○	○					18	60	6
	030L20	○	○	○				20	60	6
	030L25	○	○					25	70	6
	030L30	○	○	○				30	70	6
	030L35	○	○					35	80	6
	040L08	○	○	○	2.0	4.0	5	8	50	6
	040L10	○	○	○				10	50	6
	040L12	○	○	○				12	50	6
	040L14	○	○					14	60	6
	040L16	○	○	○				16	60	6
	040L18	○	○					18	60	6
	040L20	○	○	○				20	60	6
	040L25	○	○	○				25	70	6
	040L30	○	○	○				30	70	6
	040L35	○	○					35	80	6
	040L40	○	○					40	80	6
	040L45	○	○					45	90	6
	040L50	○	○					50	90	6
	050L20	○	○		2.5	5.0	6	20	60	6
	050L25	○	○					25	60	6
	050L30	○	○					30	70	6
	050L35	○	○					35	80	6
	050L40	○	○					40	80	6
	060L20	○	○	○	3.0	6.0	7	20	60	6
	060L30	○	○	○				30	70	6
	060L40	○	○					40	80	6
	060L50	○	○					50	90	6

● : Stock item ○ : Under preparing for stock

HRF

New

Rib processing endmills



ØD	Ød
0 - 0.008	- 0.004 - 0.008

HRF

Rib Square endmills.(V-Type)

Shows excellent wear resistance in high speed machining for high hardness (hardness HRC 65) workpiece. 2-flute flat endmills(long neck endmills) for high speed machining can be useful for precision machining in the wider range of automotive, mobile phone, electronic molds, and semiconductor parts. Special cutting edge design for chipping resistance is strong enough for grooving, deep radius machining of molds in high efficient and high quality machining.

2

- PC220G : For general, ~HRC55
- PC203G : For high hardness, ~HRC65
- PD3000 : For copper electrode

(mm)

Designation		Stock PC220G	Stock PC203G	Stock PD3000	ØD	ℓ1	ℓ2	L	Ød
HRF 2	001L01	○	○		0.1	0.15	1	50	4
	001L02	○	○				2	50	4
	002L01	○	○		0.2	0.3	1	50	4
	002L02	○	○				2	50	4
	003L01	○	○		0.3	0.4	1	50	4
	003L02	○	○				2	50	4
	003L03	○	○				3	50	4
	004L01	○	○		0.4	0.6	1	50	4
	004L02	○	○				2	50	4
	004L03	○	○				3	50	4
	004L04	○	○				4	50	4
	004L05	○	○				5	50	4
	005L02	○	○	○	0.5	0.8	2	50	4
	005L03	○	○				3	50	4
	005L04	○	○	○			4	50	4
	005L05	○	○				5	50	4
	005L06	○	○	○			6	50	4
	005L08	○	○	○			8	50	4
	005L10	○	○	○			10	50	4
	006L02	○	○	○	0.6	0.9	2	50	4
	006L03	○	○				3	50	4
	006L04	○	○	○			4	50	4
	006L05	○	○				5	50	4
	006L06	○	○	○			6	50	4
	006L08	○	○	○			8	50	4
	006L10	○	○	○			10	50	4
	007L02	○	○		0.7	1.1	2	50	4
	007L03	○	○				3	50	4
	007L04	○	○				4	50	4
	007L05	○	○				5	50	4
	007L06	○	○				6	50	4
	007L08	○	○				8	50	4
	007L10	○	○				10	50	4
	008L02	○	○	○	0.8	1.2	2	50	4
	008L03	○	○				3	50	4
	008L04	○	○	○			4	50	4
	008L05	○	○				5	50	4
	008L06	○	○	○			6	50	4
	008L08	○	○	○			8	50	4
	008L10	○	○	○			10	50	4
	009L03	○	○		0.9	1.4	3	50	4
	009L04	○	○				4	50	4
	009L05	○	○				5	50	4
	009L06	○	○				6	50	4
	009L08	○	○				8	50	4
	009L10	○	○				10	50	4
	010L02	○	○		1.0	1.5	2	50	4
	010L03	○	○				3	50	4
	010L04	○	○	○			4	50	4
	010L05	○	○				5	50	4
	010L06	○	○	○			6	50	4
	010L08	○	○	○			8	50	4
	010L10	○	○	○			10	50	4
	010L12	○	○	○			12	50	4
	010L14	○	○				14	50	4
	010L16	○	○	○			15	60	4
	010L18	○	○				18	60	4
	010L20	○	○				20	60	4
	012L03	○	○		1.2	1.8	3	50	4
	012L04	○	○	○			4	50	4
	012L05	○	○				5	50	4
	012L06	○	○	○			6	50	4
	012L08	○	○	○			8	50	4
	012L10	○	○	○			10	50	4
	012L12	○	○	○			12	50	4
	012L14	○	○				14	50	4
	012L16	○	○	○			16	60	4
	014L04	○	○		1.4	2.2	4	50	4
	014L05	○	○				5	50	4
	014L06	○	○				6	50	4
	014L08	○	○				8	50	4
	014L10	○	○				10	50	4

● : Stock item ○ : Under preparing for stock

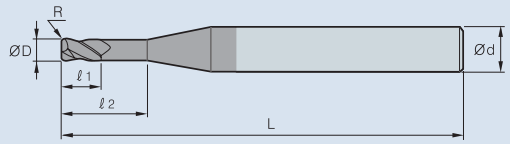
(mm)

Designation		Stock PC220G	Stock PC203G	Stock PD3000	ØD	ℓ1	ℓ2	L	Ød
HRF 2	014L12	○	○		1.4	2.2	12	50	4
	015L04	○	○	○	1.5	2.2	4	50	4
	015L05	○	○				5	50	4
	015L06	○	○	○			6	50	4
	015L08	○	○	○			8	50	4
	015L10	○	○	○			10	50	4
	015L12	○	○	○			12	50	4
	015L14	○	○				14	50	4
	015L16	○	○	○			16	60	4
	015L18	○	○				18	60	4
	015L20	○	○				20	60	4
	016L04	○	○		1.6	2.5	4	50	4
	016L05	○	○				5	50	4
	016L06	○	○				6	50	4
	016L08	○	○				8	50	4
	016L10	○	○				10	50	4
	016L12	○	○				12	50	4
	016L14	○	○				14	50	4
	016L16	○	○				16	60	4
	016L18	○	○				18	60	4
	016L20	○	○				20	60	4
	020L04	○	○	○	2.0	3	4	50	4
	020L06	○	○	○			6	50	4
	020L08	○	○	○			8	50	4
	020L10	○	○	○			10	50	4
	020L12	○	○	○			12	50	4
	020L14	○	○	○			14	50	4
	020L16	○	○	○			16	60	4
	020L18	○	○				18	60	4
	020L20	○	○	○			20	60	4
	020L22	○	○				22	60	4
	020L25	○	○				25	70	4
	020L30	○	○				30	70	4
	025L10	○	○		2.5	3.5	10	50	6
	025L12	○	○				12	50	6
	025L14	○	○				14	60	6
	025L16	○	○				16	60	6
	025L20	○	○				20	60	6
	025L25	○	○				25	70	6
	030L06	○	○	○	3.0	4	6	50	6
	030L08	○	○	○			8	50	6
	030L10	○	○	○			10	50	6
	030L12	○	○	○			12	50	6
	030L14	○	○				14	60	6
	030L16	○	○	○			16	60	6
	030L18	○	○				18	60	6
	030L20	○	○	○			20	60	6
	030L25	○	○				25	70	6
	030L30	○	○	○			30	70	6
	030L35	○	○				35	80	6
	040L08	○	○	○	4.0	6	8	50	6
	040L10	○	○	○			10	50	6
	040L12	○	○	○			12	50	6
	040L14	○	○				14	60	6
	040L16	○	○	○			16	60	6
	040L18	○	○				18	60	6
	040L20	○	○	○			20	60	6
	040L25	○	○	○			25	70	6
	040L30	○	○	○			30	70	6
	040L35	○	○				35	80	6
	040L40	○	○				40	80	6
	040L45	○	○				45	90	6
	040L50	○	○				50	90	6
	050L20	○	○		5.0	7	20	60	6
	050L25	○	○				25	60	6
	050L30	○	○				30	70	6
	050L35	○	○				35	80	6
	050L40	○	○				40	80	6
	060L20	○	○	○	6.0	8	20	60	6
	060L30	○	○	○			30	70	6
	060L40	○	○				40	80	6
	060L50	○	○				50	90	6

● : Stock item ○ : Under preparing for stock

HRNR New

Rib processing endmills



NR	ØD	Ød
0 -0.005	0 -0.008	-0.004 -0.008

(mm)

Designation		Stock PC220G	Stock PC203G	ØD	ℓ1	ℓ2	L	R	Ød
HRNR 2	010L04R01	○	○	1.0	1.5	4	50	0.1	4
	010L06R01	○	○			6	50		4
	010L08R01	○	○			8	50		4
	010L04R02	○	○	1.0	1.5	4	50	0.2	4
	010L06R02	○	○			6	50		4
	010L08R02	○	○			8	50		4
	010L10R02	○	○			10	50		4
	010L12R02	○	○			12	50		4
	010L06R03	○	○	1.0	1.5	6	50	0.3	4
	010L10R03	○	○			10	50		4
	010L12R03	○	○			12	50		4
	015L06R02	○	○	1.5	2.2	6	50	0.2	4
	015L08R02	○	○			8	50		4
	015L10R02	○	○			10	50		4
	015L12R02	○	○			12	50		4
	015L06R03	○	○	1.5	2.2	6	50	0.3	4
	015L08R03	○	○			8	50		4
	015L10R03	○	○			10	50		4
	020L06R01	○	○	2.0	3	6	50	0.1	4
	020L08R01	○	○			8	50		4
	020L10R01	○	○			10	50		4
	020L12R01	○	○			12	50		4
	020L06R02	○	○	2.0	3	6	50	0.2	4
	020L08R02	○	○			8	50		4
	020L10R02	○	○			10	50		4
	020L12R02	○	○			12	50		4
	020L06R03	○	○	2.0	3	6	50	0.3	4
	020L08R03	○	○			8	50		4
	020L10R03	○	○			10	50		4
	020L12R03	○	○			12	50		4
	020L06R05	○	○	2.0	3	6	50	0.5	4
	020L08R05	○	○			8	50		4
	020L10R05	○	○			10	50		4
	020L12R05	○	○			12	50		4
	020L16R05	○	○			16	60		4
	030L10R01	○	○	3.0	4	10	60	0.1	6
	030L12R01	○	○			12	60		6
	030L16R01	○	○			16	60		6

● : Stock item ○ : Under preparing for stock

HRNR

Nose-R(radius) endmills.(V-Type)

Shows excellent wear resistance in high speed machining at machining center for high hardness(hardness HRC 65) workpiece.
Rib corner R type 2-flute flat endmills(long neck endmills) for high speed machining can be useful for precision machining in the wider range of automotive, mobile phone, electronic molds, and semiconductor parts. Due to round shape at corner it' s very stable during deep copying operation. Its versatile function can be applied for straight and round machining at the same time. Especially, it shows excellent performance in high speed and high efficient machining at corner R for good surface roughness.

2
- PC220G : For general, ~HRC55
- PC203G : For high hardness, ~HRC65

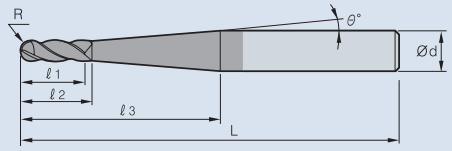
(mm)

Designation		Stock PC220G	Stock PC203G	ØD	ℓ1	ℓ2	L	R	Ød
HRNR 2	030L10R02	○	○	3.0	4	10	60	0.2	6
	030L12R02	○	○			12	60		6
	030L16R02	○	○			16	60		6
	030L10R03	○	○	3.0	4	10	60	0.3	6
	030L12R03	○	○			12	60		6
	030L16R03	○	○			16	60		6
	030L10R05	○	○	3.0	4	10	60	0.5	6
	030L12R05	○	○			12	60		6
	030L16R05	○	○			16	60		6
	030L20R05	○	○			20	60		6
	040L10R01	○	○	4.0	6	10	60	0.1	6
	040L12R01	○	○			12	60		6
	040L16R01	○	○			16	60		6
	040L12R02	○	○	4.0	6	12	60	0.2	6
	040L16R02	○	○			16	60		6
	040L12R03	○	○	4.0	6	12	60	0.3	6
	040L16R03	○	○			16	60		6
	040L20R03	○	○			20	60		6
	040L12R05	○	○	4.0	6	12	60	0.5	6
	040L16R05	○	○			16	60		6
	040L20R05	○	○			20	60		6
	060L16R01	○	○	6.0	8	16	60	0.1	6
	060L20R01	○	○			20	60		6
	060L16R02	○	○	6.0	8	16	60	0.2	6
	060L20R02	○	○			20	60		6
	060L16R03	○	○	6.0	8	16	60	0.3	6
	060L20R03	○	○			20	60		6
	060L16R05	○	○	6.0	8	16	60	0.5	6
	060L20R05	○	○			20	60		6
	060L16R10	○	○	6.0	8	16	60	1.0	6
	060L20R10	○	○			20	60		6
	060L25R10	○	○			25	70		6
	060L30R10	○	○			30	70		6
	060L16R15	○	○	6.0	8	16	70	1.5	6
	060L20R15	○	○			20	70		6
	060L25R15	○	○			25	70		6
	060L30R15	○	○			30	70		6

● : Stock item ○ : Under preparing for stock

HRTNB New

Rib processing endmills



R	ØD	Ød
0 - 0.005	0 - 0.005	- 0.004 - 0.008

(mm)

Designation		Stock PC220G	Stock PC203G	R	ℓ1	ℓ2	ℓ3	L	θ°	ød
HRTNB	010T130	○	○	0.5	2.3	5	23	60	1°30′	6
2	010T300	○	○		2.3	5	40	80	3°	6
	010T500	○	○		2.3	5	23	60	5°	6
	015T130	○	○	0.75	4	7	23	60	1°30′	6
	015T300	○	○		4	7	40	80	3°	6
	015T500	○	○		4	7	23	60	5°	6
	020T130	○	○	1.0	5	8	23	60	1°30′	6
	020T300	○	○		5	8	40	80	3°	6
	020T500	○	○		5	8	25	70	5°	6
	030T130	○	○	1.5	8	11	50	90	1°30′	6
	030T300	○	○		8	11	30	80	3°	6
	030T500	○	○		8	11	30	80	5°	8
	040T130	○	○	2.0	8	11	52	90	1°30′	6
	040T300	○	○		8	11	28	70	3°	6
	040T500	○	○		8	11	35	90	5°	8
	050T130	○	○	2.5	10	14	60	110	1°30′	8
	050T300	○	○		10	14	40	90	3°	8
	060T130	○	○	3.0	12	16	52	100	1°30′	8
	060T300	○	○		12	16	35	90	3°	8
	060T500	○	○		12	16	40	90	5°	10
	080T130	○	○	4.0	14	19	55	120	1°30′	10
	080T300	○	○		14	19	36	100	3°	10
	100T130	○	○	5.0	18	23	58	120	1°30′	12
	100T300	○	○		18	23	40	100	3°	12
	120T130	○	○	6.0	22	28	85	150	1°30′	16
	120T300	○	○		22	28	65	150	3°	16

● : Stock item ○ : Under preparing for stock

HRTNB

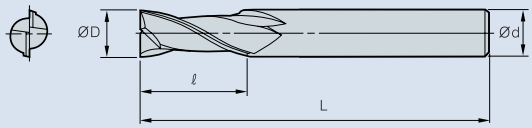
Rib Taper Neck Ball endmills(V-Type)

High rigidity ball endmills, taper shape at the neck, shows excellent wear resistance in high speed and hardness workpiece machining such as hardened steel(HRC 65).
It' s suitable for precision machining in the wider range of automotive, mobile phone, electronic molds, and semiconductor parts.

2
- PC220G : For general, ~HRC55
- PC203G : For high hardness, ~HRC65

SSE2000/3000(Square)

Carbide solid endmills



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

2 3 Helix Angle 30°

(mm)

Designation		Stock	øD	ød	ℓ	L	Remark
SSE 2	2010	●	1.0	6	3	40	
	2015	●	1.5	6	4	40	
	2020	●	2.0	6	6	40	
	2025	●	2.5	6	8	40	
	2030	●	3.0	6	10	45	
	2035	●	3.5	6	10	45	
	2040	●	4.0	6	12	45	
	2045	●	4.5	6	12	45	
	2050	●	5.0	6	15	50	
	2055	●	5.5	6	15	50	
	2060	●	6.0	6	15	50	
	2065	●	6.5	8	20	60	
	2070	●	7.0	8	20	60	
	2075	●	7.5	8	20	60	
	2080	●	8.0	8	20	60	
	2085	●	8.5	10	20	70	
	2090	●	9.0	10	20	70	
	2095	●	9.5	10	20	70	
	2100	●	10.0	10	25	70	
	2105	●	10.5	12	25	75	
	2110	●	11.0	12	25	75	
	2115	●	11.5	12	25	75	
	2120	●	12.0	12	30	75	
	2130	●	13.0	16	30	90	
	2140	●	14.0	16	35	90	
	2150	●	15.0	16	40	90	
	2160	●	16.0	16	40	90	
	2180		18.0	20	45	105	
	2200	●	20.0	20	45	105	
SSE 3	3020		2.0	6	6	40	
	3030		3.0	6	10	45	
	3035		3.5	6	10	45	
	3040		4.0	6	12	45	
	3050		5.0	6	15	50	
	3060		6.0	6	15	50	
	3070		7.0	8	20	60	
	3080		8.0	8	20	60	
	3090		9.0	10	20	70	
	3100		10.0	10	25	70	
	3110		11.0	12	25	75	
	3120		12.0	12	30	75	
	3130		13.0	16	30	90	
	3140		14.0	16	35	90	
	3150		15.0	16	40	90	

● : Stock item ○ : Under preparing for stock

• SSE2000

∗ Ordering code for special item : Coated ; SSE2◎◎◎-Q ∗ Flute length ∗ Overall length L
Non-coated ; SSE2◎◎◎ ∗ Flute length ∗ Overall length L

Ex. 1) General use, Coating, Square, 2Flutes, Cutting edge diameter : 6.3, Flute length : 16, Overall length : 90
➡ SSE2063-Q ∗ 16 ∗ 90L

Ex. 2) General use, Coating, Square, 2Flutes, Cutting edge diameter : 6.3, Standard type ➡ SSE2063-Q

• SSE3000/4000

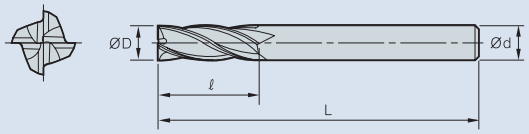
∗ Ordering code for special item : Coated ; SSE◎◎◎◎-Q ∗ Flute length ∗ Overall length L
Non-coated ; SSE◎◎◎◎ ∗ Flute length ∗ Overall length L

Ex. 1) General use, Coating, Square, 3Flutes, Cutting edge diameter : 6.3, Flute length : 16, Overall length : 90
➡ SSE3063-Q ∗ 16 ∗ 90L

Ex. 2) General use, Coating, Square, 3Flutes, Cutting edge diameter : 6.3, Standard type ➡ SSE3063-Q

SSE4000(Square)

Carbide solid endmills



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

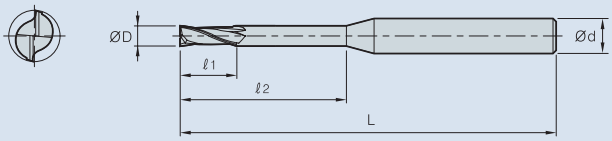
4 Helix Angle 30°

(mm)

Designation		Stock	øD	ød	ℓ	L	Remark
SSE 4	4025		2.5	6	8	40	
	4030	●	3.0	6	10	45	
	4040	●	4.0	6	12	45	
	4050	●	5.0	6	15	50	
	4060	●	6.0	6	15	50	
	4070	●	7.0	8	20	60	
	4080	●	8.0	8	20	60	
	4085		8.5	10	20	70	
	4090	●	9.0	10	20	70	
	4100	●	10.0	10	25	70	
	4110	●	11.0	12	25	75	
	4120	●	12.0	12	30	75	
	4130	●	13.0	16	30	90	
	4140		14.0	16	35	90	
	4150		15.0	16	40	90	
	4160		16.0	16	40	90	
	4180		18.0	20	45	105	
	4200		20.0	20	45	105	

● : Stock item ○ : Under preparing for stock

LSSE2000(Long square)



Ø D	Tolerance of Endmill diameter
1 < ø D ≤ 6	- 0.01 ~ - 0.030
6 < ø D ≤ 10	- 0.015 ~ - 0.040
10 < ø D ≤ 20	- 0.020 ~ - 0.050

2 Helix Angle 30°

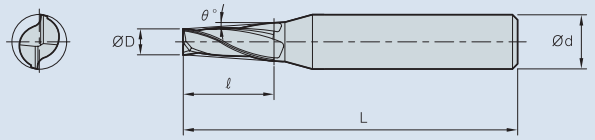
(mm)

Designation		Stock	øD	ød	ℓ1	L	Remark
LSSE 2	2030		3	6	4	100	
	2040		4	6	6	100	
	2050		5	8	7	115	
	2060		6	8	8	115	
	2070		7	10	10	125	
	2080		8	10	12	125	
	2090		9	12	15	140	
	2100		10	12	15	140	
	2110		11	16	20	150	
	2120		12	16	28	150	
	2130		13	16	32	155	
	2140		14	16	32	155	
	2150		15	16	36	155	
	2160		16	16	36	155	
	2180		18	20	40	155	
	2200		20	20	46	160	
	2220		22	25	50	165	
	2230		23	25	50	165	
	2240		24	25	55	170	
	2250		25	25	55	170	

● : Stock item ○ : Under preparing for stock

SSTE2000(Taper square)

Carbide solid taper endmills



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.01 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

2 Carbide Helix Angle 30°

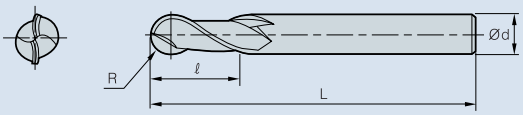
(mm)

Designation		Stock	øD	ød	θ°	ℓ	L	Remark
SSTE 2	2030-05		3.0	6	0.5°	10	45	
	2030-10		3.0	6	1.0°	10	45	
	2030-15		3.0	6	1.5°	10	45	
	2030-20		3.0	6	2.0°	10	45	
	2030-25		3.0	6	2.5°	10	45	
	2030-30		3.0	6	3.0°	10	45	
	2040-05		4.0	6	0.5°	12	45	
	2040-10		4.0	6	1.0°	12	45	
	2040-15		4.0	6	1.5°	12	45	
	2040-20		4.0	6	2.0°	12	45	
	2040-25		4.0	6	2.5°	12	45	
	2040-30		4.0	6	3.0°	12	45	
	2050-05		5.0	6	0.5°	15	50	
	2050-10		5.0	6	1.0°	15	50	
	2050-15		5.0	6	1.5°	15	50	
	2050-20		5.0	6	2.0°	15	50	
	2050-25		5.0	6	2.5°	15	50	
	2050-30		5.0	6	3.0°	15	50	
	2060-05		6.0	6	0.5°	15	50	
	2060-10		6.0	6	1.0°	15	50	
	2060-15		6.0	6	1.5°	15	50	
	2060-20		6.0	6	2.0°	15	50	
	2060-25		6.0	6	2.5°	15	50	
	2060-30		6.0	6	3.0°	15	50	
	2080-05		8.0	8	0.5°	20	60	
	2080-10		8.0	8	1.0°	20	60	
	2080-15		8.0	8	1.5°	20	60	
	2080-20		8.0	8	2.0°	20	60	
	2080-25		8.0	8	2.5°	20	60	
	2080-30		8.0	8	3.0°	20	60	
	2100-05		10.0	10	0.5°	25	70	
	2100-10		10.0	10	1.0°	25	70	
	2100-15		10.0	10	1.5°	25	70	
	2100-20		10.0	10	2.0°	25	70	
	2100-25		10.0	10	2.5°	25	70	
	2100-30		10.0	10	3.0°	25	70	
	2110-05		11.0	12	0.5°	25	70	
	2110-10		11.0	12	1.0°	25	70	
	2110-15		11.0	12	1.5°	25	70	
	2110-20		11.0	12	2.0°	25	70	
	2110-25		11.0	12	2.5°	25	70	
	2110-30		11.0	12	3.0°	25	70	
	2120-05		12.0	12	0.5°	30	75	
	2120-10		12.0	12	1.0°	30	75	
	2120-15		12.0	12	1.5°	30	75	
	2120-20		12.0	12	2.0°	30	75	
	2120-25		12.0	12	2.5°	30	75	
	2120-30		12.0	12	3.0°	30	75	
	2130-05		13.0	14	0.5°	30	75	
	2130-10		13.0	14	1.0°	30	75	
	2130-15		13.0	14	1.5°	30	75	
	2130-20		13.0	14	2.0°	30	75	
	2130-25		13.0	14	2.5°	30	75	
	2130-30		13.0	14	3.0°	30	75	
	2140-05		14.0	14	0.5°	35	80	
	2140-10		14.0	14	1.0°	35	80	
	2140-15		14.0	14	1.5°	35	80	
	2140-20		14.0	14	2.0°	35	80	
	2140-25		14.0	14	2.5°	35	80	
	2140-30		14.0	14	3.0°	35	80	
	2150-05		15.0	16	0.5°	35	80	
	2150-10		15.0	16	1.0°	35	80	
	2150-15		15.0	16	1.5°	35	80	
	2150-20		15.0	16	2.0°	35	80	
	2150-25		15.0	16	2.5°	35	80	
	2150-30		15.0	16	3.0°	35	80	
	2160-05		16.0	16	0.5°	40	90	
	2160-10		16.0	16	1.0°	40	90	
	2160-15		16.0	16	1.5°	40	90	
	2160-20		16.0	16	2.0°	40	90	
	2160-25		16.0	16	2.5°	40	90	
	2160-30		16.0	16	3.0°	40	90	

● : Stock item ○ : Under preparing for stock

SSBE2000/4000(Ball)

Carbide solid ball endmills



Ø D	Tolerance of Endmill diameter
All items	0 ~ - 0.03

2 4 Carbide Helix Angle 30°

(mm)

Designation		Stock	R	ℓ	θ°	ød	Remark
SSBE 2	2010	●	0.5	70	3	6	
	2013		0.65	70	4	6	
	2015	●	0.75	70	4	6	
	2020	●	1	70	6	6	
	2025	●	1.25	70	8	6	
	2030	●	1.5	70	10	6	
	2035	●	1.75	70	10	6	
	2040	●	2	70	12	6	
	2050	●	2.5	80	15	6	
	2060	●	3	80	15	6	
	2070	●	3.5	90	20	8	
	2080	●	4	90	20	8	
	2090	●	4.5	100	25	10	
	2100	●	5	100	25	10	
	2110	●	5.5	110	30	12	
	2120	●	6	110	30	12	
	2130		6.5	120	35	16	
	2140		7	120	35	16	
	2150		7.5	120	40	16	
	2160		8	120	40	16	
	2180		9	130	45	20	
	2200		10	130	45	20	
SSBE 4	4060		3.0	90	15	6	
	4070		3.5	100	20	8	
	4080		4.0	100	20	8	
	4090		4.5	110	25	10	
	4100		5.0	110	25	10	
	4110		5.5	120	30	12	
	4120		6.0	120	30	12	
	4130		6.5	120	35	16	
	4140		7.0	120	35	16	
	4150		7.5	120	40	16	
	4160		8.0	120	40	16	
	4180		9.0	130	45	20	
	4200		10.0	130	45	20	

● : Stock item ○ : Under preparing for stock

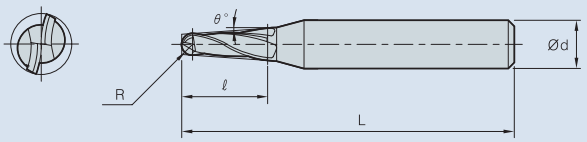
∗ Ordering code for special item : Coated ; SSBE◎◎◎◎-Q ∗ Flute length ∗ Overall length L
Non-coated ; SSBE◎◎◎◎ ∗ Flute length ∗ Overall length L

Ex.1) General use, Coating, Ball, 3Flutes, Cutting edge diameter : 6.3, Flute length : 16, Overall length : 90
➡ SSBE3063-Q ∗ 16 ∗ 90L

Ex.2) General use, Coating, Ball, 3Flutes, Cutting edge diameter : 6.3, Standard type ➡ SSBE3063-Q

STBE2000(Taper ball)

Carbide solid taper endmills



Ø D	Tolerance of Endmill diameter
All items	0 ~ - 0.03

2 Carbide Helix Angle 30°

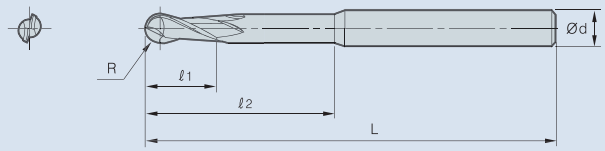
(mm)

Designation		Stock	R	ℓ	L	θ°	ød	Remark
STBE 2	2030-05		1.5	10	45	0.5°	6	
	2030-10		1.5	10	45	1.0°	6	
	2030-15		1.5	10	45	1.5°	6	
	2030-20		1.5	10	45	2.0°	6	
	2030-25		1.5	10	45	2.5°	6	
	2030-30		1.5	12	45	3.0°	6	
	2040-05		2.0	12	45	0.5°	6	
	2040-10		2.0	12	45	1.0°	6	
	2040-15		2.0	12	45	1.5°	6	
	2040-20		2.0	12	45	2.0°	6	
	2040-25		2.0	12	45	2.5°	6	
	2040-30		2.0	12	45	3.0°	6	
	2050-05		2.5	15	50	0.5°	6	
	2050-10		2.5	15	50	1.0°	6	
	2050-15		2.5	15	50	1.5°	6	
	2050-20		2.5	15	50	2.0°	6	
	2050-25		2.5	15	50	2.5°	6	
	2050-30		2.5	15	50	3.0°	6	
	2060-05		3.0	15	50	0.5°	6	
	2060-10		3.0	15	50	1.0°	6	
	2060-15		3.0	15	50	1.5°	6	
	2060-20		3.0	15	50	2.0°	6	
	2060-25		3.0	15	50	2.5°	6	
	2060-30		3.0	15	50	3.0°	6	
	2080-05		4.0	20	60	0.5°	8	
	2080-10		4.0	20	60	1.0°	8	
	2080-15		4.0	20	60	1.5°	8	
	2080-20		4.0	20	60	2.0°	8	
	2080-25		4.0	20	60	2.5°	8	
	2080-30		4.0	20	60	3.0°	8	
	2100-05		5.0	25	70	0.5°	10	
	2100-10		5.0	25	70	1.0°	10	
	2100-15		5.0	25	70	1.5°	10	
	2100-20		5.0	25	70	2.0°	10	
	2100-25		5.0	25	70	2.5°	10	
	2100-30		5.0	25	70	3.0°	10	
	2110-05		5.5	25	70	0.5°	12	
	2110-10		5.5	25	70	1.0°	12	
	2110-15		5.5	25	70	1.5°	12	
	2110-20		5.5	25	70	2.0°	12	
	2110-25		5.5	25	70	2.5°	12	
	2110-30		5.5	25	70	3.0°	12	
	2120-05		6.0	30	75	0.5°	14	
	2120-10		6.0	30	75	1.0°	14	
	2120-15		6.0	30	75	1.5°	14	
	2120-20		6.0	30	75	2.0°	14	
	2120-25		6.0	30	75	2.5°	14	
	2120-30		6.0	30	75	3.0°	14	
	2130-05		6.5	30	75	0.5°	14	
	2130-10		6.5	30	75	1.0°	14	
	2130-15		6.5	30	75	1.5°	14	
	2130-20		6.5	30	75	2.0°	14	
	2130-25		6.5	30	75	2.5°	14	
	2130-30		6.5	30	75	3.0°	14	
	2140-05		7.0	35	80	0.5°	14	
	2140-10		7.0	35	80	1.0°	14	
	2140-15		7.0	35	80	1.5°	14	
	2140-20		7.0	35	80	2.0°	14	
	2140-25		7.0	35	80	2.5°	14	
	2140-30		7.0	35	80	3.0°	14	
	2150-05		7.5	35	80	0.5°	16	
	2150-10		7.5	35	80	1.0°	16	
	2150-15		7.5	35	80	1.5°	16	
	2150-20		7.5	35	80	2.0°	16	
	2150-25		7.5	35	80	2.5°	16	
	2150-30		7.5	35	80	3.0°	16	
	2160-05		8.0	40	90	0.5°	18	
	2160-10		8.0	40	90	1.0°	18	
	2160-15		8.0	40	90	1.5°	18	
	2160-20		8.0	40	90	2.0°	18	
	2160-25		8.0	40	90	2.5°	18	
	2160-30		8.0	40	90	3.0°	18	

● : Stock item ○ : Under preparing for stock

LSBE2000(Long ball)

Carbide solid ball long endmills



Ø D	Tolerance of Endmill diameter
All items	0 ~ - 0.03

2 Carbide

(mm)

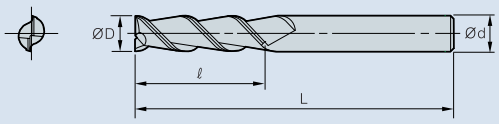
Designation		Stock	R	ℓ1	ℓ2	L	ød	Remark
LSBE 2	2030		1.5	4	35	100	6	
	2040		2.0	6	35	100	6	
	2050		2.5	77	40	115	8	
	2060		3.0	8	45	115	8	
	2070		3.5	10	45	125	10	
	2080		4.0	12	55	125	10	
	2090		4.5	15	65	140	12	
	2100		5.0	15	65	140	12	
	2110		5.5	20	75	150	16	
	2120		6.0	28	75	150	16	
	2130		6.5	32	75	155	16	
	2140		7.0	32	75	155	16	
	2150		7.5	36	75	155	16	
	2160		8.0	36	75	155	16	
	2180		9.0	40	75	155	20	
	2200		10.0	46	75	160	20	
	2220		11.0	50	80	165	25	
	2230		11.5	50	80	165	25	
	2240		12.0	55	85	170	25	
	2250		12.5	55	85	170	25	

● : Stock item ○ : Under preparing for stock

∗Ordering code for special item :
Coated; LSBE2000-Q ∗ Flute length ∗ Neck length N ∗ Overall length L
Non-coated; LSBE2000 ∗ Flute length ∗ Neck length N ∗ Overall length L
Ex. 1) Coating, Ball, 2Flutes, Cutting edge diameter : 8.3, Flute length : 13, Neck length : 60, Overall length : 130
➞ LSBE2083-Q ∗ 13 ∗ 60N ∗ 130L
Ex.2) Coating, Ball, 2Flutes, Cutting edge diameter : 8.3, Standard type ➞ LSBE2083-Q

SSEA2000/3000(Square)

Solid endmills for copper & aluminum alloy



Ø D	Tolerance of Endmill diameter
1 ~ 6	- 0.010 ~ - 0.030
7 ~ 10	- 0.015 ~ - 0.040
11 ~ 20	- 0.020 ~ - 0.050

2 3 Helix Angle 45°

(mm)

Designation		Stock H01	Stock PD3000	øD	ød	ℓ	L	Remark
SSEA 2	2010	●	●	1.0	6	3	40	
	2015			1.5	6	4	40	
	2020	●	●	2.0	6	6	40	
	2025			2.5	6	7	40	
	2030	●	●	3.0	6	10	45	
	2035	●		3.5	6	10	45	
	2040	●	●	4.0	6	12	45	
	2050	●	●	5.0	6	15	50	
	2060	●	●	6.0	6	15	50	
	2070	●		7.0	8	20	60	
	2080	●	●	8.0	8	20	60	
	2090	●		9.0	10	20	70	
	2100	●	●	10.0	10	25	70	
	2110	●		11.0	12	25	75	
	2120	●	●	12.0	12	30	75	
	2130	●		13.0	16	30	90	
	2140	●		14.0	16	35	90	
	2150	●		15.0	16	40	90	
	2160	●	●	16.0	16	40	90	
	2180			18.0	18	45	100	
	2200			20.0	20	45	100	
SSEA 3	3020			2.0	6	6	40	
	3030	●	●	3.0	6	10	45	
	3035	●	●	3.5	6	10	45	
	3040	●	●	4.0	6	12	45	
	3050	●	●	5.0	6	15	50	
	3060	●	●	6.0	6	15	50	
	3070	●	●	7.0	8	20	60	
	3080	●	●	8.0	8	20	60	
	3090	●	●	9.0	10	20	70	
	3100	●	●	10.0	10	25	70	
	3110	●	●	11.0	12	25	75	
	3120	●	●	12.0	12	30	75	
	3130	●	●	13.0	16	30	90	
	3140	●	●	14.0	16	35	90	
	3150	●	●	15.0	16	40	90	
	3160	●	●	16.0	16	40	90	

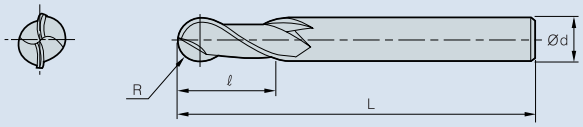
● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : SSEA◎◎◎◎ ∗ Flute length ∗ Overall length L
Ex.1) 3Flutes, Cutting edge diameter : 6.3, Flute length : 17, Overall length : 60
➞ SSEA3063 ∗ 17 ∗ 60L
Ex.2) 3Flutes, Cutting edge diameter : 6.3, Standard type ➞ SSEA3063

■ Machining properties of Copper & Aluminum alloys
1. Despite low cutting load and easy chip control built-up edge happens easily
2. Machining precision can be affected by deformation caused by cutting heat because of its high thermal expansion coefficient
3. Surface finish can be harmed by chips and flank wear affects tool life because their hardness is so low.

SSBEA2000(Ball)

Solid ball endmills for copper & aluminum alloy



Ø D	Tolerance of Endmill diameter
All items	0 ~ - 0.03

2 Helix Angle 30°

(mm)

Designation		Stock H01	Stock PD3000	R	ℓ	L	ød	Remark
SSBEA 2	2010	●	●	0.5	3	70	6	
	2015	●	●	0.75	4	70	6	
	2020	●	●	1.0	6	70	6	
	2025			1.25	8	70	6	
	2030	●	●	1.5	10	70	6	
	2035			1.75	10	70	6	
	2040	●	●	2.0	12	70	6	
	2045			2.25	15	80	6	
	2050	●	●	2.5	15	80	6	
	2055			2.75	15	80	6	
	2060	●	●	3.0	15	80	6	
	2065			3.25	20	90	8	
	2070			3.5	20	90	8	
	2075			3.75	20	90	8	
	2080	○	●	4.0	20	90	8	
	2085			4.25	25	100	10	
	2090			4.5	25	100	10	
	2100	○	●	5.0	25	100	10	
	2110			5.5	30	110	12	
	2120	○	●	6.0	30	110	12	
	2130			6.5	35	120	16	
	2140			7.0	35	120	16	
	2150			7.5	40	120	16	
	2160		●	8.0	40	120	16	
	2170			8.5	40	130	20	
	2180			9.0	45	130	20	
	2190			9.5	45	130	20	
	2200			10.0	45	130	20	

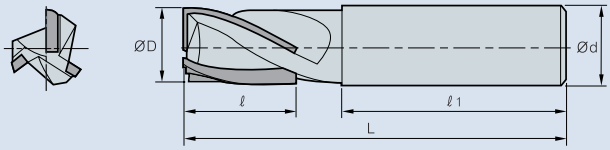
● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : SSBEA2◎◎◎ ∗ Flute length ∗ Overall length L
Ex.1) 2Flutes, Cutting edge diameter : 6.3, Flute length : 17, Overall length : 60
➞ SSBEA2063 ∗ 17 ∗ 60L
Ex.2) 2Flutes, Cutting edge diameter : 6.3, Standard type ➞ SSBEA2063

■ Machining technique of Copper & Aluminum alloys
1. Use sharp cutting edge with high rake angle and oil mist during operation to reduce cutting load and built-up edge.
2. High speed machining is favorable for productivity and surface roughness.

ZSE200/300/400/600(Square)

Brazed spiral endmills



Ø D	Tolerance of Endmill diameter
All items	0.000 ~ - 0.050

2 3 4 6 Carbide Helix Angle 24°~26°

(mm)

Designation		Stock	ØD	ød	ℓ	ℓ1	L	Remark
ZSE 2	214	●	14.0	16	28	57	95	
	215	●	15.0	16	28	57	95	
	216	●	16.0	16	28	57	95	
	217	●	17.0	20	30	70	115	
	218	●	18.0	20	30	70	115	
	219	●	19.0	20	30	70	115	
	220	●	20.0	20	30	70	115	
	221	●	21.0	20	35	65	115	
	222	●	22.0	20	35	65	115	
	223	●	23.0	25	35	75	125	
	224	●	24.0	25	35	75	125	
	225	●	25.0	25	35	75	125	
	226	●	26.0	25	35	75	125	
	227	●	27.0	25	35	75	125	
	228	●	28.0	25	35	75	125	
	229	●	29.0	32	40	95	150	
	230	●	30.0	32	40	95	150	
	231	●	31.0	32	40	95	150	
	232	●	32.0	32	45	90	150	
	233	●	33.0	32	45	90	150	
	234	●	34.0	32	50	85	150	
	235	●	35.0	32	50	85	150	
	236	●	36.0	32	50	85	150	
	237	●	37.0	32	55	80	150	
	238	●	38.0	32	55	80	150	
	238S		38.0	42	55	80	150	
	240	●	40.0	32	60	75	150	
	240S		40.0	42	60	75	150	
	242	●	42.0	32	60	75	150	
	244		44.0	32	65	80	160	
	245	●	45.0	32	65	80	160	
	245S		45.0	42	65	80	160	
	247		47.0	32	65	80	160	
	248		48.0	32	65	80	160	
	248S		48.0	42	65	80	160	
	250	●	50.0	32	65	80	160	
	250S		50.0	42	65	80	160	
ZSE 3	314	●	14.0	16	28	57	95	
	315	●	15.0	16	28	57	95	
	316	●	16.0	16	28	55	95	
	317	●	17.0	20	30	70	115	
	318	●	18.0	20	30	70	115	
	319	●	19.0	20	30	70	115	
	320	●	20.0	20	30	70	115	
	322	●	22.0	20	35	65	115	
	325	●	25.0	25	35	75	125	
	326		26.0	25	35	75	125	
	328	●	28.0	25	35	75	125	
	330	●	30.0	32	40	95	150	
	331		31.0	32	40	95	150	

● : Stock item ○ : Under preparing for stock

(mm)

Designation		Stock	ØD	ød	ℓ	ℓ1	L	Remark
ZSE 3	332	●	32.0	32	45	90	150	
	333		33.0	32	45	90	150	
	334		34.0	32	50	85	150	
	335	●	35.0	32	50	85	150	
	338	●	38.0	32	55	85	150	
	338S		38.0	42	55	85	150	
	340	●	40.0	32	60	75	150	
	340S		40.0	42	60	75	150	
	342		42.0	32	60	75	150	
	345	●	45.0	32	65	80	160	
	345S		45.0	42	65	80	160	
	350	●	50.0	32	65	80	160	
	350S		50.0	42	65	80	160	
ZSE 4	414	●	14.0	16	28	57	95	
	415	●	15.0	16	28	57	95	
	416	●	16.0	16	28	55	95	
	417	●	17.0	20	30	70	115	
	418	●	18.0	20	30	70	115	
	419	●	19.0	20	30	70	115	
	420	●	20.0	20	30	70	115	
	421	●	21.0	20	35	65	115	
	422	●	22.0	20	35	65	115	
	423	●	23.0	25	35	75	125	
	424	●	24.0	25	35	75	125	
	425	●	25.0	25	35	75	125	
	426	●	26.0	25	35	75	125	
	427	●	27.0	25	35	75	125	
	428	●	28.0	25	35	75	125	
	429	●	29.0	32	35	75	125	
	430	●	30.0	32	40	95	150	
	432	●	32.0	32	45	90	150	
	435	●	35.0	32	50	85	150	
	438		38.0	32	55	85	150	
	438S		38.0	42	55	85	150	
	440	●	40.0	32	60	75	150	
	440S		40.0	42	60	75	150	
	445	●	45.0	32	65	80	160	
	445S		45.0	42	65	80	160	
	450	●	50.0	32	65	80	160	
	450S		50.0	42	65	80	160	
ZSE 6	634		34.0	32	50	85	150	
	635	●	35.0	32	50	85	150	
	638		38.0	32	55	80	150	
	638S		38.0	42	55	80	150	
	640	●	40.0	32	60	75	150	
	640S		40.0	42	60	75	150	
	645		45.0	32	65	80	150	
	645S		45.0	42	65	80	150	
	650	●	50.0	32	65	80	150	
	650S		50.0	42	65	80	150	

● : Stock item ○ : Under preparing for stock

∗ Ordering code for special item : ZSE◎◎◎◎ ∗ Flute length ∗ Overall length L

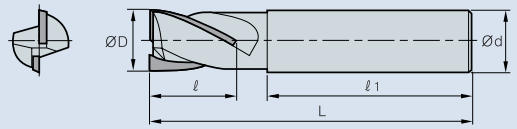
Ex.1) 2Flutes, Cutting edge diameter : 6.3, Flute length : 10, Overall length : 60

➞ ZSBE2063 ∗ 10 ∗ 60L

Ex.2) 2Flutes, Cutting edge diameter : 6.3, Standard type ➞ ZSE2063

ZSEA200(Square)

Brazed spiral endmills for Al, Cu Cutting



Ø D	Tolerance of Endmill diameter
All items	0.000 ~ - 0.050

2 | Carbide | Helix Angle 24°~26°

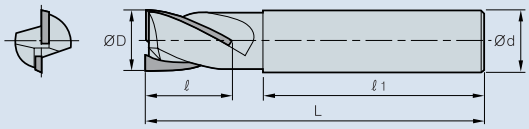
(mm)

Designation		Stock	øD	ød	ℓ	ℓ1	L	Remark
ZSEA 2	215		15.0	16	28	57	95	
	216		16.0	16	28	55	95	
	218		18.0	20	30	70	115	
	219		19.0	20	30	70	115	
	220		20.0	20	30	70	115	
	221		21.0	20	30	70	115	
	222		22.0	20	35	65	115	
	223		23.0	25	35	75	125	
	224		24.0	25	35	75	125	
	225		25.0	25	35	75	125	
	228		28.0	25	35	75	125	
	230		30.0	32	40	95	150	
	232		32.0	32	45	90	150	
	238		38.0	32	55	80	150	
	240		40.0	32	60	75	150	
	250		50.0	32	65	80	160	

● : Stock item ○ : Under preparing for stock

ZSEL, ZSEXL(Square)

Brazed spiral long endmills



Ø D	Tolerance of Endmill diameter
All items	0.000 ~ - 0.050

2 | 4 | Carbide | Helix Angle 24°~26°

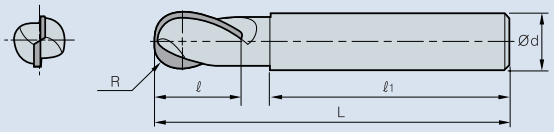
(mm)

Designation		Stock	øD	ød	ℓ	ℓ1	L	Remark
ZSEL 2	214		14.0	16	50	55	120	
	216		16.0	16	50	55	120	
	218		18.0	20	60	65	140	
	220		20.0	20	60	65	140	
	222		22.0	20	60	65	140	
	225		25.0	25	70	65	150	
	230		30.0	32	80	85	180	
	232		32.0	32	90	85	190	
	235		35.0	32	100	85	200	
	240		40.0	42	100	105	220	
	245		45.0	42	120	95	230	
	250		50.0	42	120	95	230	
ZSEL 4	416		16.0	16	50	55	120	
	420		20.0	20	60	65	140	
	425		25.0	25	70	65	150	
	430		30.0	32	80	85	180	
	435		35.0	32	100	85	200	
	440		40.0	42	100	105	220	
ZSEXL 2	220		20.0	20	120	65	200	
	222		22.0	20	120	65	200	
	225		25.0	25	140	65	220	

● : Stock item ○ : Under preparing for stock

ZSBE200(Ball)

Brazed spiral ball endmills



Ø D	Tolerance of Endmill diameter
All items	0.000 ~ - 0.050

2 | Carbide | Helix Angle 24°~26°

(mm)

Designation		Stock	R	ℓ	ℓ1	L	ød	Remark
ZSBE 2	213		6.5	16	30	100	13.0	
	214	●	7.0	16	30	100	14.0	
	215	●	7.5	16	35	100	15.0	
	216	●	8.0	20	35	100	16.0	
	217		8.5	20	35	110	17.0	
	218	●	9.0	20	35	110	18.0	
	219		9.5	20	35	110	19.0	
	220	●	10.0	20	35	110	20.0	
	221		10.5	20	35	110	21.0	
	222		11.0	20	35	110	22.0	
	223		11.5	25	40	120	23.0	
	224		12.0	25	40	120	24.0	
	225	●	12.5	25	40	120	25.0	
	230	●	15.0	32	40	130	30.0	
	231		15.5	32	40	130	31.0	
	232	●	16.0	32	50	130	32.0	
	233		16.5	32	50	140	33.0	
	234		17.0	32	50	150	34.0	
	235		17.5	32	50	150	35.0	
	235S		17.5	42	50	150	35.0	
	236		18.0	32	50	150	36.0	
	236S		18.0	42	50	150	36.0	
	237		18.5	32	50	160	37.0	
	237S		18.5	42	50	160	37.0	
	238		19.0	32	50	160	38.0	
	238S		19.0	42	50	160	38.0	
	239		19.5	32	50	160	39.0	
	239S		19.5	42	50	160	39.0	
	240		20.0	32	50	160	40.0	
	240S		20.0	42	50	160	40.0	
	245		22.5	32	50	170	45.0	
	245S		22.5	42	50	170	45.0	
	250		25.0	32	50	170	50.0	
	250S		25.0	42	50	170	50.0	

● : Stock item ○ : Under preparing for stock

• ZSBE200

∗ Ordering code for special item : ZSBE2◎◎ ∗ Flute length ∗ Overall length L

Ex.1) 2Flutes, Cutting edge diameter : 6.3, Flute length : 10, Overall length : 60

➡ ZSBE2063 ∗ 10 ∗ 60L

Ex.2) 2Flutes, Cutting edge diameter : 6.3, Standard type ➡ ZSBE2063

• ZSEA200

∗ Ordering code for special item : ZSEA2◎◎ ∗ Flute length ∗ Overall length L

Ex.1) 2Flutes, Cutting edge diameter : 16.3, Flute length : 28, Overall length : 95

➡ ZSEA2163 ∗ 28 ∗ 95L

Ex.2) 2Flutes, Cutting edge diameter : 17.0, Standard type ➡ ZSEA217

• ZSEL200/400, ZSEXL200

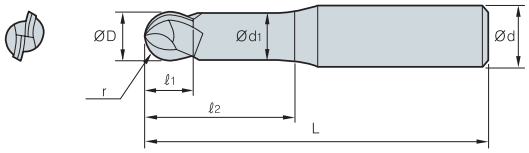
∗ Ordering code for special item : ZSEL◎◎◎ ∗ Flute length ∗ Overall length L

Ex.1) 2Flutes, Cutting edge diameter : 16.3, Flute length : 28, Overall length : 95

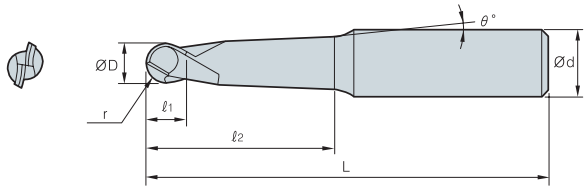
➡ ZSEL2163 ∗ 28 ∗ 95L

Ex.2) 2Flutes, Cutting edge diameter : 17.0, Standard type ➡ ZSEL217

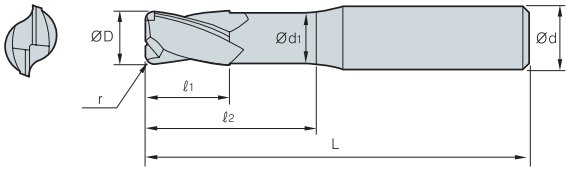
Special Endmills Order Form



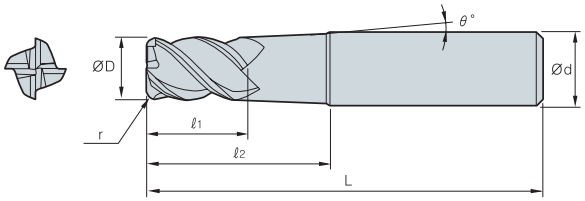
Designation (EDP. No)	Stock	Flutes	Radius (r)	Neck diameter (Ød1)	Shank diameter (Ød)	Valid length (ℓ1)	Neck length (ℓ2)	Overall length (L)



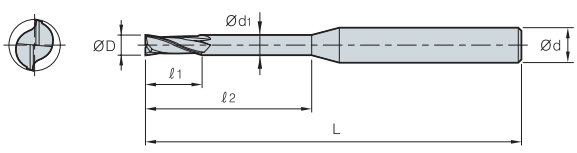
Designation (EDP. No)	Stock	Flutes	Radius (r)	Taper angle (θ°)	Shank diameter (Ød)	Valid length (ℓ1)	Neck length (ℓ2)	Overall length (L)



Designation (EDP. No)	Stock	Flutes	Radius (r)	Cutting edge diameter (ØD)	Neck diameter (Ød1)	Shank diameter (Ød)	Valid length (ℓ1)	Neck length (ℓ2)	Overall length (L)



Designation (EDP. No)	Stock	Flutes	Radius (r)	Cutting edge diameter (ØD)	Taper angle (θ°)	Shank diameter (Ød)	Valid length (ℓ1)	Neck length (ℓ2)	Overall length (L)



Designation (EDP. No)	Stock	Flutes	Cutting edge diameter (ØD)	Neck diameter (Ød1)	Shank diameter (Ød)	Valid length (ℓ1)	Neck length (ℓ2)	Overall length (L)

MEMO

Drills

G

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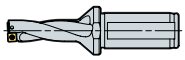
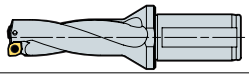
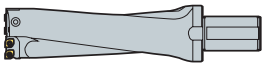
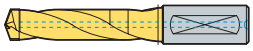
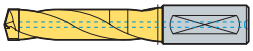
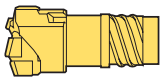
Drills Index

Type	Designation	Oil hole	Shape	Coating	Drills diameter	Aspect ratio	Workpiece P	M	K	N	S	H	Page
Indexable Drills	LPD	Through		-	Ø 12~Ø 13.5	2D 3D 4D	◎	◎	◎	◎	◎	◎	G09 G11 G13
	SPD	Through		-	Ø 13~Ø 22	2D 3D 4D 5D	◎	◎	◎	◎	◎	◎	G09 G11 G13, G15
	NPD	Through		-	Ø 23~Ø 60		◎	◎	◎	◎	◎	◎	G09~G16
	NPD Cartridge System	Through		-	Ø 61~Ø 100	3D 4D	◎	◎	◎	◎	◎	◎	G18
Mach Drills	MSD P	External		◉	Ø 2.5 ~Ø 20.0	3D 5D 7D	◎	△	○		○	○	G24, G25
	MSD M			◉			○	○	○				G24, G25
	MSD K			◉			○		◎				G24, G25
	MSD N	External		-	Ø 2.5 ~Ø 20.0					◎			G24, G25
	MSDH P	Through		◉	Ø 2.5 ~Ø 20.0		◎	○	○		○	○	G26, G27
	MSDH M			◉			○	◎	○				G26, G27
	MSDH K			◉			○	○	◎				G26, G27
	MSDH N	Through		-	Ø 2.5 ~Ø 20.0					◎			G26, G27
	MSDH ND	Through		◉	Ø 2.5 ~Ø 20.0					◎			G26, G27
	MLD	Through		◉	Ø 2.5 ~Ø 20.0	7D~25D	◎	○	◎	◎			G28
	MLDP	Through		◉	Ø 2.5 ~Ø 20.0	-	◎	○	◎	◎			G28
Vulcan Drills	VZD A	Through		◉	Ø 3.0 ~Ø 16.0	2.5D 5D	◎	○	◎		○	○	G30
	VZD BA	Through		◉	Ø 3.0 ~Ø 16.0	2.5D 5D	◎		○				G30
Solid Carbide Drills	SSD	External		-	Ø 1.0 ~Ø 15.0	-	○		◎	◎			G31
Brazed Drills	BTA	External		-	Ø 12.6~Ø 40.5	-							G32

◎ : Best ○ : Good △ : General

■ Selection of grade

Workpiece	P						M				K				N			S			H		
Type	High speed		Medium speed		Low speed roughing	Interrupted heavy machining	High speed		Medium speed	Low speed roughing	High speed		Medium speed	Low speed roughing	High speed	Medium speed	Low speed	High speed	Medium speed	Low speed	High speed	Medium speed	Low speed
ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	S01	S10	S20	S01	S10	S20	H01	H10	H20
Coated Cemented Carbide	PC205F						PC205F				PC205F							PC205F			PC205F		
	PC210F						PC210F												PC210F		PC210F		
		PC215F										PC215F											
			PC220F					PC220F														PC220F	
				PC225F					PC225F				PC225F										
Micro grain Cemented Carbide	FG2						FG2				FG2				FG2								FG2
	FS1							FS1															
					FCC																		
			FA1										FA1										

Technical Information for Indexable drills

■ Features

LPD - Least Piercing Drill	SPD - Superior Piercing Drill	NPD - New Piercing Drill
Available diameter : Ø 12mm ~ Ø 13.5mm	Available diameter : Ø 13mm ~ Ø 22mm	Available diameter : Ø 23mm ~ Ø 60mm

● High rigidity of drills

- Strong drill shank and excellent design optimizes the performance of hole-making.
- Abrasive wear resistance of shank with machined chip has been improved due to the special surface treatment.
- Obtain better performance even in difficult cutting condition with a strengthened drill body.

● Specially designed flute

- Excellent chip evacuation due to the specially designed flute guarantees long durability.

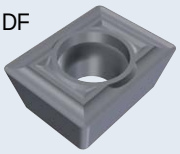
● Recommendation of chip breaker & grade as per workpiece

Workpiece	Insert	Grade
Alloy steel, Carbon steel	DM,DF	PC3525
Cast iron	DM	PC6510
Stainless steel	DS,DF	PC9530
Aluminum	DA	H01
Mild steel	DR	PC3525

■ Inserts

● LPD Insert

DF

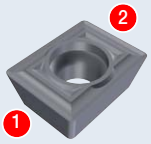


PC3525(Steel)

2 Cutting-edges using insert

- For small hole drilling
- LPD : Ø12mm~Ø13.5mm

LPD Clamping method



● SPD Insert

4 cutting-edges using insert

- Chip breaker of SPD insert provides excellent chip control property due to its engineered design.
- Easy and simple change of cutting edge without inconvenience.

Using same insert of SPD

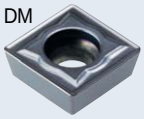
- Economical by using same insert at both position of insert pocket of drill.
- Available for SPD size : Ø13mm~Ø22mm.
- Since SPD makes small-sized chip, it is effective for small size hole drilling.

Recommendation of chip breaker & grade as per workpiece

DF

PC3525(Steel) / PC9530(Stainless steel)

DM

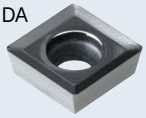


PC3525, PC9530(Steel) / PC6510(Cast iron)

DS

PC9530 (Stainless steel)

DA



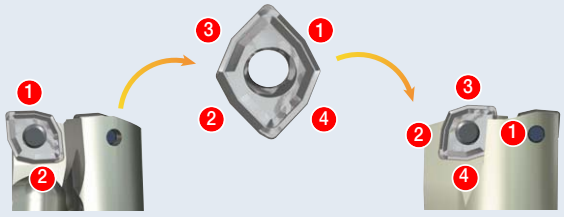
H01(Aluminum)

● NPD Insert

4 cutting-edges using insert

- Since NPD has strong cutting edge, it is suitable for big size hole drilling.
- Available for NPD size : Ø23mm~Ø60mm.

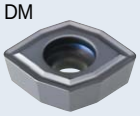
How to use 4-cutting edges of NPD inserts



- At first, use No.①,② edges at the outer position of insert pocket and then take the insert to the inner position of insert pocket of drill to use No.③,④.

Recommendation of chip breaker & grade as per workpiece

DM



PC3525(Steel) / PC6510(Cast iron)

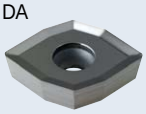
DS

PC9530(Stainless steel)

DR

PC3525(Mild steel)

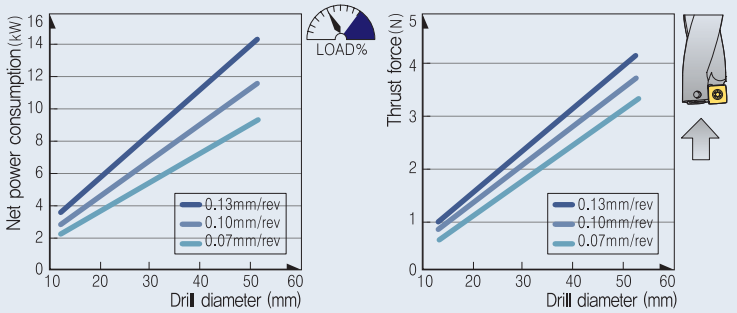
DA



H01(Aluminum)

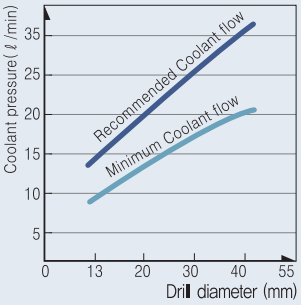
■ Machining power requirement

The graph below shows the required cutting force needed when drilling. For the best performance when using a NPD & SPD, we recommend that a machinist use those tools under the machining condition with enough horse power and rigidity.



Cutting speed : vc = 100m/min
Workpiece : SCM440 (240HB)
Through coolant system

■ Coolant pressure



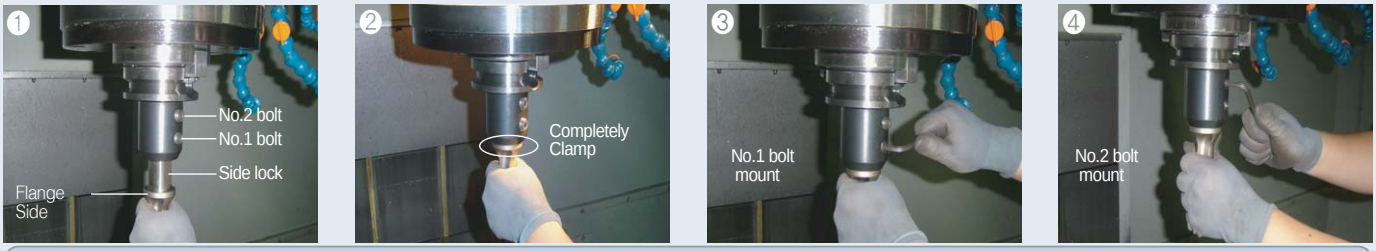
- Allropriate pressure for NPD & SPD is over 5kg/㎠.
- Since the information shown above is basic sata for normal drilling, adjustment as per workpiece & cutting conditions are necessary.

· vc = 100m/min
· Workpiece : SCM440(240HB)
· Through coolant system

■ Machined hole tolerance as per D.O.C

D.O.C	Machined Hole Tolerance	Test Cutting Condition
2 X D	$D^{+0.2}_{-0.1}$	• vc = 130 ~200 m/min • fn = 0.04 ~ 0.15 mm/rev • Workpiece = SCM440 • Coolant : Over 5kg/cm²
3 X D	$D^{+0.3}_{-0.1}$	
4 X D	$D^{+0.4}_{-0.1}$	

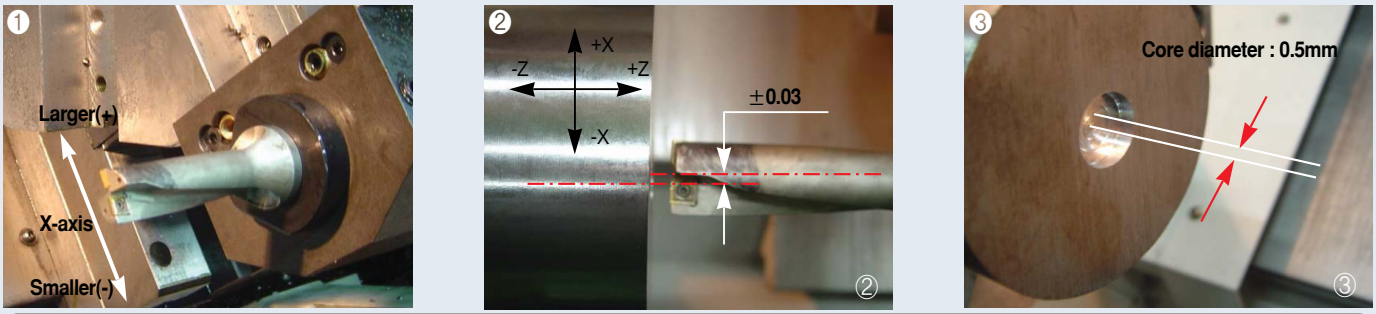
■ How to clamp the drill into the side lock arbor



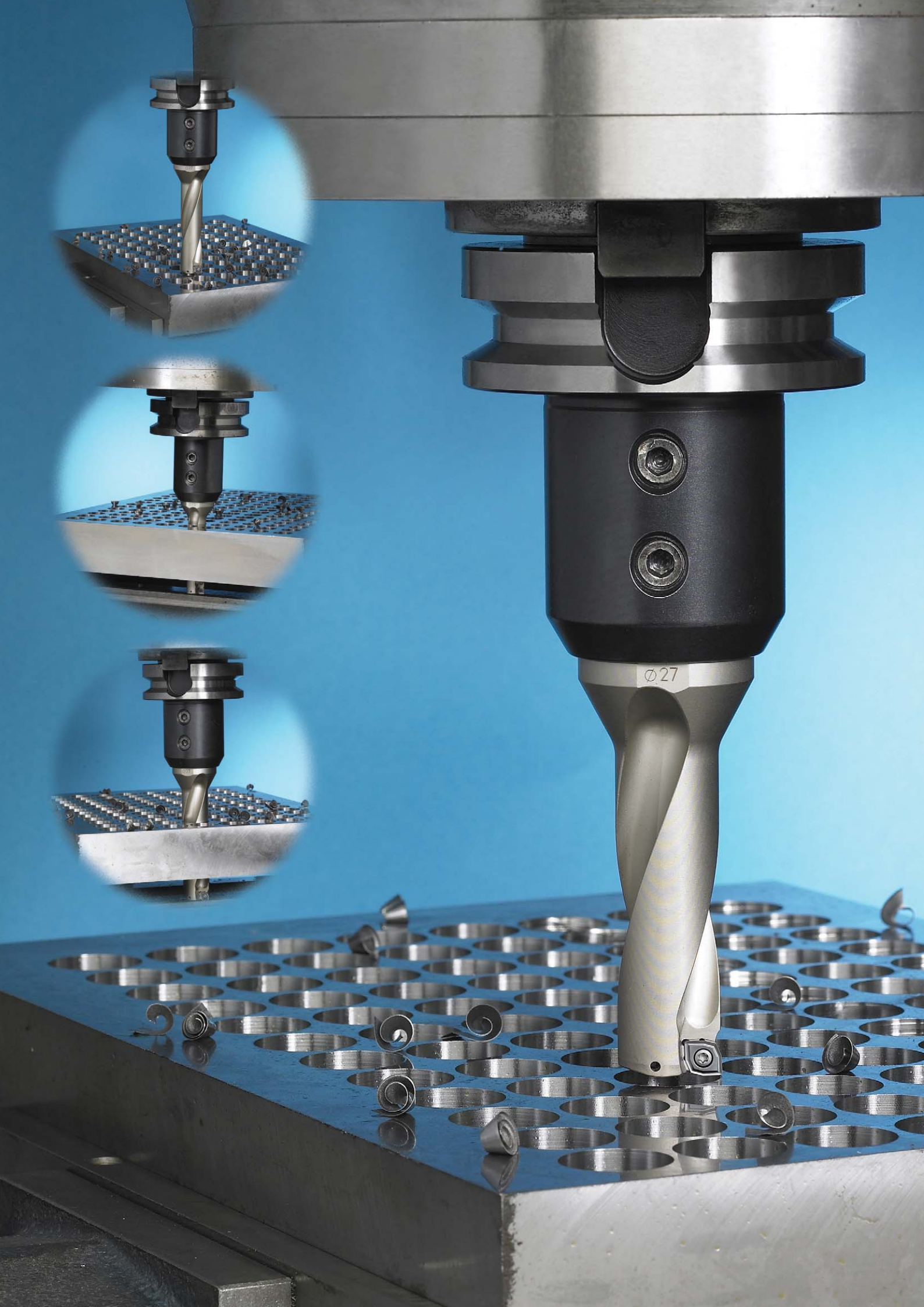
• The stable clamping method for the best hole drilling

① Insert toward same direction to the bolt of arbor and the side lock part of drill.
② Keep to completely close between clamped face of drill and the arbor.
③ Make tight to No.1 bolt first.
④ Then, make tight to No. 2 bolt.

■ Setting of drill in turning machine



① The cutting edge of insert should be parallel to X-axis to make it possible to do offset cutting.
Since a flat part on shank for side lock clamping has been made parallel with the cutting edge line of insert, operator can set the drill as per flat part of shank.
② The outer insert should be located in the direction(+) of X-axis to allow offset cutting and then the inner insert should face the operator.
③ To check up the setting of drill before use, test it by drilling about 5mm depth and then measure the core size if it is around 0.5mm.
※ Please check the side lock position when you calmp.


Ø27

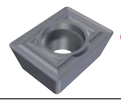
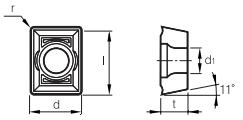
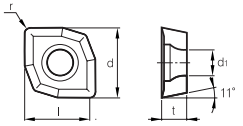
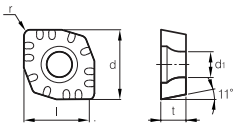
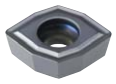
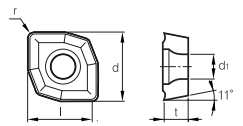
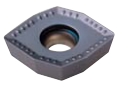
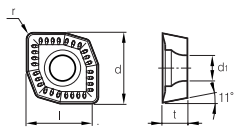
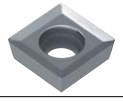
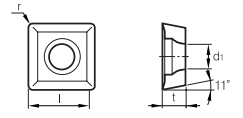
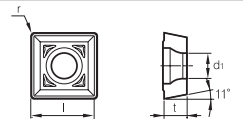
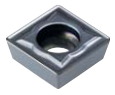
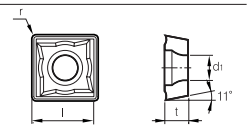
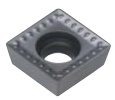
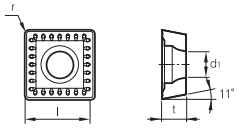
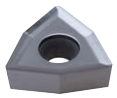
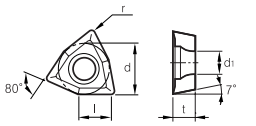
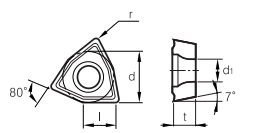
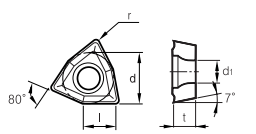
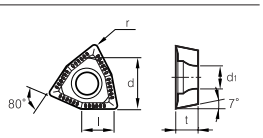
■ Recommended cutting condition(LPD, NPD, SPD)

Recommendation of chip breaker & grade as per workpiece							Cutting Speed	Feed (Aspect ratio = 2D,3D)				
Workpiece				Chip breaker & Grade				Feed(mm/rev) as per drill diameter				
ISO	KS		Hardness(HB)	Recom.	C/B	Grade	m/min	~Ø 15	Ø 16~Ø 24	Ø 25~Ø 32	Ø 33~Ø 40	over Ø 41
P Carbon steel	SM15C SM25C SM35C	Low carbon steel	80-180	1st	DM	PC3525	190(130-250)	0.04-0.08	0.04-0.08	0.04-0.08	0.05-0.10	0.06-0.12
				2nd	DS	PC9530	170(110-230)	0.04-0.08	0.04-0.08	0.04-0.08	0.05-0.10	0.08-0.12
	SM45C SM58C SCMn1 SMn438(H) SUM22 SNC236	High carbon steel	180-280	1st	DM	PC3525	140(80-200)	0.04-0.10	0.04-0.12	0.05-0.16	0.08-0.18	0.10-0.22
P Alloy steel	SCM4105 SCM440 SCMnH1	Low alloy steel	140-260	1st	DM	PC3525	130(70-200)	0.04-0.10	0.06-0.12	0.08-0.16	0.08-0.20	0.08-0.24
				2nd	DS	PC9530	120(50-180)	0.04-0.10	0.06-0.12	0.08-0.16	0.08-0.20	0.08-0.24
	SCr440 SNCM220 SNCM240	Heat treated low alloy steel	200-400	1st	DM	PC3525	100(50-150)	0.04-0.10	0.04-0.12	0.08-0.16	0.08-0.20	0.08-0.24
				2nd	DR	PC3525	90(50-140)	0.04-0.10	0.04-0.12	0.08-0.16	0.08-0.20	0.08-0.22
	STD11 STD61 STS43 SKH55 SKH3 SKH51 SKH51	High alloy steel	50-260	1st	DM	PC3525	100(50-160)	0.04-0.08	0.04-0.12	0.06-0.16	0.08-0.18	0.08-0.22
				2nd	DS	PC9530	90(50-150)	0.04-0.08	0.04-0.12	0.06-0.16	0.08-0.18	0.08-0.22
		Heat treated high alloy steel	220-420	1st	DM	PC3525	70(30-120)	0.04-0.08	0.04-0.12	0.06-0.14	0.08-0.17	0.08-0.20
				2nd	DR	PC3525	60(30-110)	0.04-0.08	0.04-0.12	0.06-0.14	0.08-0.17	0.08-0.20
M Stainless steel	STS304 STR31 STR316	Austenitic	135-275 Ni>8%	1st	DS	PC9530	100(50-150)	0.04-0.10	0.04-0.12	0.06-0.14	0.06-0.16	0.06-0.20
				2nd	DM	PC9530	90(40-150)	0.04-0.10	0.04-0.12	0.06-0.14	0.06-0.16	0.06-0.20
	STS316 B11SSC16 STS321 STS12 STS403 STS410	Austenitic (Cast steel)	150-250	1st	DS	PC9530	80(40-130)	0.04-0.08	0.04-0.12	0.06-0.14	0.06-0.16	0.06-0.20
				2nd	DM	PC9530	80(40-120)	0.04-0.08	0.04-0.12	0.06-0.14	0.06-0.16	0.06-0.20
	STS420 STS430 STR446 STR36 STR446	Ferrite Martensite	135-275	1st	DS	PC3525	120(60-170)	0.04-0.10	0.04-0.12	0.06-0.14	0.06-0.16	0.06-0.20
				2nd	DM	PC9530	110(60-160)	0.04-0.10	0.04-0.12	0.06-0.14	0.06-0.16	0.06-0.20
M Heat resistance super alloy	HRSC15 STR330 NiCu30Al CoCr22W 14Ni	Ni-base heat resistance super alloy	130-400	1st	DS	PC9530	50(30-100)	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
				2nd	DM	PC9530	40(30-90)	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
	TiAl5Sn2.5	Ti-base alloy	130-400	1st	DR	PC3525	50(30-90)	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.08-0.16
		Hardened steel	over 400	1st	DR	PC3525	40(20-80)	0.04-0.08	0.04-0.10	0.06-0.12	0.08-0.14	0.08-0.16
K Cast iron	GC100 GC150	Gray cast iron	150-220	1st	DM	PC6510	190(150-250)	0.04-0.12	0.06-0.16	0.08-0.18	0.10-0.22	0.10-0.26
	GC200 GC250 GC350 GC400 GCD500 GCD600 GCD700	Ductile cast iron	130-240	1st	DM	PC6510	150(100-200)	0.04-0.10	0.05-0.14	0.06-0.16	0.08-0.20	0.10-0.22
				2nd	DR	PC6510	130(60-180)	0.04-0.10	0.05-0.14	0.06-0.16	0.08-0.20	0.10-0.22
	GTS-35 GTS-45 GTS-55	Graphite Ductile cast iron	200-300	1st	DM	PC3525	130(70-170)	0.04-0.10	0.05-0.12	0.06-0.16	0.08-0.18	0.10-0.20
				2nd	DR	PC6510	110(70-150)	0.04-0.10	0.05-0.12	0.06-0.16	0.08-0.18	0.10-0.20
K Aluminum	Aluminum		30-150	1st	DA	H01	300(200-400)	0.04-0.12	0.06-0.16	0.08-0.18	0.10-0.22	0.10-0.24
				2nd	DM	H01	280(200-350)	0.04-0.12	0.06-0.16	0.08-0.18	0.10-0.22	0.10-0.24
K Copper	Copper, copper alloy		150-160	1st	DA	H01	280(200-350)	0.04-0.12	0.06-0.16	0.08-0.18	0.10-0.22	0.10-0.24
				2nd	DM	H01	250(200-300)	0.04-0.12	0.06-0.16	0.08-0.18	0.10-0.22	0.10-0.24

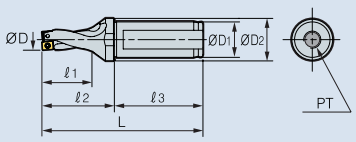
	Feed (Aspect ratio = 4D)					Feed (Aspect ratio = 5D)				
	Feed(mm/rev) as per drill diameter					Feed(mm/rev) as per drill diameter				
	~Ø 15	Ø 16~Ø 24	Ø 25~Ø 32	Ø 33~Ø 40	over Ø 41	~Ø 15	Ø 16~Ø 24	Ø 25~Ø 32	Ø 33~Ø 40	over Ø 41
	0.04-0.08	0.04-0.08	0.04-0.08	0.05-0.10	0.08-0.12	0.04-0.05	0.04-0.05	0.04-0.05	0.05-0.07	0.08-0.09
	0.04-0.08	0.04-0.08	0.04-0.08	0.05-0.10	0.08-0.12	0.04-0.05	0.04-0.05	0.04-0.05	0.05-0.07	0.08-0.09
	0.04-0.10	0.04-0.12	0.05-0.16	0.08-0.16	0.10-0.18	0.04-0.07	0.04-0.09	0.05-0.12	0.08-0.14	0.10-0.14
	0.04-0.10	0.06-0.12	0.08-0.14	0.08-0.18	0.08-0.20	0.04-0.07	0.06-0.09	0.08-0.11	0.08-0.13	0.08-0.15
	0.04-0.10	0.06-0.12	0.08-0.14	0.08-0.18	0.08-0.20	0.04-0.07	0.06-0.09	0.08-0.11	0.08-0.13	0.08-0.15
	0.04-0.10	0.06-0.12	0.08-0.14	0.08-0.18	0.08-0.20	0.04-0.07	0.06-0.09	0.08-0.11	0.08-0.13	0.08-0.15
	0.04-0.10	0.06-0.12	0.08-0.14	0.08-0.16	0.08-0.18	0.04-0.07	0.06-0.09	0.08-0.11	0.08-0.13	0.08-0.15
	0.04-0.08	0.04-0.12	0.06-0.16	0.08-0.18	0.08-0.22	0.04-0.06	0.04-0.09	0.06-0.11	0.08-0.13	0.08-0.15
	0.04-0.08	0.04-0.12	0.06-0.16	0.08-0.18	0.08-0.22	0.04-0.06	0.04-0.09	0.06-0.11	0.08-0.13	0.08-0.15
	0.04-0.08	0.04-0.12	0.06-0.14	0.08-0.17	0.08-0.20	0.04-0.06	0.04-0.09	0.06-0.10	0.08-0.12	0.08-0.14
	0.04-0.08	0.04-0.12	0.06-0.14	0.08-0.17	0.08-0.20	0.04-0.06	0.04-0.09	0.06-0.10	0.08-0.12	0.08-0.14
	0.04-0.10	0.04-0.12	0.06-0.12	0.06-0.14	0.06-0.16	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
	0.04-0.10	0.04-0.12	0.06-0.12	0.06-0.14	0.06-0.16	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
	0.04-0.08	0.04-0.12	0.06-0.12	0.06-0.14	0.06-0.15	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
	0.04-0.08	0.04-0.12	0.06-0.12	0.06-0.14	0.06-0.15	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
	0.04-0.10	0.04-0.12	0.06-0.12	0.06-0.14	0.06-0.16	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
	0.04-0.10	0.04-0.12	0.06-0.12	0.06-0.14	0.06-0.16	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.12	0.06-0.12
	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.10	0.06-0.10	0.04-0.06	0.04-0.06	0.06-0.08	0.06-0.08	0.06-0.08
	0.04-0.06	0.04-0.08	0.06-0.10	0.06-0.10	0.06-0.10	0.04-0.06	0.04-0.06	0.06-0.08	0.06-0.08	0.06-0.08
	0.04-0.07	0.04-0.08	0.06-0.11	0.08-0.14	0.08-0.16	0.04-0.06	0.04-0.09	0.06-0.09	0.08-0.11	0.08-0.11
	0.04-0.07	0.04-0.08	0.06-0.11	0.08-0.14	0.08-0.16	0.04-0.06	0.04-0.09	0.06-0.09	0.08-0.11	0.08-0.11
	0.04-0.11	0.06-0.14	0.08-0.16	0.10-0.20	0.12-0.22	0.04-0.10	0.06-0.12	0.08-0.12	0.10-0.14	0.12-0.16
	0.04-0.09	0.05-0.12	0.06-0.15	0.08-0.18	0.10-0.20	0.04-0.07	0.05-0.09	0.06-0.09	0.08-0.12	0.10-0.14
	0.04-0.09	0.05-0.12	0.06-0.15	0.08-0.18	0.10-0.20	0.04-0.07	0.05-0.09	0.06-0.09	0.08-0.12	0.10-0.14
	0.04-0.09	0.06-0.15	0.06-0.15	0.08-0.18	0.10-0.20	0.04-0.07	0.05-0.09	0.06-0.09	0.08-0.12	0.10-0.14
	0.04-0.09	0.06-0.15	0.06-0.15	0.08-0.18	0.10-0.20	0.04-0.07	0.05-0.09	0.06-0.09	0.08-0.12	0.10-0.14
	0.04-0.10	0.08-0.16	0.08-0.16	0.10-0.20	0.10-0.20	0.04-0.09	0.06-0.11	0.08-0.12	0.10-0.14	0.10-0.16
	0.04-0.10	0.08-0.16	0.08-0.16	0.10-0.20	0.10-0.20	0.04-0.09	0.06-0.11	0.08-0.12	0.10-0.14	0.10-0.16
	0.04-0.10	0.08-0.16	0.08-0.16	0.10-0.20	0.10-0.20	0.04-0.09	0.06-0.11	0.08-0.12	0.10-0.14	0.10-0.16
	0.04-0.10	0.08-0.16	0.08-0.16	0.10-0.20	0.10-0.20	0.04-0.09	0.06-0.11	0.08-0.12	0.10-0.14	0.10-0.16

Insert for Drills

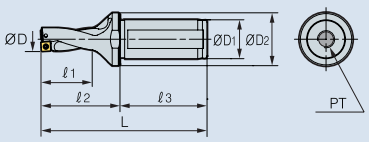
Available Inserts

Picture	Designation	Coated									Uncoated		Dimensions (mm)					Geometry
		NC3120	NC3030	PC3525	PC3530	PC3535	NCM325	PC9530	NCM335	PC6510	H01	G10	l	d	t	r	d1	
LPMT-DF  New	LPMT 040203-DF			●									6.2	4.7	2.4	0.3	2.3	
NPET-DA	NPET 222408-DA										●		8.3	8.2	2.5	0.8	2.8	
	252808-DA										●		9.3	9.2	3.3	0.8	3.4	
	293208-DA										●		10.3	10.2	3.3	0.8	3.4	
	334008-DA										●		13	12.9	3.97	0.8	4.0	
	415008-DA										●		15.3	15.2	4.76	0.8	4.5	
	516012-DA										●		18.3	18.2	5.18	1.2	5.5	
NPET-DR	NPET 222408-DR			●		●							8.3	8.2	2.5	0.8	2.8	
	252808-DR			●		●							9.3	9.2	3.3	0.8	3.4	
	293208-DR			●		●							10.3	10.2	3.3	0.8	3.4	
	334008-DR			●		●							13	12.9	3.97	0.8	4.0	
	415008-DR			●		●							15.3	15.2	4.76	0.8	4.5	
	516012-DR			●		●							18.3	18.2	5.18	1.2	5.5	
NPMT-DM 	NPMT 222408-DM			●		●				●			8.3	8.2	2.5	0.8	2.8	
	252808-DM			●		●				●			9.3	9.2	3.3	0.8	3.4	
	293208-DM			●		●				●			10.3	10.2	3.3	0.8	3.4	
	334008-DM			●		●				●			13	12.9	3.97	0.8	4.0	
	415008-DM			●		●				●			15.3	15.2	4.76	0.8	4.5	
	516012-DM			●		●				●			18.3	18.2	5.18	1.2	5.5	
NPMT-DS 	NPMT 222408-DS							●					8.3	8.2	2.5	0.8	2.8	
	252808-DS							●					9.3	9.2	3.3	0.8	3.4	
	293208-DS							●					10.3	10.2	3.3	0.8	3.4	
	334008-DS							●					13	12.9	3.97	0.8	4.0	
	415008-DS							●					15.3	15.2	4.76	0.8	4.5	
	516012-DS							●					18.3	18.2	5.18	1.2	5.5	
SPET-DA 	SPET 050203-DA										●		5.3	-	2.4	0.3	2.3	
	060204-DA										●		6.2	-	2.5	0.4	2.5	
	070204-DA										●		7.2	-	2.5	0.4	2.8	
SPMT-DF New	SPMT 050203-DF							●					5.3	-	2.4	0.3	2.3	
	060204-DF							●					6.2	-	2.5	0.4	2.5	
	070204-DF							●					7.2	-	2.5	0.4	2.8	
SPMT-DM 	SPMT 050203-DM			●		●		●		●			5.3	-	2.4	0.3	2.3	
	060204-DM			●		●		●		●			6.2	-	2.5	0.4	2.5	
	070204-DM			●		●		●		●			7.2	-	2.5	0.4	2.8	
SPMT-DS 	SPMT 050203-DS							●					5.3	-	2.4	0.3	2.3	
	060204-DS							●					6.2	-	2.5	0.4	2.5	
	070204-DS							●					7.2	-	2.5	0.4	2.8	
WCKT-DA 	WCKT 030208-DA										●		3.8	5.56	2.38	0.8	2.8	
	040208-DA										●		4.3	6.35	2.38	0.8	3.0	
	050308-DA										●		5.4	7.94	3.18	0.8	3.4	
	06T308-DA										●		6.5	9.525	3.97	0.8	4.0	
	080408-DA										●		8.7	12.7	4.76	0.8	4.3	
WCMT-C20	WCMT 030208-C20						●						3.8	5.56	2.38	0.8	2.8	
	040208-C20		●				●						4.3	6.35	2.38	0.8	3.0	
	050308-C20				●		●	●	●				5.4	7.94	3.18	0.8	3.4	
	06T308-C20	●			●		●	●	●				6.5	9.525	3.97	0.8	4.0	
	080408-C20	●			●		●						8.7	12.7	4.76	0.8	4.3	
	080412-C20						●						8.7	12.7	4.76	1.2	4.3	
WCMT-C21	WCMT 030204-C21				●		●						3.8	5.56	2.38	0.4	2.5	
	040204-C21				●		●						4.3	6.35	2.38	0.4	2.8	
	040208-C21				●								4.3	6.35	2.38	0.8	2.8	
	080408-C21				●		●						8.7	12.7	4.76	0.8	4.3	
WCMT-DS(P)	WCMT 030204-DSP												3.8	5.56	2.38	0.4	2.5	
	040204-DSP												4.3	6.35	2.38	0.4	2.8	
	050308-DS												5.4	7.94	3.18	0.8	3.4	
	06T308-DS												6.5	9.525	3.97	0.8	4.0	
	080408-DS												8.7	12.7	4.76	0.8	4.3	
	080412-DS												8.7	12.7	4.76	1.2	4.3	

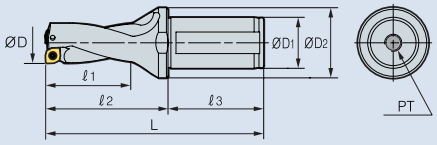
LPD, SPD, NPD - 2D



LPD



SPD



NPD

(mm)

Designation		Stock	ØD	Ø D_1	Ø D_2	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
LPD	120-20-2		12	20	24	24	41	50	91	PT1/8	LPMT040203-DF	FTNA0204	TW06P
New	125-20-2		12.5	20	24	25	41	50	91	PT1/8			
	130-20-2		13	20	24	26	43	50	93	PT1/8			
	135-20-2		13.5	20	24	27	43	50	93	PT1/8			
SPD	130-20-2	●	13	20	24	26	43	50	93	PT1/8	SPM(E)T 050203-□□	FTNA0204	TW06P
	135-20-2		13.5	20	24	27	43	50	93	PT1/8			
	140-20-2	●	14	20	24	28	46	50	96	PT1/8			
	145-20-2		14.5	20	24	29	46	50	96	PT1/8			
	150-20-2	●	15	20	24	30	49	50	99	PT1/8			
	155-20-2		15.5	20	24	31	49	50	99	PT1/8			
	160-25-2	●	16	25	34	32	51	56	107	PT1/8	SPM(E)T 060204-□□	FTKA02206S	TW07S
	165-25-2		16.5	25	34	33	51	56	107	PT1/8			
	170-25-2	●	17	25	34	34	53	56	109	PT1/8			
	175-25-2		17.5	25	34	35	53	56	109	PT1/8			
	180-25-2	●	18	25	34	36	56	56	112	PT1/8			
	185-25-2		18.5	25	34	37	56	56	112	PT1/8			
	190-25-2	●	19	25	34	38	58	56	114	PT1/8			
	195-25-2		19.5	25	34	39	58	56	114	PT1/8			
	200-25-2	●	20	25	34	40	62	56	118	PT1/8	SPM(E)T 070204-□□	FTKA02565	TW07S
	205-25-2		20.5	25	34	41	62	56	118	PT1/8			
	210-25-2	●	21	25	34	42	64	56	120	PT1/8			
	215-25-2		21.5	25	34	43	64	56	120	PT1/8			
	220-25-2	●	22	25	34	44	66	56	122	PT1/8			
	225-25-2		22.5	25	34	45	66	56	122	PT1/8			
NPD	230-32-2	●	23	32	44	46	70	60	130	PT1/4	NPM(E)T 222408-□□	FTKA02565	TW07S
	235-32-2		23.5	32	44	47	70	60	130	PT1/4			
	240-32-2	●	24	32	44	48	72	60	132	PT1/4			
	245-32-2		24.5	32	44	49	72	60	132	PT1/4			
	250-32-2	●	25	32	44	50	75	60	135	PT1/4	NPM(E)T 252808-□□	FTKA0307	TW09S
	255-32-2		25.5	32	44	51	75	60	135	PT1/4			
	260-32-2	●	26	32	44	52	77	60	137	PT1/4			
	265-32-2		26.5	32	44	53	77	60	137	PT1/4			
	270-32-2	●	27	32	44	54	80	60	140	PT1/4			
	275-32-2		27.5	32	44	55	80	60	140	PT1/4			
	280-32-2	●	28	32	44	56	83	60	143	PT1/4			
	285-32-2		28.5	32	44	57	83	60	143	PT1/4			
	290-32-2	●	29	32	44	58	85	60	145	PT1/4	NPM(E)T 293208-□□	FTKA0307	TW09S
	295-32-2		29.5	32	44	59	85	60	145	PT1/4			
	300-32-2	●	30	32	44	60	89	60	149	PT1/4			
	305-32-2		30.5	32	44	61	89	60	149	PT1/4			
	310-32-2	●	31	32	44	62	91	60	151	PT1/4			
	315-32-2		31.5	32	44	63	91	60	151	PT1/4			
	320-32-2	●	32	32	44	64	93	60	153	PT1/4			
	325-32-2		32.5	32	44	65	93	60	153	PT1/4			

• Applicable inserts, see pages G08

● : Stock item ○ : Under preparing for stock

■ LPD / SPD / NPD Code System

SPD 170 - 25 - 3

- 3 : Aspect ratio(2, 3, 4, 5)
- 25 : Shank diameter : Ø25mm
- 170 : Hole size : Ø17mm
- SPD : SPDrill

∗ LPD : ø12mm ~ ø13.5mm, SPD : ø13mm ~ ø22mm,
NPD : ø23mm ~ ø60mm
When choosing drills, please consider about the aspect ratio
(flute length / hole diameter) of drills.

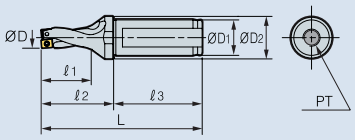
■ How to calculate machining power of drilling : P(kW)

$$Pc(kW) = 425 \times kc \times vc \times fn \times D / 10^7$$

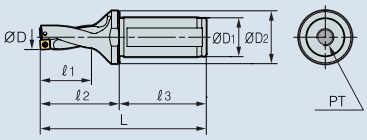
- Specific cutting force : kc(MPa) - see KORLOY catalogue
- Cutting speed : vc(m/min)
- Feed rate : fn(mm/rev)
- Drill diameter : D(mm)

∗ Example
- Workpiece = SCM440
- kc = 254MPa
- vc = 100m/min
- fn = 0.1mm/rev
- D = 20mm
- Pc(kW) = 425×254×100×0.1×20/10,000,000 = 2.159kW

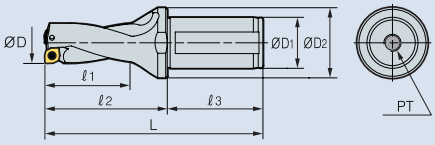
LPD, SPD, NPD - 2D



LPD



SPD



NPD

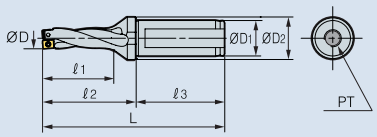
(mm)

Designation		Stock	Ø D	Ø D_1	Ø D_2	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
NPD	330-40-2	●	33	40	48	66	98	70	168	PT3/8	NPM(E)T 334008-□□	FTKA03508	TW15S
	335-40-2		33.5	40	48	67	98	70	168	PT3/8			
	340-40-2	●	34	40	48	68	100	70	170	PT3/8			
	345-40-2		34.5	40	48	69	100	70	170	PT3/8			
	350-40-2	●	35	40	48	70	103	70	172	PT3/8			
	355-40-2		35.5	40	48	71	103	70	172	PT3/8			
	360-40-2	●	36	40	48	72	105	70	175	PT3/8			
	365-40-2		36.5	40	48	73	105	70	175	PT3/8			
	370-40-2		37	40	48	74	107	70	177	PT3/8			
	375-40-2		37.5	40	48	75	107	70	177	PT3/8			
	380-40-2		38	40	48	76	110	70	180	PT3/8			
	385-40-2		38.5	40	48	77	110	70	180	PT3/8			
	390-40-2		39	40	48	78	112	70	182	PT3/8			
	395-40-2		39.5	40	48	79	112	70	182	PT3/8			
	400-40-2	●	40	40	48	80	115	70	185	PT3/8			
	405-40-2		40.5	40	48	81	115	70	185	PT3/8			
	410-40-2		41	40	58	82	119	70	189	PT3/8	NPM(E)T 415008-□□	FTKA0410	TW15S
	415-40-2		41.5	40	58	83	119	70	189	PT3/8			
	420-40-2		42	40	58	84	122	70	192	PT3/8			
	425-40-2		42.5	40	58	85	122	70	192	PT3/8			
	430-40-2		43	40	58	86	124	70	194	PT3/8			
	435-40-2		43.5	40	58	87	125	70	194	PT3/8			
	440-40-2		44	40	58	88	126	70	196	PT3/8			
	445-40-2		44.5	40	58	89	126	70	196	PT3/8			
	450-40-2	●	45	40	58	90	129	70	199	PT3/8			
	455-40-2		45.5	40	58	91	129	70	199	PT3/8			
	460-40-2		46	40	58	92	131	70	201	PT3/8			
	465-40-2		46.5	40	58	93	131	70	201	PT3/8			
	470-40-2		47	40	58	94	134	70	204	PT3/8			
	475-40-2		47.5	40	58	95	134	70	204	PT3/8			
	480-40-2		48	40	58	96	138	70	208	PT3/8			
	485-40-2		48.5	40	58	97	138	70	208	PT3/8			
	490-40-2		49	40	58	98	140	70	210	PT3/8			
	495-40-2		49.5	40	58	99	140	70	210	PT3/8			
	500-40-2	●	50	40	58	100	142	70	212	PT3/8			
	505-40-2		50.5	40	58	101	142	70	212	PT3/8			
	510-40-2		51	40	68	102	148	70	218	PT3/8	NPM(E)T 516012-□□	FTNC04511	TW20S
	515-40-2		51.5	40	68	103	148	70	218	PT3/8			
	520-40-2		52	40	68	104	150	70	220	PT3/8			
	525-40-2		52.5	40	68	105	150	70	220	PT3/8			
	530-40-2		53	40	68	106	152	70	222	PT3/8			
	535-40-2		53.5	40	68	107	152	70	222	PT3/8			
	540-40-2		54	40	68	108	154	70	224	PT3/8			
	545-40-2		54.5	40	68	109	154	70	224	PT3/8			
	550-40-2	●	55	40	68	110	156	70	226	PT3/8			
	555-40-2		55.5	40	68	111	156	70	226	PT3/8			
	560-40-2		56	40	68	112	160	70	230	PT3/8			
	565-40-2		56.5	40	68	113	160	70	230	PT3/8			
	570-40-2		57	40	68	114	163	70	233	PT3/8			
	575-40-2		57.5	40	68	115	163	70	233	PT3/8			
	580-40-2		58	40	68	116	166	70	236	PT3/8			
	585-40-2		58.5	40	68	117	166	70	236	PT3/8			
	590-40-2		59	40	68	118	169	70	239	PT3/8			
	595-40-2		59.5	40	68	119	169	70	239	PT3/8			
	600-40-2	●	60	40	68	120	172	70	242	PT3/8			
	605-40-2		60.5	40	68	121	172	70	242	PT3/8			

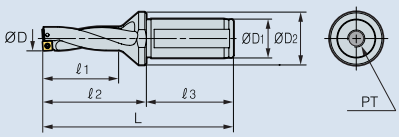
• Applicable inserts, see pages G08

● : Stock item ○ : Under preparing for stock

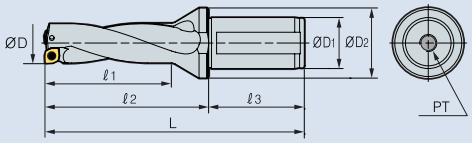
LPD, SPD, NPD - 3D



LPD



SPD



NPD

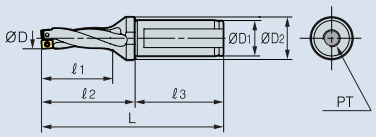
(mm)

Designation		Stock	ø D	ø D_1	ø D_2	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
LPD	120-20-3	●	12	20	24	36	53	50	103	PT1/8			
New	125-20-3	●	12.5	20	24	37.5	53	50	103	PT1/8	LPMT040203-DF	FTNA0204	TW06P
	130-20-3	●	13	20	24	39	56	50	106	PT1/8			
	135-20-3	●	13.5	20	24	40.5	56	50	106	PT1/8			
SPD	130-20-3	●	13	20	24	39	56	50	106	PT1/8			
	135-20-3	●	13.5	20	24	40.5	56	50	106	PT1/8			
	140-20-3	●	14	20	24	42	60	50	110	PT1/8	SPM(E)T 050203-□□	FTNA0204	TW06P
	145-20-3	●	14.5	20	24	43.5	60	50	110	PT1/8			
	150-20-3	●	15	20	24	45	64	50	114	PT1/8			
	155-20-3	●	15.5	20	24	46.5	64	50	114	PT1/8			
	160-25-3	●	16	25	34	48	67	56	123	PT1/8			
	165-25-3	●	16.5	25	34	49.5	67	56	123	PT1/8			
	170-25-3	●	17	25	34	51	70	56	126	PT1/8			
	175-25-3	●	17.5	25	34	52.5	70	56	126	PT1/8	SPM(E)T 060204-□□	FTKA02206S	TW07S
	180-25-3	●	18	25	34	54	74	56	130	PT1/8			
	185-25-3	●	18.5	25	34	55.5	74	56	130	PT1/8			
	190-25-3	●	19	25	34	57	77	56	133	PT1/8			
	195-25-3	●	19.5	25	34	58.5	77	56	133	PT1/8			
	200-25-3	●	20	25	34	60	82	56	138	PT1/8			
	205-25-3	●	20.5	25	34	61.5	82	56	138	PT1/8			
	210-25-3	●	21	25	34	63	85	56	141	PT1/8	SPM(E)T 070204-□ □	FTKA02565	TW07S
	215-25-3	●	21.5	25	34	64.5	85	56	141	PT1/8			
	220-25-3	●	22	25	34	66	88	56	144	PT1/8			
	225-25-3	●	22.5	25	34	67.5	88	56	144	PT1/8			
NPD	230-32-3	●	23	32	44	69	93	60	153	PT1/4			
	235-32-3	●	23.5	32	44	70.5	93	60	153	PT1/4	NPM(E)T 222408-□□	FTKA02565	TW07S
	240-32-3	●	24	32	44	72	96	60	156	PT1/4			
	245-32-3	●	24.5	32	44	73.5	96	60	156	PT1/4			
	250-32-3	●	25	32	44	75	100	60	160	PT1/4			
	255-32-3	●	25.5	32	44	76.5	100	60	160	PT1/4			
	260-32-3	●	26	32	44	78	103	60	163	PT1/4			
	265-32-3	●	26.5	32	44	79.5	103	60	163	PT1/4	NPM(E)T 252808-□□	FTKA0307	TW09S
	270-32-3	●	27	32	44	81	107	60	167	PT1/4			
	275-32-3	●	27.5	32	44	82.5	107	60	167	PT1/4			
	280-32-3	●	28	32	44	84	111	60	171	PT1/4			
	285-32-3	●	28.5	32	44	85.5	111	60	171	PT1/4			
	290-32-3	●	29	32	44	87	114	60	174	PT1/4			
	295-32-3	●	29.5	32	44	88.5	114	60	174	PT1/4			
	300-32-3	●	30	32	44	90	119	60	179	PT1/4			
	305-32-3	●	30.5	32	44	91.5	119	60	179	PT1/4	NPM(E)T 293208-□□	FTKA0307	TW09S
	310-32-3	●	31	32	44	93	122	60	182	PT1/4			
	315-32-3	●	31.5	32	44	94.5	122	60	182	PT1/4			
	320-32-3	●	32	32	44	96	125	60	185	PT1/4			
	325-32-3	●	32.5	32	44	97.5	125	60	185	PT1/4			
	330-32-3	●	33	32	48	99	131	60	191	PT1/4			
	335-32-3		33.5	32	48	100.5	131	60	191	PT1/4			
	340-32-3	●	34	32	48	102	134	60	194	PT1/4			
	345-32-3		34.5	32	48	103.5	134	60	194	PT1/4			
	350-32-3	●	35	32	48	105	137	60	197	PT1/4			
	355-32-3		35.5	32	48	106.5	137	60	197	PT1/4			
	360-32-3	●	36	32	48	108	141	60	201	PT1/4			
	365-32-3		36.5	32	48	109.5	141	60	201	PT1/4			
	370-32-3	●	37	32	48	111	144	60	204	PT1/4	NPM(E)T 334008-□□	FTKA03508	TW15S
	375-32-3		37.5	32	48	112.5	144	60	204	PT1/4			
	380-32-3	●	38	32	48	114	148	60	208	PT1/4			
	385-32-3		38.5	32	48	115.5	148	60	208	PT1/4			
	390-32-3	●	39	32	48	117	151	60	211	PT1/4			
	395-32-3		39.5	32	48	118.5	151	60	211	PT1/4			
	400-32-3	●	40	32	48	120	155	60	215	PT1/4			
	405-32-3		40.5	32	48	121.5	155	60	215	PT1/4			
	330-40-3	●	33	40	48	99	131	70	201	PT3/8			
	335-40-3		33.5	40	48	100.5	131	70	201	PT3/8			
	340-40-3	●	34	40	48	102	134	70	204	PT3/8			
	345-40-3		34.5	40	48	103.5	134	70	204	PT3/8			
	350-40-3	●	35	40	48	105	137	70	207	PT3/8	NPM(E)T 334008-□□	FTKA03508	TW15S
	355-40-3		35.5	40	48	106.5	137	70	207	PT3/8			
	360-40-3	●	36	40	48	108	141	70	211	PT3/8			
	365-40-3		36.5	40	48	109.5	141	70	211	PT3/8			
	370-40-3	●	37	40	48	111	144	70	214	PT3/8			
	375-40-3		37.5	40	48	112.5	144	70	214	PT3/8			

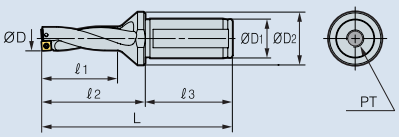
• Applicable inserts, see pages G08

● : Stock item ○ : Under preparing for stock

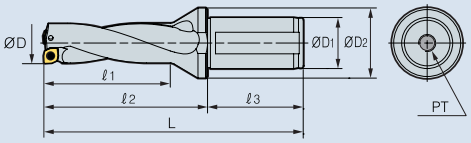
LPD, SPD, NPD - 3D



LPD



SPD



NPD

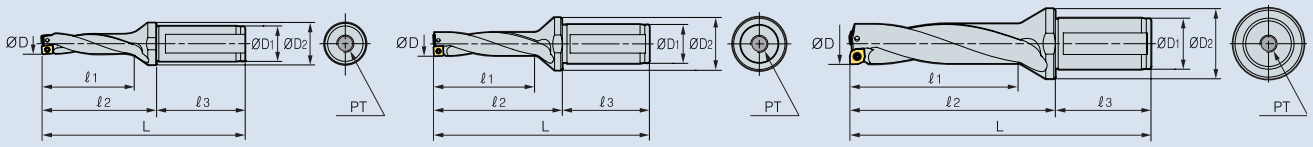
(mm)

Designation		Stock	ø D	ø D_1	ø	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
NPD	380-40-3	●	38	40	48	114	148	70	218	PT3/8	NPM(E)T 334008-□□	FTKA03508	TW15S
	385-40-3		38.5	40	48	115.5	148	70	218	PT3/8			
	390-40-3	●	39	40	48	117	151	70	221	PT3/8			
	395-40-3		39.5	40	48	118.5	151	70	221	PT3/8			
	400-40-3	●	40	40	48	120	155	70	225	PT3/8			
	405-40-3		40.5	40	48	121.5	155	70	225	PT3/8			
	410-40-3	●	41	40	58	123	160	70	230	PT3/8	NPM(E)T 415008-□□	FTKA0410	TW15S
	415-40-3		41.5	40	58	124.5	160	70	230	PT3/8			
	420-40-3	●	42	40	58	126	164	70	234	PT3/8			
	425-40-3		42.5	40	58	127.5	164	70	234	PT3/8			
	430-40-3	●	43	40	58	129	167	70	237	PT3/8			
	435-40-3		43.5	40	58	130.5	167	70	237	PT3/8			
	440-40-3	●	44	40	58	132	170	70	240	PT3/8			
	445-40-3		44.5	40	58	133.5	170	70	240	PT3/8			
	450-40-3	●	45	40	58	135	174	70	244	PT3/8			
	455-40-3		45.5	40	58	136.5	174	70	244	PT3/8			
	460-40-3	●	46	40	58	138	177	70	247	PT3/8			
	465-40-3		46.5	40	58	139.5	177	70	247	PT3/8			
	470-40-3	●	47	40	58	141	181	70	251	PT3/8			
	475-40-3		47.5	40	58	142.5	181	70	251	PT3/8			
	480-40-3	●	48	40	58	144	186	70	256	PT3/8			
	485-40-3		48.5	40	58	145.5	186	70	256	PT3/8			
	490-40-3	●	49	40	58	147	189	70	259	PT3/8			
	495-40-3		49.5	40	58	148.5	189	70	259	PT3/8			
	500-40-3	●	50	40	58	150	192	70	262	PT3/8			
	505-40-3		50.5	40	58	151.5	192	70	262	PT3/8			
	410-42-3		41	42	58	123	160	70	230	PT3/8	NPM(E)T 415008-□□	FTKA0410	TW15S
	415-42-3		41.5	42	58	124.5	160	70	230	PT3/8			
	420-42-3		42	42	58	126	164	70	234	PT3/8			
	425-42-3		42.5	42	58	127.5	164	70	234	PT3/8			
	430-42-3		43	42	58	129	167	70	237	PT3/8			
	435-42-3		43.5	42	58	130.5	167	70	237	PT3/8			
	440-42-3		44	42	58	132	170	70	240	PT3/8			
	445-42-3		44.5	42	58	133.5	170	70	240	PT3/8			
	450-42-3	●	45	42	58	135	174	70	244	PT3/8			
	455-42-3		45.5	42	58	136.5	174	70	244	PT3/8			
	460-42-3		46	42	58	138	177	70	247	PT3/8			
	465-42-3		46.5	42	58	139.5	177	70	247	PT3/8			
	470-42-3		47	42	58	141	181	70	251	PT3/8			
	475-42-3		47.5	42	58	142.5	181	70	251	PT3/8			
	480-42-3		48	42	58	144	186	70	256	PT3/8			
	485-42-3		48.5	42	58	145.5	186	70	256	PT3/8			
	490-42-3	●	49	42	58	147	189	70	259	PT3/8			
	495-42-3		49.5	42	58	148.5	189	70	259	PT3/8			
	500-42-3	●	50	42	58	150	192	70	262	PT3/8			
	505-42-3		50.5	42	58	151.5	192	70	262	PT3/8			
	510-40-3		51	40	68	153	199	70	269	PT3/8	NPM(E)T 516012-□□	FTNC04511	TW20S
	515-40-3		51.5	40	68	154.5	199	70	269	PT3/8			
	520-40-3		52	40	68	156	202	70	272	PT3/8			
	525-40-3		52.5	40	68	157.5	202	70	272	PT3/8			
	530-40-3		53	40	68	159	205	70	275	PT3/8			
	535-40-3		53.5	40	68	160.5	205	70	275	PT3/8			
	540-40-3		54	40	68	162	208	70	278	PT3/8			
	545-40-3		54.5	40	68	163.5	208	70	278	PT3/8			
	550-40-3	●	55	40	68	165	211	70	281	PT3/8			
	555-40-3		55.5	40	68	166.5	211	70	281	PT3/8			
	560-40-3		56	40	68	168	216	70	286	PT3/8			
	565-40-3		56.5	40	68	168.5	216	70	286	PT3/8			
	570-40-3		57	40	68	171	220	70	290	PT3/8			
	575-40-3		57.5	40	68	172.5	220	70	290	PT3/8			
	580-40-3		58	40	68	174	224	70	294	PT3/8			
	585-40-3		58.5	40	68	175.5	224	70	294	PT3/8			
	590-40-3		59	40	68	177	228	70	298	PT3/8			
	595-40-3		59.5	40	68	178.5	228	70	298	PT3/8			
	600-40-3	●	60	40	68	180	232	70	302	PT3/8			
	605-40-3		60.5	40	68	181.5	232	70	302	PT3/8			

• Applicable inserts, see pages G08

● : Stock item ○ : Under preparing for stock

LPD, SPD, NPD - 4D



LPD SPD NPD

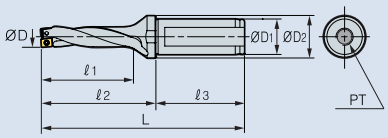
(mm)

Designation		Stock	ø D	ø D_1	ø D_2	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
LPD	120-20-4	●	12	20	24	48	65	50	115	PT1/8	LPMT040203-DF	FTNA0204	TW06P
New	125-20-4	●	12.5	20	24	50	65	50	115	PT1/8			
	130-20-4	●	13	20	24	52	69	50	119	PT1/8			
	135-20-4	●	13.5	20	24	54	69	50	119	PT1/8			
SPD	130-20-4	●	13	20	24	52	69	50	119	PT1/8	SPM(E)T 050203-□□	FTNA0204	TW06P
	135-20-4	○	13.5	20	24	54	69	50	119	PT1/8			
	140-20-4	●	14	20	24	56	74	50	124	PT1/8			
	145-20-4	○	14.5	20	24	58	74	50	124	PT1/8			
	150-20-4	●	15	20	24	60	79	50	129	PT1/8			
	155-20-4	○	15.5	20	24	62	79	50	129	PT1/8			
	160-25-4	●	16	25	34	64	83	56	139	PT1/8	SPM(E)T 060204-□□	FTKA02206S	TW07S
	165-25-4	○	16.5	25	34	66	83	56	139	PT1/8			
	170-25-4	●	17	25	34	68	87	56	143	PT1/8			
	175-25-4	○	17.5	25	34	70	87	56	143	PT1/8			
	180-25-4	●	18	25	34	72	92	56	148	PT1/8			
	185-25-4	○	18.5	25	34	74	92	56	148	PT1/8			
	190-25-4	●	19	25	34	76	96	56	152	PT1/8			
	195-25-4	○	19.5	25	34	78	96	56	152	PT1/8			
	200-25-4	●	20	25	34	80	102	56	158	PT1/8	SPM(E)T 070204-□□	FTKA02565	TW07S
	205-25-4	○	20.5	25	34	82	102	56	158	PT1/8			
	210-25-4	●	21	25	34	84	106	56	162	PT1/8			
	215-25-4	○	21.5	25	34	86	106	56	162	PT1/8			
	220-25-4	●	22	25	34	88	110	56	166	PT1/8			
	225-25-4	○	22.5	25	34	90	110	56	166	PT1/8			
NPD	230-32-4	●	23	32	44	92	116	60	176	PT1/4	NPM(E)T 222408-□□	FTKA02565	TW07S
	235-32-4	○	23.5	32	44	94	116	60	176	PT1/4			
	240-32-4	●	24	32	44	96	120	60	180	PT1/4			
	245-32-4	○	24.5	32	44	98	120	60	180	PT1/4			
	250-32-4	●	25	32	44	100	125	60	185	PT1/4	NPM(E)T 252808-□□	FTKA0307	TW09S
	255-32-4	○	25.5	32	44	102	125	60	185	PT1/4			
	260-32-4	●	26	32	44	104	129	60	189	PT1/4			
	265-32-4	○	26.5	32	44	106	129	60	189	PT1/4			
	270-32-4	●	27	32	44	108	134	60	194	PT1/4			
	275-32-4	○	27.5	32	44	110	134	60	194	PT1/4			
	280-32-4	●	28	32	44	112	139	60	199	PT1/4			
	285-32-4	○	28.5	32	44	114	139	60	199	PT1/4			
	290-32-4	●	29	32	44	116	143	60	203	PT1/4	NPM(E)T 293208-□□	FTKA0307	TW09S
	295-32-4	○	29.5	32	44	118	143	60	203	PT1/4			
	300-32-4	●	30	32	44	120	149	60	209	PT1/4			
	305-32-4		30.5	32	44	122	149	60	209	PT1/4			
	310-32-4	●	31	32	44	124	153	60	213	PT1/4			
	315-32-4		31.5	32	44	126	153	60	213	PT1/4			
	320-32-4	●	32	32	44	128	157	60	217	PT1/4			
	325-32-4		32.5	32	44	130	157	60	217	PT1/4			
	330-40-4	●	33	40	48	132	164	70	234	PT3/8	NPM(E)T 334008-□□	FTKA03508	TW15S
	335-40-4		33.5	40	48	134	164	70	234	PT3/8			
	340-40-4	●	34	40	48	136	168	70	238	PT3/8			
	345-40-4		34.5	40	48	138	168	70	238	PT3/8			
	350-40-4	●	35	40	48	140	172	70	242	PT3/8			
	355-40-4		35.5	40	48	142	172	70	242	PT3/8			
	360-40-4	●	36	40	48	144	177	70	247	PT3/8			
	365-40-4		36.5	40	48	146	177	70	247	PT3/8			
	370-40-4	○	37	40	48	148	181	70	251	PT3/8			
	375-40-4		37.5	40	48	150	181	70	251	PT3/8			
	380-40-4	○	38	40	48	152	186	70	256	PT3/8			
	385-40-4		38.5	40	48	154	186	70	256	PT3/8			
	390-40-4	○	39	40	48	156	190	70	260	PT3/8			
	395-40-4		39.5	40	48	158	190	70	260	PT3/8			
	400-40-4	●	40	40	48	160	195	70	265	PT3/8			
	405-40-4		40.5	40	48	162	195	70	265	PT3/8			

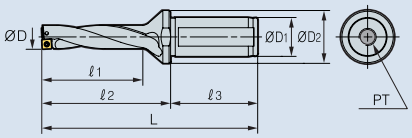
• Applicable inserts, see pages G08

● : Stock item ○ : Under preparing for stock

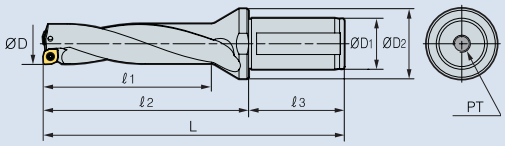
LPD, SPD, NPD - 4D



LPD



SPD



NPD

(mm)

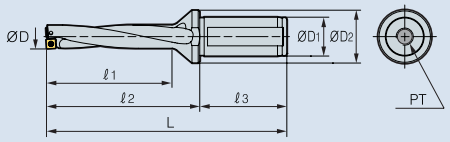
Designation		Stock	ø D	ø D_1	ø D_2	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
NPD	410-40-4	●	41	40	58	164	201	70	271	PT3/8			
	415-40-4		41.5	40	58	166	201	70	271	PT3/8			
	420-40-4	●	42	40	58	168	206	70	276	PT3/8			
	425-40-4		42.5	40	58	170	206	70	276	PT3/8			
	430-40-4	●	43	40	58	172	210	70	280	PT3/8			
	435-40-4		43.5	40	58	174	210	70	280	PT3/8			
	440-40-4	●	44	40	58	176	214	70	284	PT3/8			
	445-40-4		44.5	40	58	178	214	70	284	PT3/8			
	450-40-4	●	45	40	58	180	219	70	289	PT3/8			
	455-40-4		45.5	40	58	182	219	70	289	PT3/8	NPM(E)T 415008-□□	FTKA0410	TW15S
	460-40-4	○	46	40	58	84	223	70	293	PT3/8			
	465-40-4		46.5	40	58	186	223	70	293	PT3/8			
	470-40-4	○	47	40	58	188	228	70	298	PT3/8			
	475-40-4		47.5	40	58	190	228	70	298	PT3/8			
	480-40-4	○	48	40	58	192	234	70	304	PT3/8			
	485-40-4		48.5	40	58	194	234	70	304	PT3/8			
	490-40-4	●	49	40	58	196	238	70	308	PT3/8			
	495-40-4		49.5	40	58	198	238	70	308	PT3/8			
	500-40-4	●	50	40	58	200	242	70	312	PT3/8			
	505-40-4		50.5	40	58	202	242	70	312	PT3/8			
	510-40-4		51	40	68	204	250	70	320	PT3/8			
	515-40-4		51.5	40	68	206	250	70	320	PT3/8			
	520-40-4		52	40	68	208	254	70	324	PT3/8			
	525-40-4		52.5	40	68	210	254	70	324	PT3/8			
	530-40-4		53	40	68	212	258	70	328	PT3/8			
	535-40-4		53.5	40	68	214	258	70	328	PT3/8			
	540-40-4		54	40	68	216	262	70	332	PT3/8			
	545-40-4		54.5	40	68	218	262	70	332	PT3/8			
	550-40-4		55	40	68	220	266	70	336	PT3/8			
	555-40-4		55.5	40	68	222	266	70	336	PT3/8	NPM(E)T 516012-□□	FTNC04511	TW20S
	560-40-4		56	40	68	224	272	70	342	PT3/8			
	565-40-4		56.5	40	68	226	272	70	342	PT3/8			
	570-40-4		57	40	68	228	277	70	347	PT3/8			
	575-40-4		57.5	40	68	230	277	70	347	PT3/8			
	580-40-4		58	40	68	232	282	70	352	PT3/8			
	585-40-4		58.5	40	68	234	282	70	352	PT3/8			
	590-40-4		59	40	68	236	287	70	358	PT3/8			
	595-40-4		59.5	40	68	238	287	70	358	PT3/8			
	600-40-4	●	60	40	68	240	292	70	362	PT3/8			
	605-40-4		60.5	40	68	242	292	70	362	PT3/8			

• Applicable inserts, see pages G08

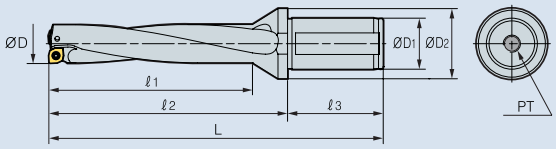
● : Stock item ○ : Under preparing for stock

SPD, NPD - 5D

New



SPD



NPD

(mm)

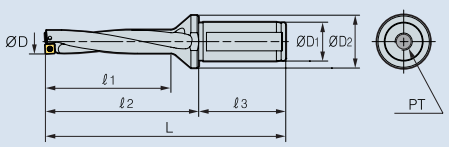
Designation		Stock	ø D	ø D_1	ø D_2	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
SPD	160-25-5	○	16	25	34	80	99	56	155	PT1/8	SPM(E)T 060204-□□	FTKA02206S	TW07S
	165-25-5		16. 5	25	34	82.5	99	56	155	PT1/8			
	170-25-5	○	17	25	34	85	104	56	160	PT1/8			
	175-25-5		17.5	25	34	87.5	104	56	160	PT1/8			
	180-25-5	○	18	25	34	90	110	56	166	PT1/8			
	185-25-5		18.5	25	34	92.5	110	56	166	PT1/8			
	190-25-5	○	19	25	34	95	115	56	171	PT1/8			
	195-25-5		19.5	25	34	97.5	115	56	171	PT1/8			
	200-25-5	○	20	25	34	100	122	56	178	PT1/8	SPM(E)T 070204-□□	FTKA02565	TW07S
	205-25-5		20.5	25	34	102.5	122	56	178	PT1/8			
	210-25-5	○	21	25	34	105	127	56	183	PT1/8			
	215-25-5		21.5	25	34	107.5	127	56	183	PT1/8			
	220-25-5	○	22	25	34	110	132	56	188	PT1/8			
	225-25-5		22.5	25	34	112.5	132	56	188	PT1/8			
NPD	230-32-5	○	23	32	44	115	139	60	199	PT1/4	NPM(E)T 222408-□□	FTKA02206S	TW07S
	235-32-5		23.5	32	44	117.5	139	60	199	PT1/4			
	240-32-5	○	24	32	44	120	144	60	204	PT1/4			
	245-32-5		24.5	32	44	122.5	144	60	204	PT1/4			
	250-32-5	○	25	32	44	125	150	60	210	PT1/4	NPM(E)T 252808-□□	FTKA0307	TW09S
	255-32-5		25.5	32	44	127.5	150	60	210	PT1/4			
	260-32-5	○	26	32	44	130	155	60	215	PT1/4			
	265-32-5		26.5	32	44	132.5	155	60	215	PT1/4			
	270-32-5	○	27	32	44	135	161	60	221	PT1/4			
	275-32-5		27.5	32	44	137.5	161	60	221	PT1/4			
	280-32-5	○	28	32	44	140	167	60	227	PT1/4			
	285-32-5		28.5	32	44	142.5	167	60	227	PT1/4			
	290-32-5	○	29	32	44	145	172	60	232	PT1/4	NPM(E)T 293208-□□	FTKA0307	TW09S
	295-32-5		29.5	32	44	147.5	172	60	232	PT1/4			
	300-32-5	○	30	32	44	150	179	60	239	PT1/4			
	305-32-5		30.5	32	44	152.5	179	60	239	PT1/4			
	310-32-5	○	31	32	44	155	184	60	244	PT1/4			
	315-32-5		31.5	32	44	157.5	184	60	244	PT1/4			
	320-32-5	○	32	32	44	160	189	60	249	PT1/4			
	325-32-5		32.5	32	44	162.5	189	60	249	PT1/4			
	330-40-5	○	33	40	48	165	197	70	267	PT3/8	NPM(E)T 334008-□□	FTKA03508	TW15S
	335-40-5		33.5	40	48	167.5	197	70	267	PT3/8			
	340-40-5	○	34	40	48	170	202	70	272	PT3/8			
	345-40-5		34.5	40	48	172.5	202	70	272	PT3/8			
	350-40-5	○	35	40	48	175	207	70	277	PT3/8			
	355-40-5		35.5	40	48	177.5	207	70	277	PT3/8			
	360-40-5	○	36	40	48	180	213	70	283	PT3/8			
	365-40-5		36.5	40	48	182.5	213	70	283	PT3/8			
	370-40-5		37	40	48	185	218	70	288	PT3/8			
	375-40-5		37.5	40	48	187.5	218	70	288	PT3/8			
	380-40-5		38	40	48	190	224	70	294	PT3/8			
	385-40-5		38.5	40	48	192.5	224	70	294	PT3/8			
	390-40-5		39	40	48	195	229	70	299	PT3/8			
	395-40-5		39.5	40	48	197.5	229	70	299	PT3/8			
	400-40-5	○	40	40	48	200	235	70	305	PT3/8			
	405-40-5		40.5	40	48	202.5	235	70	305	PT3/8			
	410-40-5		41	40	58	205	242	70	312	PT3/8	NPM(E)T 415008-□□	FTKA0410	TW15S
	415-40-5		41.5	40	58	207.5	242	70	312	PT3/8			
	420-40-5		42	40	58	210	248	70	318	PT3/8			
	425-40-5		42.5	40	58	212.5	248	70	318	PT3/8			
	430-40-5		43	40	58	215	253	70	323	PT3/8			
	435-40-5		43.5	40	58	215.5	253	70	323	PT3/8			
	440-40-5		44	40	58	220	258	70	328	PT3/8			
	445-40-5		44.5	40	58	222.5	258	70	328	PT3/8			
	450-40-5	○	45	40	58	225	264	70	334	PT3/8			
	455-40-5		45.5	40	58	227.5	264	70	334	PT3/8			

• Applicable inserts, see pages G08

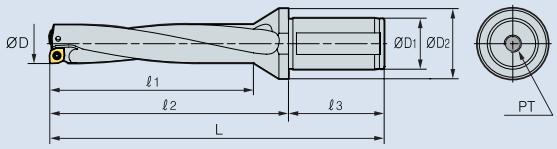
● : Stock item ○ : Under preparing for stock

SPD, NPD - 5D

New



SPD



NPD

(mm)

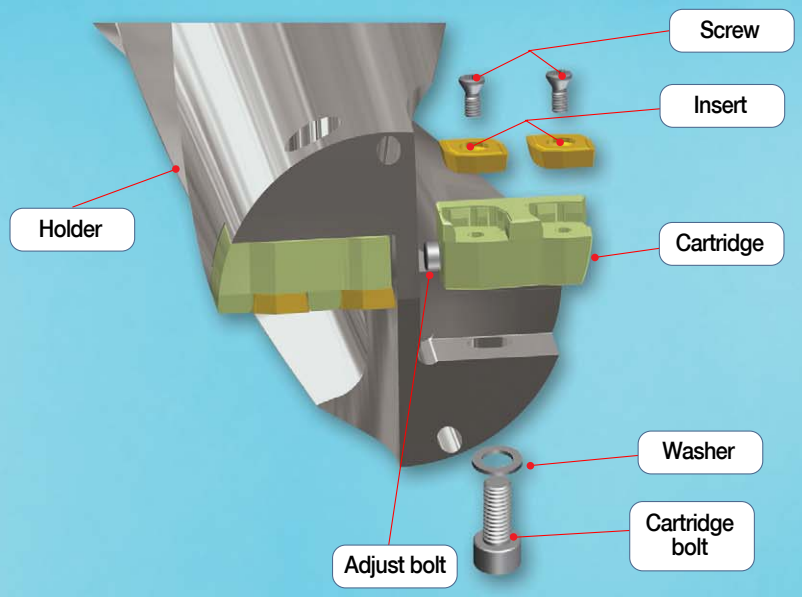
Designation		Stock	ø D	ø D_1	ø D_2	ℓ_1	ℓ_2	ℓ_3	L	PT	Parts: Inserts	Screw	Wrench
NPD	460-40-5		46	40	58	230	269	70	339	PT3/8	NPM(E)T 415008-□□	FTKA0410	TW15S
	465-40-5		46.5	40	58	232.5	269	70	339	PT3/8			
	470-40-5		47	40	58	235	275	70	345	PT3/8			
	475-40-5		47.5	40	58	237.5	275	70	345	PT3/8			
	480-40-5		48	40	58	240	282	70	352	PT3/8			
	485-40-5		48.5	40	58	242.5	282	70	352	PT3/8			
	490-40-5		49	40	58	245	287	70	357	PT3/8			
	495-40-5		49.5	40	58	247.5	287	70	357	PT3/8			
	500-40-5	○	50	40	58	200	292	70	362	PT3/8			
	505-40-5		50.5	40	58	202.5	292	70	362	PT3/8			
	510-40-5		51	40	68	255	301	70	371	PT3/8	NPM(E)T 516012-□□	FTNC04511	TW20S
	515-40-5		51.5	40	68	257.5	301	70	371	PT3/8			
	520-40-5		52	40	68	260	306	70	376	PT3/8			
	525-40-5		52.5	40	68	262.5	306	70	376	PT3/8			
	530-40-5		53	40	68	265	311	70	381	PT3/8			
	535-40-5		53.5	40	68	265.5	311	70	381	PT3/8			
	540-40-5		54	40	68	270	316	70	386	PT3/8			
	545-40-5		54.5	40	68	272.5	316	70	386	PT3/8			
	550-40-5	○	55	40	68	275	321	70	391	PT3/8			
	555-40-5		55.5	40	68	277.5	321	70	391	PT3/8			
	560-40-5		56	40	68	280	328	70	398	PT3/8			
	565-40-5		56.5	40	68	282.5	328	70	398	PT3/8			
	570-40-5		57	40	68	285	334	70	404	PT3/8			
	575-40-5		57.5	40	68	287.5	334	70	404	PT3/8			
	580-40-5		58	40	68	290	340	70	410	PT3/8			
	585-40-5		58.5	40	68	292.5	340	70	410	PT3/8			
	590-40-5		59	40	68	295	346	70	416	PT3/8			
	595-40-5		59.5	40	68	297.5	346	70	416	PT3/8			
	600-40-5	○	60	40	68	240	352	70	422	PT3/8			
	605-40-5		60.5	40	68	242.5	352	70	422	PT3/8			

• Applicable inserts, see pages **G08**

● : Stock item ○ : Under preparing for stock

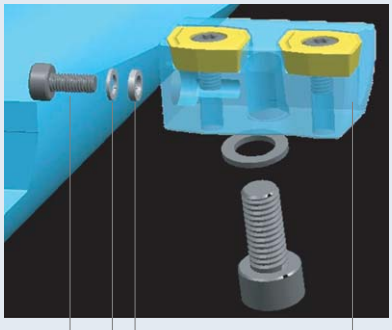
NPD Cartridge System

■ Features



- Using big hole drilling Ø 61mm ~Ø 100mm.
- Indexable cartridge & insert are able to pursue the economy and convenience of customer.
- Drill diameter can be extended up to 5mm by adjusting outer cartridge.
- An adjust bolt makes handling easy for extension of drill diameter.
- Excellent chip control guarantees good cutting performance in deep hole drilling.
- Various chip breakers & grades are available for variety of application.

Adjustment of drill diameter

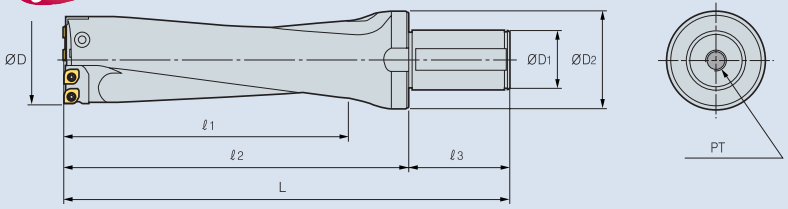


Extension of drill diameter (mm)	Washer	
	Designation	Thickness(mm)
1	WA0305	0.5
2	WA0310	1.0
3	WA0305 + WA0310	1.5
4	WA0310 × 2	2.0
5	WA0305 + WA0310 × 2	2.5

※ Drill diameter can be extended up to 5mm from adjusting of washer.

NPD Cartridge Type

New



(mm)

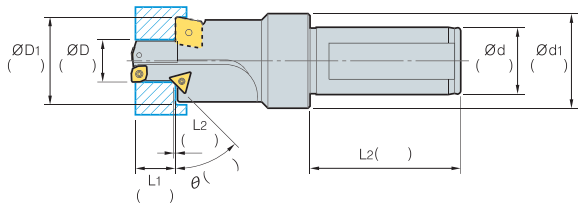
Designation		Stock	Ø D	Ø D_1	Ø D_2	ℓ 1	ℓ 2	ℓ 3	L	PT	Cartridge		Screw	Wrench
											Inner	Outer		
NPD	6165-50-3	○	61~65	50	80	195	240	85	325	PT3/8	NPC6165C	NPC6165P	FTKA0307	TW09S
	6570-50-3	○	65~70	50	88	210	255	85	340		NPC6570C	NPC6570P	FTKA03508	TW15S
	7075-50-3	○	70~75	50	88	225	270	85	355		NPC7075C	NPC7075P	FTKA03508	TW15S
	7580-50-3	○	75~80	50	88	240	285	85	370		NPC7580C	NPC7580P	FTKA03508	TW15S
	8085-50-3	○	80~85	50	88	255	300	85	385		NPC8085C	NPC8085P	FTKA0410	TW15S
	8590-50-3	○	85~90	50	95	270	315	85	400		NPC8590C	NPC8590P	FTKA0410	TW15S
	9095-50-3	○	90~95	50	95	285	330	85	415		NPC9095C	NPC9095P	FTKA0410	TW15S
	95100-50-3	○	95~100	50	95	300	345	85	430		NPC95100C	NPC95100P	FTNC04511	TW20S
	6165-50-4	○	61~65	50	80	260	305	85	390	PT3/8	NPC6165C	NPC6165P	FTKA0307	TW09S
	6570-50-4	○	65~70	50	88	280	325	85	410		NPC6570C	NPC6570P	FTKA03508	TW15S
	7075-50-4	○	70~75	50	88	300	345	85	430		NPC7075C	NPC7075P	FTKA03508	TW15S
	7580-50-4	○	75~80	50	88	320	365	85	450		NPC7580C	NPC7580P	FTKA03508	TW15S
	8085-50-4	○	80~85	50	88	340	385	85	470		NPC8085C	NPC8085P	FTKA0410	TW15S
	8590-50-4	○	85~90	50	95	360	405	85	490		NPC8590C	NPC8590P	FTKA0410	TW15S
	9095-50-4	○	90~95	50	95	380	425	85	510		NPC9095C	NPC9095P	FTKA0410	TW15S
	95100-50-4	○	95~100	50	95	400	445	85	530		NPC95100C	NPC95100P	FTNC04511	TW20S

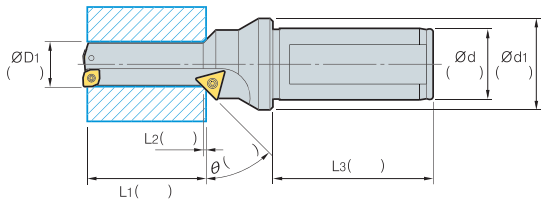
● : Stock item ○ : Under preparing for stock

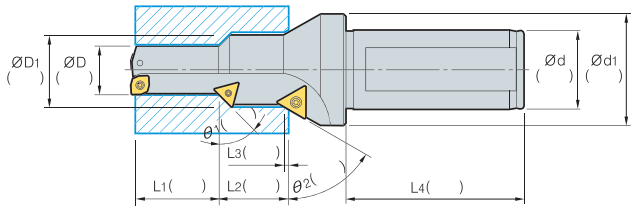
Cartridge		Drill diameter (Ø D)	Applicable inserts	No. of tooth	Screw	Wrench
Inner	Outer					
NPC6165C	NPC6165P	61~65	NPM(E)T 293208-□□	2	FTKA0307	TW09S
NPC6570C	NPC6570P	65~70	NPM(E)T 334008-□□	2	FTKA03508	TW15S
NPC7075C	NPC7075P	70~75	NPM(E)T 334008-□□	2	FTKA03508	TW15S
NPC7580C	NPC7580P	75~80	NPM(E)T 334008-□□	2	FTKA03508	TW15S
NPC8085C	NPC8085P	80~85	NPM(E)T 415008-□□	2	FTKA0410	TW15S
NPC8590C	NPC8590P	85~90	NPM(E)T 415008-□□	2	FTKA0410	TW15S
NPC9095C	NPC9095P	90~95	NPM(E)T 415008-□□	2	FTKA0410	TW15S
NPC95100C	NPC95100P	95~100	NPM(E)T 516012-□□	2	FTNC04511	TW20S

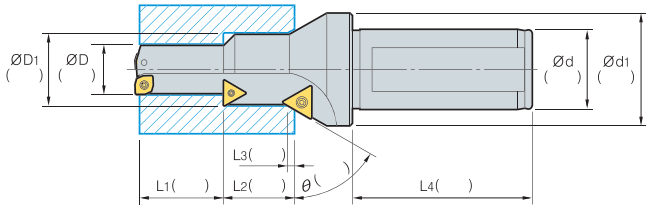
• Applicable inserts, see pages G08

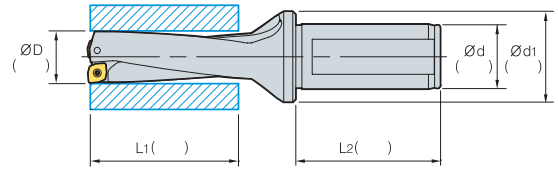
Special Indexable Drills Order Form

☐ 

☐ 

☐ 

☐ 

☐ 

※ Please fill out the requirement of tolerance for Ø D, Ø D1

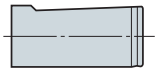
■ Coolant

- ☐ Through coolant
- ☐ Outer coolant(no oil hole)
- ☐ Side coolant(CNC)

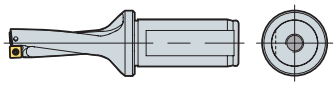
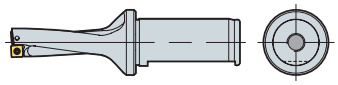
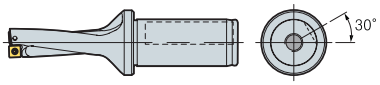
■ Machining type

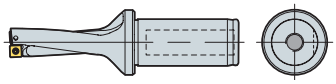
- ☐ Blind hole
- ☐ Through hole

■ Shank type

- ☐ F : Flat Type
- ☐ W : Weldon Type
- ☐  T : Whistle Notch Type

■ Position of side lock flat

- ☐ General - Parallel with outer cutting edge line 
- ☐ 90˚ with outer cutting edge line 
- ☐ 150˚ with outer cutting edge line 

- ☐ 180˚ with outer cutting edge line 

■ Note

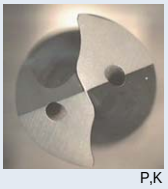
- ☐ Present tool
- ☐ Cutting condition
  n(rpm) vc(m/min) :
  vf(mm/min) fn(mm/rev) :
  Depth(mm) :
- ☐ Tool life
- ☐ Facilities
  - Machining center
  - General lathe
  - CNC lathe

Technical Information For Mach Drills

■ Features Ⅰ

- **Optimally designed chip pocket**
  Wide and deep chip pocket improve chip control to minimize friction during an operation.
- **A curvilinear edge**
  A curvilinear edge offers excellent wear resistance and shock resistance by dispersing the cutting load.
- **Ultra micro grain substrate with new TiAlN**
  The 0.6㎛ size of tungsten carbide grain enhances toughness and wear resistance.
  New K-black film guarantees excellent impact resistance.
- **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 self-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


P,K

K : Cast iron New
Die casting, Ductile cast iron
Coolant system : Through / Outer(MQL)

M : Stainless steel New
Reduced built-up edge and cutting resistance
Coolant system : Through / Outer(MQL)

M

N : Aluminum(Carbide drills) New
Medium & Low speed cutting performance
Coolant system : Through / Outer(MQL)

ND : Non-ferrous metal New
High speed, High efficiency performance
Improved welding resistance due to applied DLC coating
Coolant system : Through / Outer(MQL)

ND

■ Specification line-up

- **Line-up as per aspect ratio** (L : Overall length, D : Tool diameter)

MSD□□□-7P
MSD□□□-5P
MSD□□□-3P
· P:Steel

Line-up as per aspect ratio (Mach Drills : Ø 2.5mm~Ø 20mm)
Various choices as per aspect ratio (3D,5D,7D)
• For example) Solid, Ø10.2mm, 50mm
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 steel, Alloy steel, Stainless steel, Cast iron
K : Cast iron, Aluminum
M : Stainless steel
N : Aluminum, Brass
ND : Non-ferrous metal

Code system for special item

MSD(H) 101 - K ∗ 60 - 100L ∗ 11S
ⓐ ⓑ ⓒ ⓓ ⓔ ⓕ

ⓐ Solid type : MSD, Through coolant type : MSDH
ⓑ Tool diameter : Ø10.1
ⓒ Applications : P(Steel), K(Cast iron), M(Stainless steel), N(Aluminum), ND(Aluminum)
ⓓ Flute length : 60mm
ⓔ Overall length : 100mm
ⓕ Shank diameter : Ø11.0

■ Features Ⅱ

- **Low cutting resistance edge**

Uniformity in cutting edge treatment :
Reinforces equalized 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.

■ Recommended cutting condition

● Mach Drill : Solid Type [MSD○○○-□P,M,K)

Workpiece \ Tool diameter		Ø 2.5 ~ Ø 5.0		Ø 5.1~ Ø 8.0		Ø 8.1~ Ø 10.0		Ø 10.1~ Ø 12.0		Ø 12.1~ Ø 14.0		Ø 14.1~ Ø 20.0	
		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 diameter		vc(m/min)	Ø 2.5~ Ø 4.0	Ø 4.1~ Ø 8.0	Ø 8.1~ Ø 12.0	Ø 12.1~ Ø 16.0	Ø 16.1~ Ø 20.0
			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/㎠, volume = 2~5ℓ /min
6. Cutting formula : $vc = \frac{\pi x D x n}{1000}$ (m/min) $fn = \frac{vf}{n}$ (mm/rev) $\left[n = \frac{vc x 1000}{\pi x D} (min^{-1}), vf = fn \times n (mm/min) \right]$

●Mach Drills : Through coolant type [MSD(H)○○○-□N) cemented carbide

Workpiece \ Tool diameter		Ø 2.5~ Ø 4.0		Ø 5.1~ Ø 10.0		Ø 10.1~ Ø 16.0		Ø 16.1~ Ø 20.0	
		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

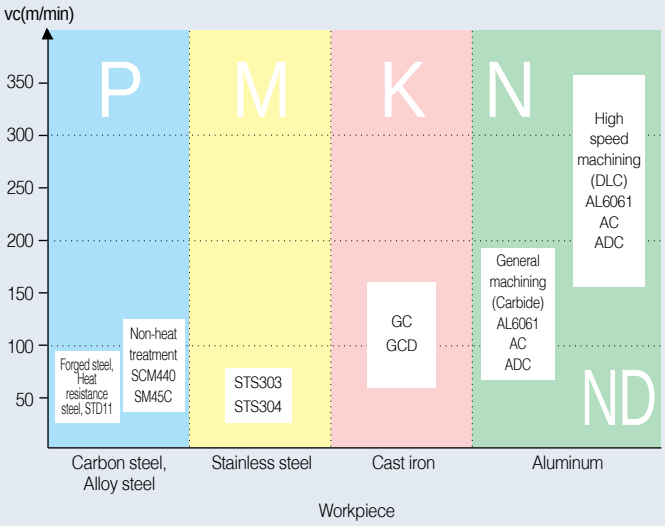
●Mach Drills : Through coolant type [MSDH○○○-□ND) DLC coated

Workpiece \ Tool diameter		Ø 2.5~ Ø 4.0		Ø 5.1~Ø 10.0		Ø 10.1~Ø 16.0		Ø 16.1~Ø 20.0	
		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.

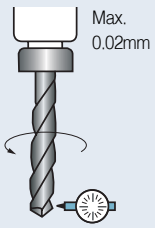
Technical Information for Mach long Drills

■ Recommended cutting condition by series

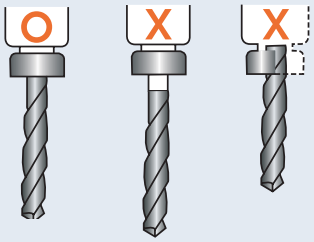


■ Setting of drills

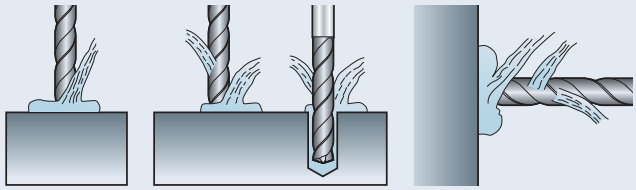
●Outer tolerance



●Setting condition

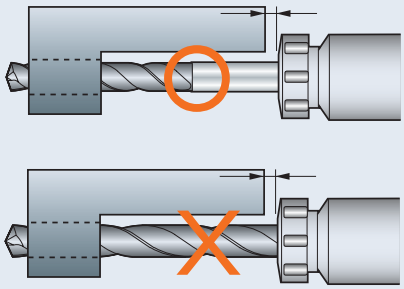


● Coolant (External system)

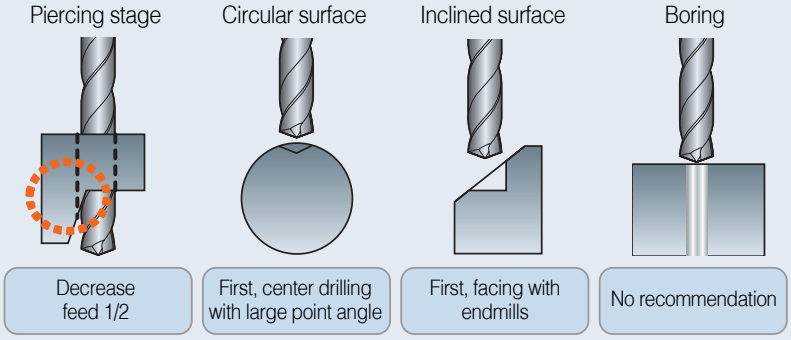


■ To improve machining method

● Machining for strength of wheel



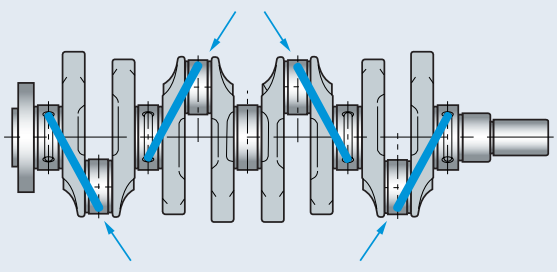
● Improvement of drilling



Features of MLD

- Over 20D deep hole drlling 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 makes to get rid of bending of drill when entering operation.
- The lubrication & thermal resistance of coating has been increased by adopting new TiAlN.
- The post treatment of our own technology has increased to chip evacuation.
- To get the best cutting performance, we encourage using MQL system.
- Guarantee tool life & cutting performance by efficient process management.

■ Mach Long Drills - Deep hole drilling



Application example (Oil hole for crank shaft, 20D)

● Mach Long Drills are ideal for.....

- deep and inclined hole drilling of crank shaft
- deep hole drilling of cam shaft
- eep hole drilling of mold and machinery
  → Deep hole drilling aspect ratio over 15D

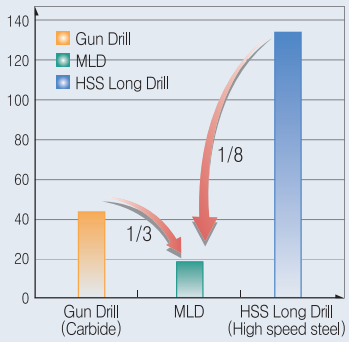
● Advantages of MLD

- 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.

● MLD productivity : MLD0680-20A (Ø 6.8㎜ 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



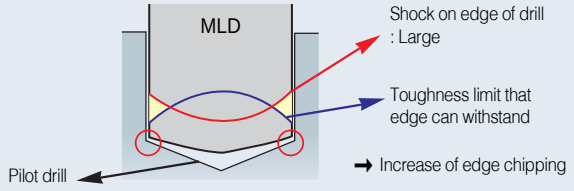
Advantages of MLD against conventional drills

- Shorting 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

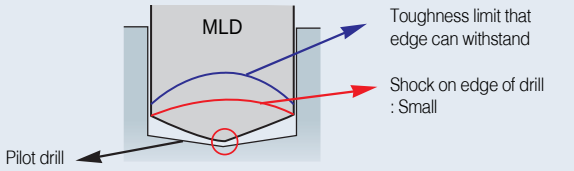
● Relationship of point angle between MLD & MLDP

• Unstable condition



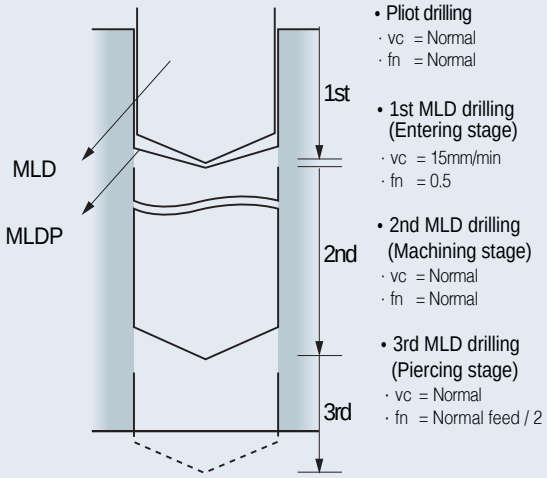
<Small point angle of Pliot Drill : Unstable condition>

• Stable condition



<Large point angle of Pliot Drill : Stable condition>

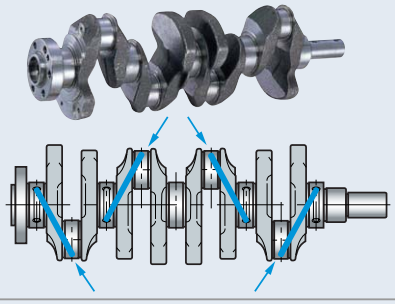
● To make the optimal of MLD



■ Application example 1)

●Workpiece : Part of automobile (SCM440, HB255~330)

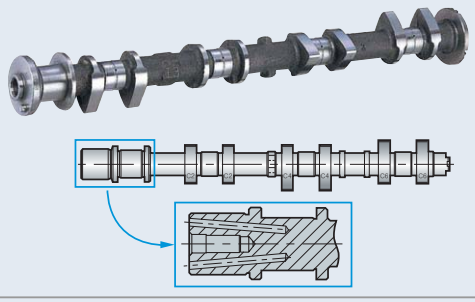
- Machine : Horizontal milling machine
- Coolant : MQL (30cc/h) / Air : 0.7MPa
- Designation : MLD0600-22A (Ø6mm, Aspect ratio 18D)
- Cutting condition vc : 70m/min fn : 0.18mm/rev
- Tool life : 1000 holes, 105m



■ Application example 2)

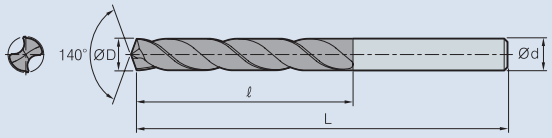
●Workpiece : Part of automobile (GC250)

- Machine : Rotary milling machine
- Coolant : Oil (3Kg/㎠, 2ℓ /min)
- Designation : MLD0400-25A (Ø4mm, Aspect ratio 16D)
- Cutting condition vc : 63m/min fn : 0.1mm/rev
- Tool life : 4400 holes, 207m

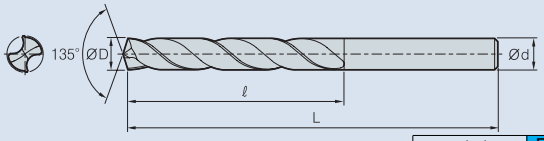


MSD-P,M,K,N

Mach Solid Drill for Drilling



• MSD - P, M, K (Coated)



• MSD - N (Uncoated)

Terminology	P	M	K	N
Coating	TiAlN			Cemented carbide
Point angle	140°			135°
Twist angle	30°			
Coolant	External system			
Tolerance (drill diameter)	h7			
Tolerance (shank diameter)	h6			
Thinning	X type			

● Steel ● Stainless steel ● Cast iron ● Non-ferrous metal

• MSD-□P,M,K,N Ø 2.5 ~Ø 6.8mm (mm)

Designation	ø D	ø d	3P,M,K,N			5P,M,K,N			7P,M,K,N		
			Stock	ℓ	L	Stock	ℓ	L	Stock	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

● : Stock item ○ : Under preparing for stock

• MSD-□P,M,K,N Ø 6.9 ~ Ø 11.2mm (mm)

Designation	ø D	ø d	3P,M,K,N			5P,M,K,N			7P,M,K,N		
			Stock	ℓ	L	Stock	ℓ	L	Stock	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

● : Stock item ○ : Under preparing for stock

▶ Note) Marked stock item is produced for steel(P) drilling

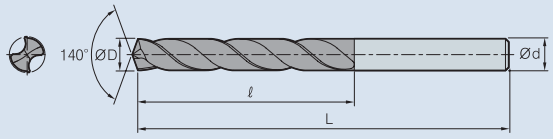
∗ Order made items : MSD○○○-Material (P,M,K,N) ∗ Flute length-Total length L ∗ Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P∗60-80L∗11S

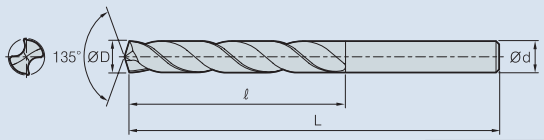
Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012-M∗60-80L∗11S

MSD-P,M,K,N

Mach Solid Drill for Drilling



• MSD - P, M, K (Coated)



• MSD - N (Uncoated)

Terminology	P M K	N
Coating	TiAlN	Cemented carbide
Point angle	140°	135°
Twist angle	30°	
Coolant	External system	
Tolerance (drill diameter)	h7	
Tolerance (shank diameter)	h6	
Thinning	X type	

● Steel ● Stainless steel ● Cast iron ● Non-ferrous metal

• MSD-□P,M,K,N Ø 11.3 ~ Ø 15.6mm (mm)

Designation		ø D	ø d	3P,M,K,N			5P,M,K,N			7P,M,K,N		
				Stock	ℓ	L	Stock	ℓ	L	Stock	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

● : Stock item ○ : Under preparing for stock

• MSD-□P,M,K,N Ø 15.7 ~ Ø 20.0mm (mm)

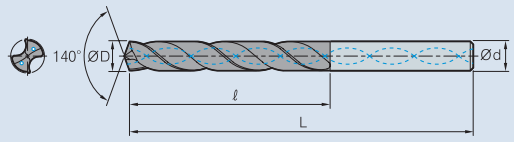
Designation		ø D	ø d	3P,M,K,N			5P,M,K,N			7P,M,K,N		
				Stock	ℓ	L	Stock	ℓ	L	Stock	ℓ	L
MSD	157-□P,M,K,N	15.7	16.0		80	146		112	178		144	210
	158-□P,M,K,N	15.8	16.0		80	146		112	178		144	210
	159-□P,M,K,N	15.9	16.0		80	146		112	178		144	210
	160-□P,M,K,N	16.0	16.0		80	146		112	178		144	210
	161-□P,M,K,N	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

● : Stock item ○ : Under preparing for stock

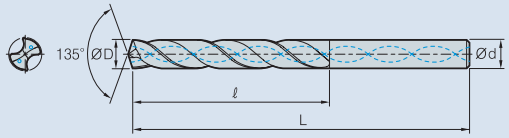
▶ Note) Marked stock item is produced for steel(P) drilling

MSDH-P,M,K,N,ND

Mach Solid Drills with Oil Hole Drilling



• MSDH - P, M, K, ND (Coated)



• MSDH - N (Uncoated)

Terminology	P	M	K	N	ND
Coating	TiAlN			Cemented carbide	DLC
Point angle	140°			135°	140°
Twist angle	30°				
Coolant	Through system				
Tolerance (drill diameter)	h7				
Tolerance (shank diameter)	h6				
Thinning	X type				N type

● Steel ● Stainless steel ● Cast iron ● Non-ferrous metal ● Aluminum alloy

• MSDH-□P,M,K,N,ND Ø 2.5 ~ Ø 6.8mm (mm)

Designation	ø D	ø d	3P,M,K,N,ND			5P,M,K,N,ND			7P,M,K,N,ND		
			Stock	ℓ	L	Stock	ℓ	L	Stock	ℓ	L
MSDH 025-□P,M,K,N,ND	2.5	3.0		20	65		25	70		30	75
026-□P,M,K,N,ND	2.6	3.0		20	65		25	70		30	75
027-□P,M,K,N,ND	2.7	3.0		20	65		25	70		30	75
028-□P,M,K,N,ND	2.8	3.0		20	65		25	70		30	75
029-□P,M,K,N,ND	2.9	3.0		20	65		25	70		30	75
030-□P,M,K,N,ND	3.0	3.0		20	65		25	70		30	75
031-□P,M,K,N,ND	3.1	4.0		25	71		34	80		40	86
032-□P,M,K,N,ND	3.2	4.0		25	71		34	80		40	86
033-□P,M,K,N,ND	3.3	4.0		25	71		34	80		40	86
034-□P,M,K,N,ND	3.4	4.0		25	71		34	80		40	86
035-□P,M,K,N,ND	3.5	4.0		25	71		34	80		40	86
036-□P,M,K,N,ND	3.6	4.0		25	71		34	80		40	86
037-□P,M,K,N,ND	3.7	4.0		25	71		34	80		40	86
038-□P,M,K,N,ND	3.8	4.0		25	71		34	80		40	86
039-□P,M,K,N,ND	3.9	4.0		25	71		34	80		40	86
040-□P,M,K,N,ND	4.0	4.0		25	71		34	80		40	86
041-□P,M,K,N,ND	4.1	5.0		30	77		43	90		50	97
042-□P,M,K,N,ND	4.2	5.0		30	77		43	90		50	97
043-□P,M,K,N,ND	4.3	5.0		30	77		43	90		50	97
044-□P,M,K,N,ND	4.4	5.0		30	77		43	90		50	97
045-□P,M,K,N,ND	4.5	5.0		30	77		43	90		50	97
046-□P,M,K,N,ND	4.6	5.0		30	77		43	90		50	97
047-□P,M,K,N,ND	4.7	5.0		30	77		43	90		50	97
048-□P,M,K,N,ND	4.8	5.0		30	77		43	90		50	97
049-□P,M,K,N,ND	4.9	5.0		30	77		43	90		50	97
050-□P,M,K,N,ND	5.0	5.0		30	77	○	43	90		50	97
051-□P,M,K,N,ND	5.1	6.0		35	81		48	96		60	108
052-□P,M,K,N,ND	5.2	6.0		35	81		48	96		60	108
053-□P,M,K,N,ND	5.3	6.0		35	81		48	96		60	108
054-□P,M,K,N,ND	5.4	6.0		35	81		48	96		60	108
055-□P,M,K,N,ND	5.5	6.0		35	81	○	48	96		60	108
056-□P,M,K,N,ND	5.6	6.0		35	81		48	96		60	108
057-□P,M,K,N,ND	5.7	6.0		35	81		48	96		60	108
058-□P,M,K,N,ND	5.8	6.0		35	81	○	48	96		60	108
059-□P,M,K,N,ND	5.9	6.0		35	81	○	48	96		60	108
060-□P,M,K,N,ND	6.0	6.0		35	81		48	96		60	108
061-□P,M,K,N,ND	6.1	7.0		40	84	●	56	105		70	120
062-□P,M,K,N,ND	6.2	7.0		40	84	●	56	105		70	120
063-□P,M,K,N,ND	6.3	7.0		40	84	●	56	105		70	120
064-□P,M,K,N,ND	6.4	7.0		40	84	●	56	105		70	120
065-□P,M,K,N,ND	6.5	7.0		40	84	●	56	105		70	120
066-□P,M,K,N,ND	6.6	7.0		40	84	●	56	105		70	120
067-□P,M,K,N,ND	6.7	7.0		40	84	●	56	105		70	120
068-□P,M,K,N,ND	6.8	7.0		40	84	●	56	105		70	120

● : Stock item ○ : Under preparing for stock

• MSDH-□P,M,K,N,ND Ø 6.9 ~ Ø 11.2mm (mm)

Designation	ø D	ø d	3P,M,K,N,ND			5P,M,K,N,ND			7P,M,K,N,ND		
			Stock	ℓ	L	Stock	ℓ	L	Stock	ℓ	L
MSDH 069-□P,M,K,N,ND	6.9	7.0		40	84	●	56	105		70	120
070-□P,M,K,N,ND	7.0	7.0		40	84	●	56	105		70	120
071-□P,M,K,N,ND	7.1	8.0		45	90	●	60	105		80	120
072-□P,M,K,N,ND	7.2	8.0		45	90	●	60	110		80	130
073-□P,M,K,N,ND	7.3	8.0		45	90	●	60	110		80	130
074-□P,M,K,N,ND	7.4	8.0		45	90	●	60	110		80	130
075-□P,M,K,N,ND	7.5	8.0		45	90	●	60	110		80	130
076-□P,M,K,N,ND	7.6	8.0		45	90	●	60	110		80	130
077-□P,M,K,N,ND	7.7	8.0		45	90	●	60	110		80	130
078-□P,M,K,N,ND	7.8	8.0		45	90	●	60	110		80	130
079-□P,M,K,N,ND	7.9	8.0		45	90	●	60	110		80	130
080-□P,M,K,N,ND	8.0	8.0		45	90	●	60	110		80	130
081-□P,M,K,N,ND	8.1	9.0		48	97	●	72	125		90	143
082-□P,M,K,N,ND	8.2	9.0		48	97	●	72	125		90	143
083-□P,M,K,N,ND	8.3	9.0		48	97	●	72	125		90	143
084-□P,M,K,N,ND	8.4	9.0		48	97	●	72	125		90	143
085-□P,M,K,N,ND	8.5	9.0		48	97	●	72	125		90	143
086-□P,M,K,N,ND	8.6	9.0		48	97	●	72	125		90	143
087-□P,M,K,N,ND	8.7	9.0		48	97	●	72	125		90	143
088-□P,M,K,N,ND	8.8	9.0		48	97	●	72	125		90	143
089-□P,M,K,N,ND	8.9	9.0		48	97	●	72	125		90	143
090-□P,M,K,N,ND	9.0	9.0		48	97	●	72	125		90	143
091-□P,M,K,N,ND	9.1	10.0		52	106	●	75	129		95	150
092-□P,M,K,N,ND	9.2	10.0		52	106	●	75	129		95	150
093-□P,M,K,N,ND	9.3	10.0		52	106	●	75	129		95	150
094-□P,M,K,N,ND	9.4	10.0		52	106	●	75	129		95	150
095-□P,M,K,N,ND	9.5	10.0		52	106	●	75	129		95	150
096-□P,M,K,N,ND	9.6	10.0		52	106	●	75	129		95	150
097-□P,M,K,N,ND	9.7	10.0		52	106	●	75	129		95	150
098-□P,M,K,N,ND	9.8	10.0		52	106	●	75	129		95	150
099-□P,M,K,N,ND	9.9	10.0		52	106	●	75	129		95	150
100-□P,M,K,N,ND	10.0	10.0		52	106	●	75	129		95	150
101-□P,M,K,N,ND	10.1	11.0		56	111	●	83	140		105	160
102-□P,M,K,N,ND	10.2	11.0		56	111	●	83	140		105	160
103-□P,M,K,N,ND	10.3	11.0		56	111	●	83	140		105	160
104-□P,M,K,N,ND	10.4	11.0		56	111	●	83	140		105	160
105-□P,M,K,N,ND	10.5	11.0		56	111	●	83	140		105	160
106-□P,M,K,N,ND	10.6	11.0		56	111	●	83	140		105	160
107-□P,M,K,N,ND	10.7	11.0		56	111	●	83	140		105	160
108-□P,M,K,N,ND	10.8	11.0		56	111	●	83	140		105	160
109-□P,M,K,N,ND	10.9	11.0		56	111	●	83	140		105	160
110-□P,M,K,N,ND	11.0	11.0		56	111	●	83	140		105	160
111-□P,M,K,N,ND	11.1	12.0		60	118	●	90	148		114	172
112-□P,M,K,N,ND	11.2	12.0		60	118	●	90	148		114	172

● : Stock item ○ : Under preparing for stock

▶ Note) Marked stock item is produced for steel(P) drilling

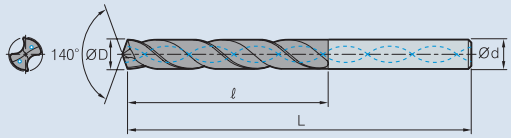
∗ Order made items : MSDH○○○-Material (P,M,K,N,ND) ∗ Flute length-Total length L ∗ Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH101-P∗60-80L∗11S

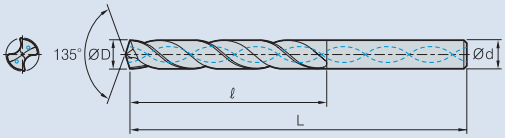
Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSDH1012-M∗60-80L∗11S

MSDH-P,M,K,N,ND

Mach Solid Drills with Oil Hole Drilling



• MSDH - P, M, K, ND (Coated)



• MSDH - N (Uncoated)

Terminology	P	M	K	N	ND
Coating	TiAlN			Cemented carbide	DLC
Point angle	140°			135°	140°
Twist angle	30°				
Coolant	Through system				
Tolerance (drill diameter)	h7				
Tolerance (shank diameter)	h6				
Thinning	X type				N type

● Steel ● Stainless steel ● Cast iron ● Non-ferrous metal ● Aluminum alloy

• MSDH-☐P,M,K,N,ND Ø 11.3 ~ Ø 15.6mm (mm)

Designation	ø D	ø d	3P,M,K,N,ND			5P,M,K,N,ND			7P,M,K,N,ND		
			Stock	ℓ	L	Stock	ℓ	L	Stock	ℓ	L
MSDH 113-☐P,M,K,N,ND	11.3	12.0		60	118	●	90	148		114	172
114-☐P,M,K,N,ND	11.4	12.0		60	118	●	90	148		114	172
115-☐P,M,K,N,ND	11.5	12.0		60	118	●	90	148		114	172
116-☐P,M,K,N,ND	11.6	12.0		60	118	●	90	148		114	172
117-☐P,M,K,N,ND	11.7	12.0		60	118	●	90	148		114	172
118-☐P,M,K,N,ND	11.8	12.0		60	118	●	90	148		114	172
119-☐P,M,K,N,ND	11.9	12.0		60	118	●	90	148		114	172
120-☐P,M,K,N,ND	12.0	12.0		60	118	●	90	148		114	172
121-☐P,M,K,N,ND	12.1	13.0		65	125	●	98	158		124	184
122-☐P,M,K,N,ND	12.2	13.0		65	125	●	98	158		124	184
123-☐P,M,K,N,ND	12.3	13.0		65	125	●	98	158		124	184
124-☐P,M,K,N,ND	12.4	13.0		65	125	●	98	158		124	184
125-☐P,M,K,N,ND	12.5	13.0		65	125	●	98	158		124	184
126-☐P,M,K,N,ND	12.6	13.0		65	125	●	98	158		124	184
127-☐P,M,K,N,ND	12.7	13.0		65	125	●	98	158		124	184
128-☐P,M,K,N,ND	12.8	13.0		65	125	●	98	158		124	184
129-☐P,M,K,N,ND	12.9	13.0		65	125	●	98	158		124	184
130-☐P,M,K,N,ND	13.0	13.0		65	125	●	98	158		124	184
131-☐P,M,K,N,ND	13.1	14.0		70	132		105	167		133	195
132-☐P,M,K,N,ND	13.2	14.0		70	132		105	167		133	195
133-☐P,M,K,N,ND	13.3	14.0		70	132		105	167		133	195
134-☐P,M,K,N,ND	13.4	14.0		70	132		105	167		133	195
135-☐P,M,K,N,ND	13.5	14.0		70	132		105	167		133	195
136-☐P,M,K,N,ND	13.6	14.0		70	132		105	167		133	195
137-☐P,M,K,N,ND	13.7	14.0		70	132		105	167		133	195
138-☐P,M,K,N,ND	13.8	14.0		70	132		105	167		133	195
139-☐P,M,K,N,ND	13.9	14.0		70	132		105	167		133	195
140-☐P,M,K,N,ND	14.0	14.0		70	132		105	167		133	195
141-☐P,M,K,N,ND	14.1	15.0		75	139		108	172		138	202
142-☐P,M,K,N,ND	14.2	15.0		75	139		108	172		138	202
143-☐P,M,K,N,ND	14.3	15.0		75	139		108	172		138	202
144-☐P,M,K,N,ND	14.4	15.0		75	139		108	172		138	202
145-☐P,M,K,N,ND	14.5	15.0		75	139		108	172		138	202
146-☐P,M,K,N,ND	14.6	15.0		75	139		108	172		138	202
147-☐P,M,K,N,ND	14.7	15.0		75	139		108	172		138	202
148-☐P,M,K,N,ND	14.8	15.0		75	139		108	172		138	202
149-☐P,M,K,N,ND	14.9	15.0		75	139		108	172		138	202
150-☐P,M,K,N,ND	15.0	15.0		75	139		108	172		138	202
151-☐P,M,K,N,ND	15.1	16.0		80	146		112	178		144	210
152-☐P,M,K,N,ND	15.2	16.0		80	146		112	178		144	210
153-☐P,M,K,N,ND	15.3	16.0		80	146		112	178		144	210
154-☐P,M,K,N,ND	15.4	16.0		80	146		112	178		144	210
155-☐P,M,K,N,ND	15.5	16.0		80	146		112	178		144	210
156-☐P,M,K,N,ND	15.6	16.0		80	146		112	178		144	210

● : Stock item ○ : Under preparing for stock

• MSDH-☐P,M,K,N,ND Ø 15.7 ~ Ø 20.0mm (mm)

Designation	ø D	ø d	3P,M,K,N,ND			5P,M,K,N,ND			7P,M,K,N,ND		
			Stock	ℓ	L	Stock	ℓ	L	Stock	ℓ	L
MSDH 157-☐P,M,K,N,ND	15.7	160.		80	146		112	178		144	210
158-☐P,M,K,N,ND	15.8	16.0		80	146		112	178		144	210
159-☐P,M,K,N,ND	15.9	16.0		80	146		112	178		144	210
160-☐P,M,K,N,ND	16.0	16.0		80	146		112	178		144	210
161-☐P,M,K,N,ND	16.1	17.0		85	151		120	186		153	220
162-☐P,M,K,N,ND	16.2	17.0		85	151		120	186		153	220
163-☐P,M,K,N,ND	16.3	17.0		85	151		120	186		153	220
164-☐P,M,K,N,ND	16.4	17.0		85	151		120	186		153	220
165-☐P,M,K,N,ND	16.5	17.0		85	151		120	186		153	220
166-☐P,M,K,N,ND	16.6	17.0		85	151		120	186		153	220
167-☐P,M,K,N,ND	16.7	17.0		85	151		120	186		153	220
168-☐P,M,K,N,ND	16.8	17.0		85	151		120	186		153	220
169-☐P,M,K,N,ND	16.9	17.0		85	151		120	186		153	220
170-☐P,M,K,N,ND	17.0	17.0		85	151		120	186		153	220
171-☐P,M,K,N,ND	17.1	18.0		85	153		120	188		162	230
172-☐P,M,K,N,ND	17.2	18.0		85	153		120	188		162	230
173-☐P,M,K,N,ND	17.3	18.0		85	153		120	188		162	230
174-☐P,M,K,N,ND	17.4	18.0		85	153		120	188		162	230
175-☐P,M,K,N,ND	17.5	18.0		85	153		120	188		162	230
176-☐P,M,K,N,ND	17.6	18.0		85	153		120	188		162	230
177-☐P,M,K,N,ND	17.7	18.0		85	153		120	188		162	230
178-☐P,M,K,N,ND	17.8	18.0		85	153		120	188		162	230
179-☐P,M,K,N,ND	17.9	18.0		85	153		120	188		162	230
180-☐P,M,K,N,ND	18.0	18.0		85	153		120	188		162	230
181-☐P,M,K,N,ND	18.1	19.0		88	157		124	193		171	240
182-☐P,M,K,N,ND	18.2	19.0		88	157		124	193		171	240
183-☐P,M,K,N,ND	18.3	19.0		88	157		124	193		171	240
184-☐P,M,K,N,ND	18.4	19.0		88	157		124	193		171	240
185-☐P,M,K,N,ND	18.5	19.0		88	157		124	193		171	240
186-☐P,M,K,N,ND	18.6	19.0		88	157		124	193		171	240
187-☐P,M,K,N,ND	18.7	19.0		88	157		124	193		171	240
188-☐P,M,K,N,ND	18.8	19.0		88	157		124	193		171	240
189-☐P,M,K,N,ND	18.9	19.0		88	157		124	193		171	240
190-☐P,M,K,N,ND	19.0	19.0		88	157		124	193		171	240
191-☐P,M,K,N,ND	19.1	20.0		90	160		130	200		180	250
192-☐P,M,K,N,ND	19.2	20.0		90	160		130	200		180	250
193-☐P,M,K,N,ND	19.3	20.0		90	160		130	200		180	250
194-☐P,M,K,N,ND	19.4	20.0		90	160		130	200		180	250
195-☐P,M,K,N,ND	19.5	20.0		90	160		130	200		180	250
196-☐P,M,K,N,ND	19.6	20.0		90	160		130	200		180	250
197-☐P,M,K,N,ND	19.7	20.0		90	160		130	200		180	250
198-☐P,M,K,N,ND	19.8	20.0		90	160		130	200		180	250
199-☐P,M,K,N,ND	19.9	20.0		90	160		130	200		180	250
200-☐P,M,K,N,ND	20.0	20.0		90	160		130	200		180	250

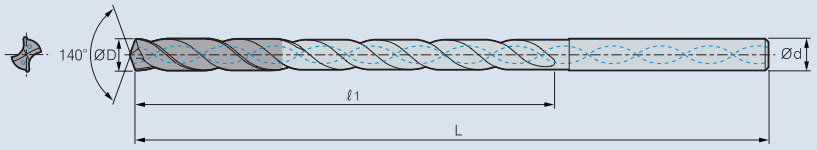
● : Stock item ○ : Under preparing for stock

▶ Note) Marked stock item is produced for steel(P) drilling

Mach long Drills

MLD

Mach Long Drills with oil hole for deep hole machine



Coating	TiAlN
Tolerance(drill diameter)	h7
Twist angle	30°
Tolerance	h6
Point angle	140°
Thinning	X type
Coolant	Through system

(mm)

Designation		ø D	ø d	20(L/ø D=20)			25(L/ø D=25)		
				Stock	ℓ 1	L	Stock	ℓ 1	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	○	225	275
	1000	10.0	10.0	○	200	250	○	250	300

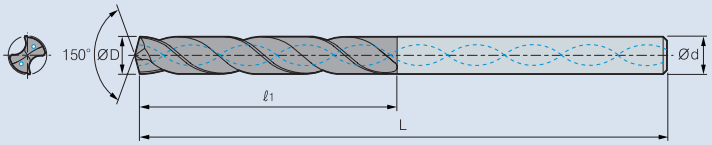
∗ Order made items : MLD○○○○-Aspect ratio

Ex.1) Machined diameter : Ø5.3mm, Flute length : 120mm, Total length : 180mm ➞ MLD0530-22(Aspect ratio)

● : Stock item ○ : Under preparing for stock

MLDP

Pilot Drills with oil hole for MLD



Coating	TiAlN
Tolerance(drill diameter)	×6
Twist angle	30°
Tolerance	h6
Point angle	150°
Thinning	X type
Coolant	Through system

(mm)

Designation		ø D	ø d	5(L/ø D=5)			7(L/ø D=7)		
				Stock	ℓ 1	L	Stock	ℓ 1	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 Sx

Ex.1) Machined diameter : Ø5.8mm, Flute length : 50mm, Total length : 100mm,

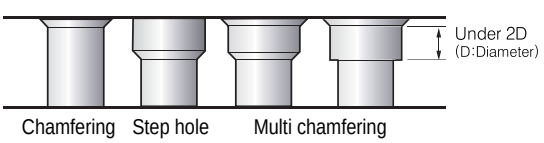
➞ MLDP0580 × 50-100L × 6S

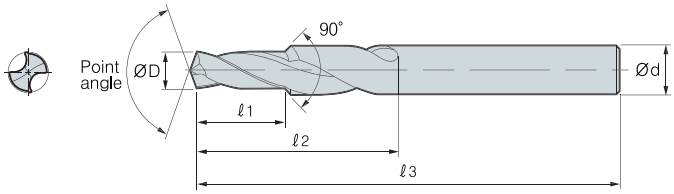
● : Stock item ○ : Under preparing for stock

■ Tolerance code

Drill diameter (Ø D)		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 drills





MSD(H)S	Ø D	∗	ℓ 1	−	ℓ 2	−	ℓ 3	∗	Ø d
- Solid type : MSDS - Oil-hole type : MSDHS	(Tool diameter)		(Valid flute length)		(Flute length)		(Overall length)L		(Shank diameter)S

Technical Information for Vulcan Drills

■ Features of vulcan drills

- Available to high feed and machine precisely due to specially designed point edge
- Vulcan drills ensure longer tool life under the high speed condition because of increased thermal & wear resistance. It also uses a reduced frictional resistance by adopting PVD coating with exclusive substrate to help maintain this.
- 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.

■ Application for vulcan drills

Workpiece

- General steel, Alloy steel, Mild steel, Dice steel, Stainless steel, Cast iron, Ductile cast iron, Non-ferrous metal, etc.

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 [VZD]

Form	Workpiece	Hardness	~Ø 15		~Ø 20		~Ø 40	
			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 A type(Standard) VZD***MA, LA General steel, Cast iron, Ductile cast iron • Vulcan Drill BA type(Standard) VZD***MBA, LBA Low carbon steel

Technical Information for Cemented Carbide Drills

■ Cemented Carbide drills

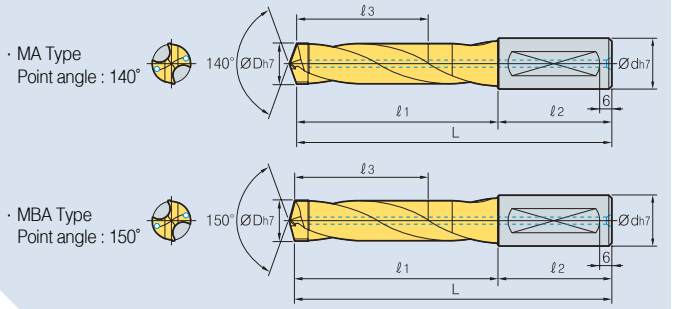
One of the most important aspects of hole-drilling is the hole precision and the tool life of the drill. The carbide drills are produced with a super fine substrate from Korloy and are also properly produced at mass production with accurate machining. At Korloy, we pride ourselves at creating tools which meet stress, hardness and resistance to plastic deformation requirements needed in today's machining.

- Long tool life by improving wear resistance and toughness for small hole drilling(Ø1mm~ Ø4mm)
- Increment of productivity by come true high feed because of specially designed cutting edge to low cutting resistance.(Ø4~ Ø15)
- Available to various workpiece as cast iron, non-ferrous metal, etc.
- Guarantees excellent chip evacuation and surface roughness by specially designed flute and high rigidity of drill.

■ Recommended cutting condition [SSD]

Workpiece	Strength	Cemented Carbide	Point angle (°)	Revolution as per drill diameter(min^{-1})							Feed as per drill diameter(mm/rev)		Coolant
				Ø 5	Ø 10	Ø 15	Ø 20	Ø 25	Ø 30	Ø 40	Ø 5~Ø 12	Ø 15~Ø 40	
SM10C~SM45C	50	ST30A	120	2900	1600	1100	1000	800	700	600	0.03~0.06	0.03~0.06	Cutting oil
SM55C	70	ST30A	120	2300	1530	1050	920	765	640	560	0.03~0.06	0.06~0.12	Cutting oil
SM55C·Pre-hardened steel	100	ST30A	120	2200	1500	1000	900	750	650	550	0.03	0.06	Cutting oil
Pre-hardened steel	150~180	H01	140	700	340	250	190	160	140	120	0.02	0.04	Cutting oil
Cr-Ni steel	100	FA1	120	2200	1200	800	652	550	460	380	0.03	0.06	Cutting oil
Mn-steel	40~110	FA1	140	700	340	260	190	170	150	120	0.04	0.08	Dry
Casting	200~300	FA1	120	2000	1500	800	600	450	400	350	0.03	0.06	Dry
Malleable iron	200	H01	120	2400	1500	900	650	500	420	380	0.03	0.06	Dry
Chilled casting	65Hs	H01	140	350	200	150	100	80	70	55	0.01	0.02	Dry
Copper	60~80	H01	120	6000	4000	2500	2000	1400	1000	800	0.06	0.12	Dry
Brass	80~120	H01	120	5000	3500	2000	1500	1400	1200	1000	0.05	0.10	Dry
Bronze casting	60~120	H01	120	3500	2500	1800	1500	1200	1000	900	0.04	0.08	Dry
Aluminum	60~120	H01	130	16000	8500	5700	4500	3700	3100	2800	0.1	0.2	Dry
Al alloy (Si13%)	40	H01	130	8000	4500	2800	2100	1750	1050	700	0.05	0.15	Dry
Synthetic resin	90~120	H01	80	8000	5400	2800	2100	1750	1050	200	0.05	0.15	Dry

VZD (MA,MBA)
Vulcan Drills



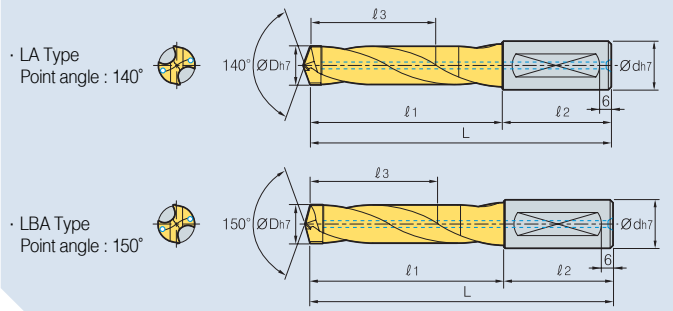
	VZD(MA)	VZD(MBA)		VZD(MA)	VZD(MBA)
Coating	TiN	TiN	Tolerance	h7	h7
Tolerance (drill diameter)	h7	h7	Point angle	140°	150°
			Thinning	X type	X type
Twist angle	20°	20°	Coolant	Through system	Through system

(mm)

Designation	ø D	ø d	L	ℓ 1	ℓ 2	ℓ 3
VZD126~135MA, MBA	12.6~13.5	16	110	62	48	44
VZD136~145MA, MBA	13.6~14.5	16	115	67	48	48
VZD146~155MA, MBA	14.6~15.5	20	125	75	50	55
VZD156~165MA, MBA	15.6~16.5	20	130	80	50	59
VZD166~175MA, MBA	16.6~17.5	20	135	85	50	63
VZD176~185MA, MBA	17.6~18.5	20	140	90	50	66
VZD186~195MA, MBA	18.6~19.5	25	155	99	56	74
VZD196~205MA, MBA	19.6~20.5	25	155	99	56	73
VZD206~215MA, MBA	20.6~21.5	25	155	99	56	72
VZD216~225MA, MBA	21.6~22.5	25	160	104	56	76
VZD226~235MA, MBA	22.6~23.5	25	160	104	56	74
VZD236~245MA, MBA	23.6~24.5	32	170	110	60	79
VZD246~255MA, MBA	24.6~25.5	32	170	110	60	78
VZD256~265MA, MBA	25.6~26.5	32	175	115	60	82
VZD266~275MA, MBA	26.6~27.5	32	175	115	60	80
VZD276~285MA, MBA	27.6~28.5	32	180	120	60	84
VZD286~295MA, MBA	28.6~29.5	32	185	125	60	88
VZD296~305MA, MBA	29.6~30.5	32	185	125	60	87
VZD306~315MA, MBA	30.6~31.5	40	205	135	70	95
VZD316~325MA, MBA	31.6~32.5	40	210	140	70	98
VZD326~335MA, MBA	32.6~33.5	40	215	145	70	101
VZD336~345MA, MBA	33.6~34.5	40	220	150	70	104
VZD346~355MA, MBA	34.6~35.5	40	225	155	70	107
VZD356~365MA, MBA	35.6~36.5	40	225	155	70	110
VZD366~375MA, MBA	36.6~37.5	40	230	160	70	113
VZD376~385MA, MBA	37.6~38.5	40	235	165	70	116
VZD386~395MA, MBA	38.6~39.5	40	240	170	70	119
VZD396~405MA, 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 : Ø18.6mm, Flute length : 110mm,
Total length : 200mm ➞ VZD186MA ∗ 110-200L
Ex.2) MAType, Machined diameter : Ø18.63, Flute length : 110mm,
Total length : 200mm ➞ VZD1863MA ∗ 110-200L
Ex.3) MAType, Machined diameter : Ø18.6, Standard ➞ VZD186MA

VZD (LA,LBA)
Vulcan Drills



	VZD(LA)	VZD(LBA)		VZD(LA)	VZD(LBA)
Coating	TiN	TiN	Tolerance	h7	h7
Tolerance (drill diameter)	h7	h7	Point angle	140°	150°
			Thinning	X type	X type
Twist angle	25°	25°	Coolant	Through system	Through system

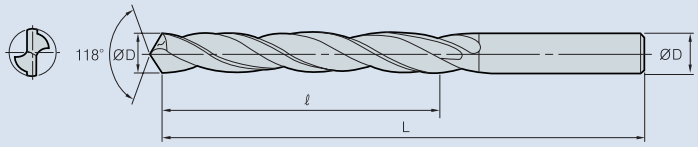
(mm)

Designation	ø D	ø d	L	ℓ 1	ℓ 2	ℓ 3
VZD126~135LA, LBA	12.6~13.5	16	140	92	48	74
VZD136~145LA, LBA	13.6~14.5	16	145	97	48	78
VZD146~155LA, LBA	14.6~15.5	20	155	105	50	85
VZD156~165LA, LBA	15.6~16.5	20	165	115	50	94
VZD166~175LA, LBA	16.6~17.5	20	170	120	50	98
VZD176~185LA, LBA	17.6~18.5	20	175	125	50	101
VZD186~195LA, LBA	18.6~19.5	25	190	134	56	109
VZD196~205LA, LBA	19.6~20.5	25	195	139	56	113
VZD206~215LA, LBA	20.6~21.5	25	195	139	56	112
VZD216~225LA, LBA	21.6~22.5	25	200	144	56	116
VZD226~235LA, LBA	22.6~23.5	25	210	154	56	124
VZD236~245LA, LBA	23.6~24.5	32	220	160	60	129
VZD246~255LA, LBA	24.6~25.5	32	225	165	60	133
VZD256~265LA, LBA	25.6~26.5	32	230	170	60	137
VZD266~275LA, LBA	26.6~27.5	32	235	175	60	141
VZD276~285LA, LBA	27.6~28.5	32	240	180	60	144
VZD286~295LA, LBA	28.6~29.5	32	245	185	60	148
VZD296~305LA, LBA	29.6~30.5	32	255	195	60	157
VZD306~315LA, LBA	30.6~31.5	40	275	205	70	166
VZD316~325LA, LBA	31.6~32.5	40	280	210	70	172
VZD326~335LA, LBA	32.6~33.5	40	280	215	70	173
VZD336~345LA, LBA	33.6~34.5	40	290	220	70	177
VZD346~355LA, LBA	34.6~35.5	40	295	225	70	181
VZD356~365LA, LBA	35.6~36.5	40	300	230	70	183
VZD366~375LA, LBA	36.6~37.5	40	305	235	70	188
VZD376~385LA, LBA	37.6~38.5	40	315	245	70	193
VZD386~395LA, LBA	38.6~39.5	40	320	250	70	198
VZD396~405LA, 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 : Ø18.6mm, Flute length : 110mm,
Total length : 200mm ➞ VZD186LA ∗ 110-200L
Ex.2) LAType, Machined diameter : Ø18.63, Flute length : 110mm,
Total length : 200mm ➞ VZD1863LA ∗ 110-200L
Ex.3) LAType, Machined diameter : Ø18.6, Standard ➞ VZD186LA

SSD

Solid Drills(Uncoated)



Twist angle	30°
Tolerance	h7
Point angle	118°
Thinning	S type
Coolant	External system

Ø D	Tolerance (drill diameter)
1<Ø D≤6	-0.010 ~ -0.030
6<Ø D≤10	-0.015 ~ -0.040
10<Ø D≤20	-0.020 ~ -0.050

(mm)

Designation		Stock FG2	Stock FA1	ø D	ℓ	L
SSD	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	●		2.3	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	25	50
	034	●		3.4	25	50
	035	●		3.5	25	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
	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

(mm)

Designation		Stock FG2	Stock FA1	ø D	ℓ	L
SSD	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	46	80
	077		●	7.7	46	80
	078		●	7.8	46	80
	079		●	7.9	46	80
	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
	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
	097		●	9.7	50	100
	098		●	9.8	50	100
	099		●	9.9	50	100
	100		●	10.0	50	100
	105		●	10.5	60	120
	110		●	11.0	60	120
	115		●	11.5	65	125
	120		●	12.0	65	125
	125		●	12.5	65	125
	130		●	13.0	65	125
	150			15.0	70	130

∗ Drill diameter : Available from Ø0.6

● : Stock item ○ : Under preparing for stock

∗ Order made items : SSD◎◎◎ ∗ Flute length - Total length L

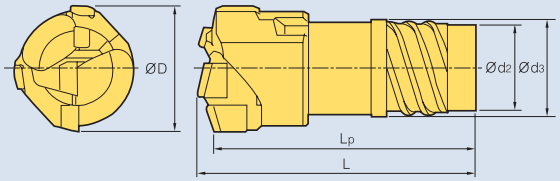
Ex.1) Genetal type, Machined diameter : Ø8.2mm, Flute length : 60mm, Total length : 90mm ➞ SSD082 ∗ 60-90L

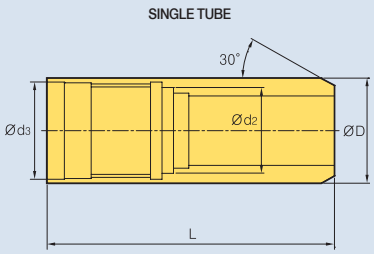
Ex.2) Genetal type, Machined diameter : Ø8.2mm ➞ SSD082

Features

- The BTA system is capable of very high penetration rates as much as five to seven times that of gun drilling.
  Deep hole making up to 100 x Diameter.
- Exceptional hole tolerance of h7 is available in just one pass with optimum cutting conditions and guarantees surface roughness of under Rmax 5s.
- Tools are available with coated drills for drilling alloy steel, cast iron and stainless steel.

BTA New





(mm)

	ØD(mm)	Dimensions				Grade				Single Tube		
		L	Lp	Ød3	Ød2	P30	P40	S20	K10	Designation	ØD	L
BTA	15.60 ~ 16.30	42.7	40.1	12.6	10.8	○	○	○	○	ST14	14	1600
	19.21 ~ 20.00	46.9	44.0	15.5	13.5	○	○	○	○	ST17	17	1600
	25.21 ~ 26.40	57.6	54.1	19.5	17.5	○	○	○	○	ST22	22	2600
	29.81 ~ 31.00	63.0	58.9	23.5	21	○	○	○	○	ST26	26	2600
	31.01 ~ 32.10	63.5	59.1	25.5	23	○	○	○	○	ST28	28	2600

○ : Under preparing for stock

● Recommended cutting condition

Workpiece	Hardness (HB)	Cutting speed vc(m/min)	ØD(mm)		
			Ø15.60 ~ Ø20.0	Ø25.21 ~ Ø31.00	Ø31.01 ~ Ø32.10
			Feed rate, fn(mm/rev)		
Carbon steel	125 - 225	60 - 120	0.14 - 0.20	0.15 - 0.25	0.17 - 0.25
Low alloy steel	150 - 350	70 - 100	0.14 - 0.20	0.17 - 0.25	0.20 - 0.30
High alloy steel	150 - 400	60 - 90	0.14 - 0.20	0.17 - 0.25	0.20 - 0.30
Stainless cast iron	90 - 250	50 - 80	0.14 - 0.20	0.15 - 0.25	0.20 - 0.30
Stainless steel	150 - 270	35 - 85	0.16 - 0.20	0.18 - 0.25	0.22 - 0.30
Heat resistant steel	200 - 300	10 - 40	0.10 - 0.18	0.14 - 0.20	0.18 - 0.26
Titanium	300 - 450	30 - 50	0.14 - 0.18	0.16 - 0.22	0.18 - 0.26
Malleable cast iron	120 - 270	70 - 110	0.14 - 0.20	0.18 - 0.25	0.20 - 0.30
Gray cast iron	170 - 330	70 - 110	0.12 - 0.18	0.15 - 0.25	0.20 - 0.28
Ductile cast iron	150 - 300	50 - 100	0.12 - 0.18	0.15 - 0.25	0.20 - 0.28
Aluminum	40 - 150	65 - 130	0.10 - 0.20	0.16 - 0.25	0.18 - 0.30
Copper	50 - 160	65 - 130	0.10 - 0.20	0.16 - 0.25	0.08 - 0.30

● Grade Application

- **P30 :** Carbon steel, Alloy steel (Max HRC40)
- **P40 :** Stainless steel, Heat resistant steel, Cast iron
- **K10 :** Aluminum
- **S20 :** Inconel

● Ordering Example

Head : BTA - H19.25 P30
(H19.25: Drill diameter, P30: Grade)

Tube : BTA - T19.25 ST14
(T19.25: Drill diameter, ST14: Single Tube)

Brazed Tools H

Contents

KORLOY Ultra-Fine Grades “F-Series” --- H02
KORLOY Corrosion & magnetism ----- H02
Proof grades, “In-Series”

General Cutting Tools

Cemented Carbide, Cermet Blank ------ H03
Square Blank ---------- H04
Round Bars Brank ---------- H05
Ring Blank ---------- H05
Helix Blank ---------- H05
Slitter Knives ---------- H06
Insert for Pulley ---------- H07
Square Bits ---------- H08
Auto Tool Bits ---------- H09
Reamer ---------- H10
Burnishing drill ---------- H11
Centering tool ---------- H11
Counter sink ---------- H11
Side cutter ---------- H11

Mining & Construction Tools

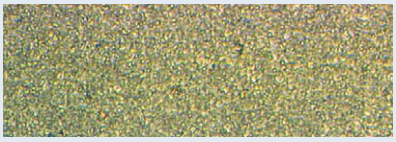
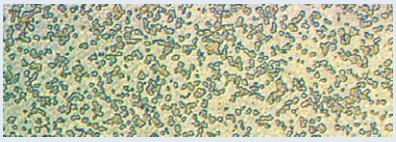
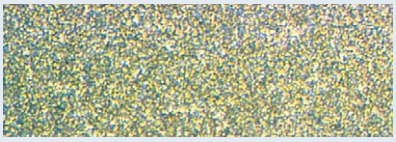
Cemented Carbide Blank for Bit ------- H12
For Taper Bits ---------- H12
Boring Crown Blank • Metal Crown Blank H12
Bit for Construction ---------- H12

KORLOY Ultra-Fine Grades "F-Series"

■ Features

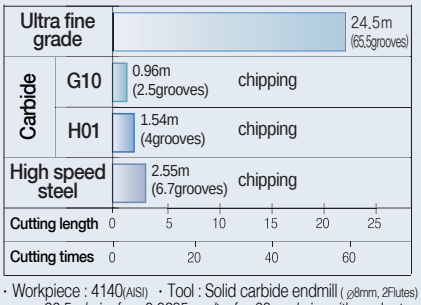
In general, when we compare cemented-carbide to high speed steel, cemented-carbide has higher hardness but is more brittle than high speed steel. To neutralize the difference of our cemented-carbide, KORLOY has developed an ultra fine cemented carbide grade "F-Series" ±(WC size under 0.5㎛). Its quality is better on 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 material like high temp alloy.

● Micro Structure of "F-Series"

FA1	FCC	FS1
		
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 property.	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.	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.

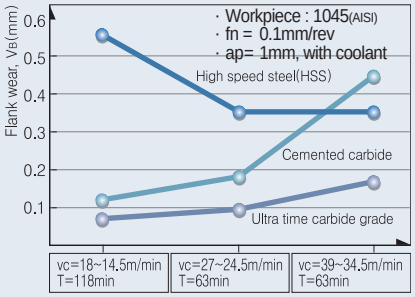
■ Cutting Performance

● Chipping Resistance



· Workpiece : 4140(AISI) · Tool : Solid carbide endmill (⌀8mm, 2Flutes)
· vc = 26.5m/min, fz = 0.0285mm/t, vf = 60mm/min, with coolant

● Wear resistance



∗ AISI : American Iron and Steel Institute

● Special Features

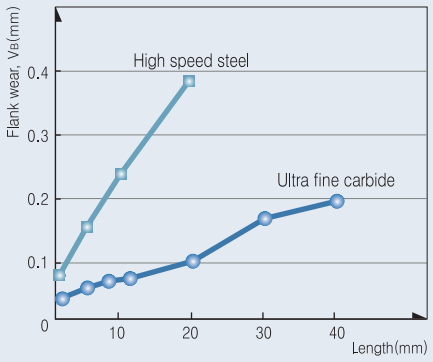
Grade	Characteristics			ISO classification	Wear resistance	Toughness
	Specific Gravity	Hardness (HRA)	TRS (kgf/㎟)			
FS1	14.4	92.4	250	Z10	⦿	○
FCC	12.6	91.5	250	Z10	⦿	○
FA1	14.1	91.2	300	Z20	○	⦿
FG2	14.3	92.7	350	Z10	⦿	○

■ Guide of Grade Selection

Workpiece	1st Recommended Grade	Application tool
Non-ferrous metal Steel, Cast iron	FS1, FG2 FCC, FA1	Drill, Endmill

● Cutting condition

- Workpiece : SM55C(HRC20)
- Tool : Ø10mm, 2 Flutes(SSE2100)
- Cutting speed = 35m/mim
- Feed = 0.1mm/t
- Downward cutting, Without coolant
- Helix angle : 30°
- RPM = 1,100min^{-1}
- Axial depth = 12mm
- Radial depth = 1mm



KORLOY Corrosion & Magnetism Proof Grades, "IN-Series"

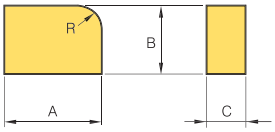
■ Features

- 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 (HRA) 85 hardness, Over (TRS) 200 toughness.
- Several grades : 3 different kind of grades for specific application, respectively.

Grade	Specific gravity(g/cm^3)	Hardness(HRA)	TRS(kgf/mm^2)	Magnetic saturation(Gauss · 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	250	90	Mechanical Seal, Sliter Knife Anti-corrosive alloy.
IN40	13.5	85.5	280	0	Mold for magnetic powder. Anticorrosive-Magnetism proof alloy.

● 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	U40	GR35	U20	H02	H01	G10	CT10	CN20		
	01- 0	10	6	3	4												
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	3	19	13	5	5		●										45type
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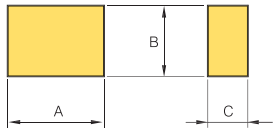
	5	25	17	7	8												
	6	30	20	8	8												
	02- 0	10	6	3	-	●	●			●		●	●				
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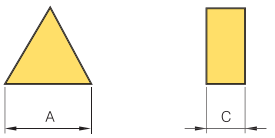
	2	16	11	4	-		●			●		●	●				41type
	3	19	13	5	-	●	●			●		●	●				42type
	4	22	15	6	-		●			●		●	●				
	5	25	17	7	-		●					●	●				
	6	30	20	8	-		●										
	03- 0	10	-	3	-												
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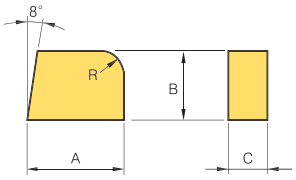	04- 0	10	6	3	4												
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	2	16	11	4	5												33type
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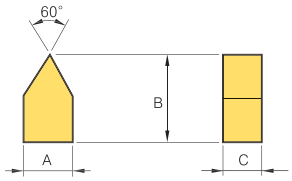	05- 1	5	8	3	-		●			●							
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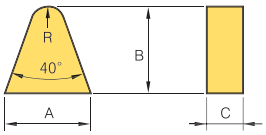	06- 0	10	10	3	2	●	●			●		●	●				
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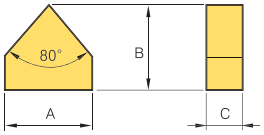	07- 0	10	10	3	-												
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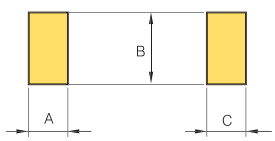	08- 1	3	8	3	-		●			●							
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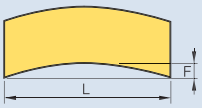
	6	8	20	8	-		●										

Square Blank

RB

■ Bending Tolerance



L		F-max
Standard	Tolerance	
30	+1.0 - 0	0.15
50	+1.5 - 0	0.25
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	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										
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										

(mm)

Designation	L	W	T = □								Grades	
			3	4	5	6	7	8	9	10	G10	G10
2006 □	3	3										
2007 □	3	4										
2008 □	3	5										
2009 □	3	6										
2010 □	3	7										
RB 3003 □	3	8										
3004 □	3	9										
3005 □	3	10										
3006 □	4	3										
3007 □	4	4										
3008 □	4	5										
3009 □	4	6										
3010 □	4	7										
RB 4003 □	4	8										
4004 □	4	9										
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4009 □	5	6										
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5005 □	5	10										
5006 □	6	3										
5007 □	6	4										
5008 □	6	5										
5009 □	6	6										
5010 □	6	7										
RB 6003 □	6	8										
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6006 □	7	3										
6007 □	7	4										
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RB 7003 □	7	8										
7004 □	7	9										
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10006 □	15	4										
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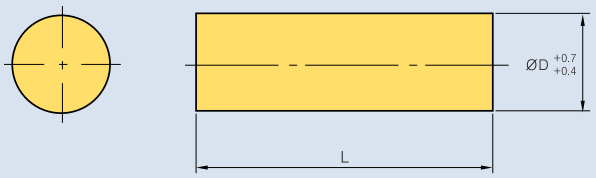
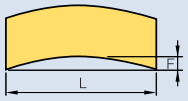
10010 □	20	5										

SR(Round bars blank)



■ Bending Tolerance



L		F-max
Standard	Tolerance	
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40	+1.5 - 0	0.15
50	+1.5 - 0	0.20
80	+2.5 - 0	0.25

※ Code System

SR 03 □

Diameter(Ø) — Length

(mm)

Designation		ØD	L = □								Grades	
			30	40	50	60	70	80	90	100	ST20	G10
SR	03 □	3										
	04 □	4										
	05 □	5										
	06 □	6										
	07 □	7										
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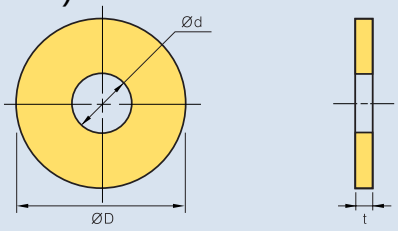
	10 □	10										
	11 □	11										
	12 □	12										

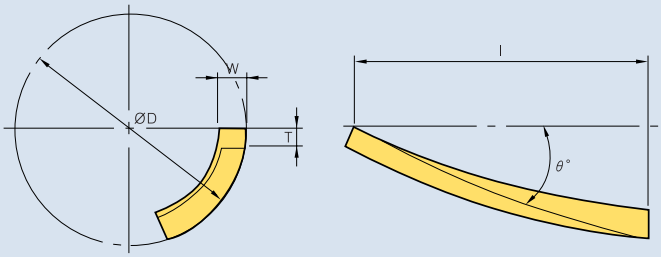
RT(Ring blank)



(mm)

Designation	ØD	Ød	T
ØD × Ød × t	ø 7.2~ø 200	ø 2.7~ø 150	0.8 ~10

ST(Helix blank)



(mm)

Designation		Available Endmill(Ø D)	L	T	W	θ°
ST	14	ø 13, 14	30	2.3	4.0	23° 44′
	15	ø 15	30	2.3	4.0	25° 13′
	18	ø 18	32	2.3	4.5	25° 13′
	20	ø 20	32	2.8	5.5	24° 09′
	24	ø 23, 24	37	2.8	5.5	25° 13′
	26	ø 26, 27	37	3.3	6.5	24° 24′
	30	ø 29, 30, 31	42	3.8	7.0	25° 13′
	32	ø 32, 33	47	3.8	7.0	26° 41′
	35	ø 34, 35, 36	52	3.8	7.0	24° 36′
	38	ø 37, 38	57	3.8	7.0	23° 51′
	40	ø 39, 40, 41, 42	62	4.3	7.5	24° 57′
	45	ø 43, 44, 45, 46, 47	67	4.3	7.5	25° 13′
	50	ø 48, 49, 50	67	4.3	7.5	24° 09′

Slitter Knives

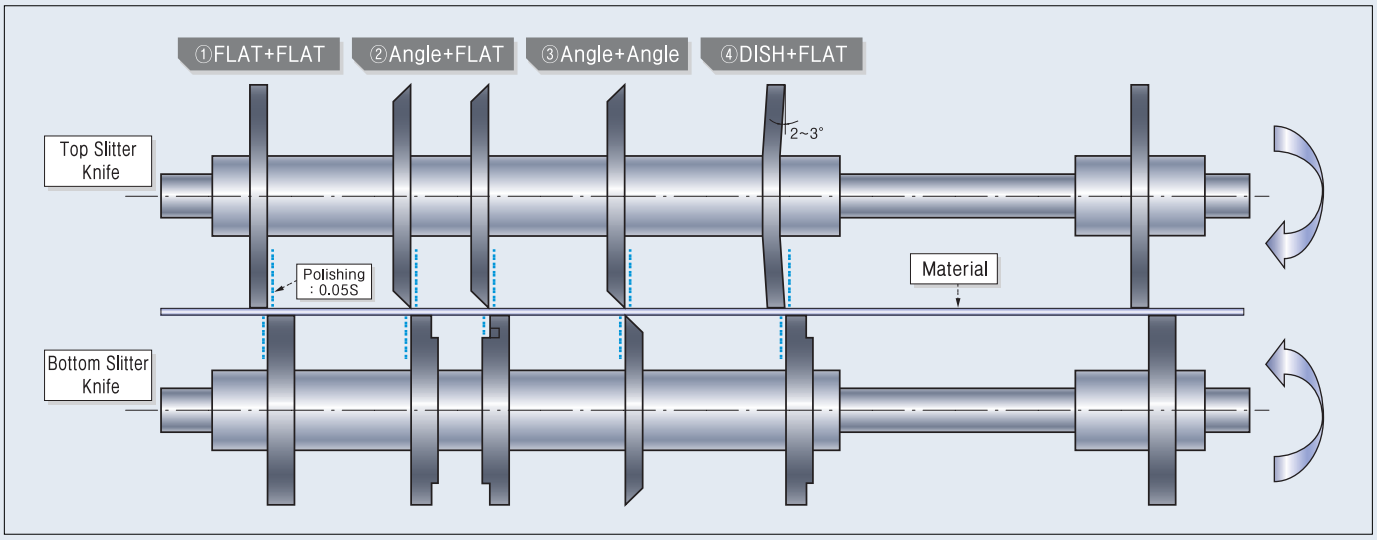
■ Application

- For video tape.
- For audio tape.
- For mangetic tape.
- For brass plate, mobile battery.

■ Tool selection

- Top slitter knife : Thickness : ±0.01~0.02mm
- Bottom slitter knife : Thickness : ±0.001mm
  Flatness : under 0.0005mm
  Polishing surface roughness : under 0.05S

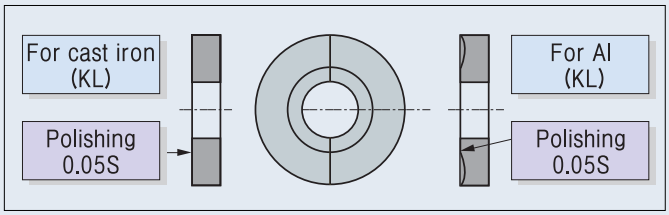
■ Machining example

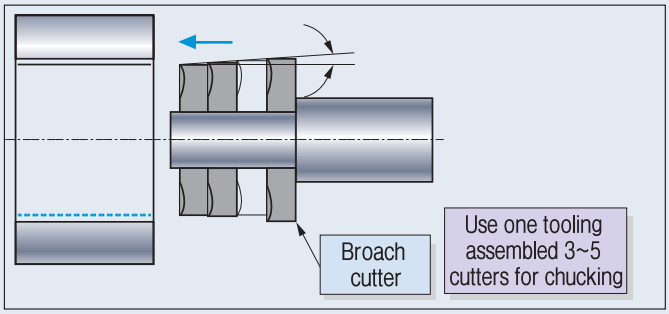


Broach cutter

■ Application

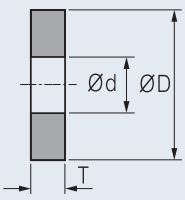
- Broach cutters apply to inner machining of metal bearing which is used for automobile crank shaft.

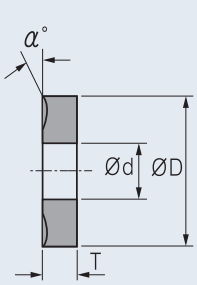




■ Order

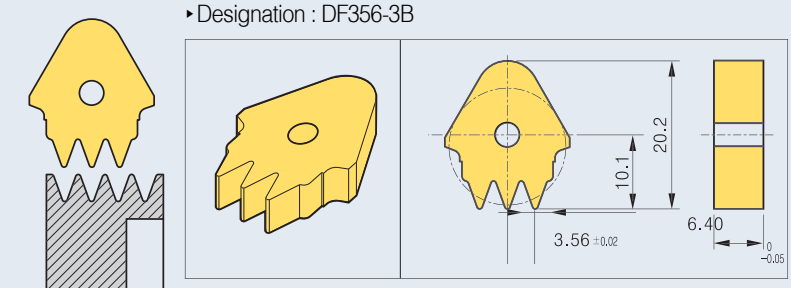
- Designation for cast iron : KL ød ∗ ød ∗ T
- Designation for AL : AL ød ∗ ød ∗ T
  : AL ød ∗ ød ∗ T ∗ α°
  (If there is no mentioned any angle, α = 30°)



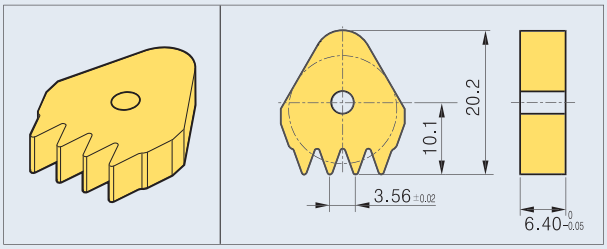


Pulley insert for tailor made

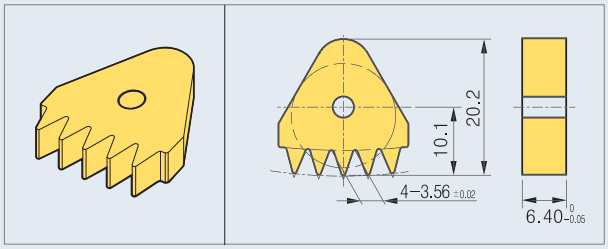
▸Designation : DF356-3B



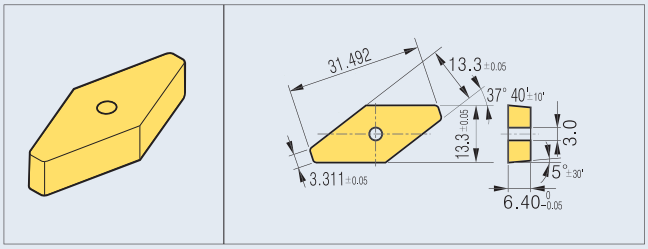
▸Designation : DF356-4B



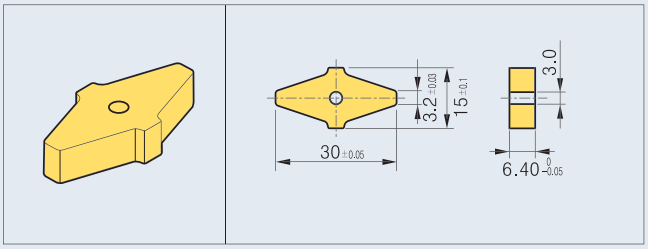
▸Designation : DF356-5A



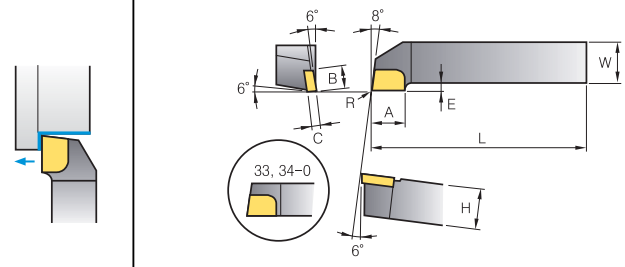
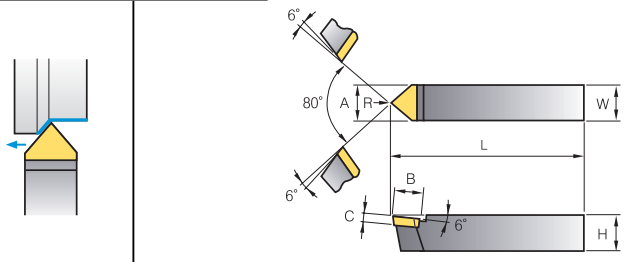
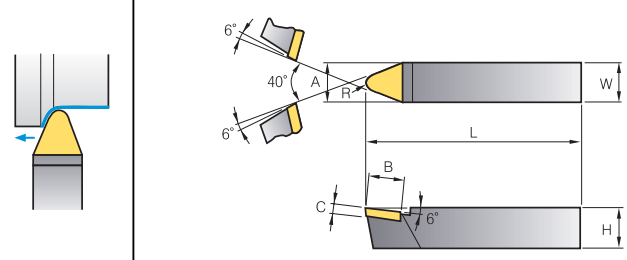
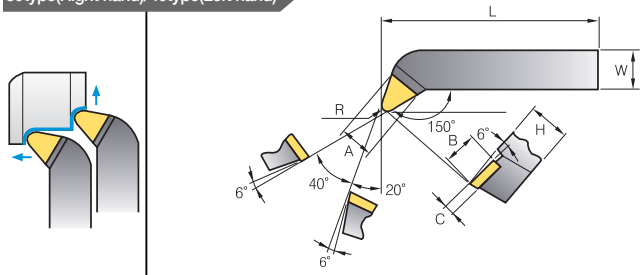
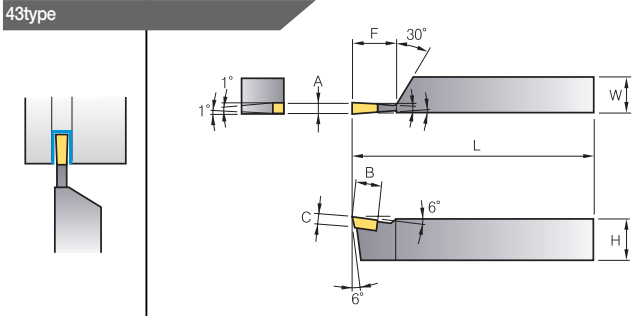
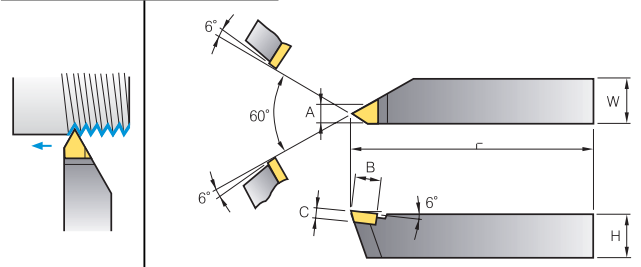
▸Designation : VF13M522



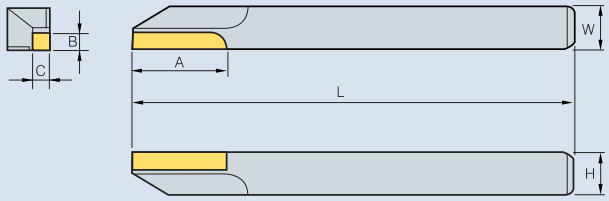
▸Designation : UF320



Square Bits

Feed direction	Figure	Designation	Grades ST20	A	B	C	(R)	W	H	L	E	F	Available blank
33type(Right hand)/34type(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
35type		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
36type		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
39type(Right hand)/40type(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
43type		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
49type(Right hand)/50type(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



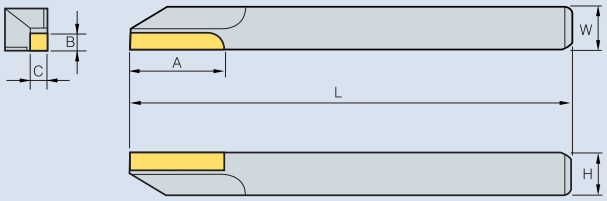
• R type insert

(mm)

Designation	A	B	C	W	H	L	FA1	H2	U2
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	●		

● : Stock item ○ : Under preparing for stock

PBX200

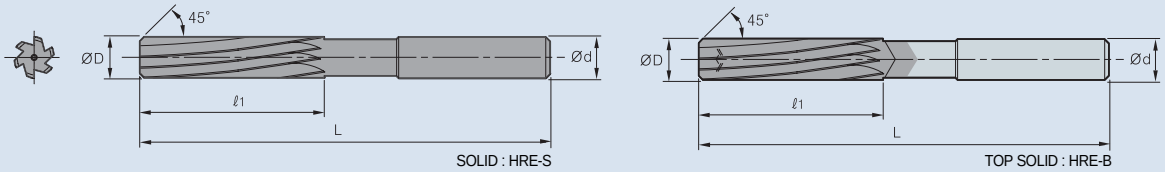


• R type insert

(mm)

Designation	A	B	C	F	W	H	L
PBX - 205	20	2.5	2.5	3.0	5	5	100
206	20	2.5	2.5	3.0	6	6	100
207	20	3.0	3.0	4.0	7	7	130
208	20	3.0	3.0	4.0	8	8	130
209	20	3.5	3.5	4.0	9	9	130
210	20	4.0	4.0	6.0	10	10	150
212	20	4.0	4.0	6.0	12	12	150

Reamer(Helical)



· Helical Flute
Grade : H01

Fig. 1

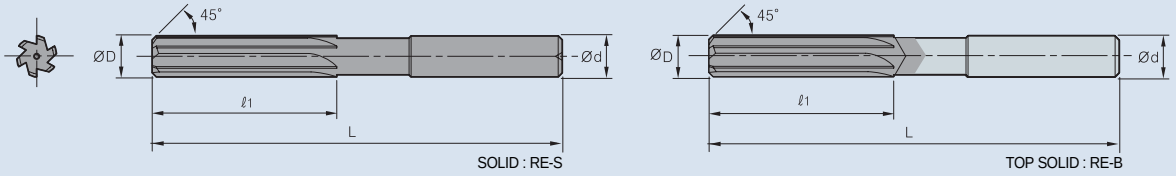
Fig. 2

(mm)

Designation		ØD	No. of flute	ℓ1	L	Ød	Fig.
HRE	030S	3.0	4	20	60	3.0	1
	035S	3.5	4	20	60	3.5	1
	040S	4.0	4	20	70	4.0	1
	045S	4.5	4	20	70	4.5	1
	050S	5.0	4	23	80	5.0	1
	055S	5.5	4	23	80	5.5	1
	060S	6.0	4	26	90	6.0	1
	070S	7.0	6	31	100	7.0	1
	080S	8.0	6	33	110	8.0	1
	090S	9.0	6	36	120	9.0	1
	100B	10.0	6	38	130	10.0	2
	110B	11.0	6	41	140	10.0	2
	120B	12.0	6	44	150	12.0	2
	130B	13.0	6	44	150	12.0	2
	140B	14.0	8	47	160	16.0	2
	150B	15.0	8	50	160	16.0	2
	160B	16.0	8	52	170	16.0	2

∗ Available for tailor made

Reamer(Straight)



· Straight Flute
Grade : H01

Fig. 1

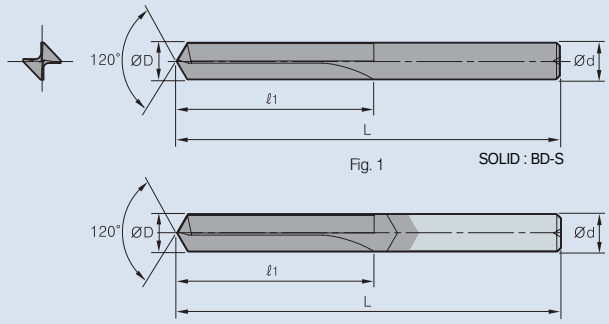
Fig. 2

(mm)

Designation		ØD	No. of flute	ℓ1	L	Ød	Fig.
RE	030S	3.0	4	20	60	3.0	1
	035S	3.5	4	20	60	3.5	1
	040S	4.0	4	20	70	4.0	1
	045S	4.5	4	20	70	4.5	1
	050S	5.0	4	23	80	5.0	1
	055S	5.5	4	23	80	5.5	1
	060S	6.0	4	26	90	6.0	1
	070S	7.0	6	31	100	7.0	1
	080S	8.0	6	33	110	8.0	1
	090S	9.0	6	36	120	9.0	1
	100B	10.0	6	38	130	10.0	2
	110B	11.0	6	41	140	10.0	2
	120B	12.0	6	44	150	12.0	2
	130B	13.0	6	44	150	12.0	2
	140B	14.0	8	47	160	16.0	2
	150B	15.0	8	50	160	16.0	2
	160B	16.0	8	52	170	16.0	2

∗ Available for tailor made

Burnishing drill

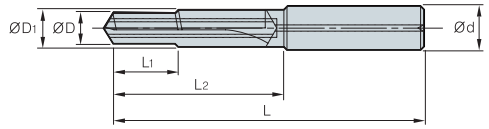


· Grade : H01

(mm)

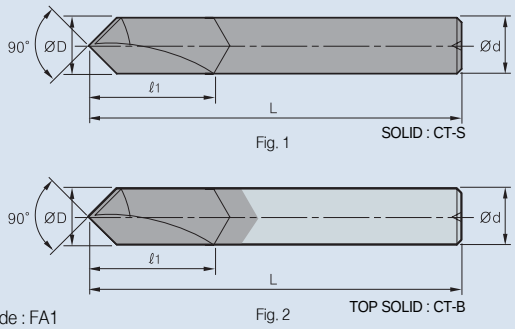
Designation		ØD	ℓ1	L	Ød	Fig.
BD	030S	3.0	33	60	3.0	1
	035S	3.5	33	60	3.5	1
	040S	4.0	33	60	4.0	1
	045S	4.5	33	60	4.5	1
	050S	5.0	33	70	5.0	1
	055S	5.5	33	70	5.5	1
	060S	6.0	35	75	6.0	1
	070S	7.0	35	75	7.0	1
	080S	8.0	40	80	8.0	1
	090S	9.0	40	80	9.0	1
	100S	10.0	45	100	10.0	1
	110S	11.0	45	100	10.0	1
	120B	12.0	50	120	12.0	2
	130B	13.0	50	120	12.0	2
	140B	14.0	60	130	16.0	2
	150B	15.0	60	130	16.0	2
	160B	16.0	60	130	16.0	2

■ Step Burnishing drill



∗ Order ex) : BD(D/D1/d−L1/L2/L)
∗ Available for tailor made

Centering tool



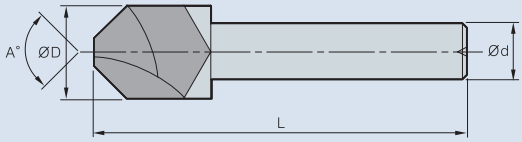
· Grade : FA1

(mm)

Designation		ØD	ℓ1	L	Ød		Fig.
CT	060S	6.0	13	60	6.0	Solid	1
	080S	8.0	23	80	8.0	Solid	1
	100S	10.0	24	100	10.0	Solid	1
	120B	12.0	28	120	12.0	top Solid	2
	160B	16.0	32	160	16.0	top Solid	2
	200B	20.0	35	200	20.0	top Solid	2

∗ Order ex) : CT(D/d-ℓ1/L)
∗ Available for tailor made

Counter sink



· Grade : FA1

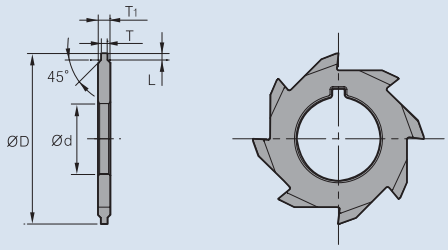
(mm)

Designation		ØD	No. of flute	A°	L	Ød
CS	100-90	10	3	90°	70	10
	200-90	20	4	90°	85	12
	300-90	30	4	90°	120	16
	100-90	10	3	60°	70	10
	200-90	20	4	60°	85	12
	300-90	30	4	60°	120	16

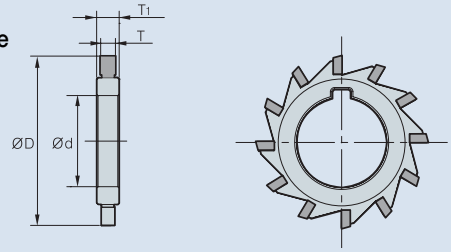
∗ Order ex) : CS(D/d−A°)
∗ Available for tailor made

Side cutter

· Solid Type



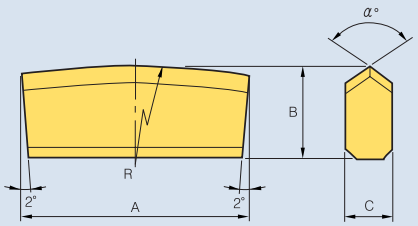
· Brazed Type



∗ Order ex) : SC(D/d-T/T1)
∗ Available for tailor made
∗ Grade : Selection according to workpiece

Cemented Carbide Blank for Bits

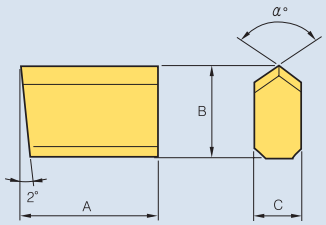
1000type (For taper bits)



(mm)

Designation	Code	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

2000type (For cross bits)

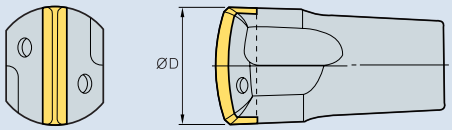


(mm)

Designation	Code	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)



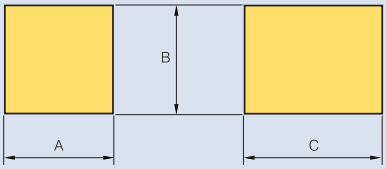
(mm)

Designation		øD	Stock GR40
TB	20	20	
	32	32	●
	34	34	●
	36	36	●
	38	38	●
	39	39	
	40	40	●

Boring Crown Blank-Metal Crown Blank

■ For Boring Crown

BT



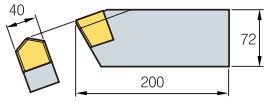
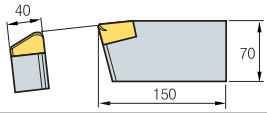
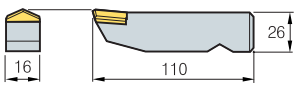
(mm)

Designation		A	B	C	Stock E1	Stock E2	Stock G2
BT	1	5	5	8			
	2	6	6	9			
	3	8	8	10			
	4	7	10	15			

Bits for construction

■ Bits for construction

(mm)

Configuration	Dimensions
Earth Auger Bits	
Casing Bits	
Rod cutter	

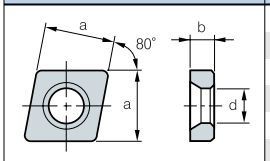
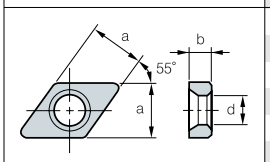
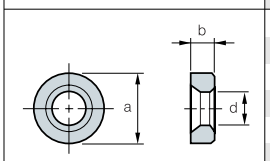
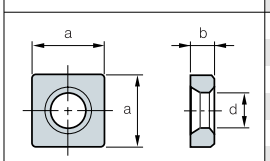
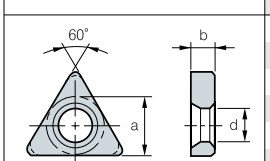
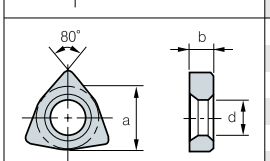
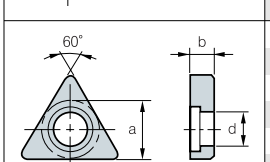
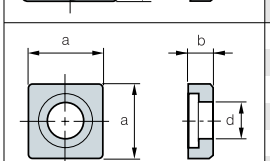
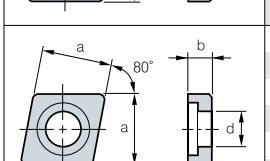
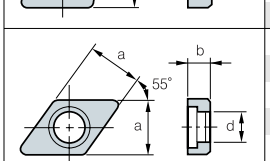
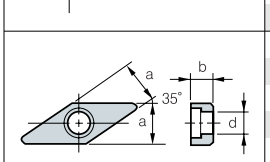
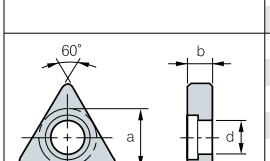
Parts

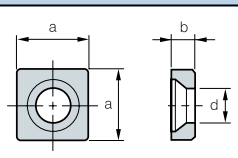
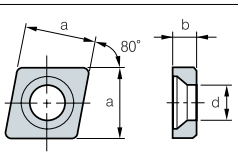
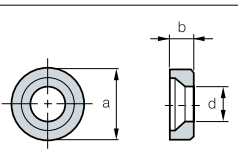
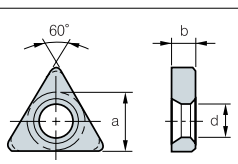
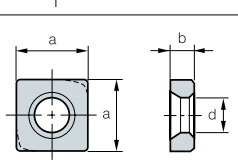
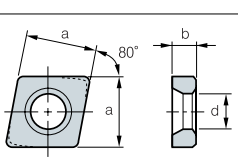
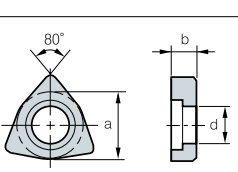
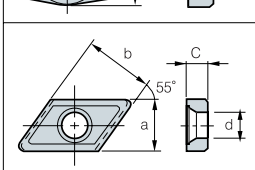
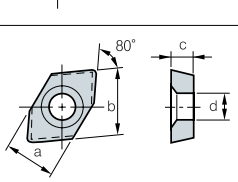
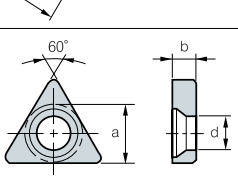
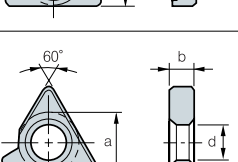
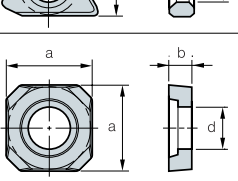
Contents

Shim ---------- I02
Cartridge ---------- I03
Chip Breaker ---------- I03
Chip Cover ---------- I03
Clamp ---------- I03
Coolant Bolt ---------- I04
Edge Ring ---------- I04
Lever ---------- I04
Locator ---------- I04
Nut ---------- I05
Pin ---------- I05
Screw ---------- I05
Shim-Pin ---------- I06
Spring ---------- I06
Stopper ---------- I06
Washer ---------- I07
Wrench ---------- I07

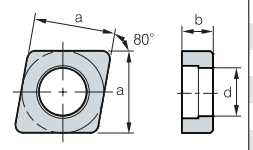
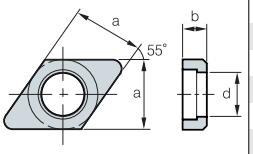
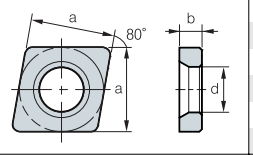
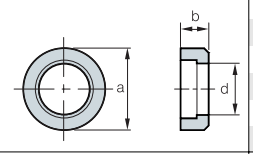
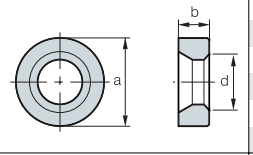
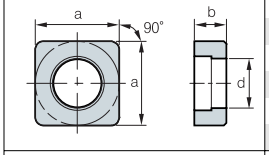
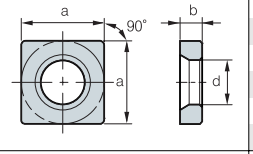
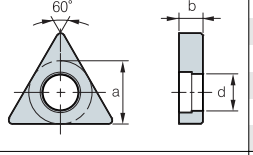
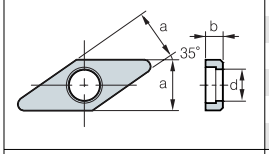
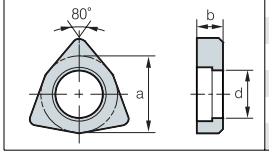
Parts

● Shim

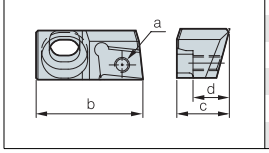
Geometry	Designation	Dimensions (mm)				
		a	b	c	d	angle
	SC32	8.5	3.18		4.9	
	SC42	12.5	3.18		6.9	
	SC53	15.7	4.76		7.9	
	SC63	18.85	4.76		10	
	SC83	24.4	4.76		12.8	
	SD317	9.35	2.7		5.2	
	SD42	12.5	3.18		6.9	
	SR10	8.4	3.18		4.7	
	SR12	10	3.18		4.7	
	SS32	8.5	3.18		4.9	
	SS42	12.5	3.18		6.9	
	SS53	15.7	4.76		7.9	
	SS63	18.85	4.76		10	
	SS84	24.4	6.35		12.8	
	ST317	9.35	2.7		5	
	ST42	12.5	3.18		6.9	
	ST53	15.7	4.76		7.9	
	SW317	9.35	2.7		5	
	SW42	12.5	3.18		6.9	
	ST32S	8.5	3.18		5.4	
	SS32S	8.3	3.18		5.4	
	SS42S	11.5	3.18		6.4	
	SC42S	11.5	3.18		6.4	
	SD32S	8.5	3.18		5.4	
	SV32D2	9.2	3.18		5.8	
	SV32S	8.4	3.18		5.4	
	ST32M	8.7	3.18		4.7	
	ST43M	12.5	4.76		6.3	

Geometry	Designation	Dimensions (mm)				
		a	b	c	d	angle
	SS42CC	12.5	3.18		3.5	
	SC42CC	12.5	3.18		3.5	
	SR42CC	12.575	3.18		3.5	
	ST317B	9.35	2.7		5	
	SS42B	12.5	3.18		6.9	
	SC42B	12.5	3.18		6.9	
	SW43M	12.5	4.76		6.2	
	SK33C	9.33	14.7	4.8	3.5	
	SK33CL	9.33	14.7	4.8	3.5	
	SES33C	9.1	12	4.76	3.5	
	ST32CC	9.35	3.18		3.5	
	ST32C1	9.13	3.18		4.95	
	ST42C1	12.3	3.18		4.95	
	SS42SAF	11.2	3		5.5	

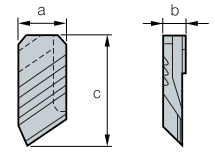
● Shim

Geometry	Designation	Dimensions (mm)				
		a	b	c	d	angle
	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	
	SD32D	9.2	3.18		5.8	
	SD43D	12.45	4.76		7.34	
	SC63N	17.8	4.76		9.6	
	SC84N	24.2	6.35		13	
	SR10S	8.8	3.18		5.4	
	SR12S	10.55	3.18		5.4	
	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	
	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	
	SS63N	17.8	4.76		9.6	
	SS84N	24.2	6.35		13	
	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	
	SV32D	9.2	3.18		5.8	
	SV43D	12.29	4.76		7.34	
	SW32D	9.25	3.18		5.8	
	SW43D	12.45	4.76		7.34	

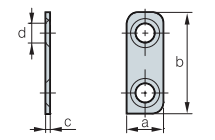
● Cartridge

Geometry	Designation	Dimensions (mm)				
		a	b	c	d	angle
	LAPDR-AJ	M4×0.7	30	15	10	

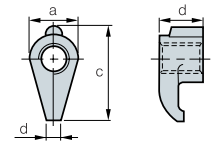
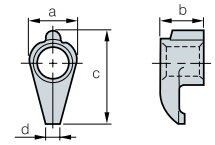
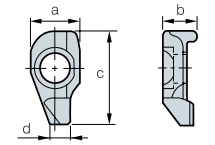
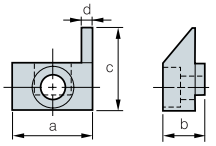
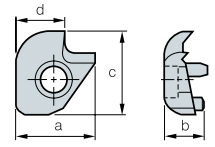
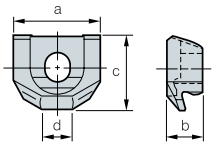
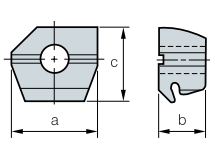
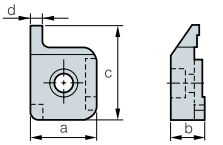
● Chip Breaker

Geometry	Designation	Dimensions (mm)				
		a	b	c	d	angle
	CB20	8.5	3.4	20		

● Chip Cover

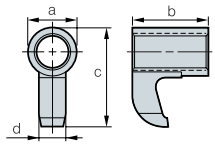
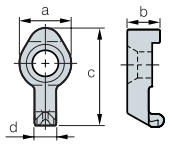
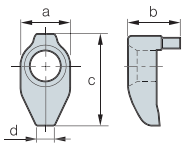
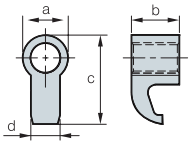
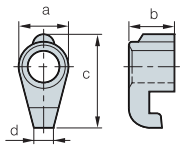
Geometry	Designation	Dimensions (mm)				
		a	b	c	d	angle
	CFMP3R14R1-A	10.5	20	1	(⌀4.3)	
	CFMP3R-A	8	18	1	(⌀4.3)	
	CFMP4R-A	8	22	1	(⌀4.3)	

● Clamp

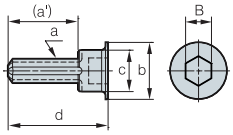
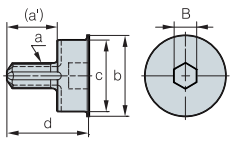
Geometry	Designation	Dimensions (mm)				
		a	b	c	d	
	CS5R1	6.8	7	14.5	2	
	CS6R1	8.8	8.5	18.1	2.7	
	CS8R1	11.8	10	23	4.2	
	CH5R2	6.85	7	13.8	2	
	CH6R2	8.85	8.7	16.5	2	
	CH6R3	11.8	10	23	4.2	
	CH4R1	7.4	5	14.1	3.1	
	CH5R1	10.0	6.6	20.2	4.5	
	CGH6R1	22.3	11.9	23.2	2.5	
	CGH6R2	23.2	11.9	23.2	3.4	
	CGH6R3	24.0	11.9	23.2	4.2	
	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	
	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		
	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	

Parts

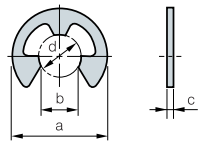
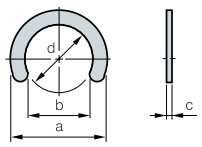
● Clamp

Geometry	Designation	Dimensions (mm) a	b	c	d
	CDS8N	10.8	17	22.2	5
	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
	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
	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
	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

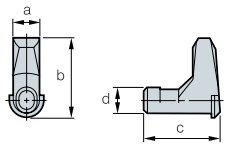
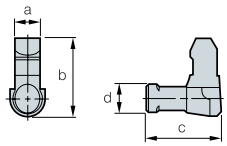
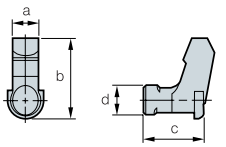
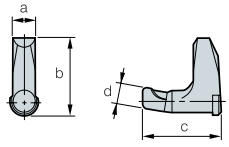
● Coolant Bolt

Geometry	Designation	Dimensions (mm) a	b	c	d	B(T)	a´
	CBA063-3IN/MM	M10	⌀25	⌀16	37	8	(27)
	CBA063-4IN/MM	M10	⌀25	⌀16	42.5	8	(27)
	CBA080-IN/MM	M12	⌀28	⌀18	45.5	10	(32)
	CBP063-IN/MM	M10	⌀22	⌀16	38.6	8	(27)
	CBP080-IN/MM	M12	⌀25	⌀18	48.6	10	(32)
	CBA100-IN/MM	M16	⌀54	⌀43	47	14	(32)
	CBA100-IN-25.4	M12	⌀44	⌀36	41.5	10	(25)
	CBA125-IN	M20	⌀65	⌀54	56	17	(38)
	CBA125-IN-25.4	M12	⌀44	⌀36	43.5	10	(25)
	CBA125-MM	M20	⌀65	⌀54	57	17	(35)
	CBA160-IN	M24	⌀83	⌀73	56	19	(38)
	CBA160-MM	M20	⌀83	⌀73	53	17	(34)
	CBP100-IN	M16	⌀50	⌀43	48.6	14	(32)
	CBP100-IN-25.4	M12	⌀44	⌀36	46.5	10	(25)
	CBP100-MM-1	M16	⌀50	⌀43	48.6	14	(36)
	CBP125-IN	M20	⌀65	⌀54	56	17	(38)
	CBP125-IN-25.4	M12	⌀44	⌀36	55	10	(25)
	CBP125-MM	M20	⌀65	⌀54	57	17	(35)
	CBP125-MM-1	M20	⌀61	⌀54	65.6	14	(33)
	CBP160-IN	M24	⌀83	⌀73	56	19	(38)
	CBP160-MM	M20	⌀83	⌀73	53	17	(34)

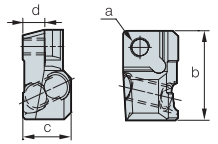
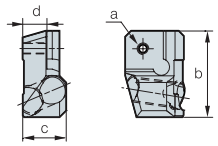
● Edge Ring

Geometry	Designation	Dimensions (mm) a	b	c	d
	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
	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

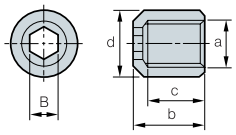
● Lever

Geometry	Designation	Dimensions (mm) a	b	c	d
	LV3	3.7	10	12	3.6
	LV3C	3.1	10	7.85	3.6
	LV3D	3.1	11.7	9.5	3.6
	LV4	4.7	14.55	14	4.7
	LV5	6.0	17.1	17	6
	LV6N	7.5	20.5	21	7.6
	LV8N	8.6	25.5	25.4	8.6
	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
	LV4A	4.6	13.24	9.95	4.7
	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

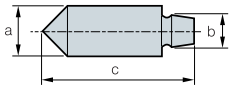
● Locator

Geometry	Designation	Dimensions (mm) 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

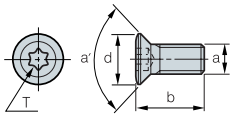
● Nut

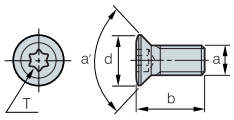
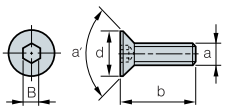
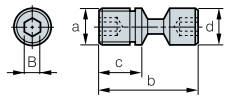
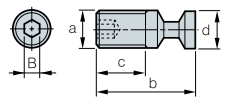
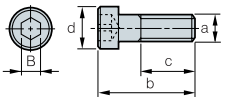
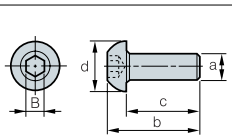
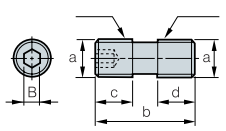
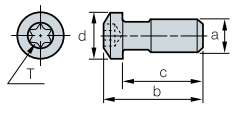
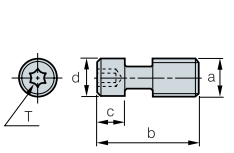
Geometry	Designation	Dimensions (mm)					
		a	b	c	d	B(T)	a´
	N0407	M4 X 0.7	7.5	6	7	3	
	N0508	M5 X 0.8	8.3	6.6	7	3	

● Pin

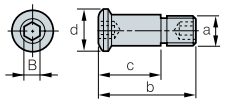
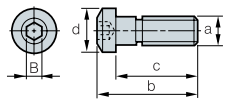
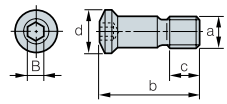
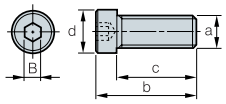
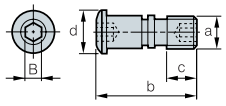
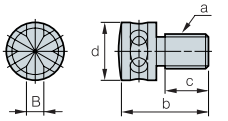
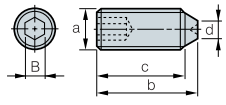
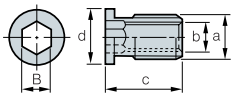
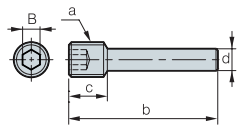
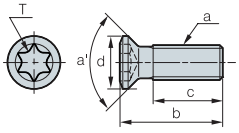
Geometry	Designation	Dimensions (mm)				
		a	b	c		
	PN0308	3.0	8			
	PN0310	3.0	10			
	PN0312	3.0	12			
	PN0314	3.0	14			
	PN0515	4.8	3.3	14.5		

● Screw

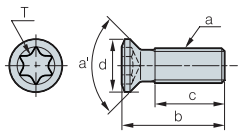
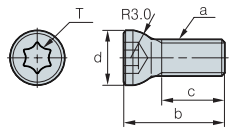
Geometry	Designation	Dimensions (mm)					
		a	b	c	d	B(T)	a´
	ETGA0520CBM	M5 X 0.8	20		6.5	20	43°
	ETGD0825	M8 X 1.25	25.2		11.1	40	40°
	ETKA0523	M5 X 0.8	23		7.6	20	43°
	ETKA0625	M6 X 1.0	25.5		8.8	20	43°
	ETKD0516	M5 X 0.8	16.4		6.8	20	40°
	ETKD0620	M6 X 1.0	20		8.3	30	40°
	ETNA02506	M2.5 X 0.45	5.7		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°
	FTKA0412B	M4 X 0.7	12.5		5.5	15	60°
	FTKA0413	M4 X 0.7	13.0		5.5	15	60°
	FTNA01633	M16 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°

Geometry	Designation	Dimensions (mm)					
		a	b	c	d	B(T)	a´
	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°
	FTNA0513	M5 X 0.8	13.0		7.0	20	60°
	FTNA0516	M5 X 0.8	16.0		7.0	20	60°
	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°
	PXMA0306	M3 X 0.5	5.9		5.7	2	90°
	SHX0310	M3 X 0.5	10		5.9	2	91°
	VHX0509B	M5 X 0.8	9.0	4.15	5.0	2.0	
	VHX0512B	M5 X 0.8	12.0	6.5	5.0	2.0	
	VHX0514	M5 X 0.8	14.5	8.25	5.0	2.0	
	VHX0617	M6 X 1.0	17.0	10.0	6.0	2.5	
	VHX0821	M8 X 1.0	21.0	10.0	8.0	3.0	
	VHX0825	M8 X 1.0	25.0	12.0	8.0	3.0	
	VHX1027N	M10 X 1.0	27.2	14.4	9.8	5.0	
	VHX1236N	M12 X 1.0	36.0	18.3	11.8	5.0	
	VHX0613A	M6 X 1.0	13.4	9.1	6.0	2.5	
	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	
	RHA0620	M6 X 1.0	24	16	10.5	4	
	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	
	LTX0512	M5 X 0.8	15.1	12	7.3	20	
	LTX0514	M5 X 0.8	17.1	14	7.3	20	
	WTX0813	M8 X 1.25	17.2	4.9	8.5	25	
	WTX0817	M8 X 1.25	22	4.9	8.5	25	

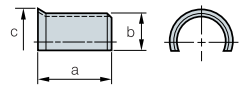
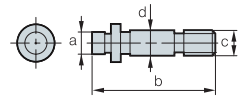
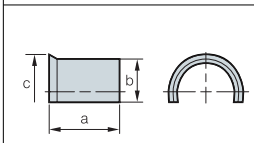
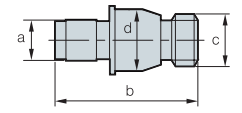
● Screw

Geometry	Designation	Dimensions (mm) a	b	c	d	B(T)	a´
	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(왼나사)	17.2	10.1	8.5	3	
	CHX0621	M6 X 1.0	21	10.1	8.5	3	
	CHX0407	M4 X 0.7	9.5	7.36	5.7	2.5	
	CHX0510	M5 X 0.8	13.1	10.1	7.7	3	
	CHX0518	M5 X 0.8	21.5	18	8	3	
	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	
	BHA0616	M6 X 1.0	22	16	10	5	
	BHA0619-NYLOK	M6 X1.0	25	19	10	5	
	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	
	AZ0508F	M5 X 0.5	13	8	9	⌀2	
	AZ0514	M5 X 0.8	14	7	9	⌀2.5	
	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	
	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	
	KHB0417	M4 X 0.7	17.2	4.5	2.5	2	
	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°

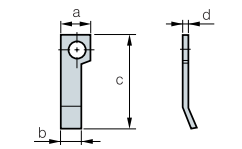
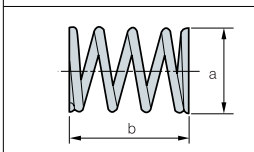
● Screw

Geometry	Designation	Dimensions (mm) a	b	c	d	B(T)	a´
	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	

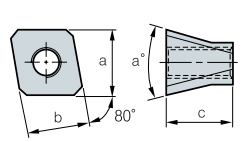
● Shim-Pin

Geometry	Designation	Dimensions (mm) a	b	c	d
	SP3	5.5	3.5	5.9	
	SP4	7.0	4.0	7.6	
	SP5	8.5	4.5	8.8	
	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	12	M4 X 0.7	4
	SP4M	5	19	M5 X 0.8	6
	SP10	6.85	3.3	5.8	
	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

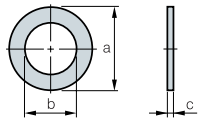
● Spring

Geometry	Designation	Dimensions (mm) 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		

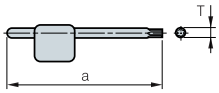
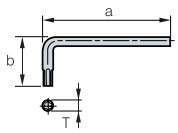
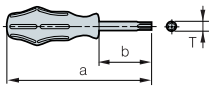
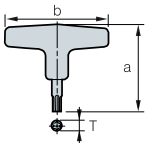
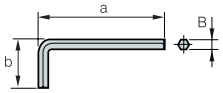
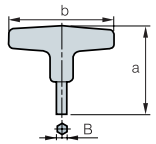
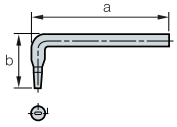
● Stopper

Geometry	Designation	Dimensions (mm) a	b	c	d
	STP5	11	10.2	11	30

● Washer

Geometry	Designation	Dimensions (mm)				
		a	b	c		
	WA3	11.0	6.8	0.5~1.0		
	WA4	10.0	5.3	0.5~1.0		

● Wrench

Geometry	Designation	Dimensions (mm)				
		a	b	B(T)	d	angle
	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		
	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		
	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			

MEMO

Tooling System

J

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HSK Tooling System ---------- J02
BT Tooling System ---------- J03
SK Tooling System ---------- J04
DHE Series ---------- J05
High Speed Milling Chuck HPM -------- J06
Shrinking Chuck DSC ---------- J07

HSK Tooling System

DIN 69893-1, ISO 12164-1 : 2001

Drilling

Collet Chuck
SDC

Slim Collet Chuck
SDC / S

Ultra High Speed Collet Chuck **HDC**

NPU Drill Chuck
NPU

Face Milling

Morse Taper Arbor
MTA

Face Mill Arbor
FMA, FMC

Endmilling

Side Lock Arbor
SLA

High Speed Milling Chuck **HPM**

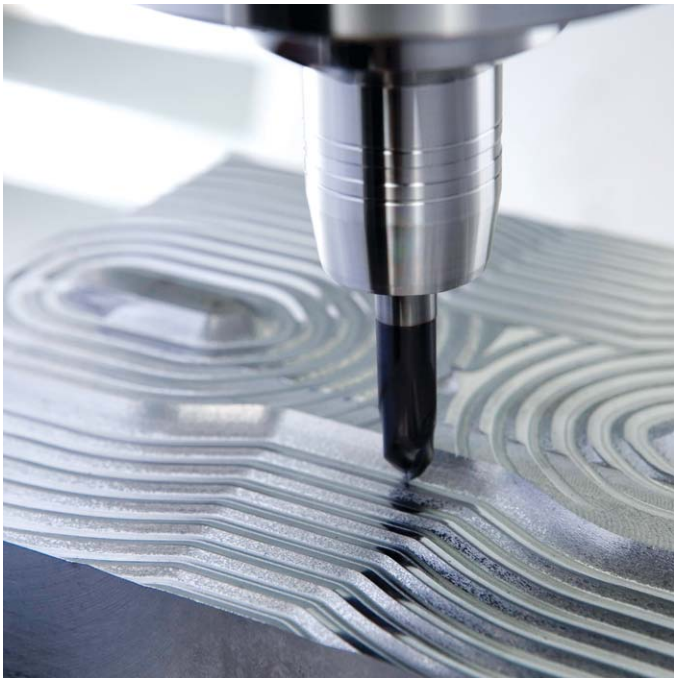
New Power Milling Chuck **NPM**

Fine Boring

Hydraulic Expansion Chuck **DHE**

Shrinking Chuck
DSC

Micro Boring Bar
BKA



BT Tooling System

MAS403-BT

Drilling

Collet Chuck
SDC

High Speed Collet Chuck
HPS

Ultra High Speed
Collet Chuck **HDC**

Slim Collet Chuck
SDC/S

NPU Drill Chuck
NPU

Endmilling

Side Lock Arbor
SLA, SLW

Face Milling

High Speed Milling Chuck
HPM

New Power Milling
Chuck **NPM**

Milling Chuck
DPSN

Hydraulic Expansion
Chuck **DHE**

Shrinking Chuck
DSC

Face Mill Arbor
FMA/B/C

Side Cutting

Side Cutter Arbor
SCA

Tapping

Tapping Holder
KTN

Synchro Tap Chuck
SDT

Rough Boring

Balance Cut Tool
DBC

Balance Cut Tool
TBC

Square Boring Bar
BSA/BSB

Fine Boring

Micro Boring Bar
BKA/BKB

Micro Boring Bar
BCF

Small Micro Boring Bar
SMH

Small Micro Boring Bar
SMB

Micro Boring Bar
KMB

Micro Boring Bar
FBH

Oil Hole Holder

Angular Head

Spindle Speeder

Modular

Micro Boring Bar
FBC

Micro Boring Bar
MUP

Oil Hole Holder
OHDC, OHSL

Angular Head

Spindle Speeder
KSH

Basic Holder(Body)
MD

SK Tooling System

DIN 69871-1 A/B, ISO 7388/1 : 1983(E)

Drilling

Collet Chuck **SDC**

Ultra High Speed Collet Chuck **HDC**

NPU Drill Chuck **NPU**

Endmilling

Morse Taper Arbor **MTA**

Side Lock Arbor **SLA, SLW**

High Speed Milling Chuck **HPM**

New Power Milling Chuck **NPM**

Hydraulic Expansion Chuck **DHE**

Shrinking Chuck **DSC**

Tapping

Tapping Holder **KTN**

Synchro Tap Chuck **SDT**

Face Milling

Face Mill Arbor **FMA, FMC**

Rouhg Boring

Balance Cut Tool **TBC**

Fine Boring

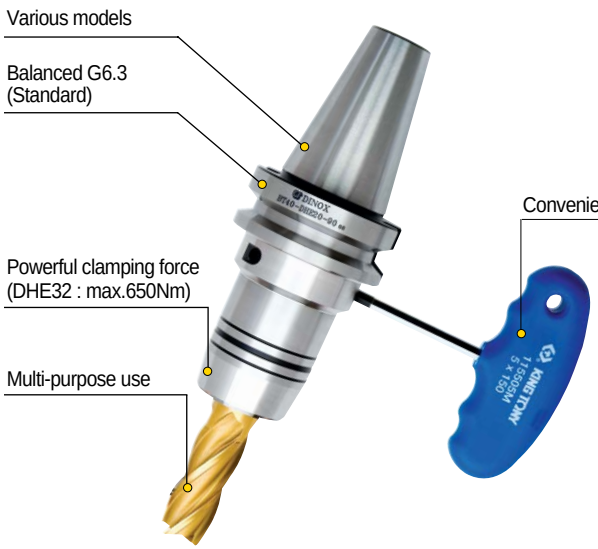
Micro Boring Bar **FBH**

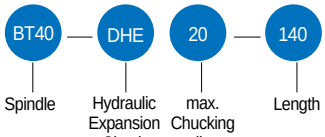
Micro Boring Bar **FBC**

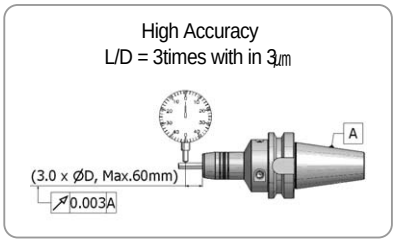
Hydraulic Expansion Chuck DHE

Hydraulic Chuck for high precision machining due to high accuracy and high clamping force.

High accuracy and high rigidity	High durability	Convenient clamping / unclamping	max. Chucking dia. ϕ32mm



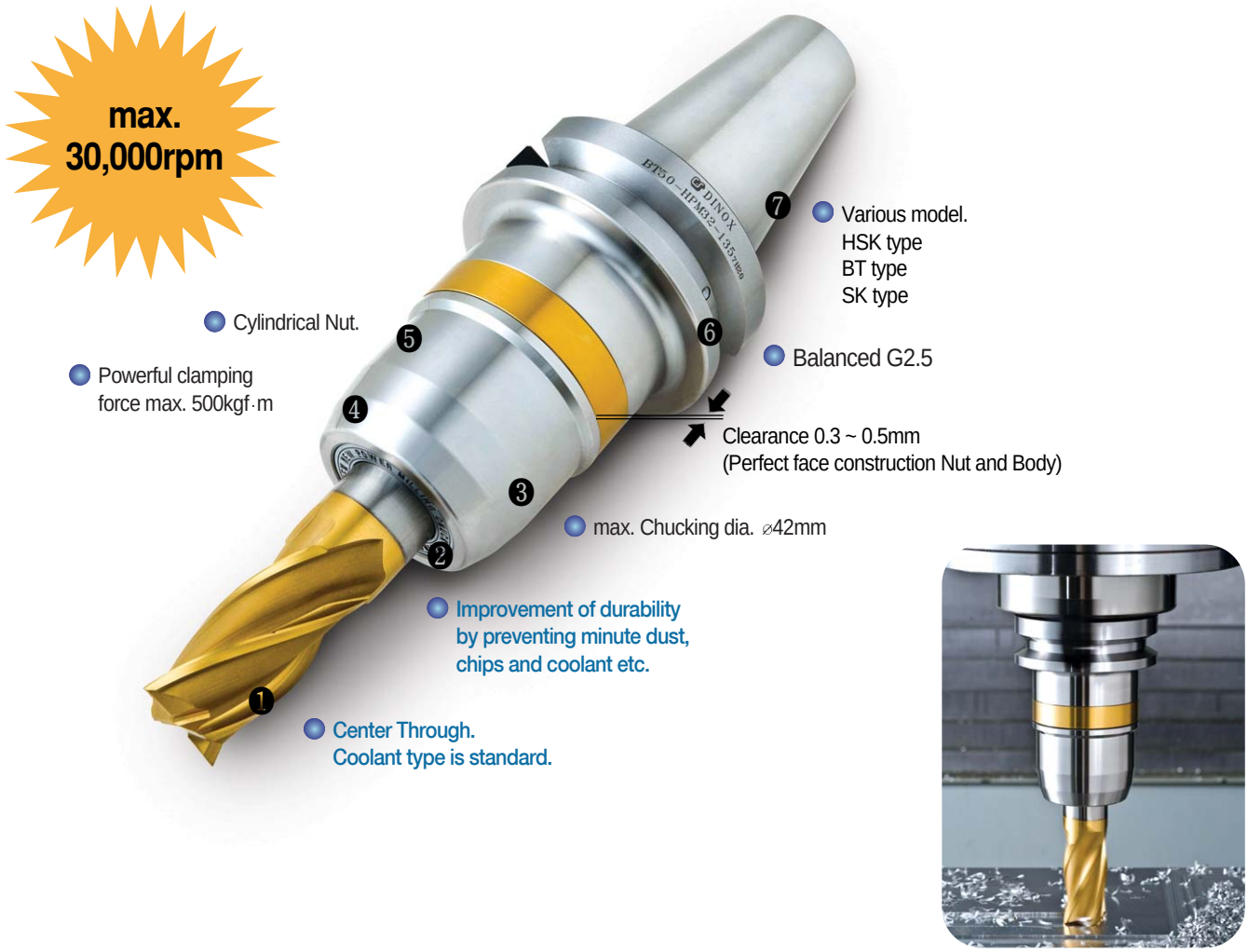




■ Application example

High Speed Milling Chuck HPM

For High speed and high precision machining
Balanced G2.5max. revolution 30,000rpm, max. Chucking dia. : ϕ42mm



Spanner

One way clutch system
with Needle Roller Bearing

Easy and Firm Clamping
Cat No. : HS20 for HPM20
HS32 for HPM32
HS42 for HPM42

Collet

CS Collet :
CS20, CS32, CS42

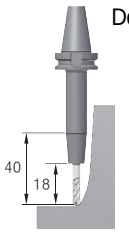
C Collet :
C20, C32, C42

Shrinking Chuck DSC

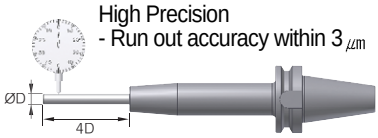
for Ultra High Speed Endmilling,
High Speed Drilling and High Precision Reaming.

- Excellent rigidity
- Special heat treatment ensures maximum life
- Chucking dia. Ø6~Ø32mm
- Compact Design
- Minimum cutting tool overhang
- High precision - Run out accuracy within 3㎛
- Balanced G2.5
- Various model - HSK type, BT type, SK type

Deep place machining



High Precision
- Run out accuracy within 3㎛



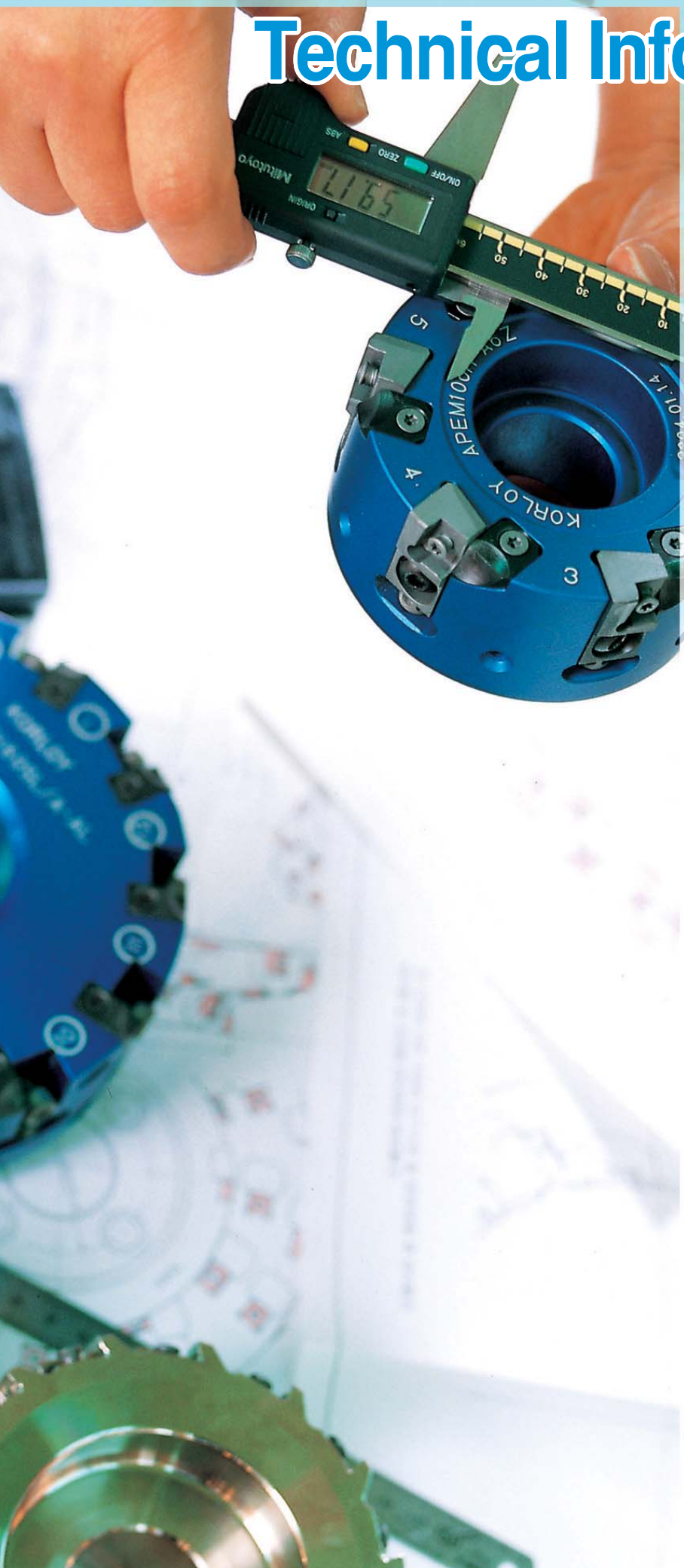
Tool Holder

Cooling Adaptor

Induction Coil

MEMO

Technical Information K



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■ 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	ГOCT
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	-	S458C	-	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

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	ГOCT
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

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	ГOCT
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	-	-	30ГЛ 35ГЛ
		SMn438(H)	36Mn6(H)	SMn438(H)	1541(H)	150M36			35ГЛ 40ГЛ
		SMn443(H)	42Mn6(H)	SMn443(H)	1541(H)	-	-	-	40ГЛ 45ГЛ
		SMnC420(H)	-	SMnC420(H)	-	-	-	-	-
		SMnC443(H)	-	SMnC443(H)	-	-	-	-	-
	Aluminum chromium molybdenum steel	SACM645	41CrAlMo74	SACM645	-	-	-	-	-

■ 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	ГOCT
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 1/2				
	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				

■ Special use 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	ГОСТ
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	-					

■ 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	ГОСТ
Stainless steel	Austenitic	STS201	X12CrMnNiN17-7-5	SUS201	S20100	201	284S16	X12CrNi17-7	Z12CMN17-07Az	12Х17 · √ 9АН4
		STS202	X12CrMnNiN18-9-5	SUS202	S20200	202	301S21	X2CrNiN18-7		07Х16Н6
		STS301	X10CrNi18-8	SUS301	S30100	301		X12CrNi17-7	Z11CN17-08	
		STS301L	X2CrNiN18-7	SUS301L						
		STS301J1		SUS301J1			302S25			12Х18Н9
		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	12Х18Н10Е
		STS303Se		SUS303Se	S30323	303Se		X5CrNi18-10		
		STS303Cu		SUS303Cu			304S31			08Х18Н10
		STS304	X5CrNi18-9 X2CrNi18-9	SUS304	S30400	304	304S11	X2CrNi19-11	Z7CN18-09	03Х18Н11
		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			06Х18Н11
		STS305	X6CrNi18-12	SUS305	S30500	305			Z8CN18-12	
		STS309S		SUS309S	S30908	309S	310S31	X5CrNiMo27-12-2	Z10CN24-13	10Х23Н18
		STS310S	X6CrNi25-20	SUS310S	S31008	310S	316S31	X5CrNiMo27-13-3	Z8CN25-20	
		SUS316	X5CrNiMo17-12-2 X3CrNiMo17-12-3	SUS316	S31600	316	316S11	X2CrNiMo17-13-2 X2CrNiMo17-14-3	Z7CND17-12-02 Z6CND18-12-03	03Х17Н14М3
		STS316L	X2CrNiMo17-12-2 X2CrNiMo17-12-3 X2CrNiMo18-14-3	SUS316L	S31603	316L			Z3CND17-12-02 Z3CND17-12-03	
		STS316N		SUS316N	S31651	316N	317S16	X6CrNiTi18-10		
		STS317		SUS317	S31700	317	321S31	X6CrNiNb18-10		08Х18Н10Т
		STS321	X6CrNiTi18-10	SUS321	S32100	321	347S31		Z6CNT18-10	08Х18Н12
		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		12Х17
		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	20Х13
		STS420J1	X20Cr13	SUS420J1	S42000	420	431S29		Z20C13	20Х17Н2
		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	09Х17Н7ІО
		STS631	X7CrNiAl17-7	SUS631	S17700	S17700			Z9CNA17-07	
		STS631J1		SUS631J1						

■ 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	ГОСТ
Casting Iron	Gray 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	ГОСТ
Aluminum alloy	Aluminum alloy ingots for casting	AC1B	Al-Cu4MgTi	AC1B	204.0		-	-	A-U5GT	
		AC2A	-	AC2A	-		-	-	-	
		AC2B	-	AC2B	319.0		-	-	-	
		AC3A	-	AC3A	-		LM-6	-	-	
		AC4A	-	AC4A	-		-	G(GK)-AlSi9Cu3	-	
		AC4B	-	AC4B	-		-	-	-	
		AC4C	Al-Si7Mg(Fe)	AC4C	356.0		LM-25	G(GK)-AlSi7MG	A-S7G	
		AC4CH	Al-Si7Mg	AC4CH	A356.0		-	-	-	
		AC4D	Al-Si5Cu1Mg	AC4D	355.0		LM-16	-	-	
		AC5A	Al-Cu4Ni2Mg2	AC5A	242.0		-	G(GK)-AlMg5	A-U4NT	
		AC7A	-	AC7A	514.0		LM-5	-	-	
		AC8A	-	AC8A	-		LM-13	-	A-S12UNG	
		AC8B	-	AC8B	-		LM-26	-	A-S10UG	
		AC8C	-	AC8C	-		-	-	A-S10UG	
		AC9A	-	AC9A	-		LM-29	-	-	
		AC9B	-	AC9B	-		-	GD-AlSi12 (Cu)	A-S18UNG	
	Aluminum alloy die casting	ALDC1	Al-Si12CuFe	ADC1	A413.0		LM20	GD-AlSi10Mg	A-S13	
		ALDC2	-	ADC3	A360.0		-	GD-AlMg9	A-S9G	
		ALDC3	-	ADC5	518.0		-	-	A-G6	
		ALDC4	-	ADC6	-		-	GD-AlSi9Cu3	A-G3T	
		ALDC7	Al-Si8Cu3Fe	ADC10	A380.0		-	GD-AlSi9Cu3	-	
		ALDC7Z	Al-Si8Cu3Fe	ADC10Z	A380.0		LM24	-	-	
		ALDC8	-	ADC12	383.0		LM2	-	-	
		ALDC8Z	-	ADC12Z	383.0		LM2	-	-	
		ALDC9	-	ADC14	B390.0		LM30	EN AW-5052	-	
	Aluminum alloy extruded shapes	A5052S	-	A5052S	5052		EN AW-5052	EN AW-5454	EN AW-5052	
		A5454S	-	A5454S	5454		EN AW-5454	EN AW-5083	EN AW-5454	
		A5083S	AlMg4.5Mn0.7	A5083S	5083		EN AW-5083	EN AW-5086	EN AW-5083	
		A5086S	-	A5086S	5086		EN AW-5086	EN AW-6061	EN AW-5086	
		A6061S	AlMg1SiCu	A6061S	6061		EN AW-6061	EN AW-6063	EN AW-6061	
		A6063S	AlMg0.7Si	A6063S	6063		EN AW-6063	EN AW-7003	EN AW-6063	
		A7003S	-	A7003S	-		EN AW-7003	-	EN AW-7003	
		A7N01S	-	A7N01S	-		-	EN AW-7075	-	
		A7075S	AlZn5.5MgCu	A7075S	7075		EN AW-7075		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	ГОСТ
Heat resistant steel	Austenitic	STR31		SUH31			331S42		Z35CNWS14-14	
		STR35		SUH35			349S52	X53CrMnNi21-9	Z52CMN21-09-Az	
		STR36		SUH36			349S54		Z55CMN21-09-Az	
		STR37		SUH37	S63008		381S34			
		STR38		SUH38	S63017					
		STR309		SUH309			309S24	CrNi2520	Z15CN24-13	
		STR310		SUH310	S30900		310S24		Z15CN25-20	20X25H20C2
		STR330		SUH330	S31000	309			Z12NCS35-16	
		STR660		SUH660	N08330	310			Z6NCTV25-20	
		STR661		SUH661	S66286	N08330		CrAl1205		
	Ferritic	STR21		SUH21	R30155			X6CrTi12		
		STR409	X6CrTi12	SUH409			409S19		Z6CT12	
		STR409L	X2CrTi12	SUH409L	S40900				Z3CT12	
		STR446		SUH446		409		X45CrSi9-3	Z12C25	15X28
	Martensitic	STR1		SUH1	S44600		401S45		Z45CS9	
		STR3		SUH3	S65007	446			Z40CSD10	40X10C2M
		STR4		SUH4			443S65		Z80CSN20-02	
		STR11		SUH11						40X9C2
		STR600		SUH600						20X12BHMГР
		STR616		SUH616	S42200					

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	SBCR
		Nickel Chromium Steel	SNC
		Nickel Chromium Molybdenum Steel	SNCM
		Manganese Steel and manganese Chromium Steel for Machine Structural Use	SMn
Special steel	Tool steel	Carbon Tool Steel	STC
		Hollow Drill Steel	STC
		Alloy Tool Steel	STS, STD, STT
		High Speed Tool Steel	SKH
	Stainless steel	Free Cutting Carbon Steel	SUM
		High Carbon Chromium Bearing Steel	STB
		Spring Steel	SPS
		Stainless Steel Bar	STS
	Heat resisting steel	Heat Resisting Steel	STR
		Heat Resisting Steel Bar	STR
		Heat Resisting Steel Sheet	STR

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	AlDC
	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	1.019 72×10-1	1×10-5
9.806 65	1	9.806 65×105
1×10^{-5}	1.019 72×10-6	1

● Stress

Pa or N/m²	MPa or N/mm²	kgf/mm²	kgf/cm²	kgf/m²
1	1×10^{-6}	$1.019\ 72\times10^{-7}$	$1.019\ 72\times10^{-5}$	$1.019\ 72\times10^{-1}$
1×10^{6}	1	$1.019\ 72\times10^{-1}$	$1.019\ 72\times10$	$1.019\ 72\times10^{5}$
$9.806\ 65\times10^{6}$	9.806 65	1	1×10^{2}	1×10^{6}
$9.806\ 65\times10^{4}$	$9.806\ 65\times10^{-2}$	1×10^{-2}	1	1×10^{4}
9.806 65	$9.806\ 65\times10^{-6}$	1×10^{-6}	1×10^{-4}	1

● Pressure

Pa	kPa	MPa	bar	kgf/cm²
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	$1.019\ 72\times10^{-5}$
1×10^{3}	1	1×10^{-3}	1×10^{-2}	$1.019\ 72\times10^{-2}$
1×10^{6}	1×10^{3}	1	1×10	$1.019\ 72\times10$
1×10^{5}	1×10^{2}	1×10^{-1}	1	1.019 72
$9.806\ 65\times10^{4}$	$9.806\ 65\times10$	$9.806\ 65\times10^{-2}$	$9.806\ 65\times10^{-1}$	1

● Work, Energy, Calorie

J	kW·h	kgf·m	kcal
1	$2.777\ 78\times10^{-7}$	$1.019\ 72\times10^{-1}$	$2.388\ 89\times10^{-4}$
$3.600\ 00\times10^{6}$	1	$3.670\ 98\times10^{5}$	$8.600\ 00\times10^{2}$
9.806 65	$2.724\ 07\times10^{-6}$	1	$2.342\ 70\times10^{-3}$
$4.186\ 05\times10^{3}$	$1.162\ 79\times10^{-3}$	$4.268\ 58\times10^{2}$	1

● Power

W	kW	kgf·m/s	PS	kcal/h
1	1×10^{-3}	$1.019\ 72\times10^{-1}$	$1.359\ 62\times10^{-3}$	$8.600\ 00\times10^{-1}$
1×10^{3}	1	$1.019\ 72\times10^{2}$	1.359 62	$8.600\ 00\times10^{2}$
9.806 65	$9.806\ 65\times10^{-3}$	1	$1.333\ 33\times10^{-2}$	8.433 71
7.355×10^{2}	7.355×10^{-1}	7.5×10	1	$6.325\ 29\times10^{2}$
1.162 79	$1.162\ 79\times10^{-3}$	$1.185\ 72\times10^{-1}$	$1.580\ 95\times10^{-3}$	1

● Specific heat

J/(kg·K)	kcal/(kg·°C) cal/(g·°C)
1	$2.388\ 89\times10^{-4}$
$4.186\ 05\times10^{3}$	1

● Thermal conductivity

W/(m·k)	kcal/(h·m·°C)
1	$8.600\ 0\times10^{-1}$
1.162 79	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	Tensile strength (approximate value)
	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	HS	MPa(1)
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	Brinell, 3000kgf HB		Rockwell				Shore	Tensile strength (approximate value)
	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	HS	MPa(1)
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	-	-	-	-

Note1.) Gothic number is ASTM E 1 in the list 140

Note2.) 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/cm^3)	Hardness (H_RA)	TRS (kgf/mm^2)	compressive strength (kg/mm^2)	Young's modulus ($10^3kgf/mm^2$)	Thermal expansion coefficient ($10^{-6}/℃$)	Thermal conductivity (cal/cm·sec·℃)
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	U40	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/cm^3)	Hardness (H_RA)	Young's modulus ($\times10^3kgf/mm^2$)	Thermal conductivity (cal/cm·sec·℃)	Thermal expansion coefficient ($\times10^{-6}/℃$)	Melting point (℃)
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

Technical information for Stainless steel

■ Guide of stainless-steel machining

- Stainless steels are well known for their excellent anti-corrosive property.
- Excellent anti-corrosive property are due to Chromium added to these alloys. In general, stainless steels have 4%~10% content of Chromium.

● Classifications & Features of Stainless steel.

1) Austenite series : One of the most general kinds of stainless steels, it has some of the best corrosion-resistance properties due to a high Cr & Ni content. A high Nickel content also makes machining more difficult. Austenite series stainless steels are usually used for can processing, chemical products and construction purposes. (AISI 303,304,316)
2) Ferrite series : It has Chromium content similar to Austenite series, but none of Ni content which results in freer machining. (AISI 410,430,434)
3) Martensite series : The only stainless steel with the ability to be heat treated. It has high carbon content but poor corrosion resistance, so it is used for parts that need higher hardness. (AISI410, 420,432)
4) Precipitate hardened series : A Chromium-Nickel alloy, it has improved hardness through low temperature heat-treatment and has superior corrosion resistance and toughness at the same time. (AISI 17, 15)
5) Austenite-Ferrite series : Though it has similar properties with Austenite and Ferrite, it has much more superior heat-resistance (approx. 2 times better). Usually used where thermal-corrosion stability is needed, such as condensers (AISI S2304, 2507).

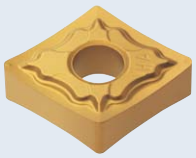
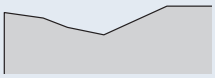
● Difficult-to-Cut Factors of Stainless steel.

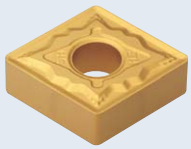
1) Work-hardening property - Causes premature wear of tool and poor control chip.
2) Low thermal conductivity - Causes plastic deformation of cutting edge and fast wear of tools.
3) Built-up-edge - More susceptible to micro-chipping on cutting edges and causes bad surface-finish.
4) Chemical affinity between tool and workpiece caused by work-hardening and low thermal-conductivity of workpiece, this might generate abnormal-wear, chipping and/or abnormal fracture.

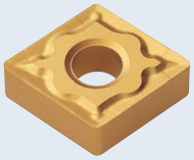
● Tips for Machining of Stainless steel.

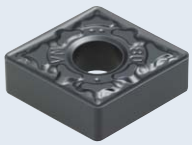
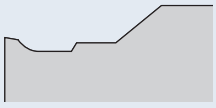
1) Use a tool that has higher thermal-conductivity
   Low thermal-conductivity of stainless steels accelerates tool wear resulting from a decline in hardness of the cutting edge of an insert, this is due to heat piling up. It is better to use a tool that has higher thermal conductivity and with enough coolant.
2) Sharper cutting edge-line
   It is necessary to utilize larger rake-angles and wider chip-breaker lands to reduce cutting-load pressure and prevent build-up-edge. This will help provide better chip control to an operator.
3) Optimal cutting condition
   Inappropriate machining conditions like extremely low or high-speeds or low feed rates can cause poor tool life due to work-hardening of work piece.
4) Choose an appropriate tool
   Tools for stainless steels should have good toughness attributes, enough strength on their edge-line (cutting edge) & a higher film adhesion.

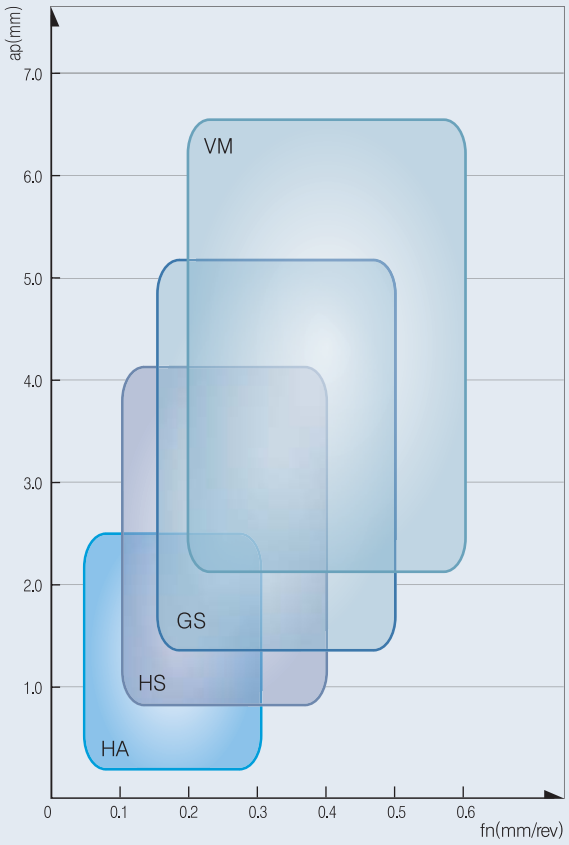
■ Chip Breakers for Stainless steel

HA / Finishing		
		• Sharp edge for shallow depth cutting • Increase tool life through reduce chip control friction at high speed cutting • Good surface finish of work piece

HS / Medium cutting		
		• Enhanced cutting efficiency and increase tool life due to enhanced chip flow. • Reinforce wear resistance through adopting high land rake angle. • Special land design to prevent notching and enhance toughness

GS / Medium to Rough cutting		
		• Superior tool life at light intermittent cutting • Better chip flow through wide chip pocket • Prevent build-up-edge by low cutting force design

VM / Roughing		
		• Chip breaker for intermittent cutting • Unique chip breaker design provide smooth chip control. • Strong edge line permit superior toughness

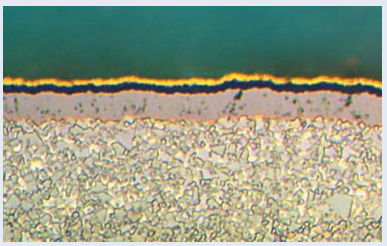


■ Korloy's New Grades for Stainless steel machining.

‣ KORLOY New Grades for Stainless steel machinig

● NC9020, For high speed turning of Stainless steel.

- Specially designed substrate & film suitable for high-speed machining of stainless steels.
- Superior cutting performance under conditions in moderate-speed applications for cutting low-carbon steels and low-carbon alloy steel
- Longer tool-life can be achieved thanks to a superior chipping-resistance design in the grade.
- Obtain better cutting performance. Korloy offers a variety of combinations of chip breakers to machine easily even in deeper depth of cut.

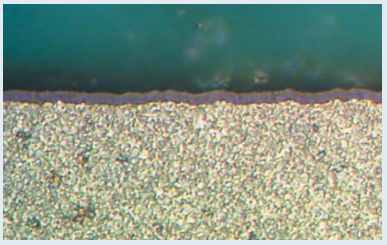


● PC9030, for medium to low speed turning of Stainless steel.

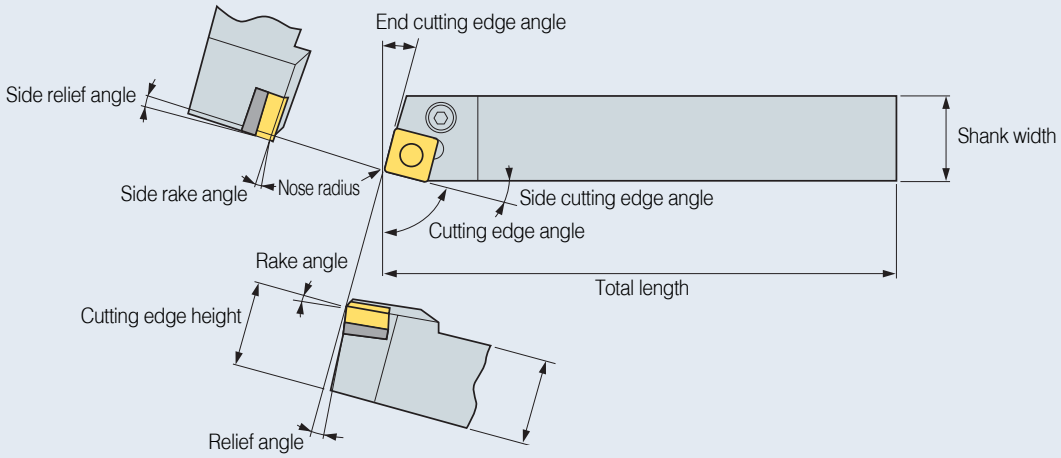
- By using an ultra fine carbide substrate, the PC9030 has a tougher substrate for moderate speed machining and intermittent cutting of Stainless steel
- A PVD coating is applied to this grade to enhance chipping-resistance and adhesion-resistance during machining of difficult-to-cut material
- Exclusive grade for stainless steel, using tougher carbide as a substrate and a PVD coated, this gives the insert superior lubrication properties.
- Enhance your surface finish and reduce burrs by utilizing our chip-breakers, exclusively made for Stainless steels.

● PC9530, for medium to low speed milling of Stainless steel.

- Tough ultra-fine carbide substrate primarily used for roughing and/or intermittent milling applications in stainless steel
- A PVD coating is applied to achieve better tool life in stainless steel and Ni-Cr steel applications.
- To reduce chipping in the cutting edge Korloy uses a tough carbide substrate and PVD coating to help prevent material build up around the cutting edges.



■ Insert shape and terminology

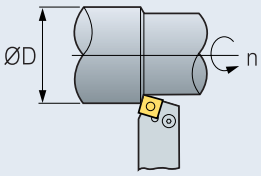


● Relating angles between tool and workpiece

Cutting edge inclination	Terminology	Function	Effect
Rake angle	Side 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.
	Rake angle		
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



$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}$$

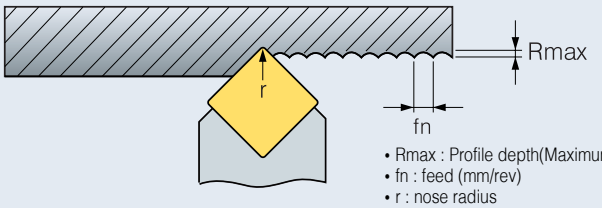
- vc : Cutting speed (m/min)
- n : Revolution per minute (min^{-1})
- D : Diameter (mm)
- π : Circular constant(3.14)

● Feed

$$fn = \frac{vf}{n} \text{ (mm/rev)}$$

- fn : Feed per revolution(mm/rev)
- n : Revolution per minute (min^{-1})
- vf : Table feed (mm/min)

● 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

$$P_{HP} = \frac{kc \times W \times ap \times fn}{4500 \times \eta} \qquad P_{KW} = \frac{kc \times W \times ap \times fn}{6120 \times \eta}$$

- 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 [MPa]
- 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

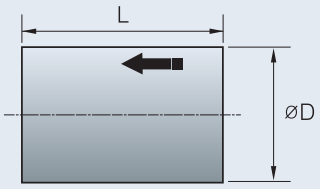
● Material removal rate

$$Q = vc \times ap \times fn^2$$

- Q : Material removal rate [cm^3/min]
- vc : Cutting speed [m/min]
- d : Depth of cut [m]
- fn : Feed per tooth [mm/tooth]

● Machining time

External face machining 1



• Constant Revolution per minute

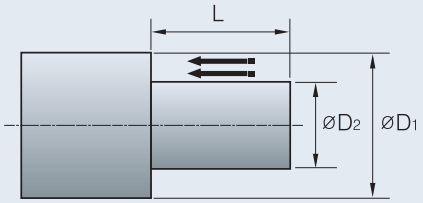
$$T = \frac{60 \times L}{fn \times n}$$

• Constant cutting speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times fn \times n}$$

T : Machining time [sec]
L : Cutting length [mm]
fn: Feed per revolution [mm/rev]
n : Revolution per minute [min]
D : Diameter of workpiece [mm]
vc : Cutting speed [m/min]

External face machining 2



• Constant Revolution per minute

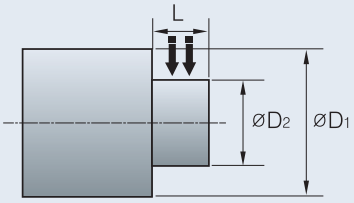
$$T = \frac{60 \times L}{fn \times n} \times N$$

• Constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1000 \times fn \times n} \times N$$

T : Machining time [sec]
L : Cutting length [mm]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min]
D_1 : Maximum diameter of workpiece [mm]
D_2 : Minimum diameter of workpiece [mm]
vc : Cutting speed [m/min]
N : The number of pass = $(D_1-D_2)/d/2$

Facing



• Constant Revolution per minute

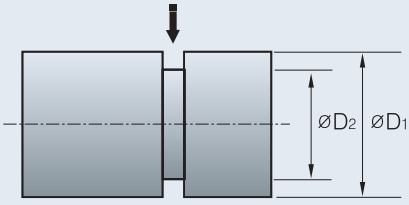
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n} \times N$$

• 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]
T_1 : Machining time before the maximum rpm[sec]
L : Width of machining [mm]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min^{-1}]
D_1 : Maximum diameter of workpiece [mm]
D_2 : Minimum diameter of workpiece [mm]
vc : Cutting speed [m/min]
N : The number of pass = $(D_1-D_2)/d/2$

Grooving



• Constant Revolution per minute

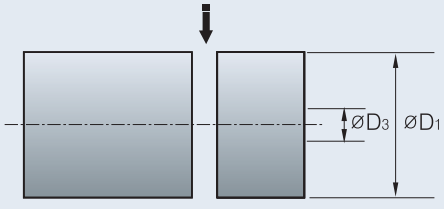
$$T = \frac{60 \times (D_1 - D_2)}{2 \times fn \times n}$$

• 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]
T_1 : Machining time before the maximum rpm[sec]
L : Width of machining [mm]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min^{-1}]
D_1 : Maximum diameter of workpiece [mm]
D_2 : 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

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3)(D_1 - D_3)}{4000 \times fn \times vc}$$

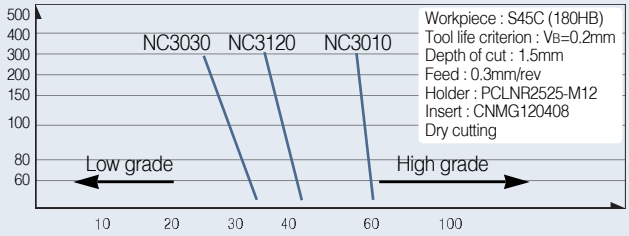
$$T_3 = T_1 + \frac{60 \times D_3}{2 \times fn \times n_{max}}$$

T : Machining time [sec]
T_1 : Machining time before the maximum rpm[sec]
T_3 : Machining time till maximum RPM[sec]
fn : Feed per revolution [mm/rev]
n : Revolution per minute [min^{-1}]
n_{max} : Maximum revolution per minute [min^{-1}]
D_1 : Maximum diameter of workpiece [mm]
D_3 : Maximum diameter at maximum RPM [mm]
vc : Cutting speed [m/min]

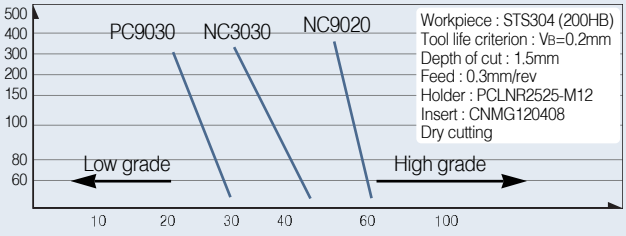
■ The affects of cutting condition

· 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.

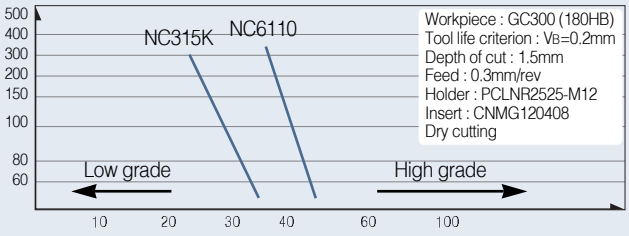
■ Cutting speed



- The tool life feature of P grade -



- The tool life feature of M grade -



- 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 down to 20%. On the other hand if cutting speed is too low (20-40m/min) Tool life shortens due to vibration.

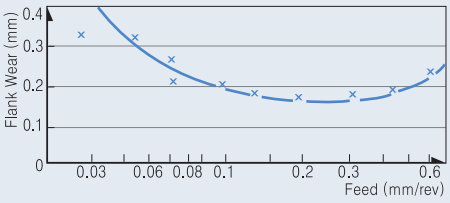
■ Feed

· 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 increases. When the feed rate is too low, the tool life radically shortens.
· When the feed rate increases, the flank wear gets larger due to high temperatures, however the feed rates effect tool life less than the cutting speed. And higher feed rates improve machining efficiency.

- Relationship between feed and flank wear in steel turning



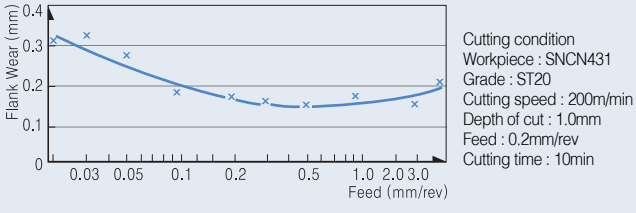
■ Depth of cut

· Determined by 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.

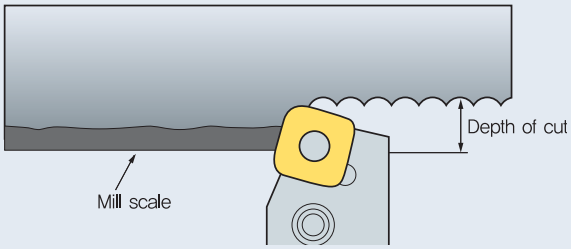
■ The effect of a depth of cut

· 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.

- Relationship between depth of cut and flank wear in steel turning



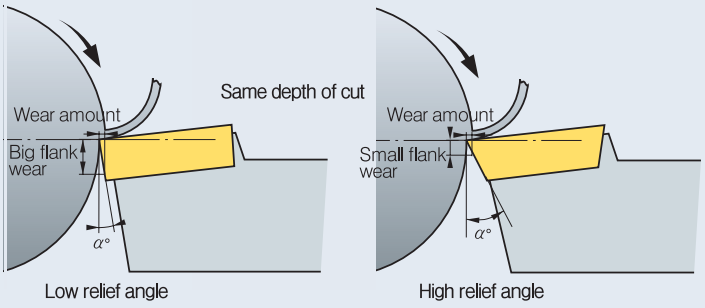
- Surface parts including mill scale Roughing

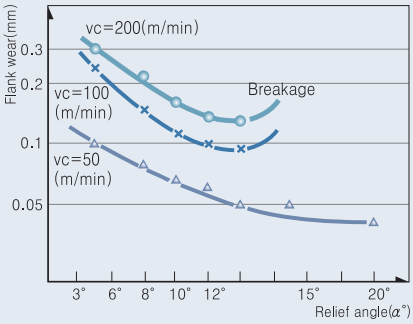


■ Relief angle

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





- Workpiece : SNCM431(HB200)
- Grade : P20
- ap : 1mm
- fn : 0.32mm/rev
- T : 20min

· 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 .

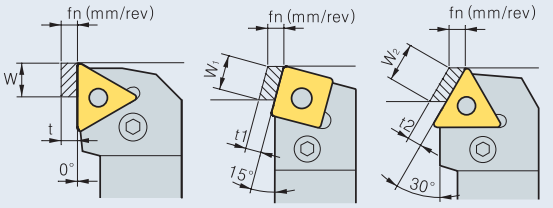
· Selection system

1. Hard workpiece / When strong cutting edge is needed - **Low relief angle**
2. Soft workpiece / Workpiece turning to work hardening easily - **High relief angle**

■ 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

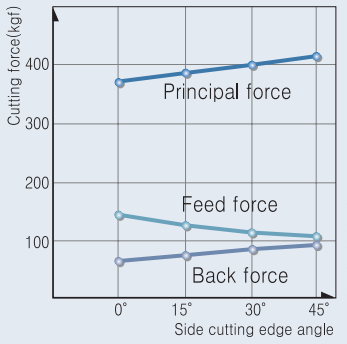


①Approach angle 0° ②Approach angle 15° ③Approach angle 30°

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).

t1 = 0.97t, W1 = 1.04W
t2 = 0.87t, W2 = 1.15W

● Side cutting edge angle and 3 cutting forces



- Workpiece : SCM440(HB250)
- Grade : TNGA220412
- vc = 100m/min
- ap= 4mm
- fn = 0.45mm/rev

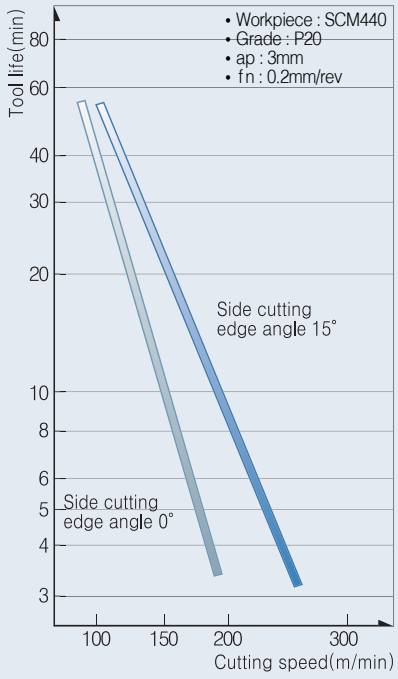
· Affects

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.

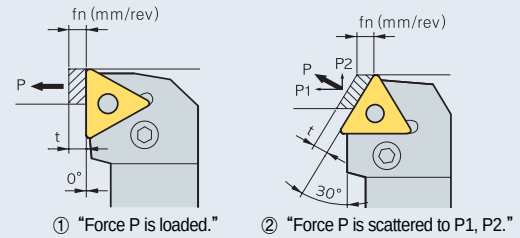
· Selection system

1. Deep depth of cut finishing / Long thin workpiece / Low machine rigidity - **Low relief angle**
2. Hard and high calorific power workpiece / Roughing big workpiece / High machine rigidity - **High relief angle**

● Side cutting edge angle and Tool life



● 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 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.

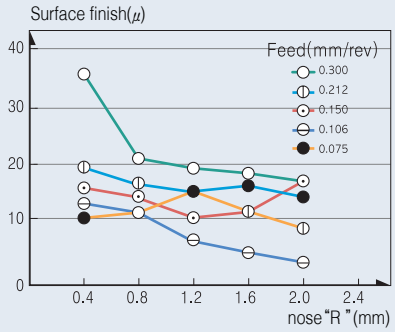
• Affects

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"

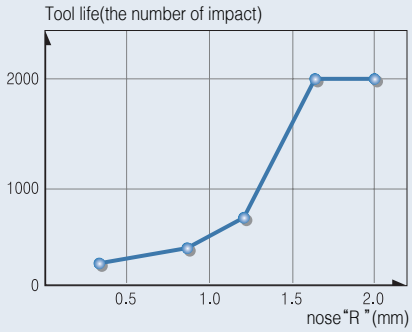
1. Nose "r" affects not only surface roughness but strength of cutting edge.
2. In general, It' s desirable that nose "R" is 2~3 times bigger than feed.

● Nose"R" and surface finish



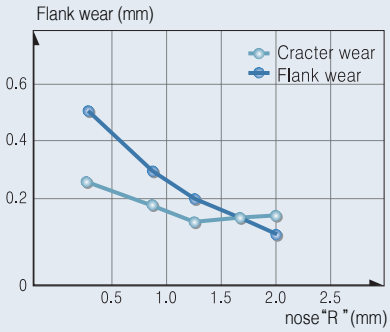
• Workpiece : SNCM439, HB200
• Grade : P20
• vc = 120m/min, ap = 0.5mm

● Nose"R"and tool life



• Workpiece : SCM440, HB280
• Grade : P10
• vc = 100m/min, ap = 0.5mm
• fn = 0.3mm/rev

● Nose"R" and wear of tool



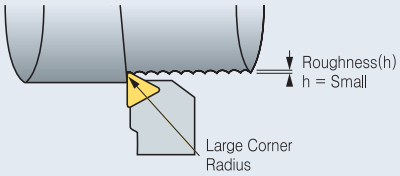
• Workpiece : SNCM439, HB200
• Grade : P10
• vc = 140m/min, ap = 2mm
• fn = 0.2mm/rev, T = 10min

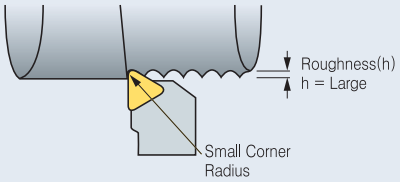
· Affects of nose "R"

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.

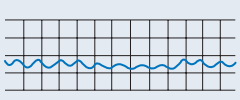
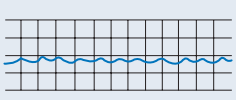
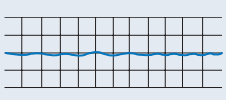
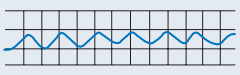
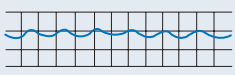
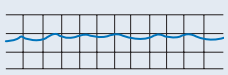
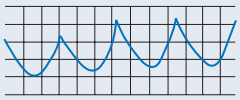
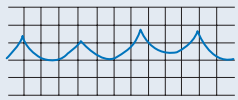
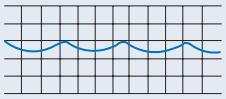
· Selection system

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"**





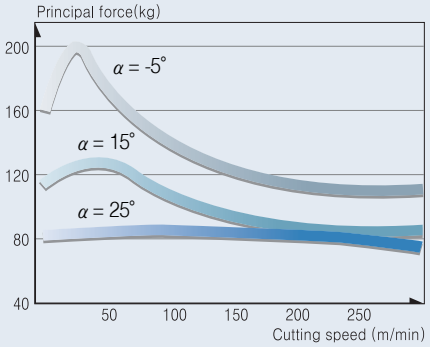
● Relationship between nose radius, feed and various surface roughness.

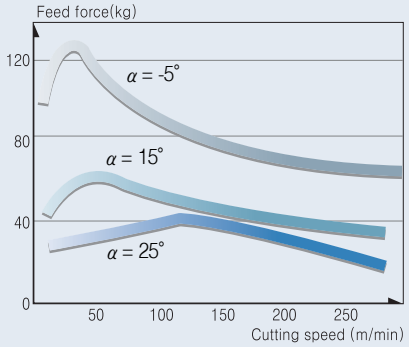
Nose "R" / Feed(mm/rev)	0.4	0.8	1.2
0.15			
0.26			
0.46			

■ Cutting edge shape and the affects

● Rake angle[α]

Rake angle has big influence on cutting force, chip flow and tool life.





· Affects

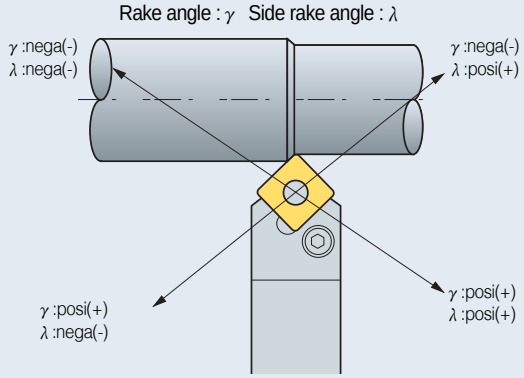
1. High rake angle results in good suface finish.
2. As the rake angle increases by 1° Machining power decreases by 1%.
3. High rake angle weakens cutting edge.

· Selection system

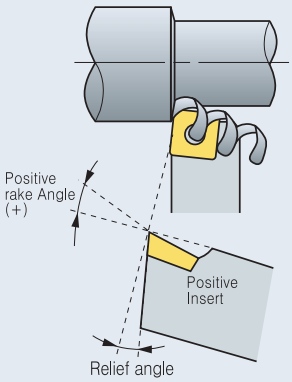
1.For hard workpiece / For applications that need strong cutting edge such as interrupted and machining mill scale
- Low rake angle

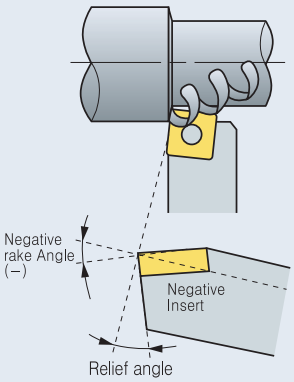
2.For soft workpiece / Easy to cut material / When the rigidity of machine power and workpieceis is low
- High rake angle

● 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.

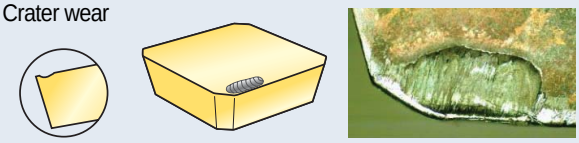
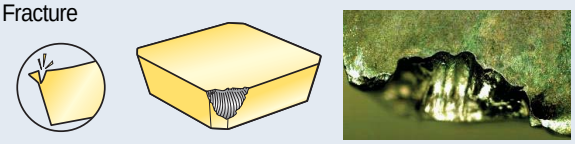
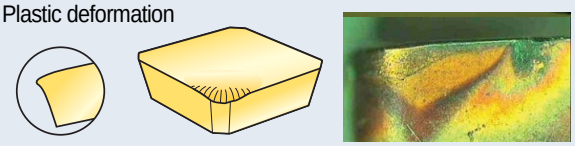
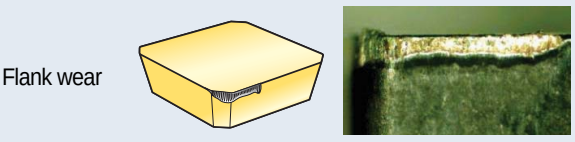
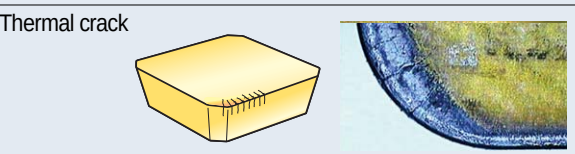
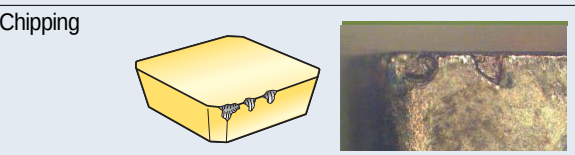
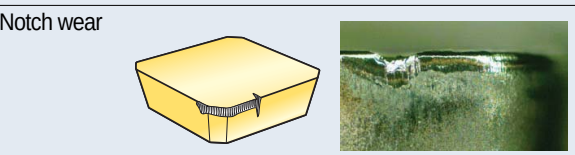
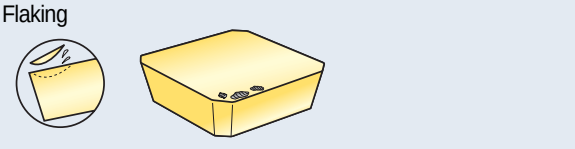
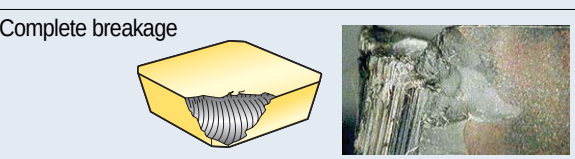
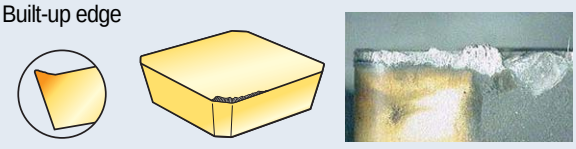
A : Basic factors

- 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	• When the hardness of workpiece is too high compare with tool • When machinig surface hardened workpiece	
Flank wear 	• 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	
Built-up edge 		

■ 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														
	Tools, Improper cutting edge shape									●		⬆		⬇	●				
	Vibration, chattering	⬇	⬇	⬇	Wet cutting		●			●	⬆	⬇		⬇		●	●	●	●
Cutting heat generation Poor machining precision and short tool life by cutting heat	Improper cutting conditions	⬇	⬇	⬇															
	Tools, Improper cutting edge shape					●				●	⬆			⬇					
burr, chipping, nap steel, aluminum (burr)	Improper cutting conditions	⬇	⬆		Wet cutting														
	Wear of tool, Improper cutting conditions.					●				●	⬆	⬇		⬇					
Cast iron (Weak chipping)	Improper cutting conditions		⬇	⬇															
	Wear of tool, Improper cutting conditions.					●				●	⬆	⬆		⬇		●	●	●	●
Soft steel (nap)	Improper cutting conditions	⬆	⬍		Wet cutting														
	Wear of tool, Improper cutting conditions.					●				●	⬆			⬇					

⬆ : Increase ⬇ : Decrease ○ : use ◉ : Correct use

■ Tool life criterion

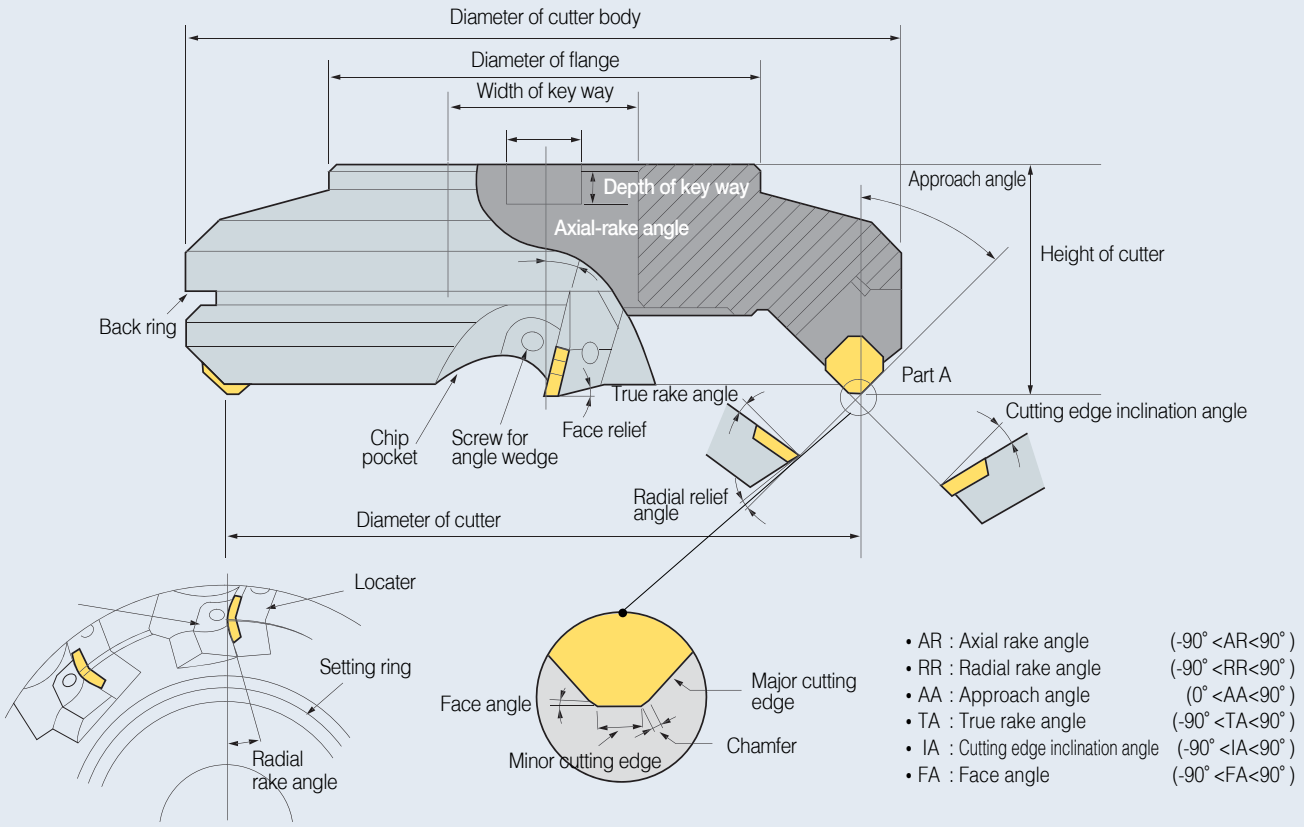
● KS B0813

Flank wear width	0.2mm	Precision light cutting , Finishing in nonferrous alloy
	0.4mm	Machining special steel
	0.7mm	General cutting in cast iron, steel etc
	1~1.25mm	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 V_B = 0.3mm	Even flank wear of cemented carbides, Ceramic tool
V_{Bmax} = 0.5mm	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

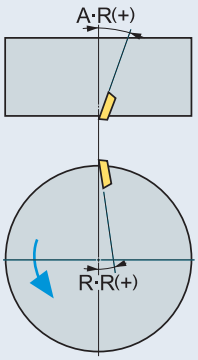
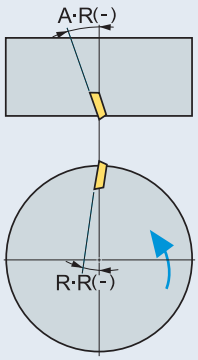
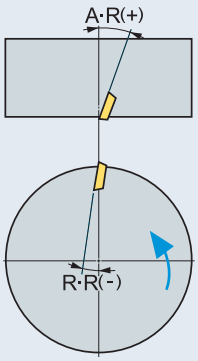
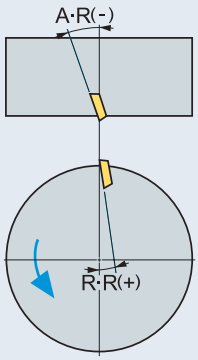
■ Milling cutter shape and designation



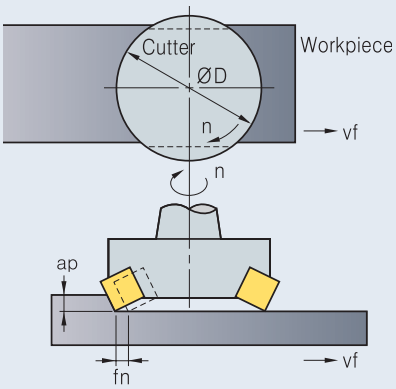
● The terminology and functions of cutting edge angle

Tool failure		Symbol	Function	Effects
1	Axial rake angle	A.R	Chip flow direction, Adhesion	-
2	Radial rake angle	R.R	Affecting on thrust	-
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 decreases, Corner edge strength weakens
6	Face angle	F.A	Controlling surface roughness for finishing	(-) : Surface roughness improves
7	Relief angle	R.A	Controlling cutting edge strength, tool life and chattering	-

■ Features by combination of rake angle

	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

$$Q = \frac{L \times vf \times ap}{1000} \text{ (cm^3/min)}$$

- Q : Chip removal amount (cm^3/min)
- L : Width of cut (mm)
- vf : Table feed (mm/min)
- ap: Depth of cut (mm)

● Power requirement

$$Pc = \frac{Q \times kc}{60 \times 102 \times \eta} \text{ (kw)} \qquad H = \frac{Pc}{0.75} \text{ (hp)}$$

- 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 cps(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/㎟) 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(cm^3/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)

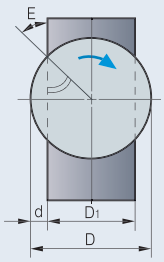
● Selection by machine rigidity

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

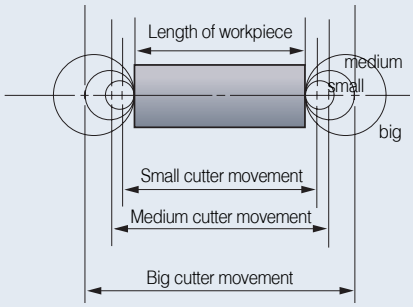
Workpiece	E	δ
Steel	+20°~-10°	3 : 2
Cast iron	Under +50°	5 : 4
Light alloy	Under +40°	5 : 3

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.

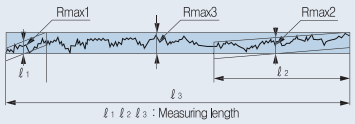
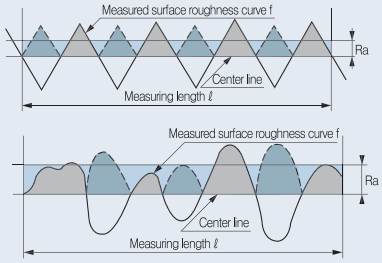


● Selection by number of tooth

Workpiece	Steel	Cast iron	Light alloy
Number of tooth	D×(1~1.5)	D×(1~4)	D×1+α

ex) D=Ø100 ⇒ 4″×(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

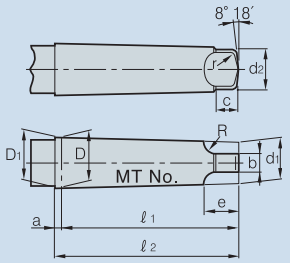
■ General formulas for milling

● 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	

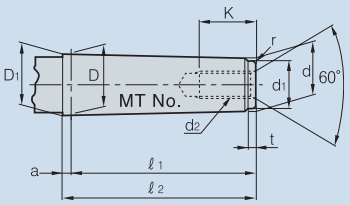
Tapers

● Morse taper (Tang type)



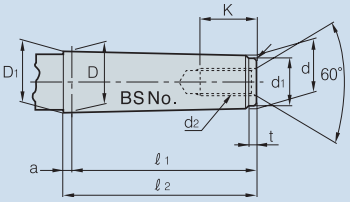
MT No.	Taper	Taper angle(α)	D	a	D1	d1	ℓ1	ℓ2	d2	b	c	e	R	r
0	1/19.212	1° 29′ 27″	9.045	3	9.201	6.104	56.5	59.5	6.0	3.9	6.5	10.5	4	1
1	1/20.047	1° 25′ 43″	12.065	3.5	12.240	8.972	62.0	65.5	8.7	5.2	8.5	13.5	5.	1.2
2	1/20.020	1° 25′ 50″	17.780	5	18.030	14.034	75.0	80.0	13.5	6.3	10	16	6	1.6
3	1/19.922	1° 26′ 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)



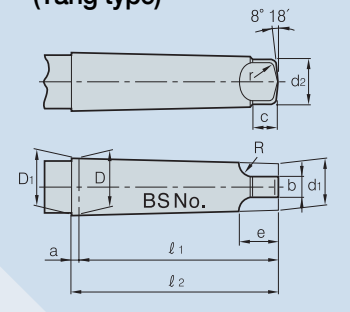
MT No.	Taper	Taper angle(α)	D	a	D1	d	ℓ1	ℓ2	d1	d2	k	t	r
0	1/19.212	1° 29′ 27″	9.045	3	9.201	6.442	50	53	6	-		4	0.2
1	1/20.047	1° 25′ 43″	12.065	3.5	12.230	9.396	53.5	57	9	M6	16	5	0.2
2	1/20.020	1° 25′ 50″	17.780	5	18.030	14.583	64	69	14	M10	24	5	0.2
3	1/19.922	1° 26′ 16″	23.825	5	24.076	19.759	81	86	19	M12	28	7	0.6
4	1/19.254	1° 29′ 15″	31.267	6.5	31.605	25.943	02.5	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)



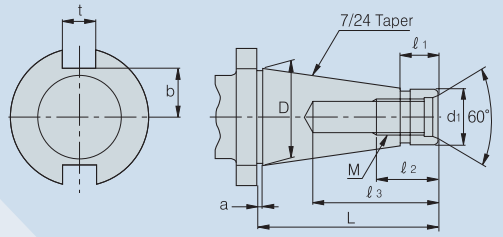
B&S No.	D	a	D1	d	d1	ℓ1	ℓ2	t	r	d2	K
4	10.221	2.4	10.321	8.890	8.0	31.0	34.2	2	0.2	-	-
5	13.286	2.4	13.386	11.430	10.0	44.4	46.8	3	0.2	-	-
6	15.229	2.4	15.330	12.700	11.0	60.0	62.7	3	0.2	M 8(1/4)	20
7	18.424	2.4	18.524	15.240	14.0	76.2	78.6	4	0.2	M10(3/8)	24
8	22.828	3.2	22.962	19.090	17.0	90.5	93.7	4	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)



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

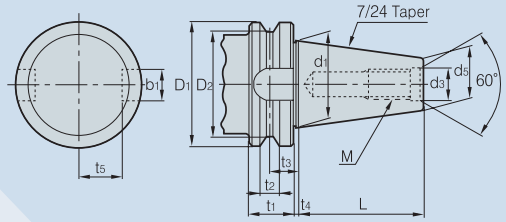
● Standard taper of American milling machine



(mm)

NT No.	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	UNC1″	45	90	3.2	25.4	35
60	$4\frac{1}{4}$	107.950	60.20 $^{-0.34}_{-0.46}$	210	45	UNC$\frac{1}{4}''$	56	110	3.2	25.4	60

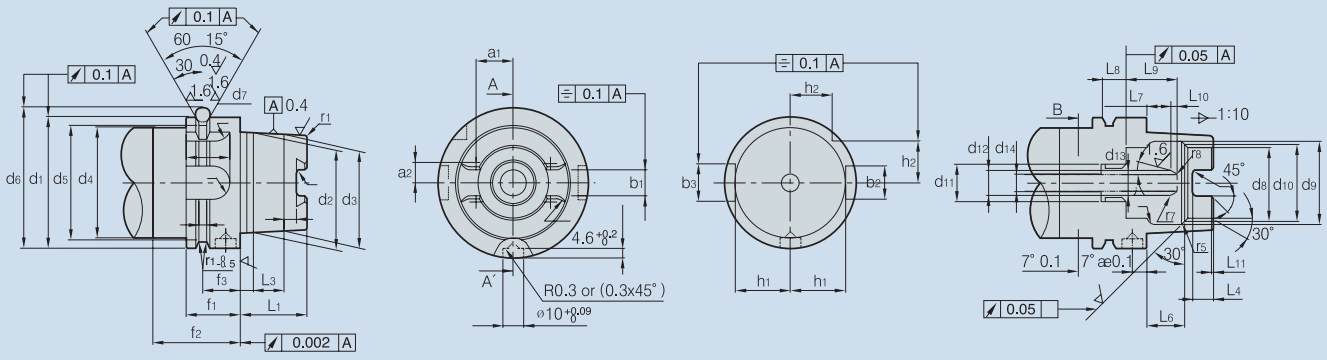
● Bottle grip taper



(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)

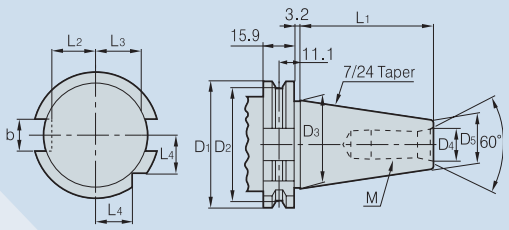
Shank No	b1	b2	b3	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	a1	a2
HSK50	10.54	12	14	50	38	36.90	42	43	59.3	7	26	32	29	M16X1	10	6.8	6.8	13.997	7.648
63	12.5	16	14	63	48	46.53	53	55	72.3	7	34	40	37	M18X1	12	8	8.4	17.862	9.25
100	20	20	14	100	75	72,80	85	92	109.75	7	53	63	58	M24X1.5	16	12	12	27.329	15.00

(mm)

Shank 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
HSK50	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

Tapers

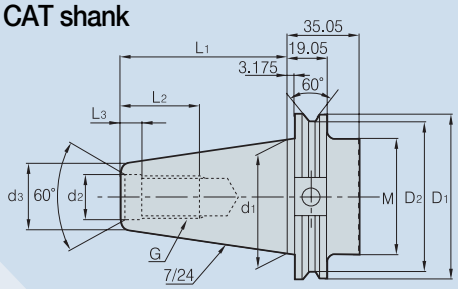
● DIN 69871



(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.	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

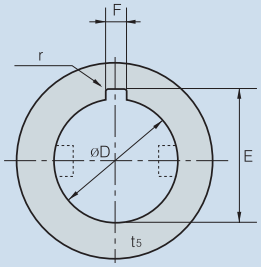
● CAT shank



(mm)

Shank No	D1	D2	M	d1	d2	d3	L1	L2	L3	G
CAT40	63.5	56.36	44.45	44.45	16.28	21.84	68.25	28.45	4.78	5/8-11
CAT45	82.55	75.41	57.15	57.15	19.46	27.69	82.55	38.1	4.78	3/4-10
CAT50	98.43	91.29	69.85	69.85	26.19	35.05	101.6	44.45	6.35	1-8

● Standard of milling cutter hole (KSB3203)



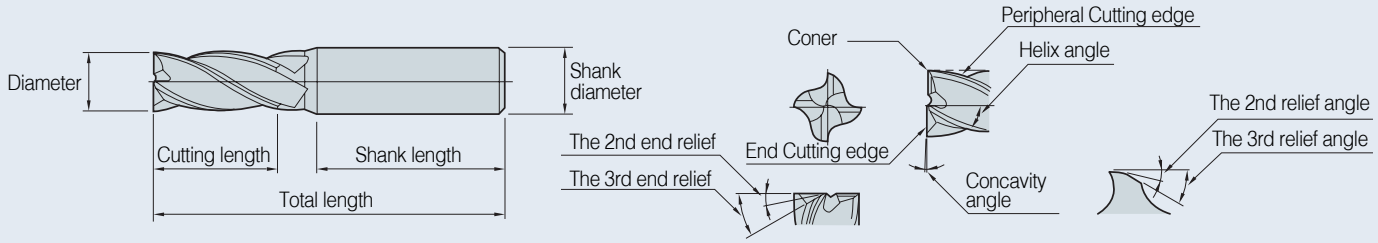
● Type A

Diameter	ø DH7	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	$50^{+0.025}_{0}$	$53.5^{+0.3}_{0}$	$12^{+0.275}_{+0.095}$	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

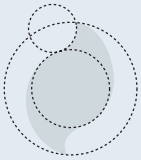
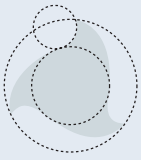
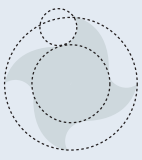
Diameter	ø DH7	E	F	r
$\frac{1}{2}$	$12.70^{+0.018}_{0}$	$14.17^{+0.25}_{0}$	$2.38^{+0.31}_{+0.13}$	0.5
$\frac{5}{8}$	$15.875^{+0.018}_{0}$	$17.74^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{3}{4}$	$19.050^{+0.021}_{0}$	$20.89^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	0.8
$\frac{7}{8}$	$22.225^{+0.021}_{0}$	$24.07^{+0.25}_{0}$	$3.18^{+0.31}_{+0.13}$	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

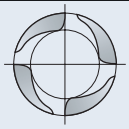
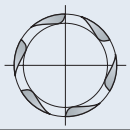
Ø10mm	2 flutes (SSE2100)	3 flutes (SSE3100)	4 flutes (SSE4100)
Shape			
Cross section	44mm²	46mm²	48mm²
Ratio	56%	58%	61%
Advantages	Good chip flow	Good chip flow	High rigidity
Disadvantages	Weak rigidity	Difficult to measure external diameter	Bad chip flow
Usages	Side facing, Grooving Multi-functional	Side facing, Grooving Medium, finishing	Side cutting 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

$$vc = \frac{\pi \times D \times n}{1000} \qquad n = \frac{1000 \times vc}{\pi \times D}$$

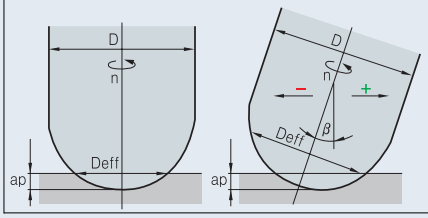
● Calculations of feed speed

$$vf = n \times fn \text{ or } n \times fz \times z$$

$$fn = \frac{vf}{n} \qquad fz = \frac{fn}{z} \text{ or } \frac{vf}{n \times z}$$

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 	$Deff = 2 \times \sqrt{D \times ap - ap^2}$ Calculation Table $Deff = D \times \sin\left[\beta \pm \arccos\left(\frac{D-2ap}{D}\right)\right]$

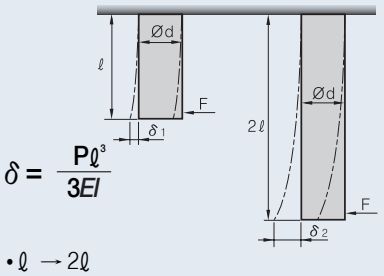
The affection of flute length

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.



$$\delta = \frac{P\ell^3}{3EI}$$

- $\ell \rightarrow 2\ell$
- $\delta_1 \rightarrow \delta_1 = 8\delta_1 = \delta_2$

δ = Deformation volume ℓ = Length of cut I = Inertia moment ($I = \frac{\pi d^4}{64}$)

P = Cutting force E = Elasticity coefficient

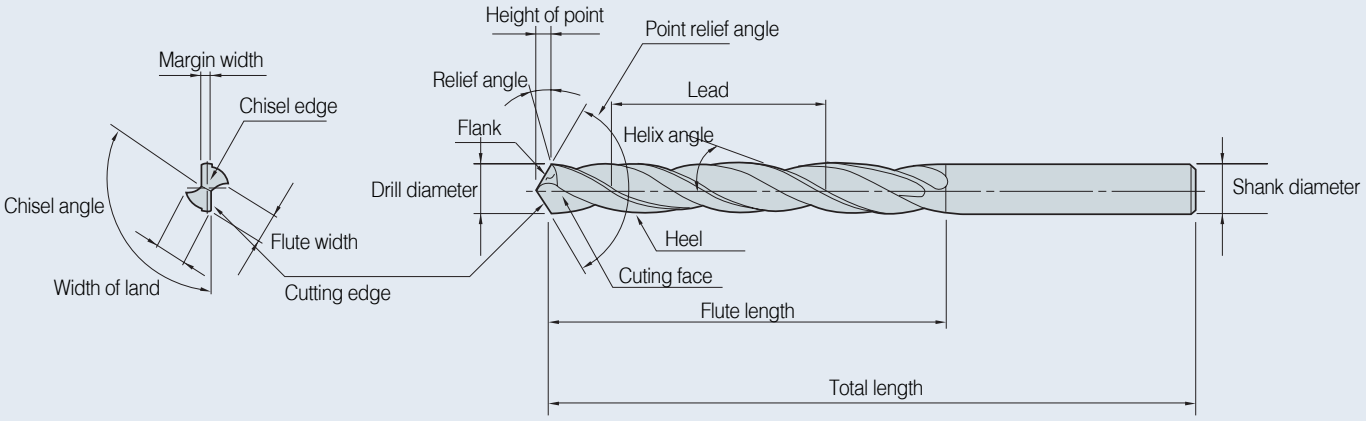
Spindle revolution conversion table(RPM) - external diameter

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

Troubles		Causes	Solution																	
			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		⬇	⬇						⬇		⬆						

■ The shape of drills and the names

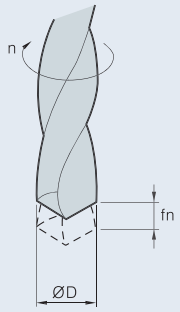


■ Shape and the feature of cutting

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 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)

$Md = KD^2 \times (0.0631 + 1.686 \times fn)(kg \cdot cm)$

$T = 57.95KDfn^{0.85}(kg)$

• 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(kg/㎟)	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)

$Md = K_1 \cdot d^2 \cdot fn^m$

$T = K_2 \cdot d \cdot fn^n$

• Md : Cutting torque (kg·㎝)
• T : Thrust (kg)
• fn : Feed (mm/rev)
• K_1, K_2, m, n : Experimental Data Characteristic value
• d : Drill diameter (mm)

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	Solution																	
			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

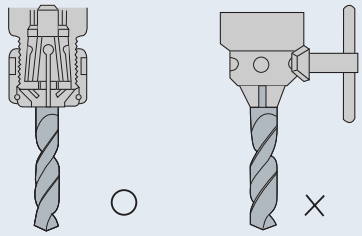
● Metric fine screw threads

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

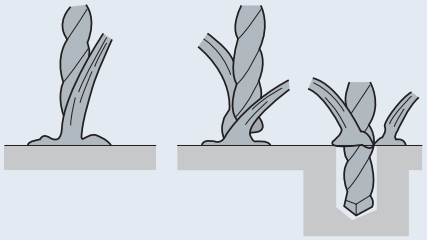
• Collect chuck is favorable Because it has strong grip power
(General drill-chuck and Keyless chuck don' t have enough grip power.)



• Collect chuck • General drill-chuck

● Coolant supply

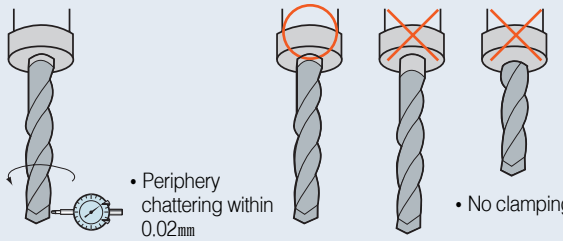
• Supply enough coolant around hole entrance.
• Standard cutting oil pressure : 3~5kg/㎠, Flux : 2~5ℓ/min.



• Supply much coolant at hole entrance

● Mounting drill

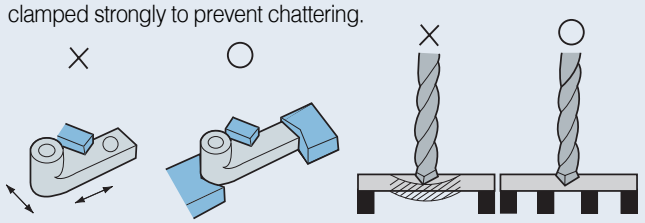
• When mounting drill Periphery chattering should be within 0.02㎜.
• Flute should not be clamped.



• 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.



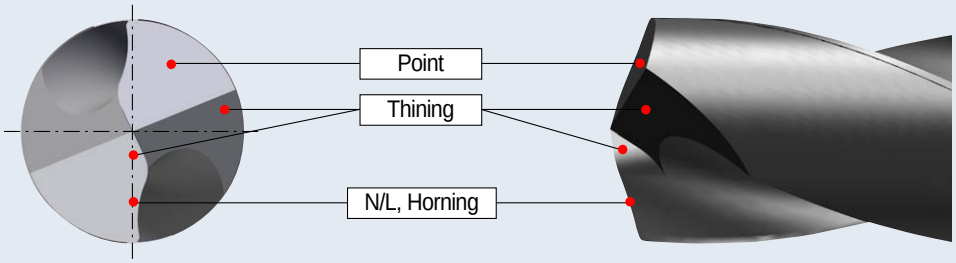
• Uniformed and strong clamping is needed (Right and left, up and down)
• Strong clamping is needed because bending causes chipping

■ Notice

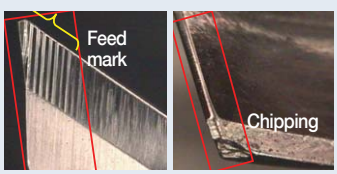
1) For better drill' s life, small damage and wear are favorable to be reground.
2) Damage and wear size should be within 1.5㎜ for regrinding.
3) If drill has crack, regrinding is impossible.
4) Ordering for regrinding is acceptable or purchase regrinding machine

■ Regrinding procedures

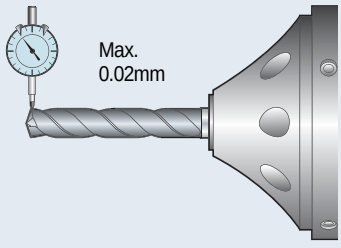
● Regrinding mathod (MACH drill)



1) Preparation
- Determination of regrinding areas
Check the cutting edgefor damage and wear If large fracture is found, remove it by rough grinding.



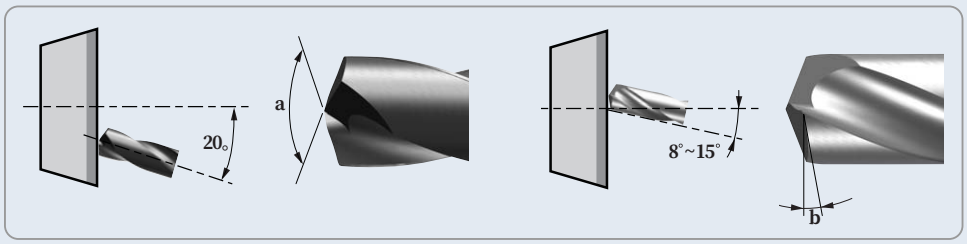
2) Grinding operation
- Drills setting
Drill is clamped to collet chuck Chattering is kept within 0.02mm.

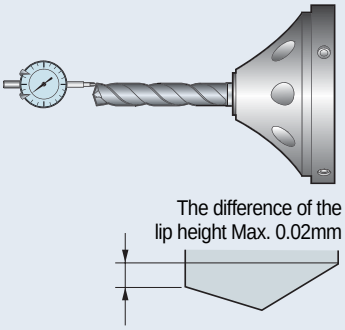


3) Grinding operation-Grinding point

- Check damage and wear at the point and remove it completely.
- The difference of the lip height is kept within 0.02mm.

Point angle(a) : 140°
Point relief angle(b)t : 8° ~15°

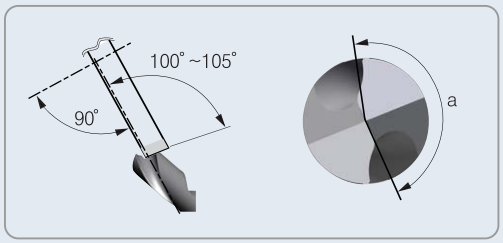


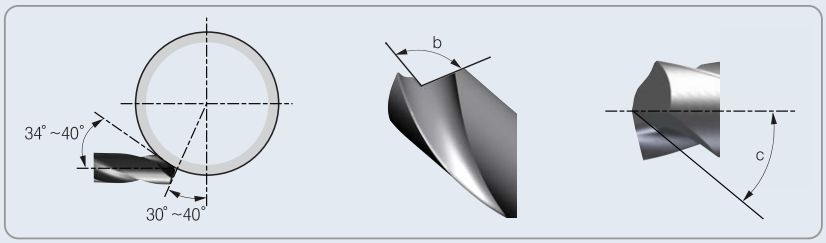


4) Grinding operation-Thinning grinding

- 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°

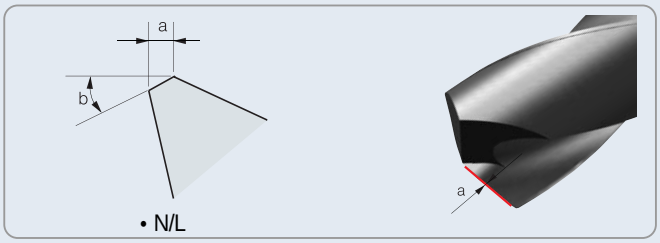




5) Grinding - N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge.
- After negaland operation Finishes with brush or handstone.

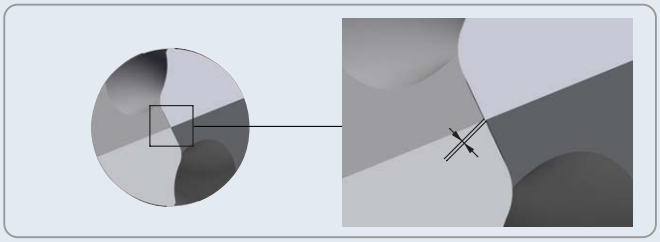
N/L width(a) : 0.05mm~0.16mm / N/L angle(b) : 24° ~26°



● TIP

· Making point
- Without center drill, the point width should be below 0.10mm.

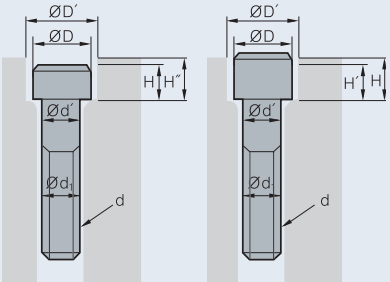
· Recommended grinding condition
- Diamond wheel : 240~400 mesh
- Diamond chisel : 400~600 mesh
- Diamond hand stone : 800~1500 mesh



■ 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
Ø d_1	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
Ø d′	3.4	4.5	5.5	6.5	6	11	14	16	18	20	22	24	26	30	33
Ø D	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
Ø D′	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

Application			KORLOY Main	KORLOY Sub	SMITOMO	SANDVIK	KENNA-METAL	KYOCERA	MITSU-BISHI	ISCAR	TOSHIBA	SECO	WALTER	DIJET	TAEGUTEC
NEGA · TYPE	For steel	For ultra-finishing	HU	D02	FA FL	QF	FF	GP DP CF	FS FH FY	SF	TF			F1 FA	FA EA
		Finishing	VF	GF	SU LU	PF	FN FP K	CQ HQ	SA SH SY	NF	TSF TS,SS CF,ZF	MF2	NF NF5	FT UA	FG SF
		For medium to finishing	HC	VM	SX UU	SM	P	CQ HQ	SH	NF RF LF	ZM NM	MF1	NS4 NS8	GP UR PF	ML
		Medium machining	VM	GM	GU UX UG	PM QM	MN MP	GS HS CS PS	MV MA MH	TF PP	CM TM SM	M3 MR3 MF5	NM,NM4 NM5 NM7	UB GG	MP MC MT
		Roughing	HR	GR	MU MX	PR	RN	GT HT ★	GH	NR	TH CH	MR4 M5	NR5 NR7	UD	RT ★
		Heavy duty machining	GH	B40	HG MP HP	HR	RH	HX	HZ HV HH HX	TNM	TU 57 65	RR9		UC	RH HT
		For better surface finish WIPER I/S	VW LW		GUW LUW	WF,WM WR,WL	MW FW RW	WQ WP	MW SW	WG WF	AFW ASW	M3,M5	NF,NM		WS WT
	For general		B25	GR	UZ	23	MG	★	MT, MV	GN				GN	★
	Stainless steel, soft steel		HA HS GS	HC VM GR X38	SU EX (GU) MU FL	MF MM,QM MR,QM LC	FF,FW FP,MP MW,RN	GU,HU XP,XQ XS MU,MS	FS, FJ SH, MJ MS, GJ GH,FY	PP TF	TF SS SA TU MS	MF1 MF3 M5	NS4 NM4 NR7	SF	FG,ML MP,MT RH,ET EA
	For cast iron		GR	B20 B25 HR	UZ UX ★	KF KM,QM KR,QR	FF,FW MP,MW RN,UN	GC ★ ZS	★ MA GH	GN	★ 33 ★ CM	MF3 M5	NS4,NS8 ★ NM4		MT,RT ★
	For aluminum		HA				F GP MS	AH		PP					
POSI · TYPE	For steel · cast iron	For finishing	HFP		LU FP	PF KF	MT-UF MT-LF GT-LF	GP DP HQ	FV SQ	★ SM	01 PF	F1	PF5	FT	FA
		For medium to finishing (medium machining)	HMP		SJ,SU SK	(PM) (KM)	MT-LF	XQ HQ GK	SV R/L R/L-F	14,SM 17,19	PS 23 PM	F1 F2	PS4 PS5		FG
		Medium machining (Roughing)	C25	HMP	SF MU	(PR) (KR)	MT-MF	★ G	MV MQ ★	19	24 ★	F2	PM2 PM5 (PR5)		MT
	For aluminum		AR AK MA		AG	AL	HP	A3		AS	PP			ALU ACB	FL
	For stainless steel		HMP	AK	SU	MF, MM MR	LF	(XQ)	FV ★	14,SM 17,19	SS		PS4 PM5		FA FG MT
	WIPER I/S				LUW	WF WM			SW MW	WF WG					WT
	Indexable drills		DM DS,DA DF	C20 C21	S04 R06	51,53 56,58		★ SU,SP		SW,GF GG,DT		C1,P1 85,86			

★ : Simple Type ★ : Non - Name

The comparison of grade for turning

■ WC

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	ST05 ST10 ST15 ST20 MA2 ST30 ST30A ST30N ST40	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	U10 U20 U40	U10E U2 A30 A40	 	 	H13A H10F	AT10 AT15 TTR	K2885 K2S	TU10 TU20 TU40	UTi20T	WAM10B EX35	 VC27 VC28	 	M10 M20 M40	 	
	K	H02 H01 H05 H10 G10	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	TAECUTEC	NTK	DIJET
Turning	P	 NC3010★ NC3020 NC3120★ NC3030★ NC500H	 AC700G AC2000 AC3000	CA5505 CA5515 CA5525 CA5535	 IC8150 IC8250 IC8350	GC4005 GC4215 GC4225 GC4235	 TP1000 TP2500 TP2000 TP3000	KC9105 KC9110 KC9115 KU30T KC9125 KC9240 KC9245	T9005 T9015 T9025 T9035	UE6005 UE6110 UE6020 UE6035	 HG8015 HG8025	 VP5515 VP5525 VP5535	WPP01 WPP05 WPP10 WPP20 WPP30	 TT8115 TT3500 TT5100 TT7100	 CP5	 JC110V JC215V JC325V JC450
	M	NC9020 NC3030★	AC610M AC630M	CA6515 CA6525	 IC9025	GC2015 GC2025	TM2000 TM4000	KC9215 KC9225 KC9245	 	US7020 US735	 GM25 GX30	MR8515 MR8525	WAM20 WAM30	 TT5100	 	JC5003 JC110V JC5015
	K	NC305K NC6110★ NC6010 NC315K	 AC410K AC300G AC700G	 CA4110 CA4125 CR7015	 IC5005 IC5010 IC428 IC9150	GC3205 GC3210 GC3215	 TK1000 TK2000	 KC9315 KC9325	 T5105 T5115 T5125	 UC5105 UC5115	 HG3315 GM8015 GM8020	 VP1505 VP1510 VP5515	 WAK10 WAK20	 TT7310 TT1300	CP2 CP5	 JC105V JC110V JC215V

■ PVD COATED

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	 PC230 PC3535 PC3545	 	 PR1005 PR915 PR1115 PR930 PR1025 PR630 PR660	IC220 IC570 IC907 IC507 	 GC4125	 CP200 CP250 CP500	 KU10T KU25T 	AH710 GH730 AH330 AH740 AH120 GH330	 	 CZ25 	VC907 VC927 VC905 	 WTA43 WTA41	 	 	
	M	 PC9030	 EH510Z EH520Z	 PR915 PR930 PR1125 PR630 PR660	IC520 IC907 IC3028 IC928 IC1008 IC1028 IC328	GC1020 GC1025 GC2035 GC2145	 CP200 CP250 CP500 	 	AH330 GH330 AH120 GH730 AH140 	 VP15TF VP20MF UP20M 	 	 VC929 VC927 VC902 VC901 VC905 	 	 TT5030 	 ZM3 QM3 VM1 TAS 	 JC8015
	K	 PC205K PC215K	 	 	 IC220 IC908 IC228	 	 CP200 CP250 CP500	 	 AH110 GH110 AH120	 	 CY110H 	VC929 VC903 VC927 VC902 VC901 VC907	 	 	 	

■ CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Turning	P	CN1000 CT10 CC115★ CN2000 CN20	T110A T2000Z★ T1200A T3000Z★	PV30★ TN30 PV60★ TN60 TN6020 TN90	 IC20N IC520N IC30N IC530N	 CT5015 CT525 GC1525★	CM C15M	HT2 KT125 HT5 KT175 KT195M	NS520 GT530★ NC530 NC540 NC730	NX2525 NX3035 UP35N★ AP25N★ NX335	CH350 CZ25★ CH530 CH550 CH570	VC83	WTA43★ WTA41★	PV3010★ CT3000	T3N T15 N20 C30 N40	LN10 CX50 CX75 CX90 CX99
	M		T1200A							NX2525						LN10 CX75 CX99
	K	CN1000	T110A T1200A							NX2525				CT3000	T15	LN10 CX75

★ : PVD Coated cermet ★ : New Grade

The comparison of grade for milling

■ CVD COATED

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	NCM325 NCM335	ACP100		IC520M IC635	GC4220 GC4230 GC4240	T20M T250M T350M		T325 T3030	F7030		SM245	WQM15 WKP25 WQM25 WKP35 WQM35	TT7800	QM3	
	M	NCM335				GC2040	MP2500						WQM25 WTP35 WXP45			
	K		ACK100 ACK200		IC4050	GC3220	MK1500 MK3000	KC992M	T1015	F5010		V01 VN8	WAK15 WKP25 WKP35			

■ PVD COATED

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	PC3525 PC230 PC3535 PC3545	AC230 ACP200 ACZ330 ACP300 ACZ350	PR730 PR830 PR630 PR660	IC903 IC908 IC950 IC1008 IC928	GC1030 GC1030	F25M F30M F40M T60M	KC522M KUC20M KC525M KUC30M KC935M KC7140 KC720	AH120	VP15TF AP20M GP20M UP20M VP30RT	PTH08M PCA08M PCS08M PCA12M PC20M JX1005 TB6005 JX1020 CY9020 JX1045 TB6045 CY250 PTH30E JX1060 PTH40H TB6060 GF30 GX30	VC935		TT7070 TT7080 TT7030 TT8020		JC8015
	M	PC9530 PC3545	ACP200 ACP300 ACZ350	PR730 PR1025 PR630 PR660	IC903 IC900 IC250 IC928 IC328	GC1025 GC2030 GC1030	F25M F30M F40M	KC5510 KC7020 KC7030 KC722	AH120 AH140		JX1020 CY9020 JX1015 TB6020 CY250 JX1045 TB6045 JX1060 TB6060	VC928 VC902 VC901	WQM35 WSP45	TT9080 TT8020		JC8015
	K	PC205K PC6510 PC215K		PR510 PR905	DT7150 IC900 IC910 IC950 IC350			KC510M KC915M KC520M	AH120	VP10MF VP15TF VP20RT		VC903 VC928 VC902 VC901		TT6030 TT6060 TT6290		

■ CERMET

ISO		KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENNAMETAL	TOSHIBA	MITSUBISHI	HITACHI	VALENITE	WALTER	TAECUTEC	NTK	DIJET
Milling	P	CN20 CN30	T250A	TN100M TC60M	IC30N			KT195M	NS540 NS740	NX2525 NX4545	CH550 CH570			CT3000 CT5000	C50	
	M		T250A			CT530										
	K									NX2525						

Tooling Examples

L

Contents

Railway wheel machining ---------- L02
Pipe machining ---------- L04
Gear machining ---------- L05
Edge miller clamp system ---------- L05

Automobile Tooling Exampls

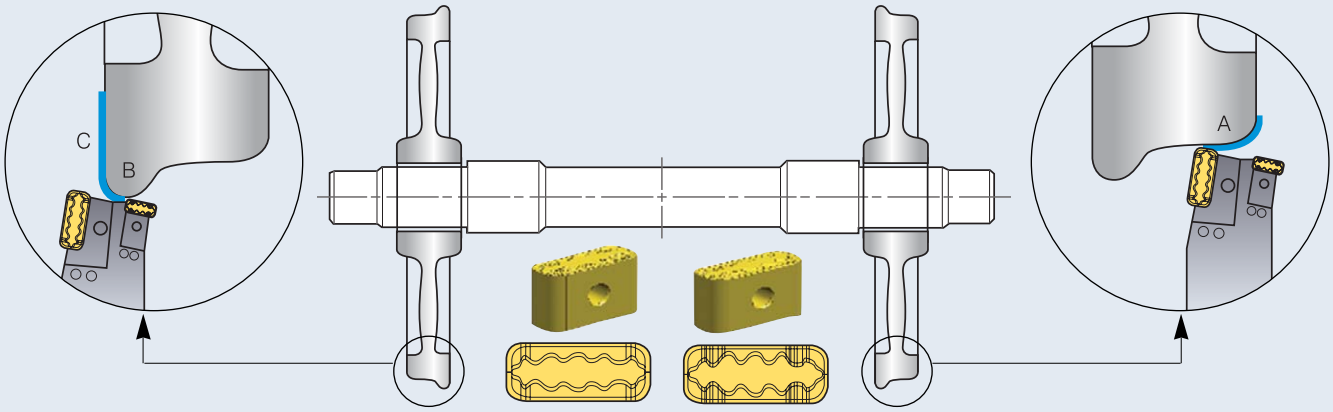
Knuckle ---------- L06
Carrier ---------- L08
Housing ---------- L09
Connecting Rod ---------- L10
Block ---------- L12
Head ---------- L14
Crank Shaft ---------- L16

Railway wheel machining

■ Features

- Exclusive tools for railway wheel machining
- A class wheel : RCMX (32,25,20,16 series)
- Repair (returning) wheel : LMUX (30,19 series)
- Excellent tool life and chip evacuation from finishing to roughing

■ Machining example (repair)

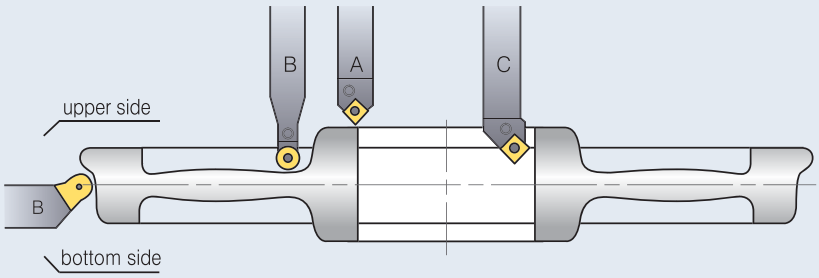


※ Field Test

- Tool : LNUX301940-TM
- Grade : NC3015
- Workpiece : SSW2, ø920~1000mm
- Condition : vc=78m/min (13~18min^{-1}) fn=1.0mm/rev ap=3~4mm
- Result : Better chip evacuation, longer tool life and stable machining than competitor's

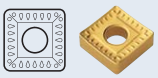
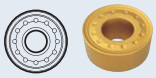
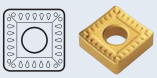
	A	B	C
Insert	LNUX301940-TF/TM	LNUX191940-25/22	
Grade	NC3015	NC3015	
Ideal condition	Decrease cutting speed at machining part 'A'. Because of deep D.O.C	Increase cutting speed at part 'B,C' for better chip evacuation	

■ Machining example (A class)



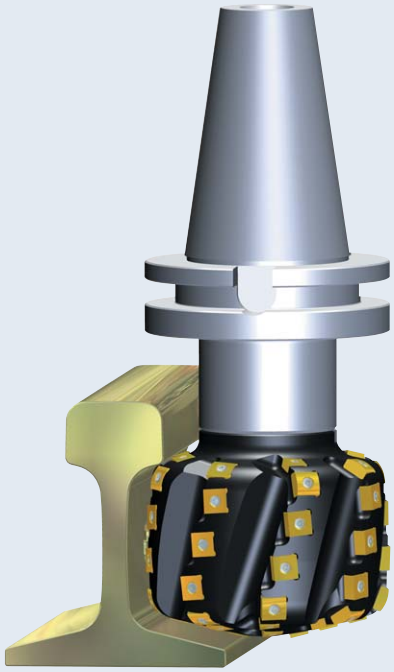
※ Field Test

- Tool : RCMX3209M0-SL
- Grade : NC3015
- Workpiece : SSW2, ø840mm
- Condition : vc=55~100m/min fn=1.0~1.5mm/rev ap=1~6mm
- Result : Better chip evacuation, longer tool life and stable machining than competitor's

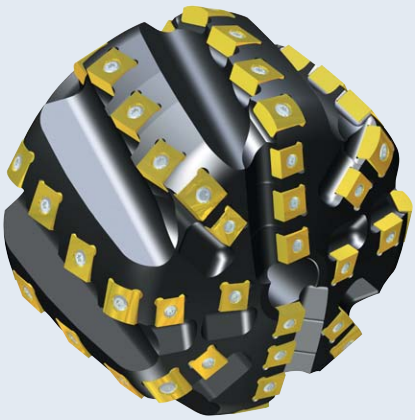
	A	B	C
Picture			
Holder	PSDNN5050-U25	PRDCN5050-U32 PRGCN5050-U32	PSSNR5050-S25
Insert	SNMM250724-GH	RCMX3209M0-SL	SNMM250724-GH
Grade	NC3015	NC3015	NC3015

Railway machining

■ Cutter for railway track-1



Milling of Fish Plating



Ø 160 x 54 Insert

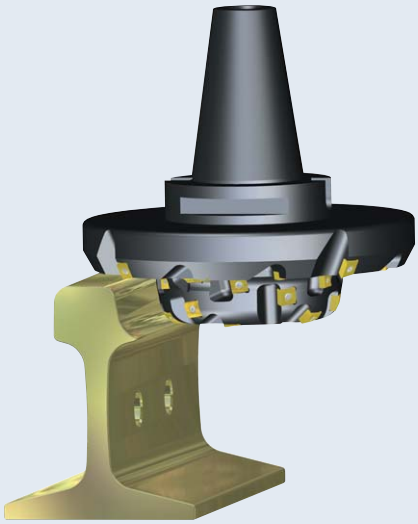
- Material : Rail
  (High manganese steel)
- Cutting condition
  vc = 72(m/min)
  fz = 0.8(mm/t)
  ap = 3(mm)
- Dry

SNC55-60-R19-1
NCM325 / PC3525

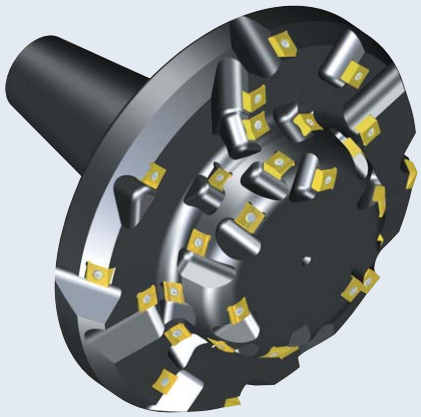
SNC55-KH04-S031
NCM325 / PC3525

SNC44-50-CF04
NCM325 / PC3525

■ Cutter for railway track-2



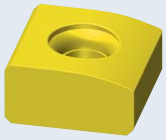
Milling of Running gear & Lowering



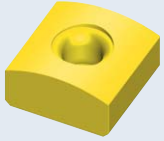
Ø 300 x 33 Insert

- Material : Rail
  (High manganese steel)
- Cutting condition
  vc = 95(m/min)
  fz = 0.34(mm/t)
  ap = 3(mm)
- Dry

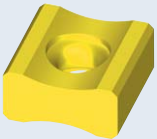
SNC55-KH04-S031
NCM325 / PC3525



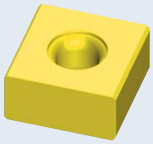
SNC55-173-S031
NCM325 / PC3525



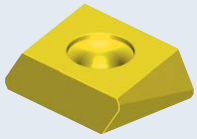
SNC55-172-S031
NCM325 / PC3525



SNC55-RK13
NCM325 / PC3525



SNC55-S031
SNC44-50-CF04
NCM325 / PC3525

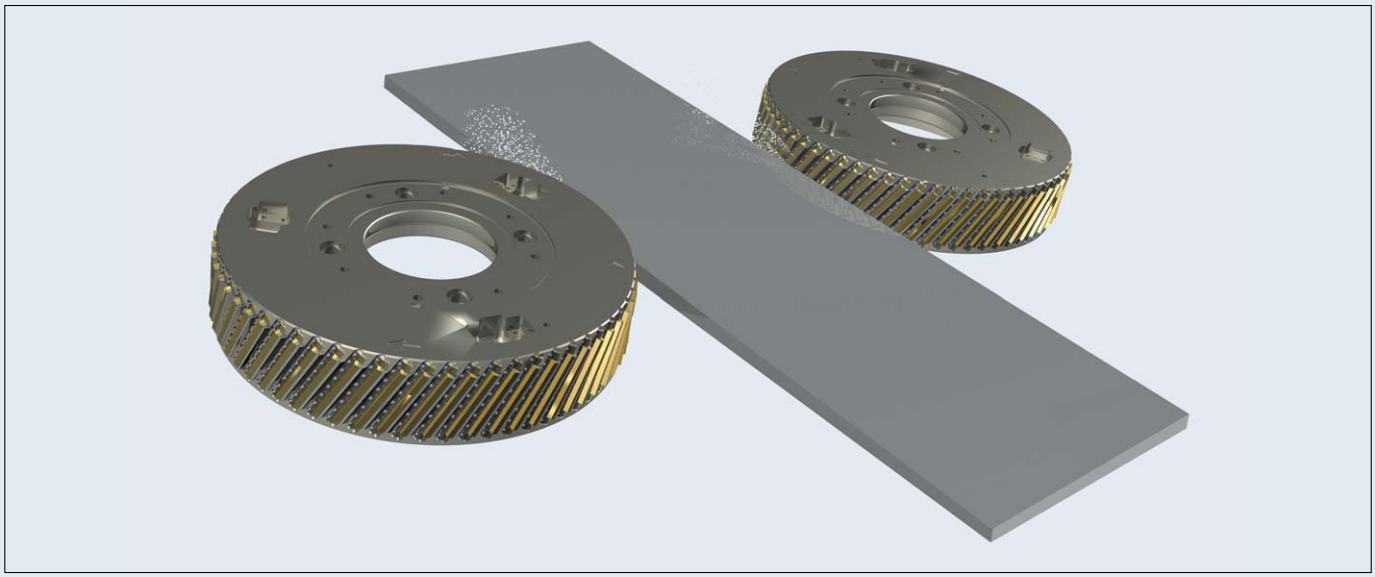


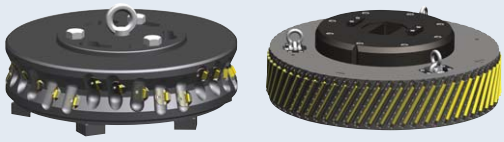
LSE434-R01
NCM325 / PC3525

Pipe machining

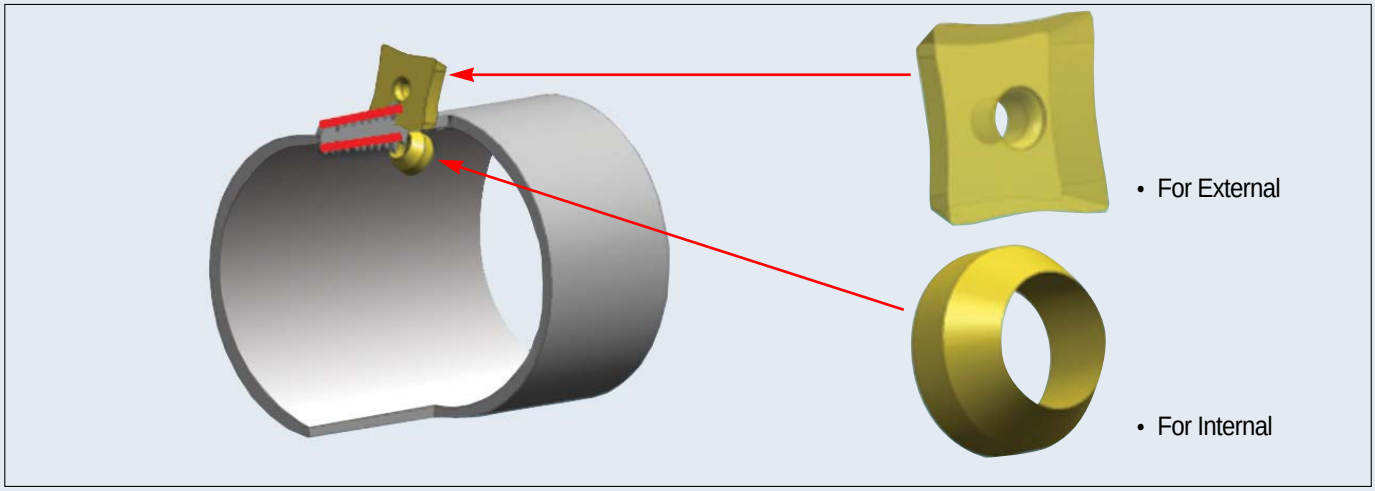
■ Pipe machining for welding part

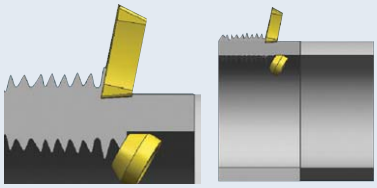
• Edge Milling Cutter



Pipe Edge Milling	Application	Available insert	Cutter
	For Pipe	LNMG 400924 / LNUX 400924 / LNUX 500924 SNMG 250616 / TNMG 440912Z / CNHQ 1606	Order -made
	For Edge Milling	SNMG 190608 / SNMN 250716 / SOCX 2010 LNEN 160604 /LNUX 501224 / LOCX 3010Z LOCX 4010Z / SOCX 1810ZZ / LNMN 500604	

• Breazed bead removal

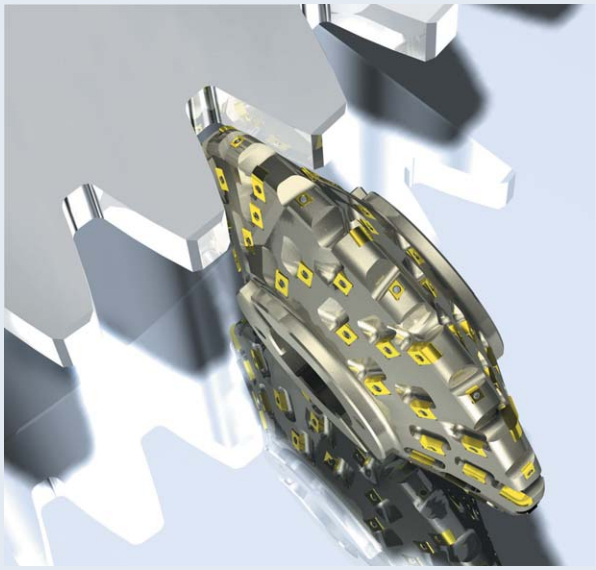


Machining	Application	Available insert	Cutter
	External	SDMX80-R□□ / SEGW54-R□□ SNMG150708-R□□/ SNMN1207(SUN452)-□□R SNMN1507(SUN552)-□□R / SOET1906-254 SEGX2509-R□□	Order -made
	Internal	AR□□(AC) / SF□□R-□□	

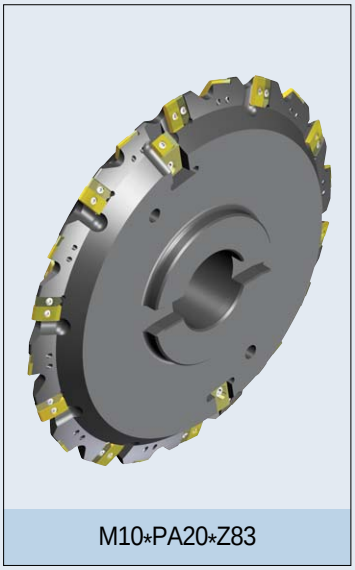
Gear machining

■ Involute Cutter

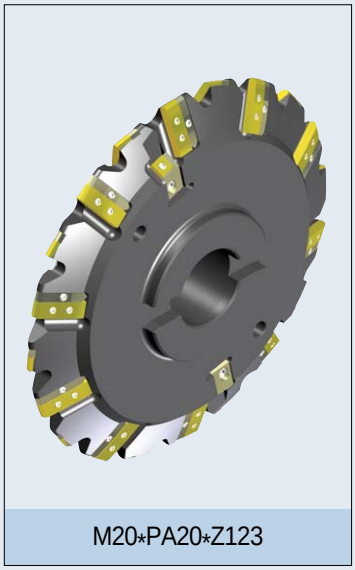
• Roughing



• Finishing

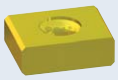
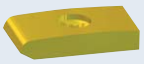
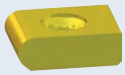
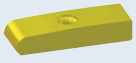
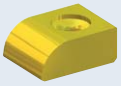
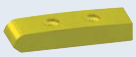
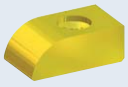


M10*PA20*Z83



M20*PA20*Z123

■ Insert for gear

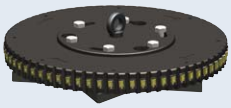
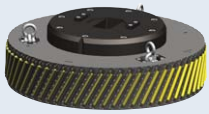
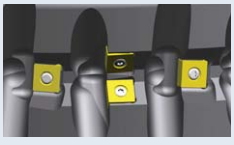
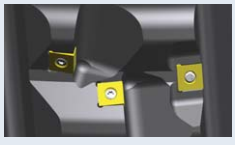
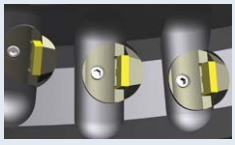
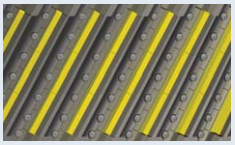
Designation								
								
LNE434-02-1	M10X283	M12-M14ROU	M12XZ130-EX	M16XZ130	M20-M22-ROU	M20XZ123	M40-ROU	SNEQ1507-C0.8

• Grades - PC230, PC240, PC3545, PC9530

• M-Module - Z-Number of tooth / ROU-Roughing / A,T-Special

Edge miller clamp system

• Cutter for steel pipe and welding part of ship

Index	Locator & Screw on	Screw on		Locator & Wedge	
Cutter					
Clamp					
Feature	90° cutting	40° cutting	35° cutting	25° cutting	90° cutting (Helical machining)
Diameter/ Tooth/Row	Ø1000/64/64	Ø400/42/14	Ø420/30/10	Ø500/30/6	Ø850/32/64
Weight	≈ 530kg	≈ 85kg	≈ 65kg	≈ 164kg	≈ 620kg

* Max. Cutter diameter 3,000mm

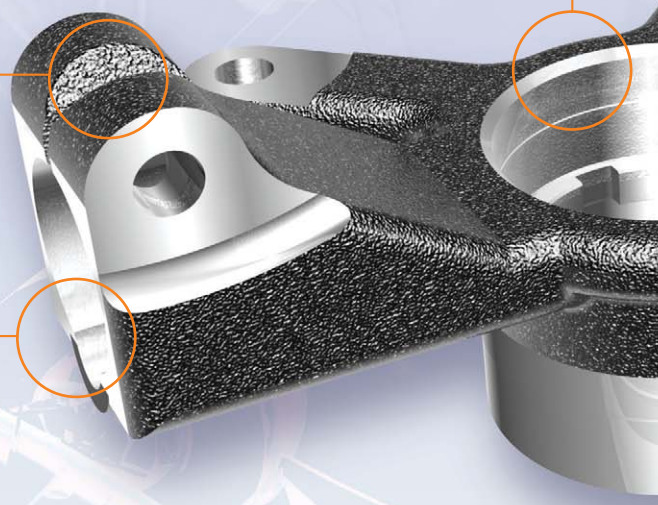
Automobile tooling example (Knuckle)

Micro Boring bar

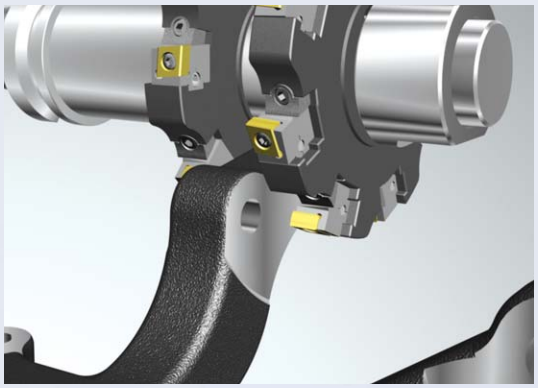
Micro Boring bar

Indexable Side Cutter(SPB)

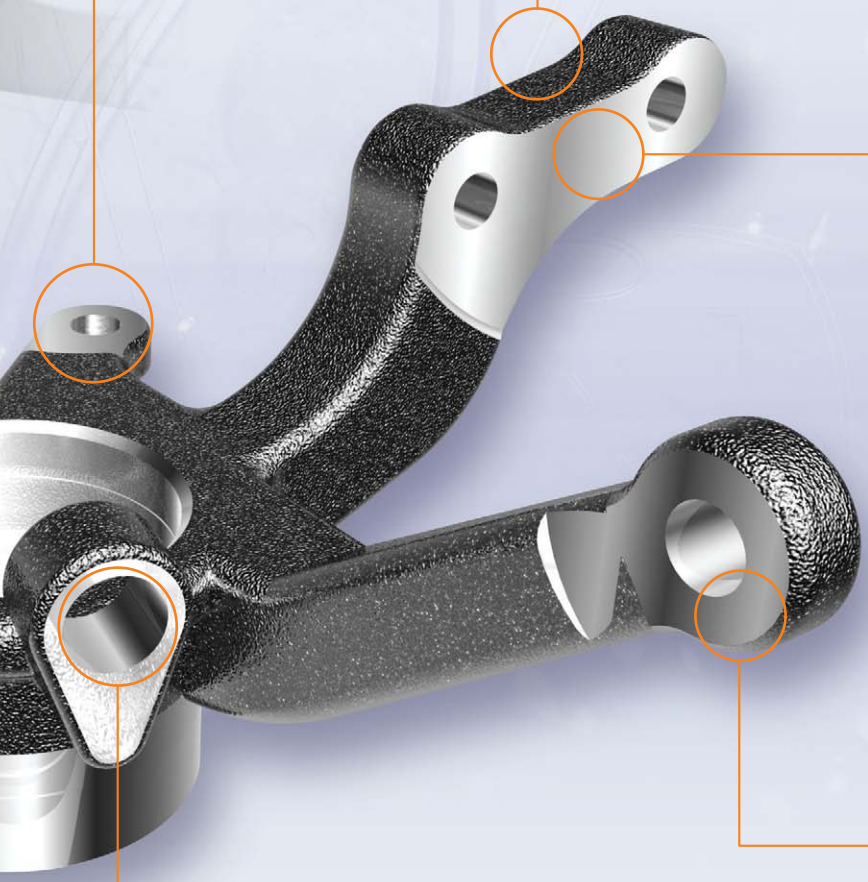
Future Mill(FMP)



Mach Drill

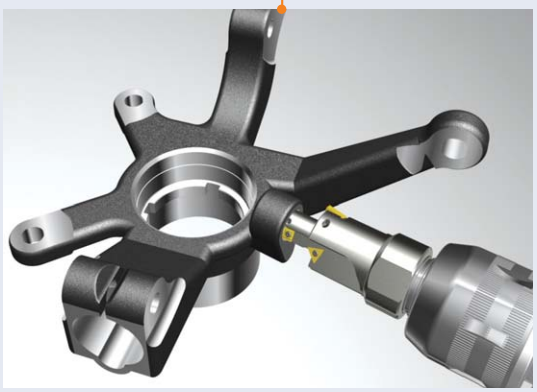


Indexable Side Cutter(tangential type)



Indexable Side Cutter(tangential type)

Future Mill(FMP)



Step Drill

Drill(SPD)

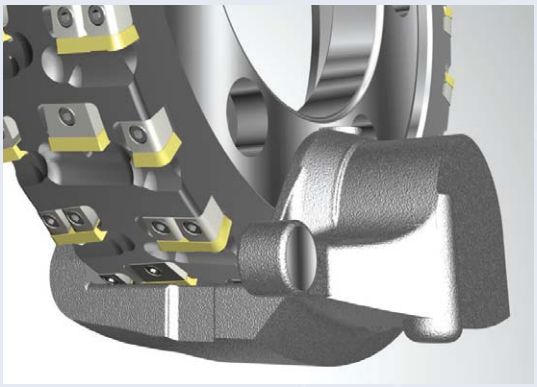
Automobile break tooling example (Carrier)

Drill

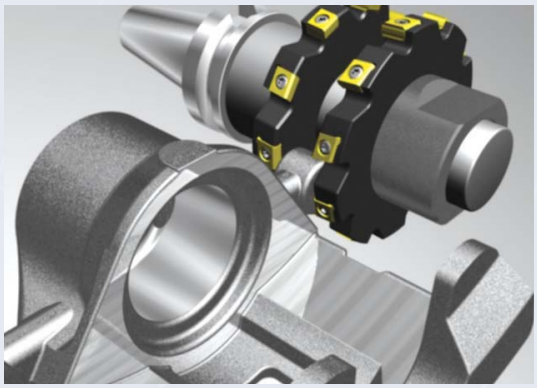
Drill

Side Cutter

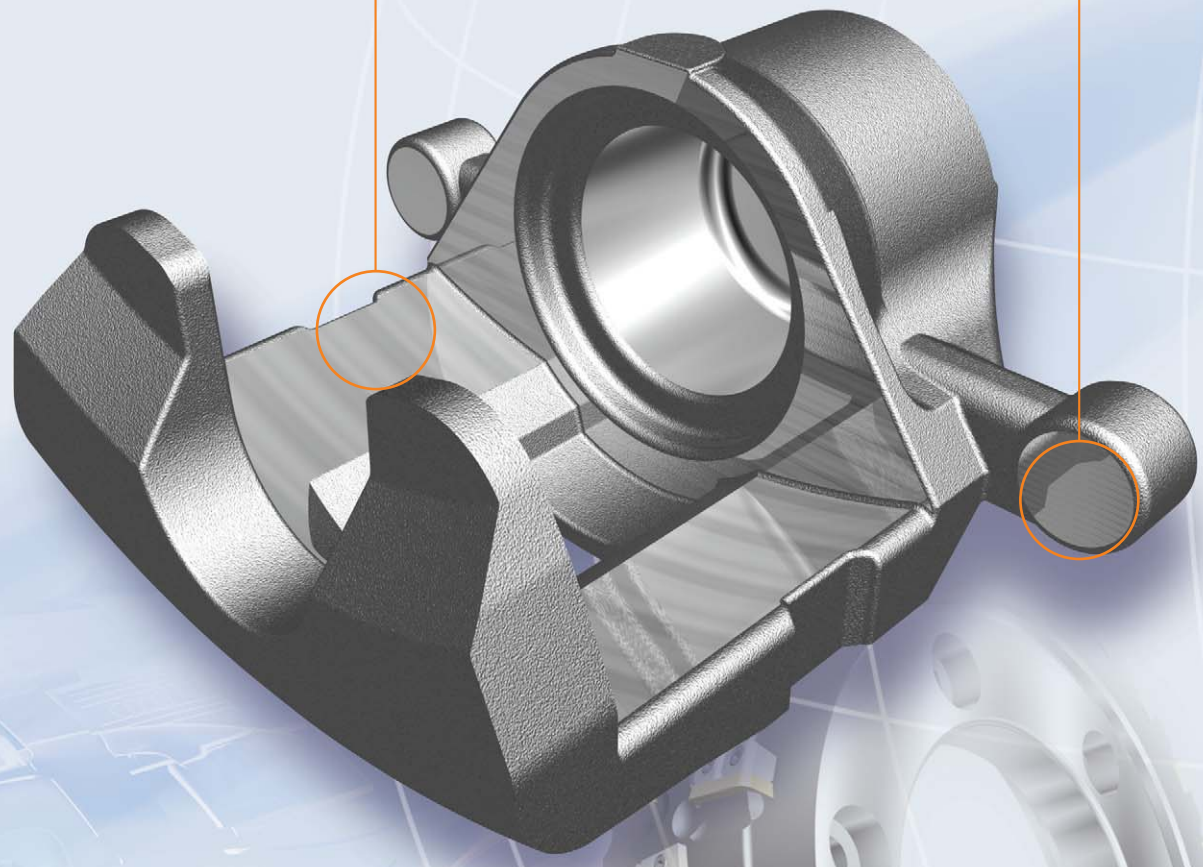
Automobile break tooling example (Housing)



Side Cutter



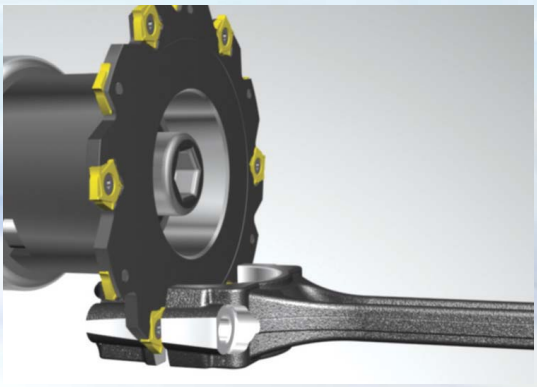
Side Cutter



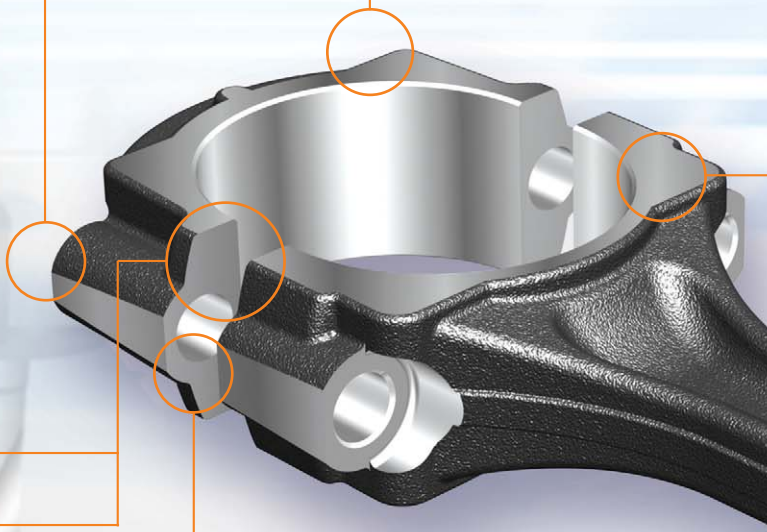
Automobile tooling example (Connecting Rod)

Drill

Rich Mill(RM4)

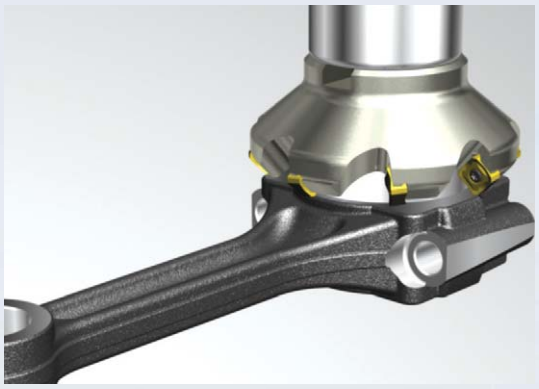


Side Cutter



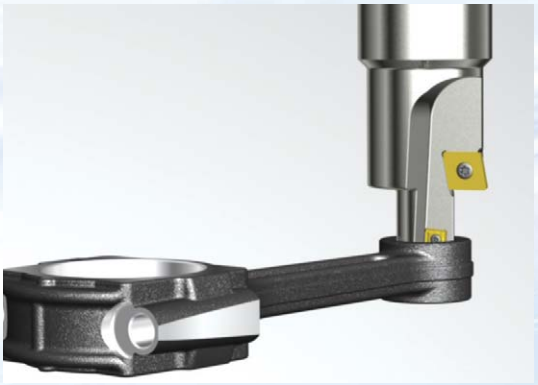
Side Cutter

Rich Mill(RM4)

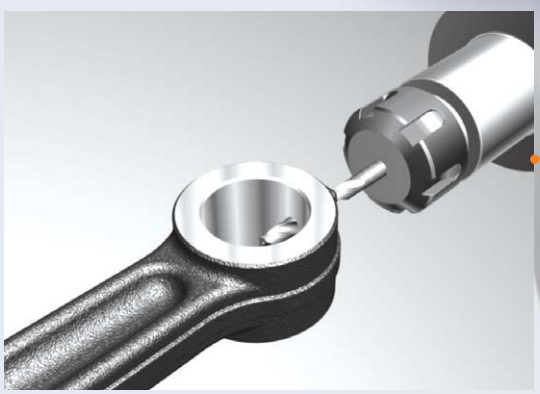


Rich Mill(RM8)

Drill(SPD)



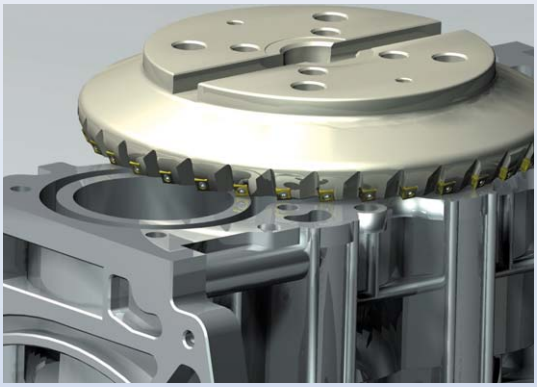
Step Drill



Drill

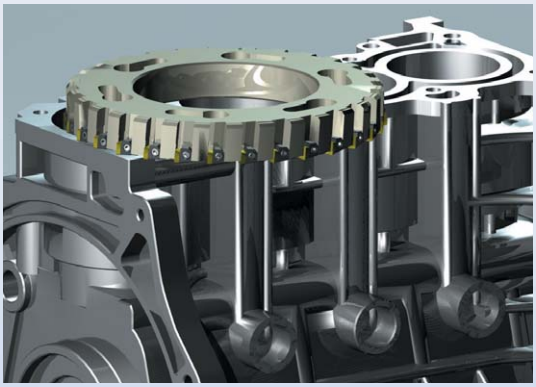
Automobile Tooling Examples

Automobile engine tooling example (Block)

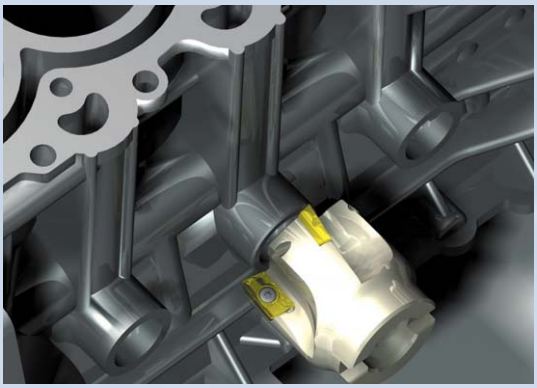


Top Face (Roughing)

• 8 Corner per insert available

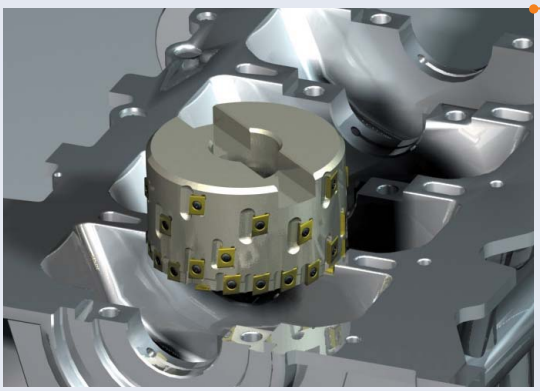


Top Face(Finishing) - High feed Cutter

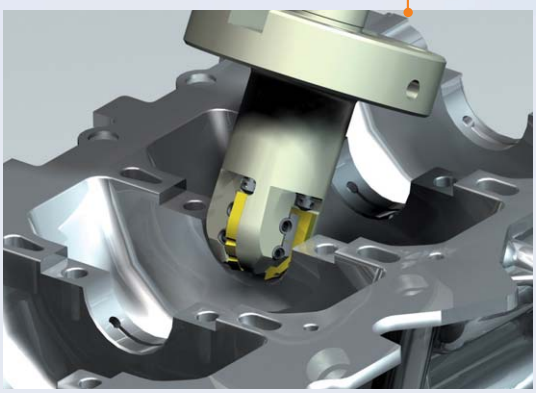


Bosses - Alpha Mill

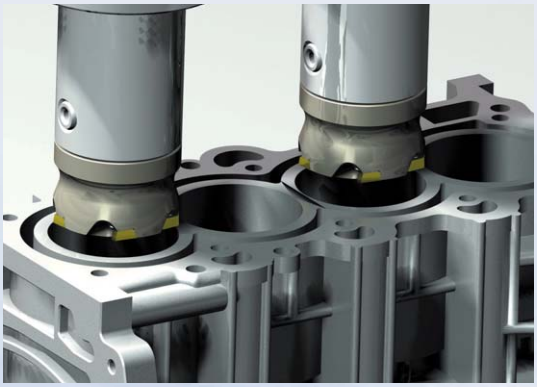
Step burnishing Reamer



Bearing Cap Seat - Form Cutter



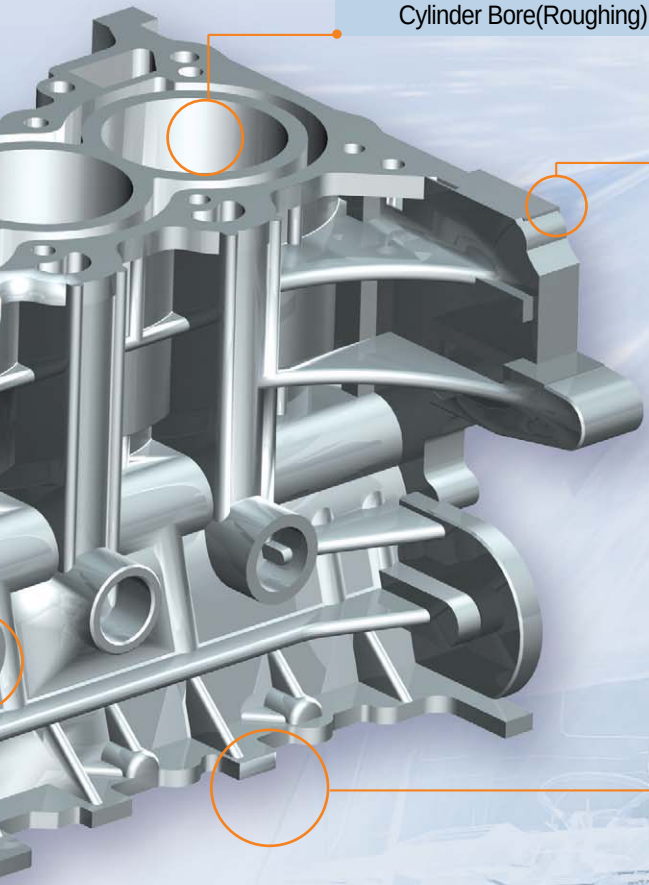
Crank Bore(Crankshaft Bearing Bore) - Form Cutter

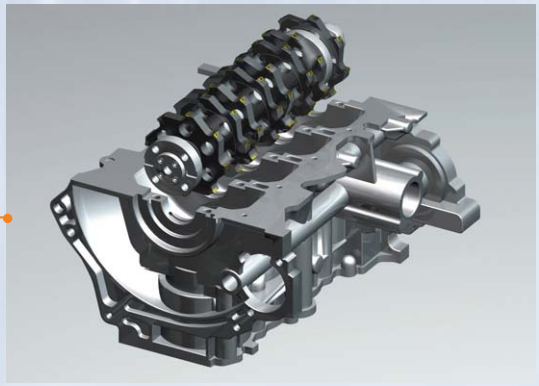


Cylinder Bore(Roughing) - Boring Cutter

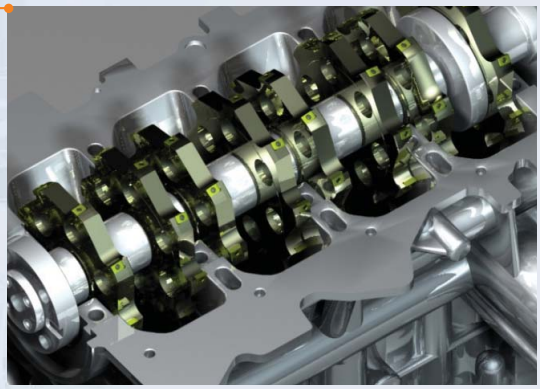
Front & Rear Face - Cube Couple Mill

- High feed cutter made of aluminum
- Due to light weight, it's easy to handle & effective to prevent accident





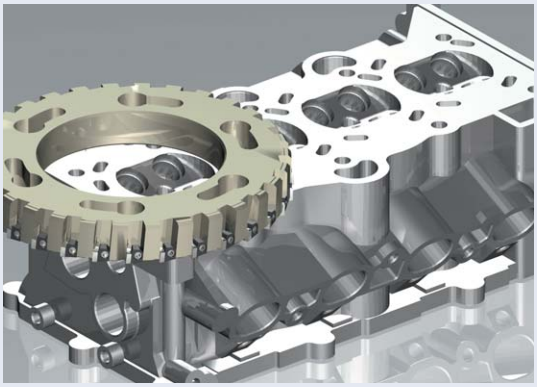
Cheek Faces - Gang Cutter



Cheek Faces - Gang Cutter

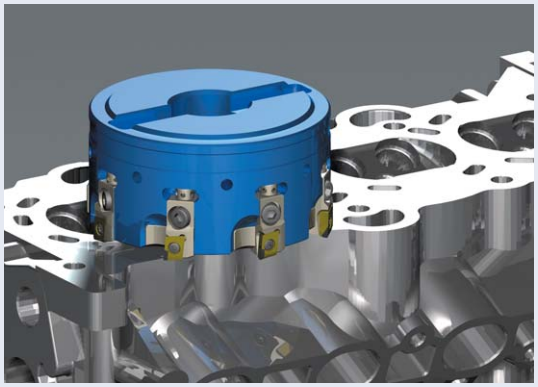
Automobile Tooling Examples

Automobile engine tooling example (Head)



Top Face(Roughing & Finishing) - High Feed Cutter

• Carbide insert, PCD insert

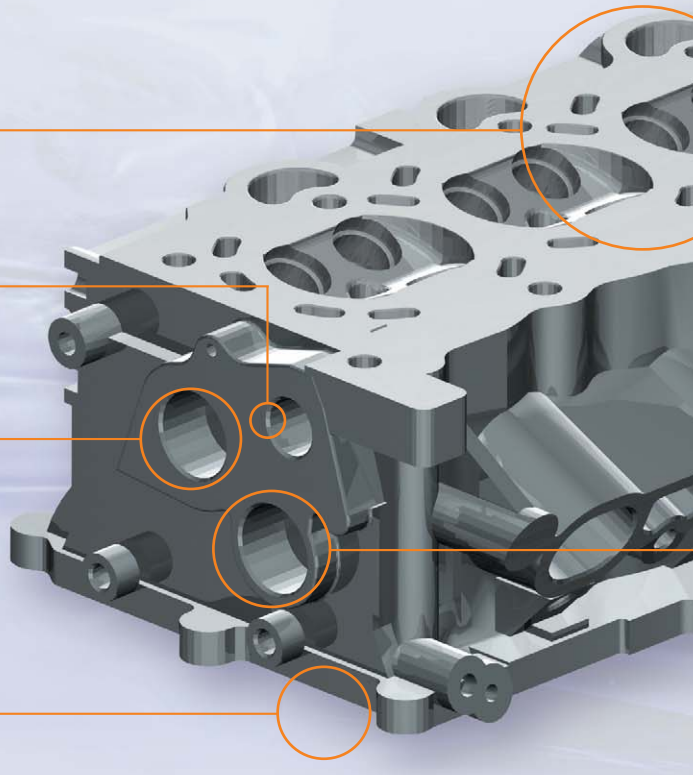


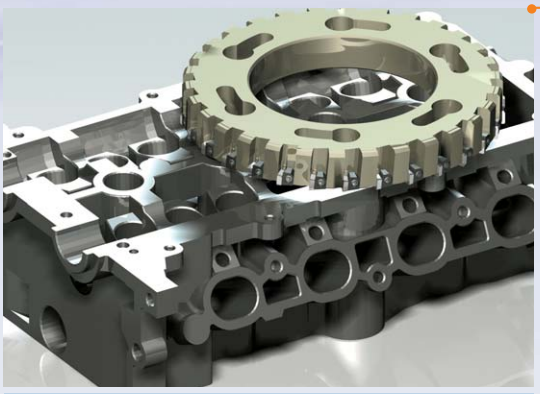
Top Face(Roughing & Finishing) - Aero Mill

• 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



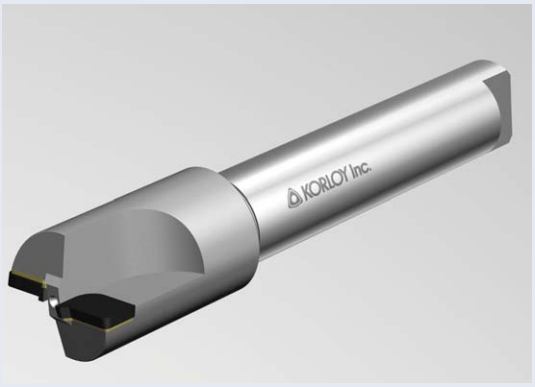


Bottom Face(Roughing & Finishing) - High feed Cutter

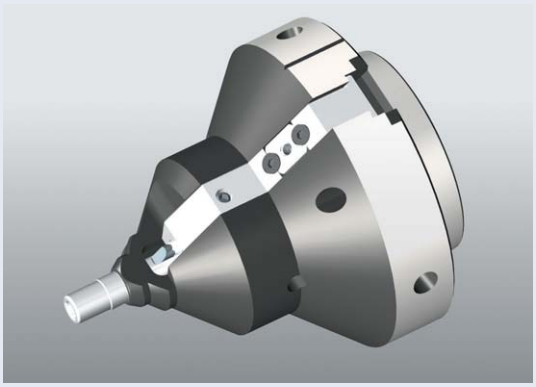
• Carbide insert, PCD insert

Cam Shaft Bearing Seat - Line Boring Bar

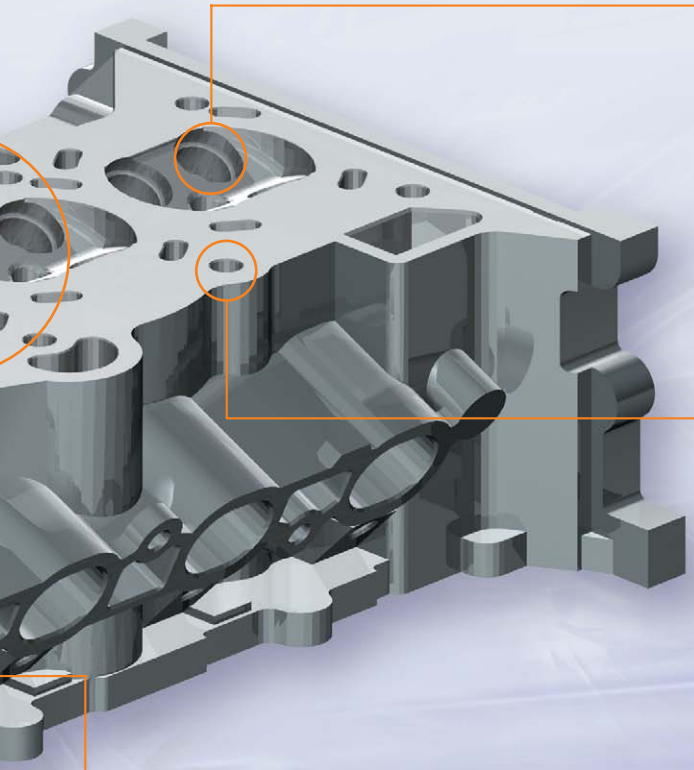
• Stable machining at high speed without chattering

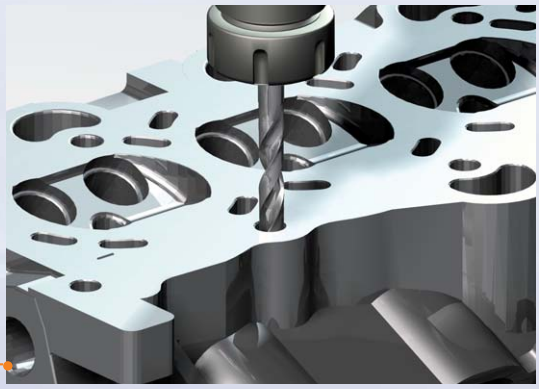


Counter Bore Tool



Valve Seat - Apolo Cutter(Special Boring Holder)



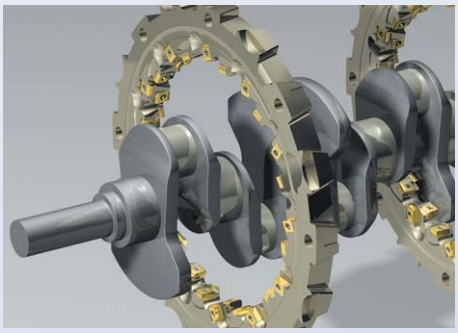


Top Face(Drilling) - Mach Drill

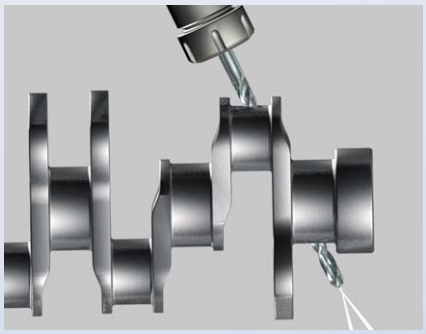
Cam Journal Bore - High Speed Reamer

- Available for high speed machining
- Excellent surface finish & roundness

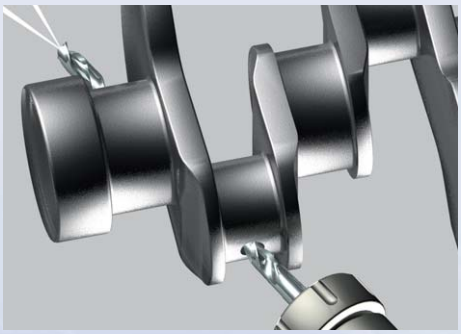
Automobile engine tooling example (Crank Shaft)



Pin & Journal - Crankshaft Cutter(Internal / External)



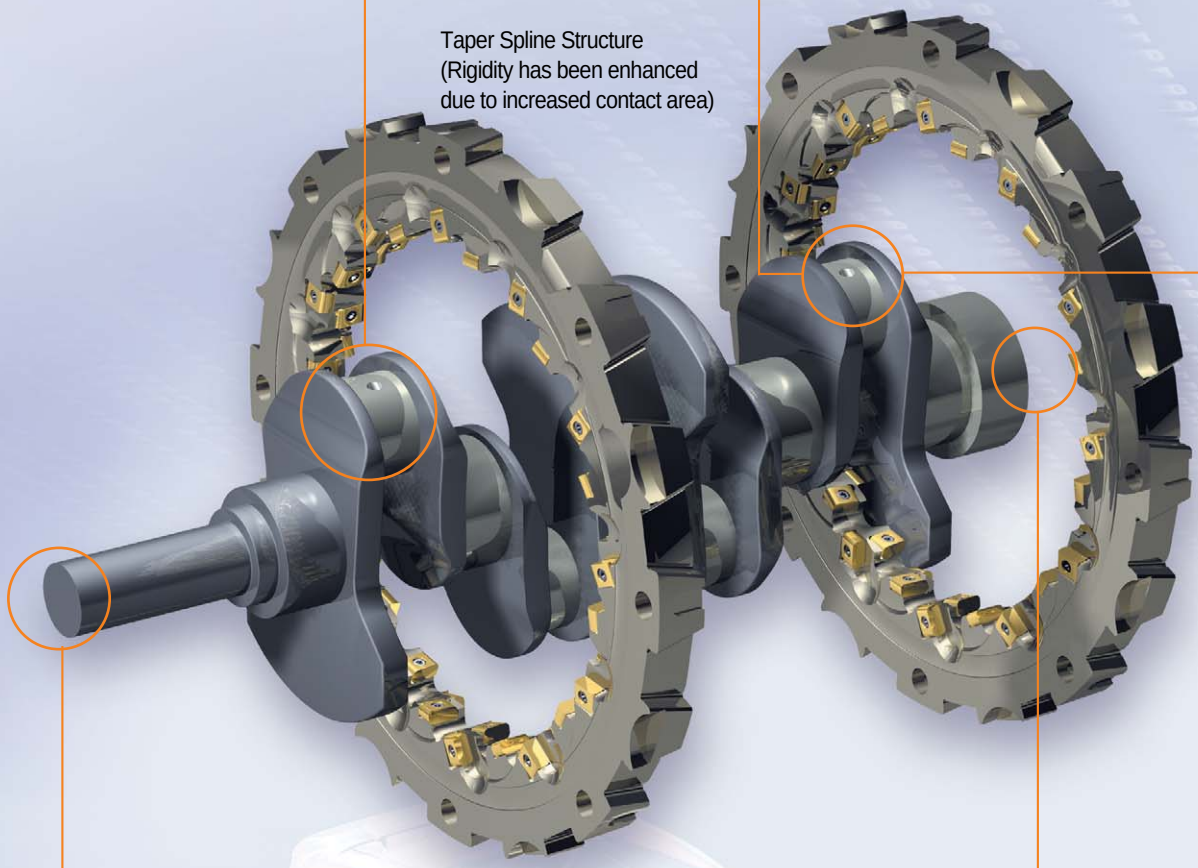
Oil Bore - Mach Long Drill(MLD)

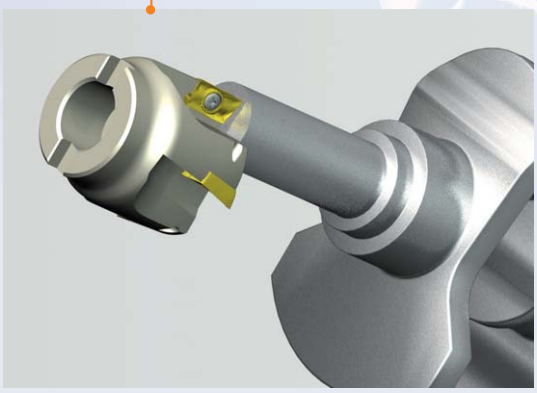


Oil Bore - Mach Long Drill(MLD)

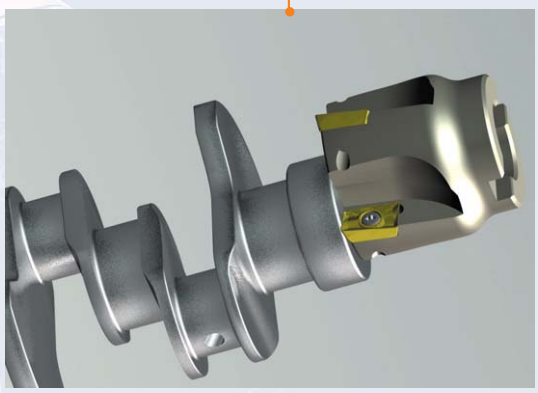
- Machining wihout “step feed” operation for deep hole drilling like 20D
- Optimal performance with MQL System

Taper Spline Structure
(Rigidity has been enhanced due to increased contact area)





Post End - Alpha Mill



Flange End - Alpha Mill

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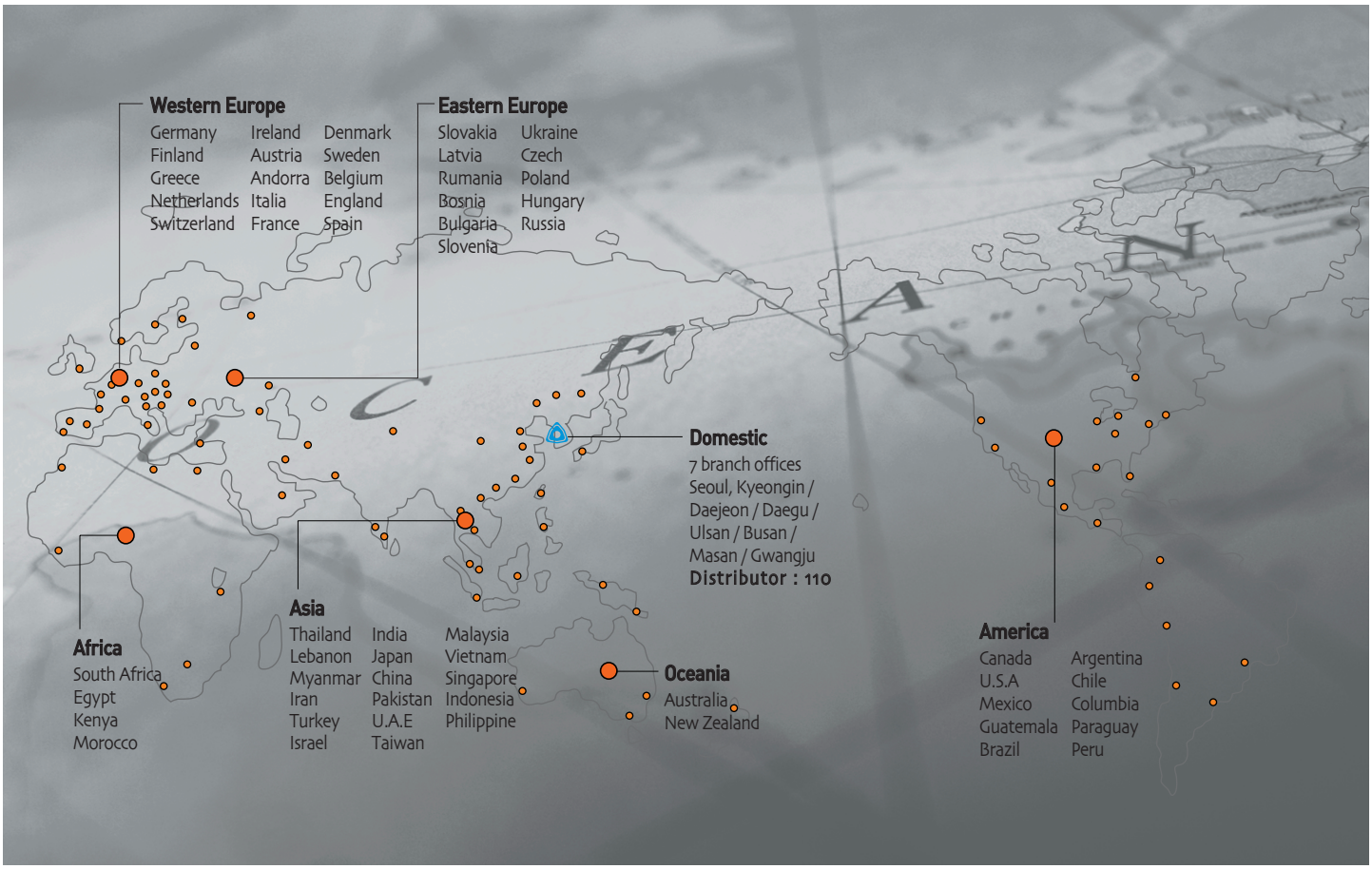
MEMO



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