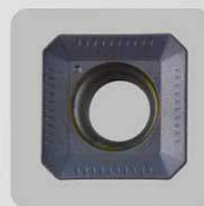


NASKA®

2016.05
NO.05



西安海纳精密机械有限公司
XI'AN HEINER PRECISION MACHINERY CO., LTD.

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New Fine Tools

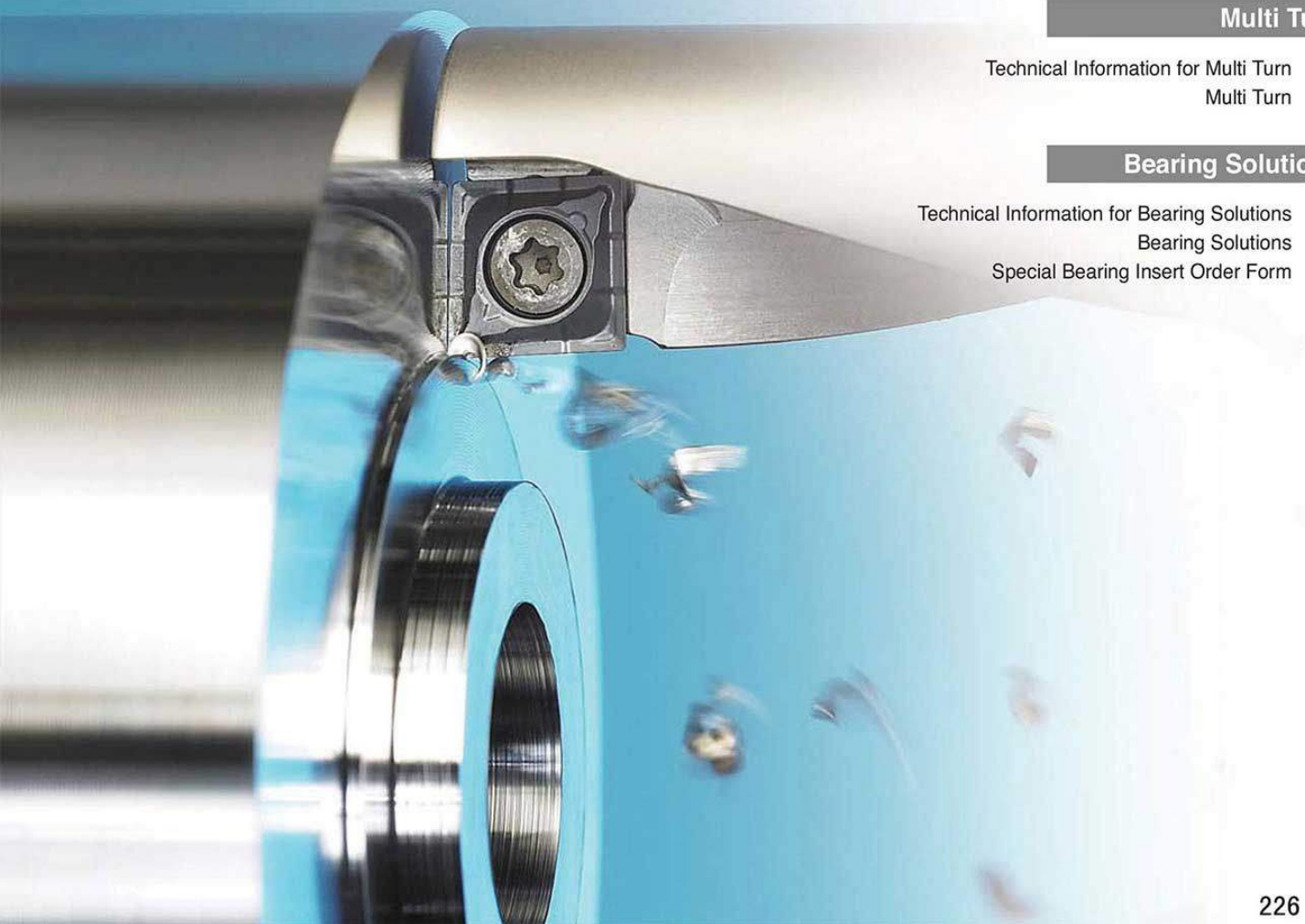
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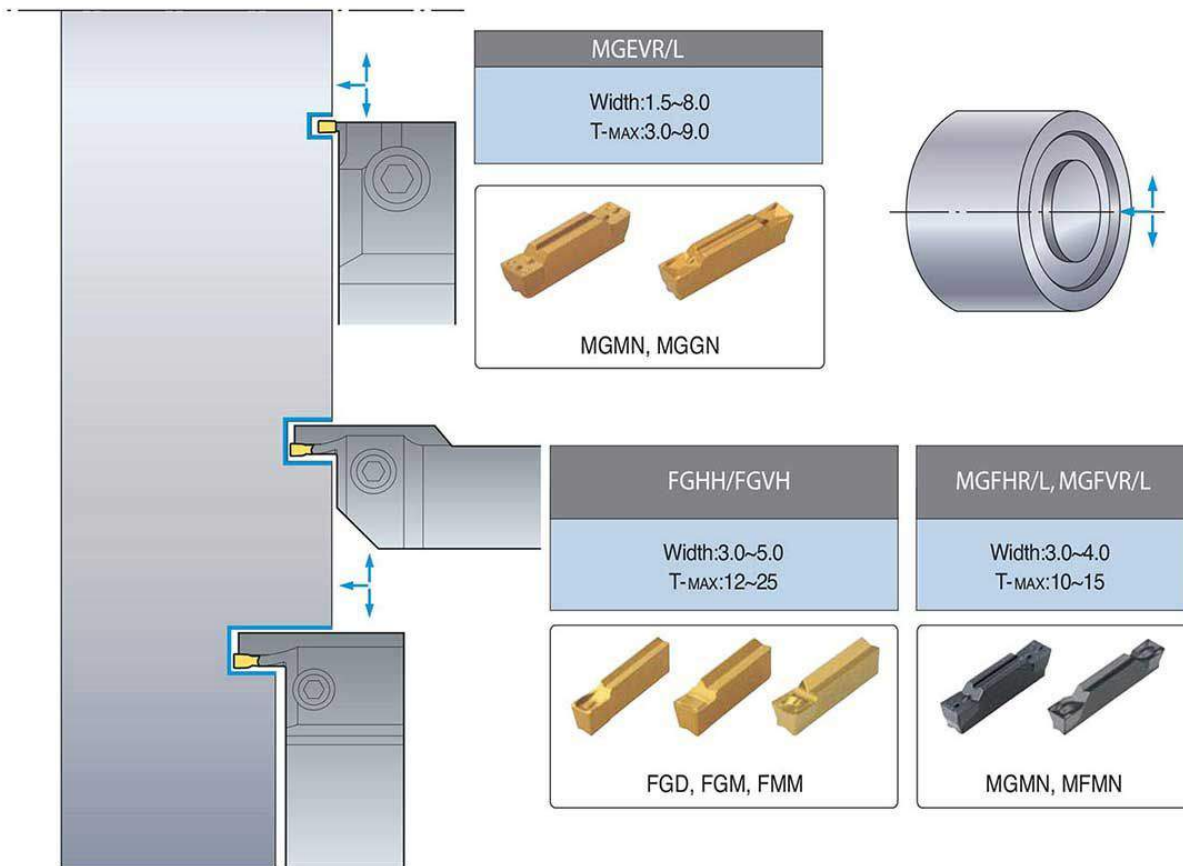
For external machining

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

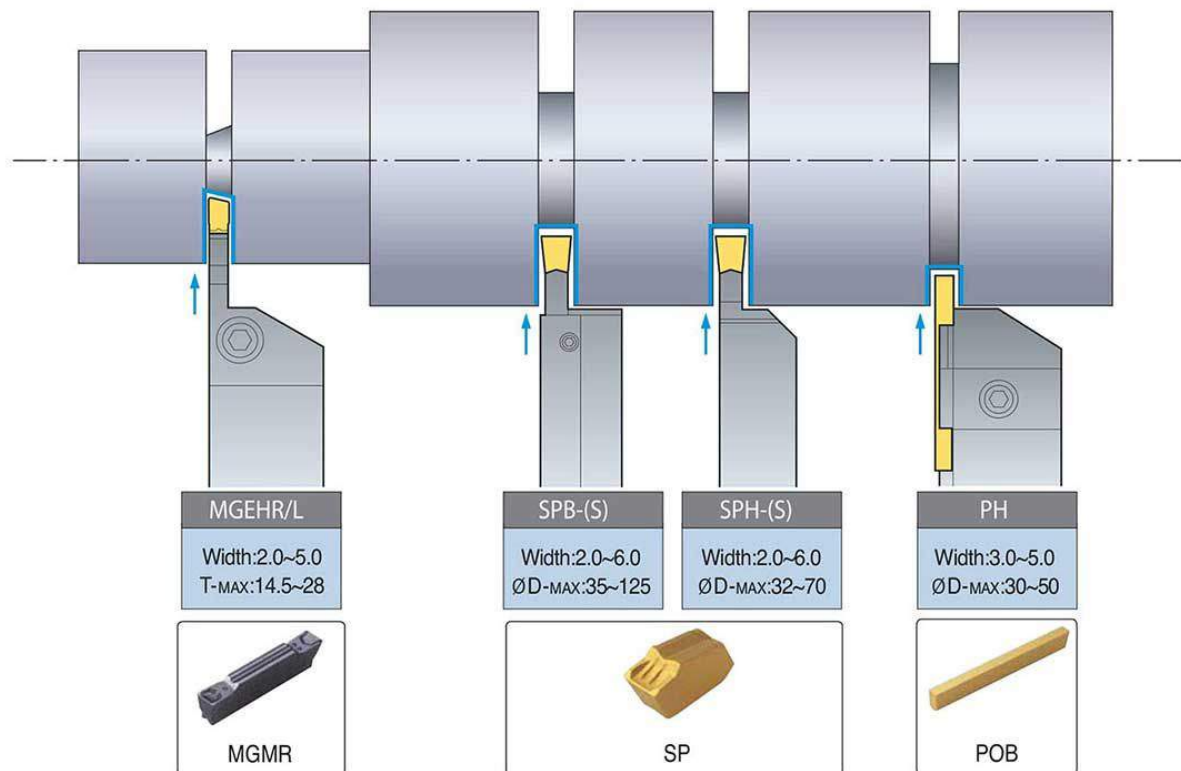
For internal machining

NFTIH Width:0.75~4.02 T-MAX:1.3~4.6	GFIK Width:2.0~8.0 T-MAX:2.0~8.0	GFIP Width:1.1~8.0 T-MAX:2.1~9.0	IGH Width:1.25~2.8 T-MAX:1.5~2.3	MGIVR/L Width:1.5~8.0 T-MAX:4.0~10	MGIUR/L 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

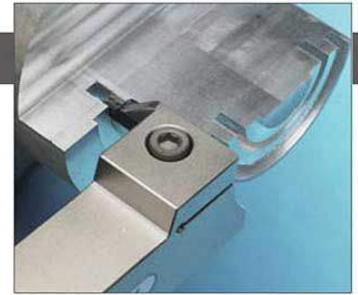


NASKA[®]
Germany Naska company












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

 <p>MGM(G)N-M</p> <ul style="list-style-type: none"> · 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 	 <p>MGMN-G</p> <ul style="list-style-type: none"> · Specially designed chip breaker allows narrower chips to promote better chip flow · Specifically designed for grooving applications 	 <p>MRMN-M</p> <ul style="list-style-type: none"> · Full radius geometry for applications that require profiling · Available for relief machining 	 <p>MFMN300</p> <ul style="list-style-type: none"> · Specially designed chip breaker allows narrower chips to promote better chip flow · Chip breaker specially designed for face-grooving
 <p>MRGN-A</p> <ul style="list-style-type: none"> · Specially designed high positive geometry, ideal for machining aluminum · The chip breaker's super buffed, high rake angle allows optimal chip flow of aluminum 	 <p>MGMR-PS</p> <ul style="list-style-type: none"> · 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 	 <p>MGMR-PT</p> <ul style="list-style-type: none"> · 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 narrow chips for better flow 	
 <p>MGMN-L</p> <ul style="list-style-type: none"> · Sharp cutting edge · Low cutting resistance · For auto CNC machine · For small Dia. processing 	 <p>MGMN-R</p> <ul style="list-style-type: none"> · Strong cutting edge · For high feed rate processing 	 <p>MGMN-T</p> <ul style="list-style-type: none"> · For turning & grooving · Reduced chipwidth & smooth chip control by dot designed on the top corner 	 <p>MGMN-A</p> <ul style="list-style-type: none"> · Smooth chip flow · Reduced build up on cutting edge

Parting off (MGMN/MGMR/L)

Workpiece	Cutting Speed										Feed					
	CVD					PVD					Uncoated	Cutting width (mm)				
	NC3120	NC3030	NCM325	NC5330	NC500H	PC230	PC8110	PC5300	PC3500	PC6510		ST30A	2	3	4	5
SM□□C	80~180			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				70~150		0.02~0.15	0.03~0.2	0.08~0.3	0.10~0.4	0.12~0.5
GC/GCD				50~100							50~100	0.05~0.12	0.1~0.25	0.1~0.30	0.1~0.35	0.1~0.40
STS			50~120	50~120			50~120	60~140				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	NC5330	NC3120	PC3500	PC215K	PC8110/PC5300	H01		3	4	5	
SM□□C			100~160	100~160							0.05~0.1	0.05~0.12	0.05~0.15
SCM		50~130	50~130	50~130	50~130						0.05~0.1	0.05~0.12	0.05~0.15
GC/GCD	120~150		120~150				120~150				0.05~0.1	0.05~0.12	0.05~0.15
STS			60~150					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	NC5330	PC215K	PC5300	PC230	PC3500	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		80~200		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	80~180		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		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						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

Face grooving tools






For Shallow Grooving

MFMN300	MGMN400-M
	
Cutting width 3mm	Cutting Width 4mm
Horizontal MGFHR	Vertical MGFVR
	
Machined diameter ∅24~200mm	Machined diameter ∅24~60mm

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)
Horizontal FGHH	Vertical FGVB	
		
Machined diameter ∅25~140mm	Machined diameter ∅25~140mm	

Features

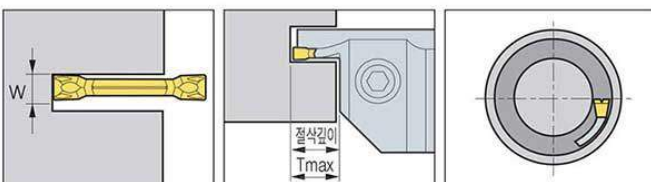
- ▶ These tools are suitable for deep grooving with a single cutting edge (Tmax 25mm)
- ▶ A variety of chip breakers enable a machinist to apply a wide range of functions in machining
- ▶ A variety of holders ensures multiple application ranges

Note

FGM and FMM have similar application ranges 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

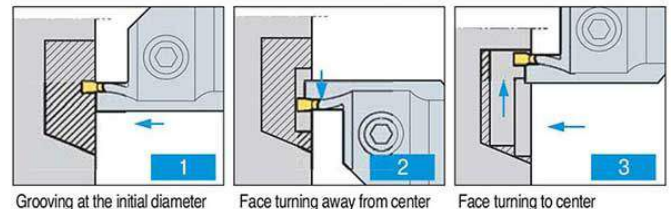
Before machining, check and adjust the following holder position



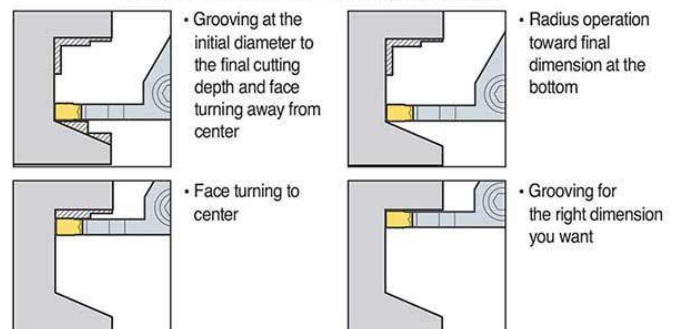
- Check the cutting edge height at the center of the workpiece
- Machine towards the center and check for burrs
- For better surface roughness, set up the insert in order to perpendicular at center line

Optimization of Face Grooving

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



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



Turning and Grooving

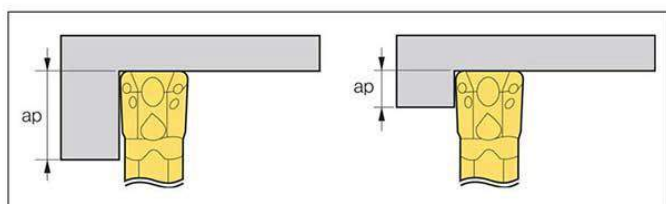
Selection of Insert

Feed rate

- Decide maximum feed rate after considering the insert's characteristics and machine capabilities. ($F_{max} = W \times 0.075$)
- Max feed rate should not be larger than the corner radius of the insert
- In grooving applications, chip evacuation problems can be remedied by using step feed methods at small intervals

Depth of cut

- The minimum depth of cut should be bigger than corner radius of insert
- When deciding on the max depth of cut please consider the machine's cutting load
- Depending on the shape of the insert, deflection of work piece and clearance angle can be changed

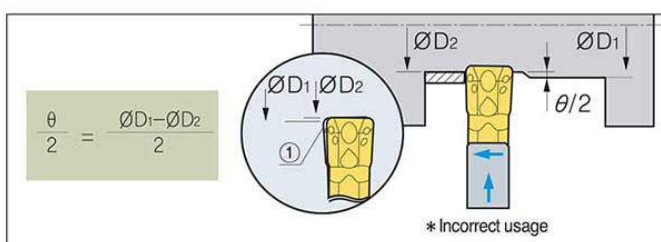


Notice for turning

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)

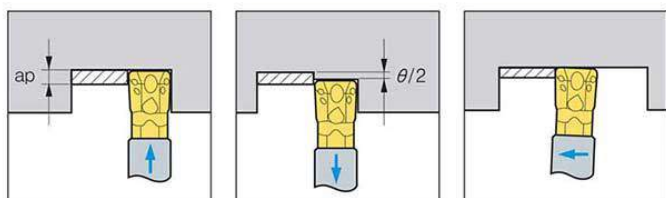
After desired diameter is grooved, continuous turning operation might cause some deflection of the workpiece. In these cases follow the given formula, offsetting these factors enables the desired diameter that you want



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

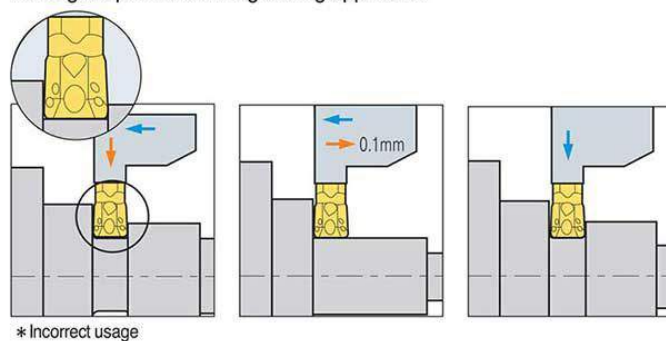
To obtain a good surface roughness without offsetting in an application follows the directions below

- 1) Groove to the desired diameter
- 2) Pull the tool back a total distance of $\theta/2$
- 3) Continue the external turning operation to desired diameter

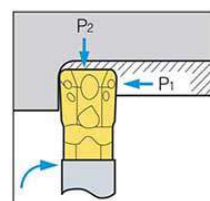


Notice for MGT turning applications

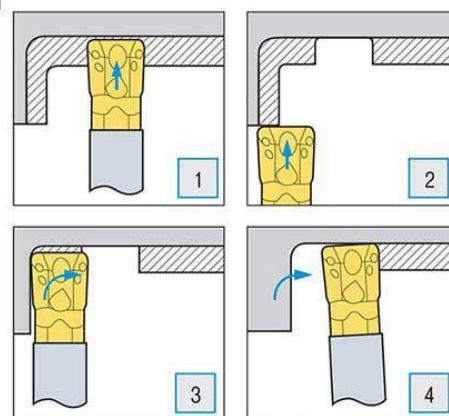
M.G.T tools are available for grooving and turning as a multifunctional tool. When using a M.G.T tool keep in mind that the tool imitates a standard ISO turning application. The application uses a positive clearance angle where a tool's cutting force and depth of cut are all applied in an application. 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



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

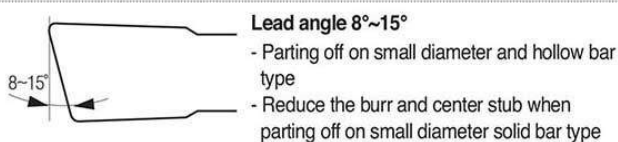
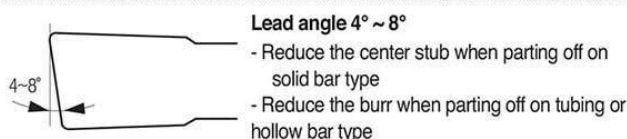
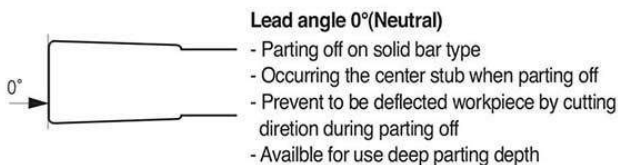
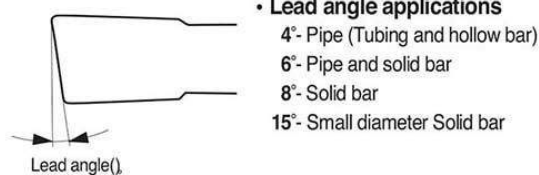


Stabilize your tool pressure. MGT tools create a cutting load when machining a workpiece with a radius larger than the corner radius of insert (shown in the picture). The unequal cutting force might initially break the insert or holder



Parting off & Grooving

Insert



※ Available Inserts : MGMR/L □□□ - □□ - PS/PT
 Lead angle(°)

Selection of Insert

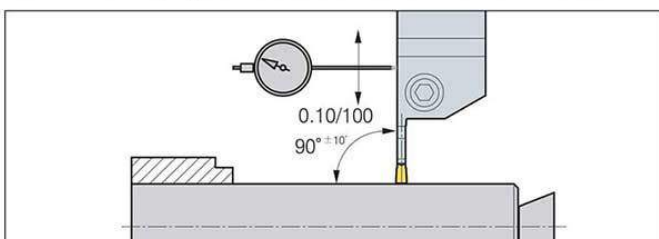
To properly match the insert and cutting condition, the following factors should be considered

- Width of insert
- Chip breaker
- Grade and nose R
- The relationship between the cutting width and cutting depth
 - Neutral type, inserts with a 0 degree lead angle are best when used an applications maximum depth of cut
 - In general alloy steel, the maximum depth of cut = $W \times 0.8$
- 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

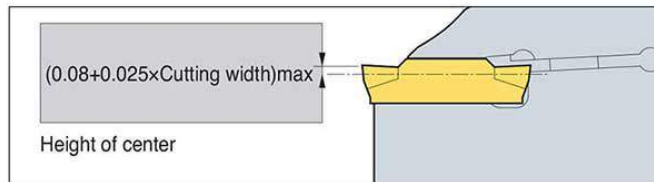
The cutting position should be exactly mounted on machined axis in order to create a perpendicular direction or 90 to minimize vibration



Setting of Parting off

The edge height of an insert should be set within $\pm 0.1\text{mm}$ 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

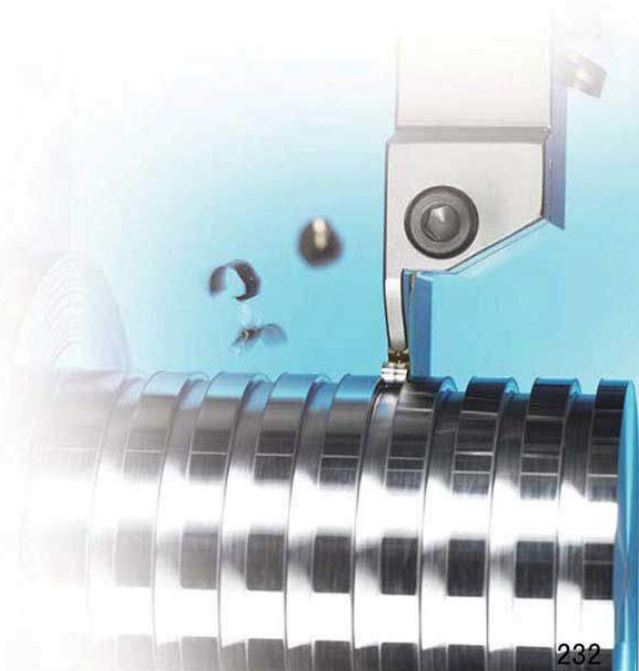
Usage

- 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



MGT-Machining AI 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

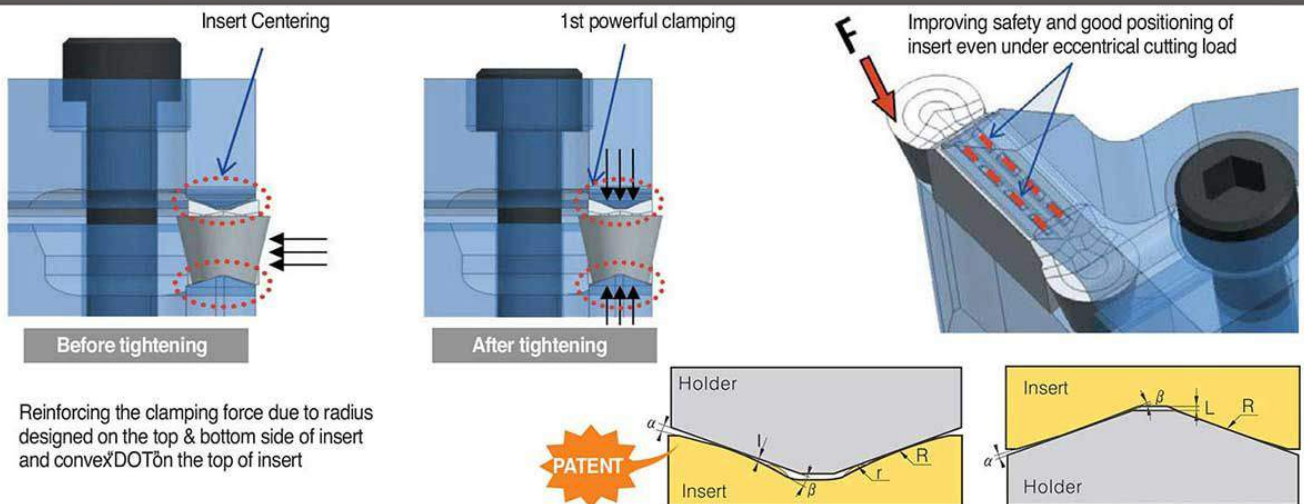


• MRGN type : Full "Round" geometry

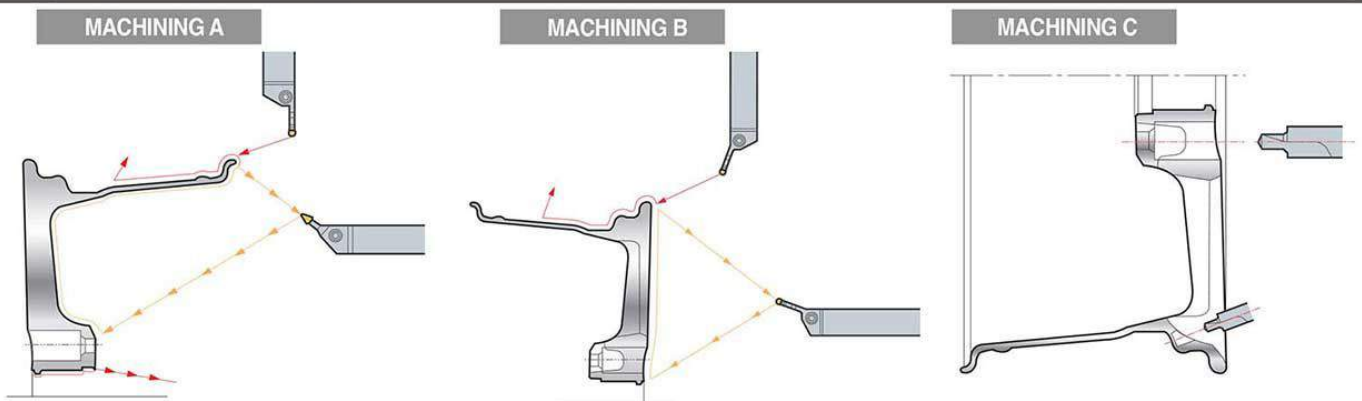
Various insert types

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



Application of AI Wheels

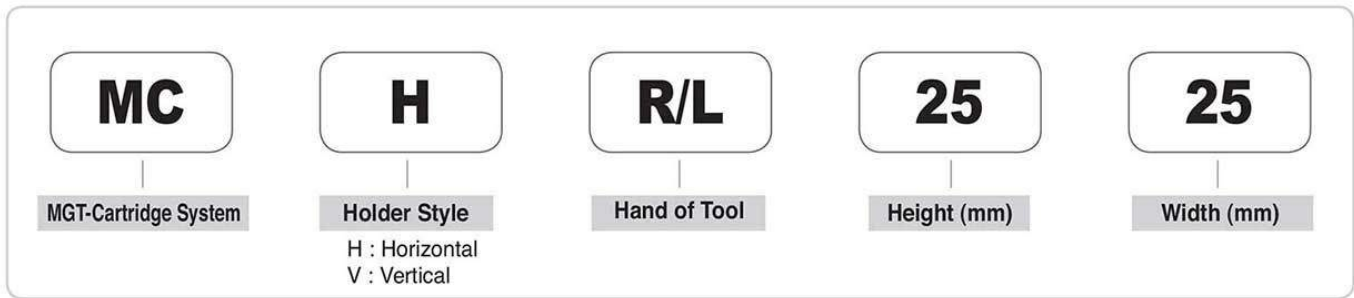


Recommended cutting condition

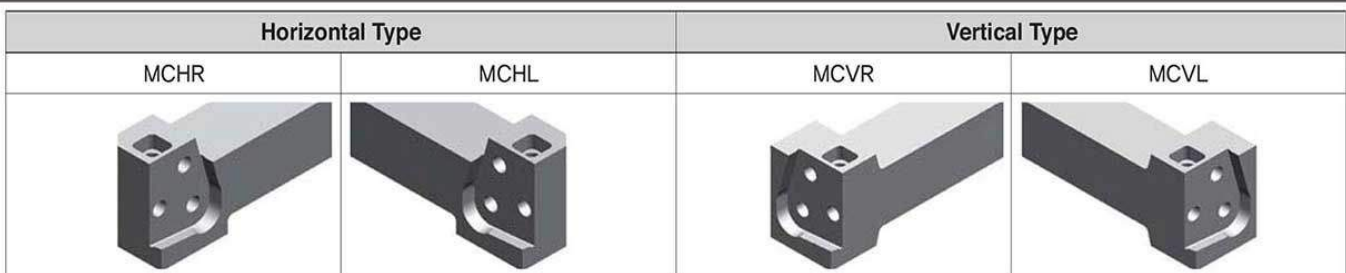
Workpiece		Hardness Brinell (HB)	kc (MPa)	vc (m/min)	fn (mm/rev)
Aluminum alloy (Forged)	Unhardened	50 ~ 70	500 ~ 600	1,000 ~ 2,500	0.1 ~ 0.6
	Hardened	90 ~ 110	700 ~ 900	300 ~ 1,000	0.1 ~ 0.5
Aluminum alloy (Cast)	Unhardened	70 ~ 80	700 ~ 800	300 ~ 1,000	0.1 ~ 0.5
	Hardened	80 ~ 110	800 ~ 950	200 ~ 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

MGT-Cartridge

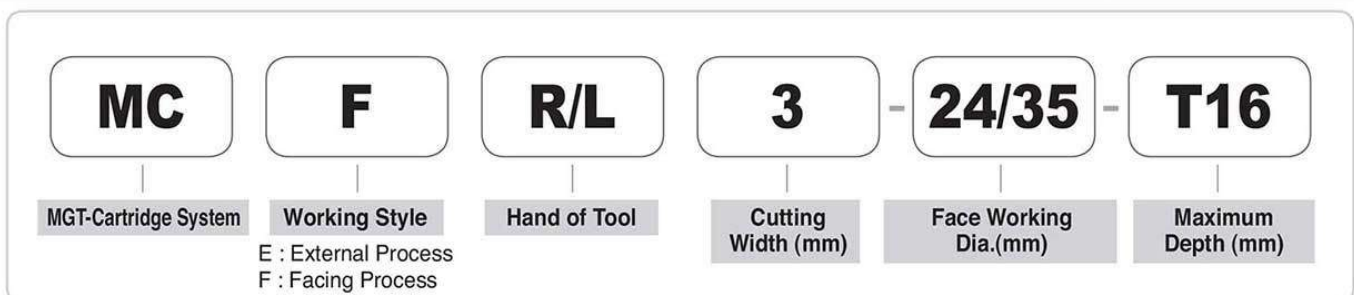
Holder Code System



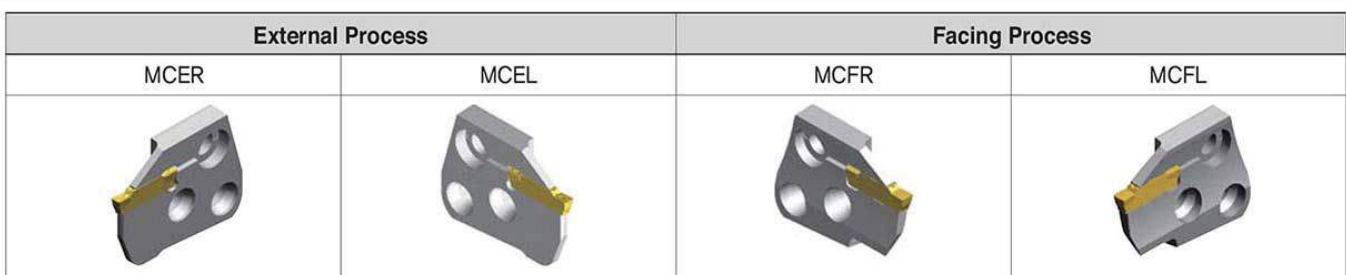
Holder



Cartridge Code System

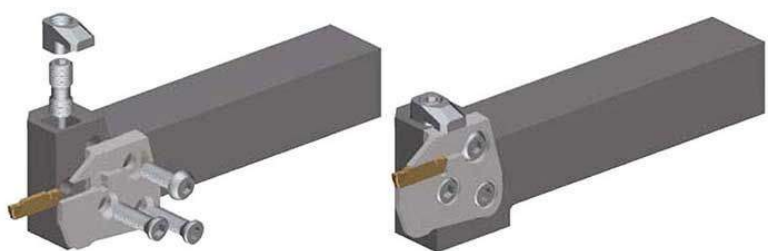


Cartridge



System Figure

- ▶ **Compatible and Economical** due to divided cartridge & exclusive holder system from existing single body system
- ▶ **Interchangeable cartridge**
 - Various assembly depends on working style
 - Reduce cutting tool costs by over 30%
 - Setting with upper clamp & side screw
- ▶ **Strong & Stable setting force**
 - Simultaneous assembly of insert & cartridge
 - Easy assembly & tool exchange
- ▶ **Stable assembly system**
 - Simple & Superior setting force



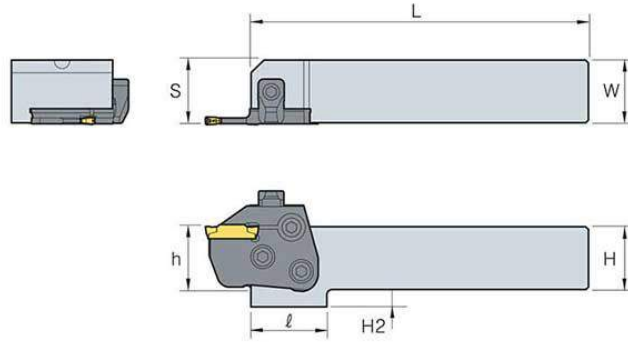
Stable Assembly thanks to double screw & clamp ▶ Simple & Strong Setting

MCHR/L (Holder)



MCER/L
MCFR/L

For Grooving, Turning, Parting off, Relieving, Profiling machining



R type insert

Designation	Stock		H=(h)	W	L	S	l	H ₂	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping screw	Wrench
	R	L												
MCHR/L 2020	●	●	20	20	133	20.7	30	12	MCER/L					
2525	●	●	25	25	133	25.7	30	7	MCFR/L					
3232	●	●	32	32	153	32.7	-	-						

(mm)

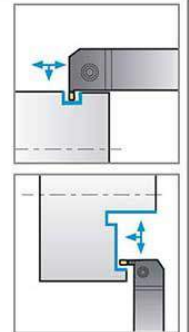
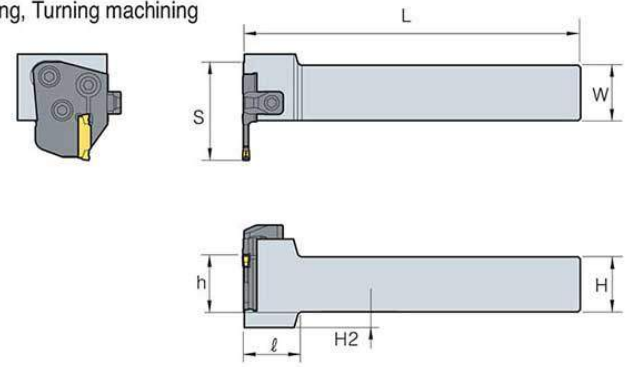
● : Stock item ○ : Under preparing for stock

MCVR/L (Holder)



MCER/L
MCFR/L

For Face Grooving, Turning machining



R type insert

Designation	Stock		H=(h)	W	L	S	l	H ₂	Cartridge	Clamp	Clamp Screw	Hinge Screw	Clamping screw	Wrench
	R	L												
MCVR/L 2020	○	○	20	20	150	38	30	12	MCER/L					
2525	○	○	25	25	150	43	30	7	MCFR/L					
3232	○	○	32	32	170	50	-	-						

(mm)

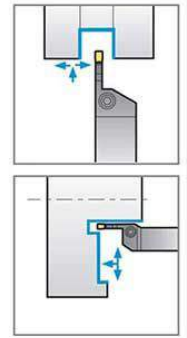
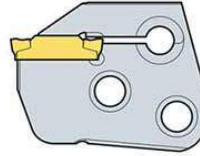
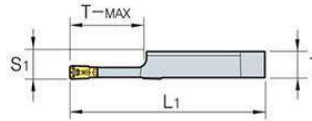
● : Stock item ○ : Under preparing for stock

MCER/L (Cartridge)



MGMN
MGMR
MGGN
MRMN

For Grooving, Turning, Parting off, Relieving, Profiling machining



R type insert

(mm)

Designation	Stock		T	L ₁	S ₁	T-max	Inserts		Holder
	R	L					width	Designation	
MCER/L	3-T16	● ●	6.00	44.5	6.35	16	3	MGMN MGMR/L MGGN MRMN	MCHR/L MCVR/L
	4-T16	● ●	5.97	44.5	6.35	16	4		
	5-T20	● ●	5.87	48.5	6.35	20	5		
	6-T20	● ●	5.82	48.5	6.35	20	6		

• Applicable inserts, see pages C21, C22

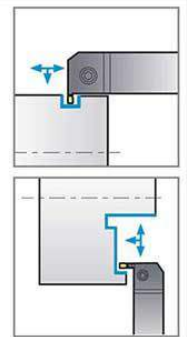
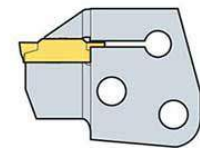
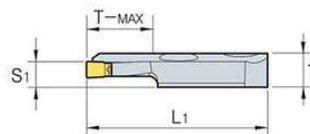
● : Stock item ○ : Under preparing for stock

MCFR/L (Cartridge)



MFNM
MGMN

For Face Grooving, Turning machining



R type insert

(mm)

Designation	Stock		T	L ₁	S ₁	T-max	Inserts		Holder
	R	L					width	Designation	
MCFR/L3-24/35-T16	○ ○		8.00	44.5	6.35	16	3	MFNM300	MCHR/L MCVR/L
MCFR/L3-29/40-T16	○ ○		8.00	44.5	6.35	16	3		
MCFR/L3-34/50-T16	○ ○		8.00	44.5	6.35	16	3		
MCFR/L3-44/70-T16	○ ○		8.00	44.5	6.35	16	3		
MCFR/L3-64/99-T16	○ ○		8.00	44.5	6.35	16	3		
MCFR/L4-44/60-T16	○ ○		7.97	44.5	6.35	16	4	MGMN400	
MCFR/L4-60/120-T16	○ ○		7.97	44.5	6.35	16	4		
MCFR/L4-112/200-T16	○ ○		7.97	44.5	6.35	16	4		

• Applicable inserts, see pages C21, C22

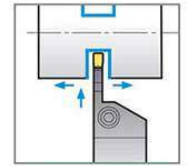
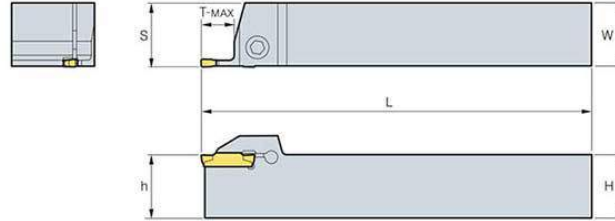
● : Stock item ○ : Under preparing for stock

MGEHR/L



MGMN MRMN
MGMR MRGN
MGGN

For Grooving, Turning, Parting off, Relieving, Profiling machining



R type insert

(mm)

Designation	Stock		H=(h)	W	L	S	T-MAX	Inserts	Screw	Wrench			
	R	L											
MGEHR/L 1616-1.5	●	●	16	16	100	16.2	14	MGMN150-G	LTX0514	TW20L			
2020-1.5	●	●	20	20	125	20.2	14						
2525-1.5	●	●	25	25	150	25.2	14						
1212-2	●	●	12	12	100	14.25	14	MGMN200-G MGMN200-M MGMR200-□□-□□	MHA0512	HW40L			
1616-2	●	●	16	16	100	16.25	14						
2020-2	●	●	20	20	125	20.25	14						
2525-2	●	●	25	25	150	25.25	14	MGMN250-G MGMN250-M	MHA0512	HW40L			
1616-2.5	●	●	16	16	100	16.30	16						
2020-2.5	●	●	20	20	125	20.30	16						
2525-2.5	●	●	25	25	150	25.30	16	MGMN300-M/T MGGN300-□□-M MRMN300-M MGMR300-□□-□□ MGMN300-□□-L/R	BHA0616	HW50L			
1616-3	●	●	16	16	100	16.35	18						
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						
2020-4-T10	●	●	20	20	125	20.4	10						
2525-4	●	●	25	25	150	25.4	18	MGMN400-M/T MGGN400-□□-M MRMN400-M MGMR400-□□-□□ MGMN400-□□-L/R	BHA0616	HW50L			
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	MGMN500-M/T MGGN500-□□-M MRMN500-M MGMR500-□□-□□ MGMN500-□□-L/R	BHA0616	HW50L			
2020-5	●	●	20	20	150	20.5	23						
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	BHA0616	HW50L
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	MRMN800-M MGMN800-M	BHA0616	HW50L			
3232-6	●	●	32	32	170	32.6	23						
3232-6-T15	●	●	32	32	170	32.6	15						
2525-8	●	●	25	25	150	26.1	28	MRMN800-M MGMN800-M	BHA0616	HW50L			
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	MRGN600-A	BHA0616	HW50L			
2525-6A	●	●	25	25	150	25.6	23						
2525-6A-T15	●	●	25	25	150	25.6	15						
3232-6A	●	●	32	32	170	32.6	23	MRGN800-A	BHA0616	HW50L			
3232-6A-T15	●	●	32	32	170	32.6	15						
2525-8A	●	●	25	25	150	26.1	28						
2525-8A-T15	●	●	25	25	150	26.1	16	MRGN800-A	BHA0616	HW50L			
3232-8A	●	●	32	32	170	33.1	28						
3232-8A-T15	●	●	32	32	170	33.1	15						

• Applicable inserts, see pages C21, C22

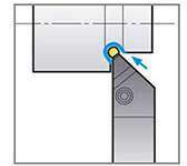
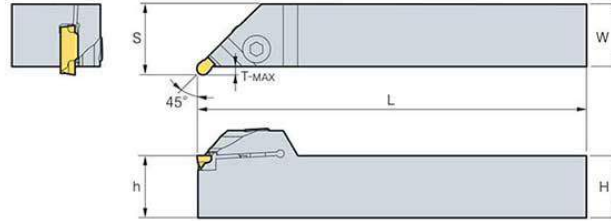
● : Stock item ○ : Under preparing for stock

MGEUR/L



MRMN
MRGN

For Relieving, Profiling machining



R type insert

(mm)

Designation	Stock		H=(h)	W	L	S	T-MAX	Inserts	Screw	Wrench
	R	L								
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			
2525-4	●		25	25	150	28	3			
3232-4			32	32	170	35	3			
2020-5			20	20	125	24	4			
2525-5	●		25	25	150	29	4			
3232-5			32	32	170	36	4			
2020-6			20	20	125	24	4			
2525-6	●	●	25	25	150	29	4			
3232-6	●	●	32	32	170	36	4			
2525-8			25	25	150	30	5			
3232-8			32	32	170	37	5			
2525-6A			25	25	150	29	4			
3232-6A			32	32	170	36	4			
2525-8A			25	25	150	30	5			
3232-8A			32	32	170	37	5			

• Applicable inserts, see pages C22

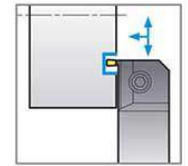
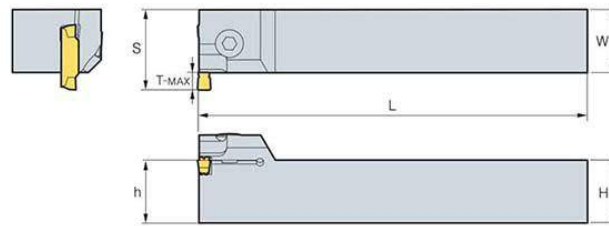
● : Stock item ○ : Under preparing for stock

MGEVR/L



MGMN
MRMN
MRGN

For Grooving, Turning, Profiling machining



R type insert

(mm)

Designation	Stock		H=(h)	W	L	S	T-MAX	Min. diameter	Inserts	Screw	Wrench
	R	L									
MGEVR/L 2020-1.5			20	20	125	23	3	85	MGMN150-G	LTX0514	TW20L
2525-1.5			25	25	150	28	3	85			
3232-1.5			32	32	170	35	3	85			
2020-2	●		20	20	125	23.5	3.5	65	MGMN200-M MGMN200-G	BHA0616	HW50L
2525-2			25	25	150	28.5	3.5	65			
3232-2			32	32	170	35.5	3.5	65			
2020-2.5			20	20	125	24	4	65			
2525-2.5			25	25	150	29	4	65			
3232-2.5			32	32	170	36	4	65			
2020-3	●		20	20	125	25.5	5	75	MGMN300-M/T MGMN300-□□-M MRMN300-M MGMN300-□□-L/R		
2525-3	●	●	25	25	150	30.5	5	75			
3232-3			32	32	170	37.5	5	75			
2020-4	●		20	20	125	25.5	5	70	MGMN400-M/T MGMN400-□□-M MRMN400-M MGMN400-□□-L/R		
2525-4	●		25	25	150	30.5	5	70			
3232-4			32	32	170	37.5	5	70			
2020-5			20	20	125	27	7	75	MGMN500-M/T MGMN500-□□-M MRMN500-M MGMN500-□□-L/R		
2525-5			25	25	150	32	7	75			
3232-5			32	32	170	39	7	75			
2020-6			20	20	125	27	7	70	MGMN600-M MGMN600-□□-M MRMN600-M MGMN800-M		
2525-6			25	25	150	32	7	70			
3232-6			32	32	170	39	7	70			
2525-8			25	25	150	34	9	50	MRMN800-M MGMN800-M		
3232-8			32	32	170	41	9	50			
2525-6A			25	25	150	32	7	70			
3232-6A			32	32	170	39	7	70	MRGN600-A		
2525-8A			25	25	150	34	9	45	MRGN800-A		
3232-8A			32	32	170	41	9	45			

• Applicable inserts, see pages C21, C22

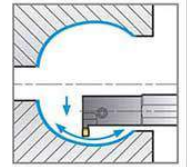
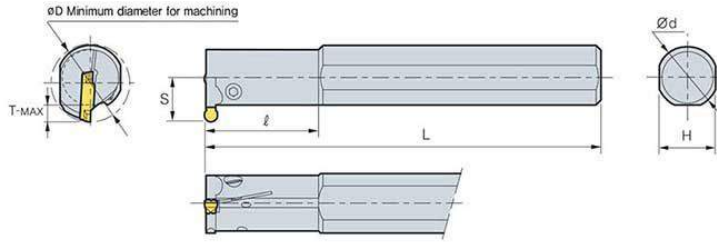
● : Stock item ○ : Under preparing for stock

MGIVR/L



MGMN MRMN
MGGN MRGN

For Grooving, Turning, Profiling machining

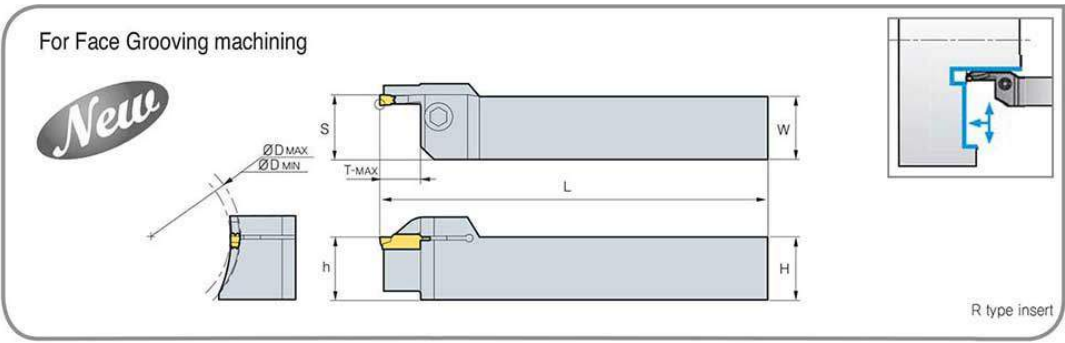


R type insert

Designation	Stock		øD	ød	L	l	T-MAX	H	S	Inserts	Screw	Wrench
	R	L										
MGIVR/L 2016-1.5			20	16	125	35	3.5	15	11.3	MGMN150-G	MHB0310	HW25L
			25	20	150	45	3.5	18	13.1		MHA0512	HW40L
2925-1.5			29	25	200	45	3.5	23	16.2	MGMN200-G MGMN200-M MRMN200-M	MHB0310	HW25L
2016-2	●	●	20	16	125	35	4.5	15	12.4		MHA0512	HW40L
2520-2	●	●	25	20	150	45	4.5	18	14.0	MGMN250-G MGMN250-M	MHB0310	HW25L
2925-2	●	●	29	25	200	45	4.5	23	17.2		MHB0512	HW40L
2016-2.5			20	16	125	35	4.5	15	12.5	MGMN300-M/G/T MGGN300-□□-M MRMN300-M MRMN300-□□-L/R	MHA0512	HW40L
2520-2.5			25	20	150	45	4.5	18	15.1			
2925-2.5			29	25	200	45	4.5	23	18.2	MGMN400-M/G/T MGGN400-□□-M MRMN400-M MRMN400-□□-L/R	MHA0512	HW40L
2520-3	●	●	25	20	150	45	5	18	15.6			
3125-3	●	●	31	25	200	45	6	23	18.9	MGMN500-M/G/T MGGN500-□□-M MRMN500-M MRMN500-□□-L/R	BHA0616	HW50L
3732-3	●		37	32	250	65	6	30	21.5			
2520-4	●	●	25	20	150	45	6	18	15.6	MGMN600-M/G MGGN600-□□-M MRMN600-M	BHA0620	HW50L
3125-4	●		31	25	200	45	6	23	18.9			
3732-4	●		37	32	250	65	6	30	21.5	MRMN800-M MGMN800-M	BHA0620	HW50L
3125-5	●		31	25	200	45	8	23	19.4			
3732-5	●	●	37	32	250	65	8	30	21.5	MRGN600-A	BHA0616	HW50L
3125-6	●	●	31	25	200	45	8	23	19.4			
3732-6	●		37	32	250	65	8	30	21.5	MRGN800-A	BHA0620	HW50L
3732-8	●		37	32	250	65	10	30	23.4			
4540-8	●		45	40	300	70	10	37	27.2			
3125-6A			31	25	200	45	8	23	19.4			
3732-6A			37	32	250	65	8	30	21.5			
3732-8A			37	32	250	65	10	30	23.4			
4540-8A			45	40	300	70	10	37	27.2			

• Applicable inserts, see pages C21, C22

● : Stock item ○ : Under preparing for stock

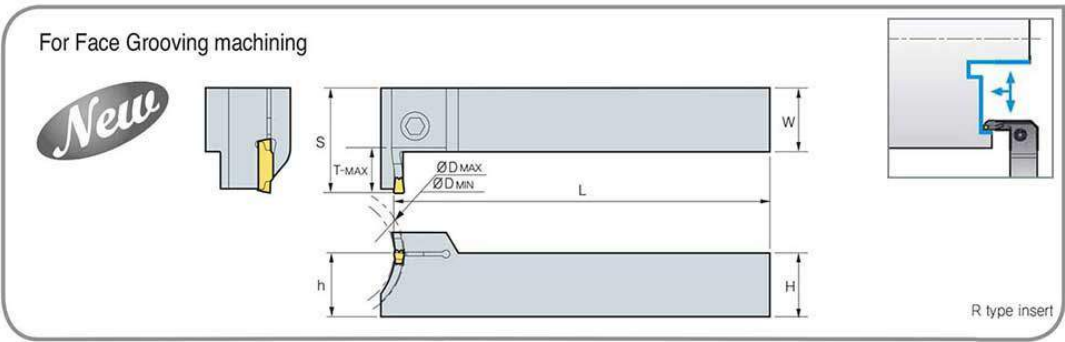


(mm)

Designation	Stock		H=(h)	W	L	S	T-MAX	min. (øD)	max. (øD)	Inserts	Screw	Wrench	
	R	L											
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			
425-112/200-T15	●		25	25	150	25.6	15	112	200	MGMN400-M/T MGMN400-□□-L/R			

• Applicable inserts, see pages C21

● : Stock item ○ : Under preparing for stock



(mm)

Designation	Stock		H=(h)	W	L	S	T-MAX	min. (øD)	max. (øD)	Inserts	Screw	Wrench	
	R	L											
MGFVR/L	325-24/35-T10	●		25	25	150	36	10	24	35	MFMN300	MHA0512	HW40L
	325-29/40-T10	●		25	25	150	36	10	29	40			
	325-34/50-T10	●		25	25	150	36	10	34	50			
	325-44/70-T10	●		25	25	150	36	10	44	70			
	325-64/99-T10	●		25	25	150	36	10	64	99			
	425-44/60-T10	●		25	25	150	41	15	44	60			
425-60/120-T10	●		25	25	150	41	15	60	120	MGMN400-M/T MGMN400-□□-L/R	BHA0616	HW50L	
425-112/200-T10	●		25	25	150	41	15	112	200				

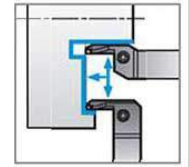
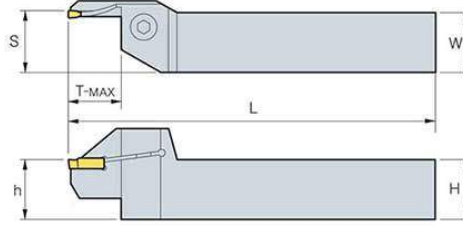
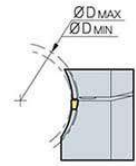
• Applicable inserts, see pages C21

● : Stock item ○ : Under preparing for stock



For Face Grooving, Turning machining

• FGHH



R type insert

(mm)

Designation	Stock		H=(h)	W	L	S	T-MAX	ØD MIN	ØD MAX	Inserts	Screw	Wrench
	R	L										
FGHH 320R - 25/30	●		20	20	125	20.6	12	25	30	FMM300R-03	BHA0616	HW50L
30/35	●		20	20	125	20.6	12	30	35			
35/48	●		20	20	125	20.6	12	35	48			
48/60			20	20	125	20.6	22	48	60			
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	FGD300R-03 FGM300R-03		
325R - 25/30	●		25	25	150	25.6	12	25	30			
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			
60/75	●		25	25	150	25.6	22	60	75			
75/100	●		25	25	150	25.6	22	75	100	FGD300R-03 FGM300R-03		
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			
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	FGD400R-04 FGM400R-04		
425R - 25/30	●		25	25	150	25.6	12	25	30			
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			
60/75	●		25	25	150	25.6	25	60	75			
75/100	●		25	25	150	25.6	25	75	100	FGD400R-04 FGM400R-04		
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			
60/75			20	20	125	20.6	25	60	75			
75/100			20	20	125	20.6	25	75	100	FGD500R-04 FGM500R-04		
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			
60/75	●		25	25	150	25.6	25	60	75			
75/100	●		25	25	150	25.6	25	75	100	FGD500R-04 FGM500R-04		
100/140	●		25	25	150	25.6	25	100	140			

• Applicable inserts, see pages C21

● : Stock item ○ : Under preparing for stock

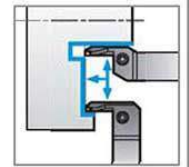
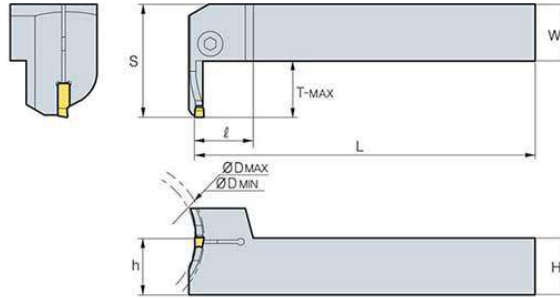
FGVH



FGD
FGM
FMM



For Face Grooving, Turning machining


• FGVH



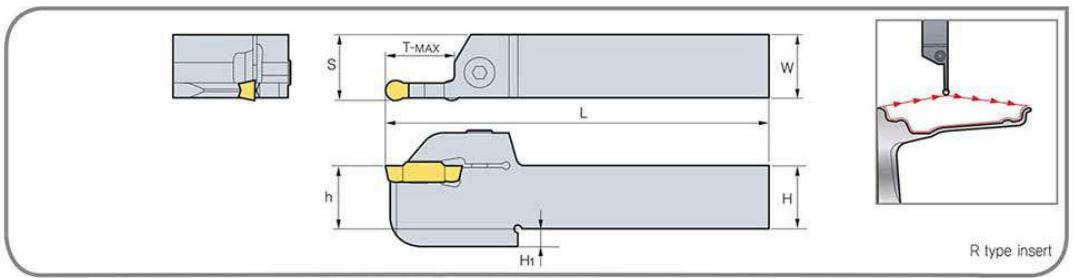
R type insert

(mm)

Designation	Stock		H=(h)	W	L	S	T-MAX	ØD MIN	ØD MAX	Inserts	Screw 	Wrench 
	R	L										
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			
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	FGD300R-03 FGM300R-03		
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	FGD500R-04 FGM500R-04		
48/60			20	20	125	20.6	25	48	60			
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	FGD500R-04 FGM500R-04		
48/60	●		25	25	150	25.6	25	48	60			
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 C21

● : Stock item ○ : Under preparing for stock

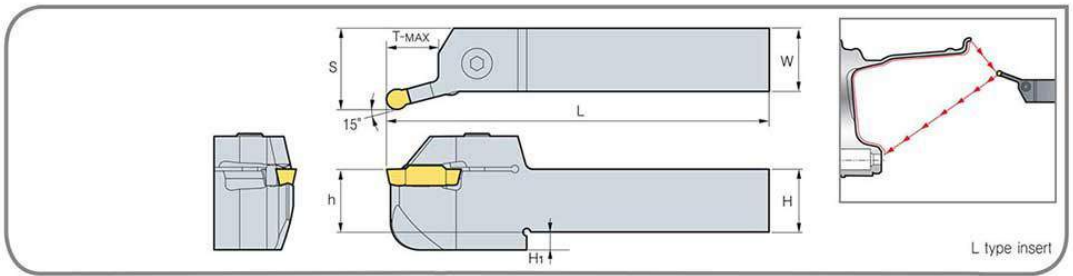


(mm)

Designation	Stock		H=(h)	H ₁	W	L	S	T-MAX	Inserts	Screw	Wrench
	R	L									
MGEHR/L 25N-6A	●		25	7	25	150	25.55	23.5	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
32N-6A			32	8	32	150	32.55	27			
25N-6A5	●		25	7	25	150	25.55	23.5	MRGN6N-A5		
32N-6A5			32	8	32	150	32.55	27			
25N-8A	●		25	7	25	150	25.55	23.5	MRGN8N-A MRGN8N-AP MRGN8N-AM		
32N-8A	●		32	8	32	150	32.55	27			
25N-8A5			25	7	25	150	25.55	23.5	MRGN8N-A5		
32N-8A5			32	8	32	150	32.55	27			

• Applicable inserts, see pages C22

● : Stock item ○ : Under preparing for stock

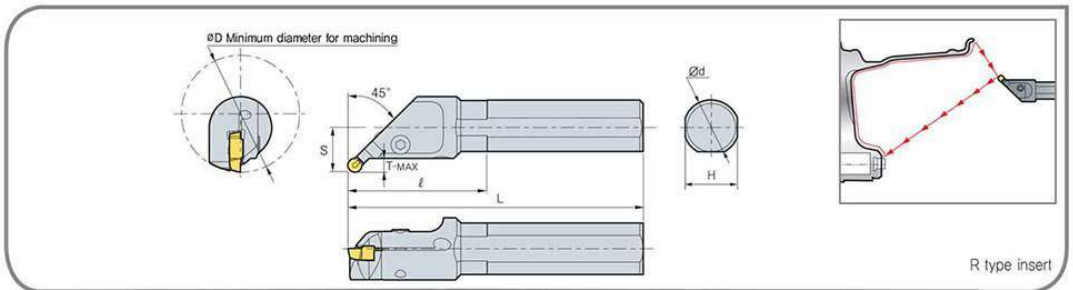


(mm)

Designation	Stock		H=(h)	H ₁	W	L	S	T-MAX	Inserts	Screw	Wrench
	R	L									
MGEHR/L 25N-6A-15	●		25	7	25	150	32.2	20	MRGN6N-A MRGN6N-AP MRGN6N-AM	BHA0620	HW50L
32N-6A-15			32	8	32	150	39.2	25			
25N-6A5-15	●		25	7	25	150	32.2	20	MRGN6N-A5		
32N-6A5-15			32	8	32	150	39.2	25			
25N-8A-15	●		25	7	25	150	32.2	20	MRGN8N-A MRGN8N-AP MRGN8N-AM		
32N-8A-15	●		32	8	32	150	39.2	25			
25N-8A5-15	●		25	7	25	150	32.2	20	MRGN8N-A5		
32N-8A5-15	●		32	8	32	150	39.2	25			

• Applicable inserts, see pages C22

● : Stock item ○ : Under preparing for stock



(mm)

Designation	Stock		øD	ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
	R	L										
MGIUR/L 6832-8A-MR	●		68	32	170	65	7	30	26	MRGN8N-A/AM/AP MRGN8N-A5	BHA0616	HW50L
6832-8A5-MR	●		68	32	170	65	7	30	26			

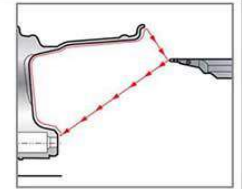
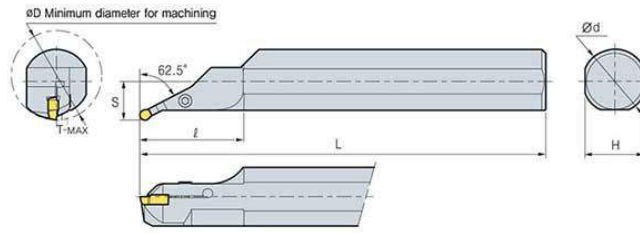
• Applicable inserts, see pages C22

● : Stock item ○ : Under preparing for stock

MGIXR/L-MR



MRGN



R type insert

(mm)

Designation	Stock		$\varnothing D$	$\varnothing d$	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
	R	L										
MGIXR/L 7050-8A-MR	●		70	50	350	80	5.5	46	30.2	MRGN8N-A/AM/AP	BHA0616	HW50L
7050-8A5-MR	●		70	50	350	80	5.5	46	30.2	MRGN8N-A5		

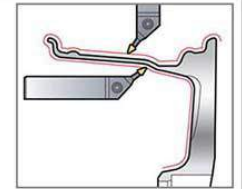
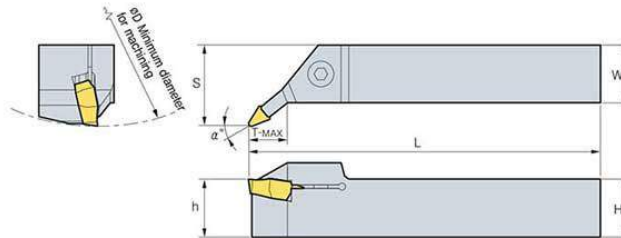
• Applicable inserts, see pages C22

● : Stock item ○ : Under preparing for stock

MGEXR/L



MVGN



R type insert

(mm)

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

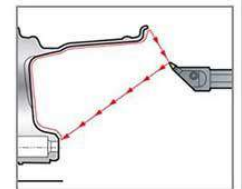
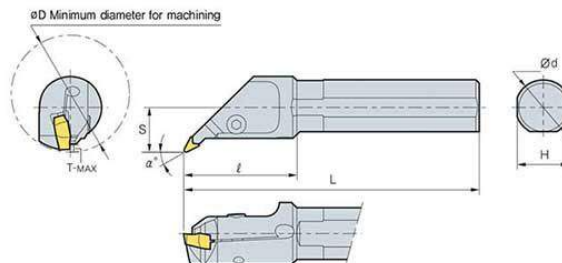
• Applicable inserts, see pages C22

● : Stock item ○ : Under preparing for stock

MGIUR/L-MV



MVGN



R type insert


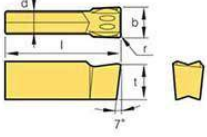

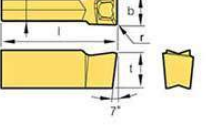

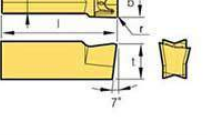

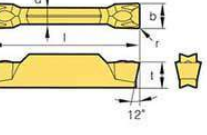

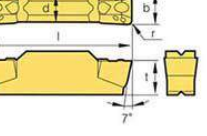

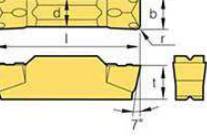

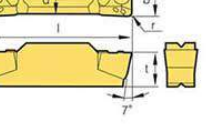
(mm)

Designation	Stock		$\varnothing D$	$\varnothing d$	L	ℓ	T-MAX	H	S	α°	Inserts	Screw	Wrench
	R	L											
MGIUR/L 6832-8A-MV	●		68	32	170	65	4.5	30	26	27.5	MVGN8N-A-R1.2	BHA0616	HW50L
											MVGN8N-A-R1.6		


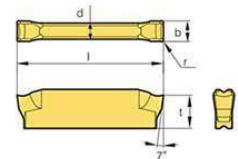

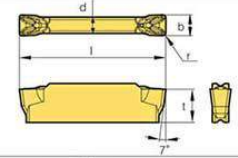

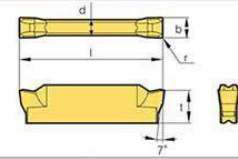

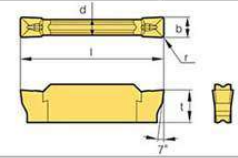

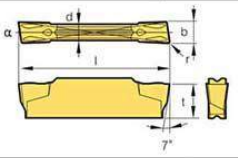

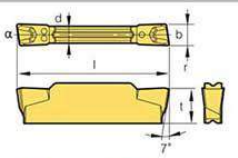

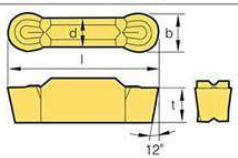

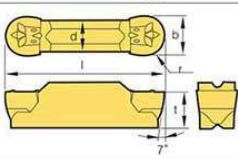

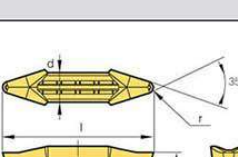

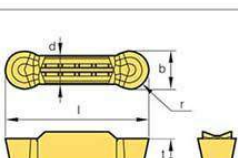
• Applicable inserts, see pages C22

● : Stock item ○ : Under preparing for stock

Available Inserts

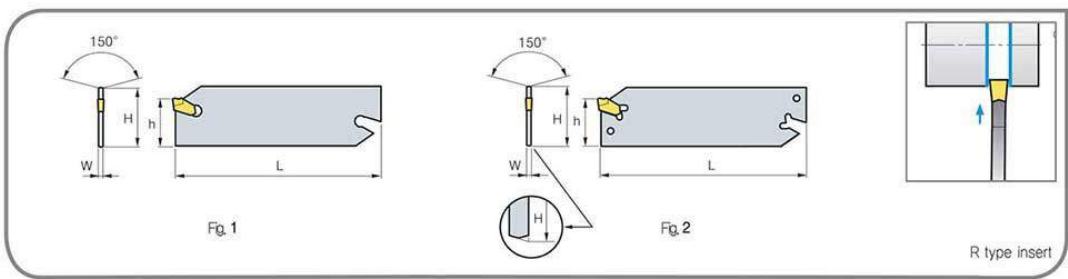
Application	Picture	Designation	Coated									Carnel	Dimensions (mm)					Configuration	Page				
			MU3010	MU3020	MU3030	MU3120	MU5300	MU9030	MU5330	MU6510	MU8110		MD2020	b	r	l	d			t			
Face Grooving		FGD 300R-03 400R-04 500R-04			●									3.0	0.3	15.0	2.0	4.0		C17			
					●										4.0	0.4	15.0	3.0			4.5		
					●											5.0	0.4	15.0			4.0	5.0	
Face Grooving		FGM 300R-03 400R-04 500R-04			●									3.0	0.3	15.0	2.0	4.0		C17			
					●										4.0	0.4	15.0	3.0			4.5		
					●											5.0	0.4	15.0			4.0	5.0	
Face Grooving		FMM 300R-03 400R-04 500R-04			●						●	●		3.0	0.3	15.0	2.0	3.91		C17			
					●						●	●			4.0	0.4	15.0	3.0			3.96		
					●							●	●			5.0	0.4	15.0			4.0	4.42	
Face Grooving		MFMN 300				●				●				3	0.2	18	2	3		C11 C16			
Grooving · Turning		MGGN 300-02-M 300-04-M 300-08-M 400-02-M 400-04-M 400-08-M 500-02-M 500-04-M 500-08-M 600-02-M 600-04-M 600-08-M											●	3.0	0.2	21.0	2.35	4.8		C11 C12 C13 C15			
															●	3.0	0.4	21.0			2.35	4.8	
																3.0	0.8	21.0			2.35	4.8	
																●	4.0	0.2			21.0	3.3	4.8
																●	4.0	0.4			21.0	3.3	4.8
																4.0	0.8	21.0			3.3	4.8	
																5.0	0.2	26.0			4.1	5.8	
																●	5.0	0.4			26.0	4.1	5.8
																5.0	0.8	26.0			4.1	5.8	
																6.0	0.2	26.0			5.0	5.8	
Grooving		MGMN 150-G 200-G 250-G 300-G 400-G 500-G 600-G			●	●	●							1.5	0.15	16.0	1.2	3.5		C11 C12 C13 C15			
					●	○	●	●	●							2.0	0.2	16.0			1.6	3.5	
					●		●	●	●							2.5	0.2	18.5			2.0	3.85	
						○	○	○	●							3.0	0.4	21.0			2.35	4.8	
							○	●								4.0	0.4	21.0			3.3	4.8	
																5.0	0.8	26.0			4.1	5.8	
																6.0	0.8	26.0			5.0	5.8	
Grooving · Turning		MGMN 200-M 250-M 300-02-M 300-M 350-03-M 400-02-M 400-M 500-04-M 500-M 600-M 800-M			●	●	●	●	●					2.0	0.2	16.0	1.2	3.5		C12 C13 C15 C16			
					●	○	●	●	●							2.5	0.2	18.5			2.0	3.85	
					●	●	●	●	●							3.0	0.2	21.0			2.35	4.8	
					●	●	●	●	●							3.0	0.4	21.0			2.35	4.8	
							●	●	●							3.5	0.3	21.0			2.9	4.8	
							●	●	●							4.0	0.2	21.0			3.3	4.8	
							●	●	●	○	●					4.0	0.4	21.0			3.3	4.8	
							●	●	●							5.0	0.4	26.0			4.1	5.8	
							●	●	○		●					5.0	0.8	26.0			4.1	5.8	
							●	●			●					6.0	0.8	26.0			5.0	5.8	
				●		○		●					8.0	0.8	31.0	6.0	6.5						

Available Inserts



Application	Picture	Designation	Coated										Cermet		Dimensions (mm)						Configuration	Page						
			MU3020	MU3030	MU3120	MU8110	MU9030	MU3525	MU5300	MU6510	MU230	MU5330	MU3225	MU3215	b	r	l	d	t	α°								
Grooving		MGMN 300-02-L	●														3.0	0.2	21	2.35	4.8			C11 C12 C16				
		400-02-L	●															4.0	0.2	21	3.3	4.8						
		500-04-L	●																5.0	0.4	26	4.1			5.8			
Grooving Parting off		MGMN 300-02-R	●															3.0	0.2	21	2.35	4.8			C11 C12 C16			
		400-02-R	●																4.0	0.2	21	3.3	4.8					
		500-04-R	●																	5.0	0.4	26	4.1			5.8		
Grooving Turning		MGMN 300-T	●															3.0	0.4	21	2.35	4.8			C11 C16			
		400-T	●																4.0	0.4	21	3.3	4.8					
		500-T	●																	5.0	0.8	26	4.1			5.8		
Grooving		MGMN 300-02-A																3.0	0.2	21	2.35	4.8			C11 C12 C13 C15			
		300-04-A																	3.0	0.4	21	2.35	4.8					
		300-08-A																		3.0	0.8	21	2.35			4.8		
Parting off		MGMR/L 300-6D-PS		●														3	0.2	21	2.35	4.8	6		C11			
		300-8D-PS		●															3	0.2	21	2.35	4.8			8		
		300-15D-PS		●																3	0.2	21	2.35			4.8	15	
		400-4D-PS		●																4	0.3	21	3.3			4.8	4	
		500-4D-PS		●																	5	0.3	26			4.1	5.8	4
Parting off		MGMR/L 200-6D-PT		●														2	0.2	16	1.6	3.6	6		C11			
		300-6D-PT		●								●							3	0.2	21	2.35	4.8			6		
		300-8D-PT		●								●								3	0.2	21	2.35			4.8	8	
		300-15D-PT		●								●								3	0.2	21	2.35			4.8	15	
		400-4D-PT		●								●									4	0.3	21			3.3	4.8	4
		500-4D-PT		●								●										5	0.3			26	4.1	5.8
Aluminum		MRGN 400-A																4.0	2.0	21.0	3.3	4.8			C11 C12 C13 C14 C15 C19			
		500-A																	5.0	2.5	26.0	4.1	5.8					
		600-A																		6.0	3.0	26.0	5.0			5.8		
		800-A																		8.0	4.0	31.0	6.0			6.5		
Relieving Profiling		MRMN 200-M	●	●														2.0	1.0	16.0	1.50	3.5			C11 C12 C13 C14 C15			
		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		Uncoated		Dimensions						Configuration	Page														
			MU150	MU3215	b	r	l	d	t	α°																		
For Aluminum Wheel		MVGN 8N-A-R1.2				●												1.2	30.0	6.0	6.9			C20				
		8N-A-R1.6				●													1.6	30.0	6.0	6.9						
For Aluminum Wheel		MRGN 6N-A																	6.0	3.0	26.0	5.0	5.9		C19 C20			
		6N-AM																		6.0	3.0	26.0	5.0			5.9		
		6N-AP																		6.0	3.0	26.0	5.0			5.9		
		6N-A5																		6.0	3.0	26.0	5.0			5.9		
		8N-A																		8.0	4.0	30.0	6.0			6.5		
		8N-AM																		8.0	4.0	30.0	6.0			6.5		
		8N-AP																		8.0	4.0	30.0	6.0			6.5		
		8N-A5																		8.0	4.0	30.0	6.0			6.5		

● : Stock item ○ : Under preparing for stock

Designation	Configuration
<p>MFGN 4 - 0.5R - 30D</p> <p>① ② ③ ④ ⑤ ⑥ ⑦</p> <p>① Multi ② Forming ③ Grinding ④ Feed Direction ⑤ Clamp part : 4mm ⑥ Nose Radius : 0.5 ⑦ Degree : 30°</p>	<p>Ex) MFGN4-0.5R-30D</p>
<p>MFGN4 - 0.5R - L 50 D - R 30D</p> <p>① ② ③ ④ ⑤ ⑥</p> <p>① Refer to No. 1 ② Nose Radius : 0.5 ③ Left ④ Degree : 50° ⑤ Right ⑥ Degree>30°</p>	<p>Ex) MFGN4-0.5R-L50D-R30D</p>
<p>MFGN4 - 2.0 - R 020 250 - L 105 335</p> <p>① ② ③ ④ ⑤ ⑥ ⑦ ⑧</p> <p>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°</p>	<p>Ex) MFGN4-2.0-R020250-L105335</p>
<p>MFGN5 - 4.0R F</p> <p>① ② ③</p> <p>① Refer to No. 1 ② Radius : 4.0 ③ Front(Concave)</p>	<p>Ex) MFGN5-4.0RF</p>
<p>MFGN5 - 4.0R B</p> <p>① ② ③</p> <p>① Refer to No. 1 ② Radius : 4.0 ③ Back(Concave)</p>	<p>Ex) MFGN5-4.0RB</p>
<p>MFGN5 - 4.0 - R 005 - L 030</p> <p>① ② ③ ④ ⑤ ⑥</p> <p>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</p>	<p>Ex) MFGN5-4.0-R005-L030</p>
<p>MFGN5 - 4.0 - 0.05 R</p> <p>① ② ③</p> <p>① Refer to No. 1 ② Width of cutting edge: 4.0mm ③ Nose Radius: 0.05</p>	<p>Ex) MFGN5-4.0-0.05R</p>
<p>MFG R 5 - 4.0 - 5D - R 002 - L 115</p> <p>① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨</p> <p>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</p>	<p>Ex) MFGR5-4.0-5D-R002-L115</p>
<p>MFG L 5 - 4.0 - 15D - 1.5R</p> <p>① ② ③ ④ ⑤ ⑥</p> <p>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</p>	<p>Ex) MFG L 5-4.0-15D-1.5R</p>
<p>MFG R 5 - 4.10 - 25D - R012 - L000</p> <p>① ② ③ ④ ⑤ ⑥ ⑦</p> <p>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: 1.2⑦ Left Nose Radius :0.0</p>	<p>Ex) MFG R 5-4.10-25D-R012-L000</p>

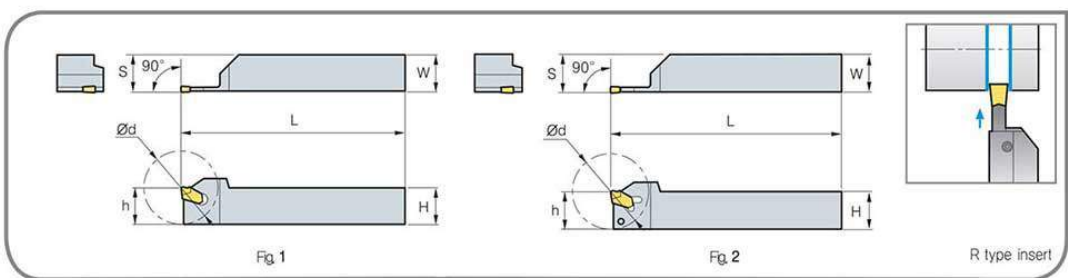


(mm)



Designation	Stock	H	W	L	h	Inserts	Wrench		Fig.
									
SPB 226	●	26	1.6	110	21	SP200, 200R/L	SW50L	-	1
326	●	26	2.4	110	21	SP300, 300R/L			
426	●	26	3.2	110	21	SP400, 400R/L			
526	●	26	4.0	110	21	SP500, 500R/L			
626	●	26	5.2	110	21	SP600, 600R/L			
232	●	32	1.6	150	25	SP200, 200R/L			
332	●	32	2.4	150	25	SP300, 300R/L			
432	●	32	3.2	150	25	SP400, 400R/L			
532	●	32	4.0	150	25	SP500, 500R/L			
632	●	32	5.2	150	25	SP600, 600R/L			
SPB 226-S	●	26	1.6	110	21	SP200, 200R/L	-	SW15S	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 C25

● : Stock item ○ : Under preparing for stock

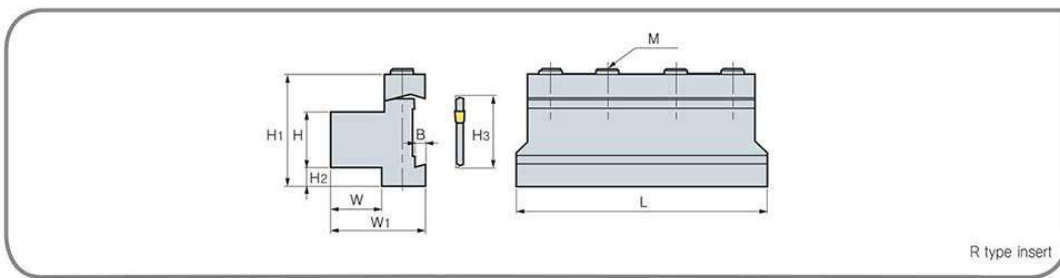
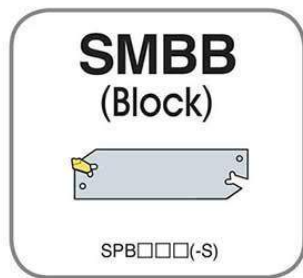


(mm)

Designation	Stock		H=(h)	W	L	Ød	S	Inserts	Wrench		Fig.
	R	L									
SPH 316R/L			16	16	100	32	16.3	SP300, 300R/L	SW50L	-	1
320R/L	●	●	20	20	120	40	20.3	SP300, 300R/L			
420R/L	●		20	20	120	50	20.4	SP400, 400R/L			
520R/L	●		20	20	120	60	20.5	SP500, 500R/L			
325R/L	●		25	25	150	50	25.3	SP300, 300R/L			
425R/L	●	●	25	25	150	60	25.4	SP400, 400R/L			
525R/L	●		25	25	150	70	25.5	SP500, 500R/L			
SPH 316R/L-S	●		16	16	100	32	16.3	SP300, 300R/L	-	SW15S	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 B16~B18

● : Stock item ○ : Under preparing for stock



Designation	Stock	H	W	H ₃	L	H ₁	H ₂	W ₁	B	M	Blades	Wrench
SMBB 1626		16	12	26	86	43	13	30	5.3	3-M6	SPB□□□(-S)	HW50L
2026	●	20	19	26	86	43	9	38	5.3	3-M6		
2032	●	20	19	32	100	50	13	38	5.3	4-M6		
2526	●	25	23	26	86	43	4	42	5.3	4-M6		
2532	●	25	23	32	110	50	8	42	5.3	4-M6		
3232	●	32	30	32	110	54	5	48	5.3	4-M6		

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Coated										W	l	r	Configuration				
			MU3120	MU3030	MUM325	MU5330	MU3500	MU500H	MU8110	MU5300	MU9030	MU6510					MU3025			
00 00 00		SP 200	●	●	●	●					●	●	●			2.2	9.3	0.2	R type 무기호 L type W = ±0.1	
		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
		500R												●			5.1	11.4		0.3
		500L													●		5.1	11.4		0.3
600		●		●								●		●	6.4	11.4	0.35			
600R													●		6.4	11.4	0.35			
600L														●	6.4	11.4	0.35			

● : Stock item ○ : Under preparing for stock

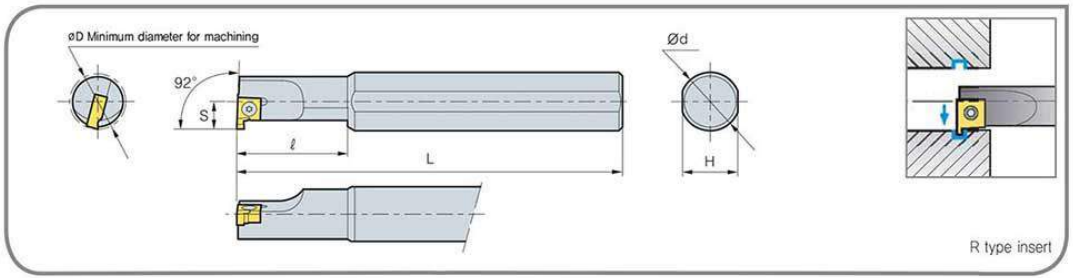
● Features of multi parting tools

- ▶ 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					PVD					Uncoated	Cutting width (mm)				
	NC3120	NC3030	NCM325	NC5330	NC500H	PC230	PC8110	PC5300	PC3500	PC6510		ST30A	2	3	4	5
SM C	80~180			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				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			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

GROOVING TOOLS



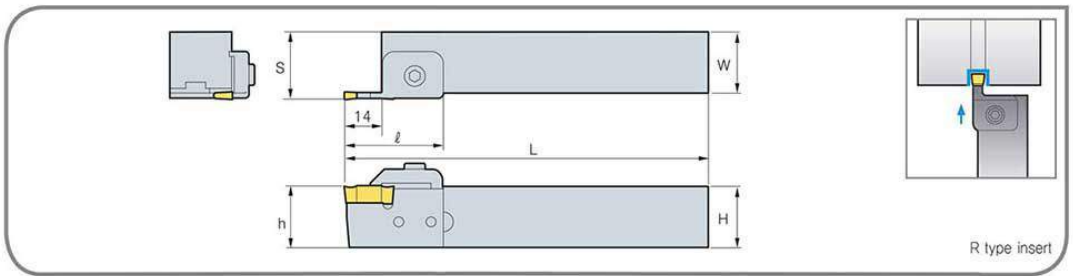
Designation	Stock		øD	ød	H	L	ℓ	S	Inserts	Screw	Wrench
	R	L									
IGH	214R/L	●	14	16	15	150	25	6.6	IG125~280	FTKA02565	TW07P
	216R/L	●	16	16	15	150	30	7.6			
	220R/L	●	20	20	18	200	40	9.6			

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Coated		Uncoated			b	g	t	d	d ₁	Configuration		
			MU3010	MU3120	MU3225	MU3215	MU3025								
Internal grooving		IG	125					●	1.25	1.5	3.18	6.35	2.8		
		145						●	1.45	1.5	3.18	6.35	2.8		
		175							●	1.75	1.5	3.18	6.35		2.8
		200							●	2.0	2.3	3.18	6.35		2.8
		230							●	2.3	2.3	3.18	6.35		2.8
		280							●	2.8	2.3	3.18	6.35		2.8

● : Stock item ○ : Under preparing for stock



Designation	Stock		H=(h)	W	L	ℓ	S		Inserts		Clamp	ClampScrew	Screw	Locator	Wrench	
	R	L					*	**	*	**						
DBH	320R/L	●	20	20	150	40	22.3	22.8	DB300	DB400	CGH5R1	MHA0512	MHB0410	LD34	HW30L HW40L	
	325R/L	●	25	25	150	40	27.3	27.8	DC300	DC400						
	520R/L	●	20	20	150	40	23.8	24.3	DB500	DB600	CGH5R2	MHA0512	MHB0410	LD56	HW30L HW40L	
	525R/L	●	25	25	150	40	28.8	29.3	DC500							
	720R/L			20	20	150	40	25.8	26.3		DB700	CGH5R3	MHA0512	MHB0410	LD78	HW30L HW40L
	725R/L			25	25	150	40	30.8	31.3							

* Inserts : Inserts Change 'S' following *, **

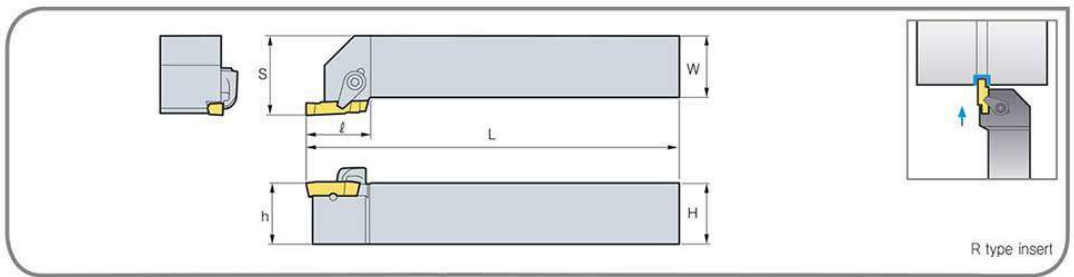
● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Coated		Cermet	Uncoated		b	l	t	r	Configuration
			MU3010	MU3120	MD2020	MU3225	MU3215					
DB		300			●			3.0	20	7.5	0.2	
		400			●			4.0	20	7.5	0.2	
		500			●			5.0	20	7.5	0.2	
		600			●			6.0	20	7.5	0.2	
		700						7.0	20	7.5	0.2	
		800						8.0	20	7.5	0.2	
DC		300			●			3.0	20	7.5	0.2	
		400			●			4.0	20	7.5	0.25	
		500						5.0	20	7.5	0.3	

● : Stock item ○ : Under preparing for stock

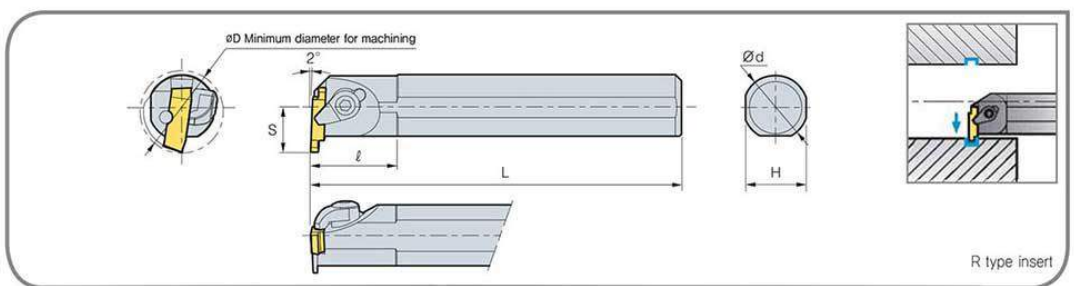
GROOVING TOOLS



Designation	Stock		H=(h)	W	L	ℓ	S	Inserts	Clamp	Screw	Pin	Wrench
	R	L										
GFT	320R/L	●	20	20	125	23.5	25	GW110~300R/L,BF3	CS5R1	DHA0514	PN0310	HW25L
	325R/L	● ●	25	25	150	23.5	32					
	525R/L	●	25	25	150	25.5	32					
	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



Designation	Stock		øD	ød	H	L	ℓ	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
	R	L												
GFIP	316R/L	● ●	20	16	15	150	17	11	GW110~300R/L,BF3	CH5R2	CR04	CHX0513	PN0310	HW25L
	320R/L	●	26	20	18	150	22	13						
	325R/L	●	32	25	23	200	22	17						
	340R/L	●	50	40	37	300	32	27						
	525R/L	●	32	25	23	200	22	17						
	540R/L	●	50	40	37	300	32	27						
	840R/L	●	50	40	37	300	32	27						
								GW600~800R/L,BF8	CS8R1	-	DHA0820	PN0314	HW40L	

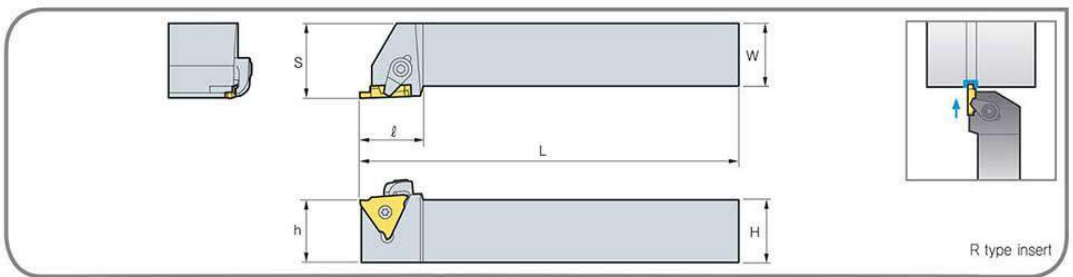
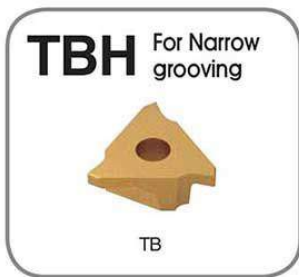
• Use right-hand insert for left-hand holder

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Uncoated		b	g	W	l	t	r	Configuration
			R	L							
Bore		BF -3	●				3.1	16.4	5.26	-	
		BF -5	●				5.1	22.4	6.26	-	
		BF -8	●				8.1	27.4	7.26	-	
Flange		GW 110R/L	●	●	1.1	2.1	3.1	16	5.0	0.2	
		GW 130R/L	●	●	1.3	2.3	3.1	16	5.0	0.2	
		GW 160R/L	●	●	1.6	2.6	3.1	16	5.0	0.2	
		GW 185R/L	●	●	1.85	2.9	3.1	16	5.0	0.2	
		GW 215R/L	●	●	2.15	3.2	3.1	16	5.0	0.2	
		GW 265R/L	●	●	2.65	3.7	3.1	16	5.0	0.2	
		GW 300R/L	●	●	3.0	4.0	3.1	16	5.0	0.2	
		GW 315R/L	●	●	3.15	4.2	5.1	22	6.0	0.3	
		GW 415R/L	●	●	4.15	5.2	5.1	22	6.0	0.3	
		GW 500R/L	●	●	5.0	6.0	5.1	22	6.0	0.3	
		GW 600R/L	●	○	6.0	7.0	8.1	27	7.0	0.3	
GW 800R/L	●	○	8.0	9.0	8.1	27	7.0	0.3			


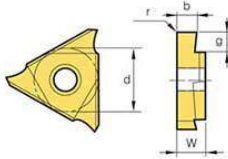

● : Stock item ○ : Under preparing for stock



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

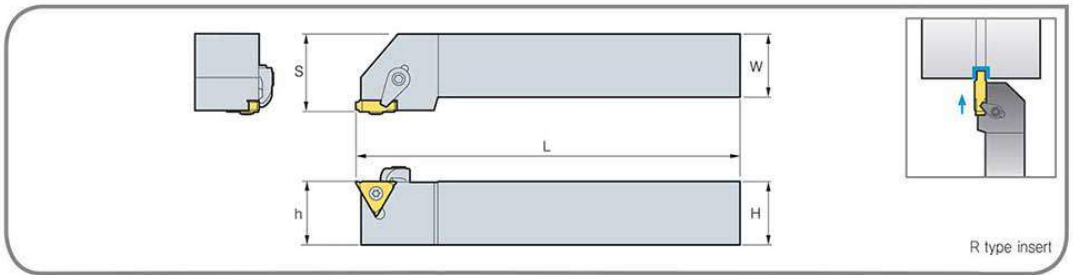
● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Coated			Cermet		b	g	W	r	d	Configuration	
			MU3010	MU3120	MU8110	MU5300	MD2000							MD2020
Narrow grooving		TB											 <p>Feature of TB-M</p> <ul style="list-style-type: none"> • Suitable for automated line with Chip breaker • Superior surface 	
		3125R/L						1.25	1.5	4.76	0.2	9.525		
		3145R/L							1.45	1.5	4.76	0.2		9.525
		3175R/L							1.75	2.5	4.76	0.2		9.525
		3185R/L							1.85	2.5	4.76	0.2		9.525
		3200R/L							2.00	2.5	4.76	0.2		9.525
		3230R/L						●	2.30	3.5	4.76	0.3		9.525
		3280R/L							2.80	3.5	4.76	0.3		9.525
		3330R/L							3.30	3.5	4.76	0.3		9.525
		3430R/L							4.30	3.5	4.76	0.4		9.525
		4125R/L						●	1.25	2.0	4.76	0.2		12.7
		4145R/L						●	1.45	2.0	4.76	0.2		12.7
		4150R/L						●	1.50	3.5	4.76	0.2		12.7
		4175R/L						●	1.75	3.5	4.76	0.2		12.7
		4185R/L						●	1.85	3.5	4.76	0.2		12.7
		4200R/L						●	2.00	3.5	4.76	0.2		12.7
		4215R/L						●	2.15	3.5	4.76	0.2		12.7
	4230R/L						●	2.30	3.5	4.76	0.2	12.7		
	4250R/L						●	2.50	4.0	4.76	0.3	12.7		
	4265R/L						●	2.65	4.0	4.76	0.3	12.7		
	4280R/L						●	2.80	4.0	4.76	0.3	12.7		
	4300R/L						●	3.00	4.0	4.76	0.3	12.7		
	4330R/L						●	3.30	4.0	4.76	0.3	12.7		
	4350R/L						●	3.50	5.0	4.76	0.3	12.7		
	4400R/L						●	4.00	5.0	4.76	0.4	12.7		
	4430R/L						●	4.30	5.0	4.76	0.4	12.7		
	4450R/L						●	4.50	5.0	4.76	0.4	12.7		
			4200R-M						2.00	3.5	4.76	0.2	12.7	
4215R-M								2.15	3.5	4.76	0.2	12.7		
4230R-M								2.30	3.5	4.76	0.2	12.7		
4250R-M								2.50	4.0	4.76	0.3	12.7		
4265R-M								2.65	4.0	4.76	0.3	12.7		
4280R-M								2.80	4.0	4.76	0.3	12.7		
4300R-M				●	●			3.00	4.0	4.76	0.3	12.7		
4330R-M				○	●			3.30	4.0	4.76	0.3	12.7		
4350R-M				○	●			3.50	5.0	4.76	0.3	12.7		

● : Stock item ○ : Under preparing for stock


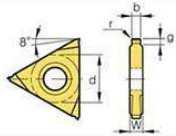

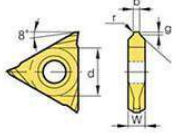
GROOVING TOOLS



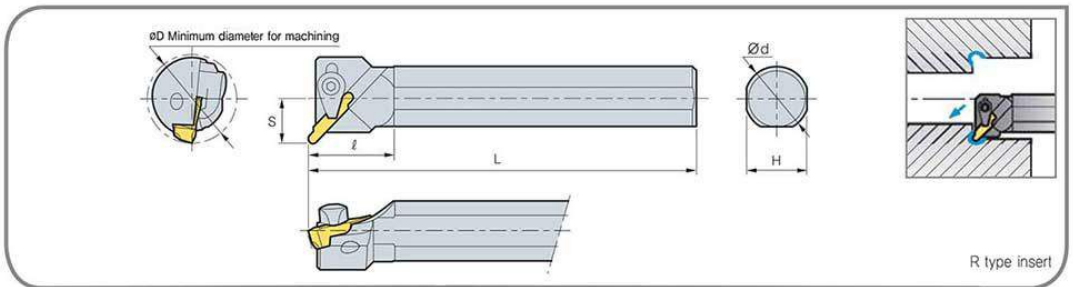
Designation	Stock		H=(h)	W	L	S	Inserts	Clamp	ClampScrew	Screw	Wrench
	R	L									
GH	2020R/L-3	●	20	20	125	22	GS 125~280	CS6R1	DHA0617	PTMA03508	TW09P-HW30L
	2525R/L-3	●	25	25	150	27	GO 250				
	2020R/L-4	●	20	20	125	21	GS 330 / 430				
	2525R/L-4	●	25	25	150	26	GO 320 / 410				

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Coated		Uncoated		b	g	W	r	d	Configuration	
			MU3010	MU3120	MU3225	MU2020							MU3025
Grooving(Narrow · O-ring · Snap-ring)		GO 250			●		2.5	1.5	3.3	0.35	9.525		
		GO 320			●		3.2	2.0	3.8	0.35	9.525		
		GO 410			●		4.1	2.5	4.5	0.65	9.525		
		GS 125				●		1.23	1.5	2.5	0.2	9.525	
		GS 145				●		1.43	1.5	2.5	0.2	9.525	
		GS 175				●		1.73	2.0	2.5	0.2	9.525	
		GS 185				●		1.83	2.0	2.5	0.2	9.525	
		GS 200				●		2.03	2.5	2.5	0.2	9.525	
		GS 230				●		2.28	3.5	2.8	0.2	9.525	
		GS 280				●		2.78	3.5	3.3	0.3	9.525	
GS 330				●		3.28	4.0	3.8	0.3	9.525			
GS 430				●		4.28	4.0	4.5	0.4	9.525			

● : Stock item ○ : Under preparing for stock


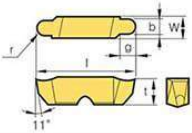


Designation	Stock		øD	ød	H	L	l	S	Inserts	Clamp	C-ring	Screw	Pin	Wrench
	R	L												
GFIK	316R/L		22	16	15	150	21.5	11	GR3□□	CH5R2	CR04	CHX0513	PN0310	HW25L
	325R/L		32	25	23	200	21.5	17		CH5R2	CR04	CHX0513	PN0310	HW25L
	340R/L		50	40	37	300	35.4	27		CS5R1	-	DHA0514	PN0310	HW25L
	525R/L		32	25	23	200	27.5	17	GR5□□	CS6R1	-	DHA0617	PN0314	HW30L
	540R/L		50	40	37	300	39.5	27		CS8R1	-	DHA0820	PN0314	HW40L
	840R/L		50	40	37	300	41.8	27		CS8R1	-	DHA0820	PN0314	HW40L

• Use same hand of tools

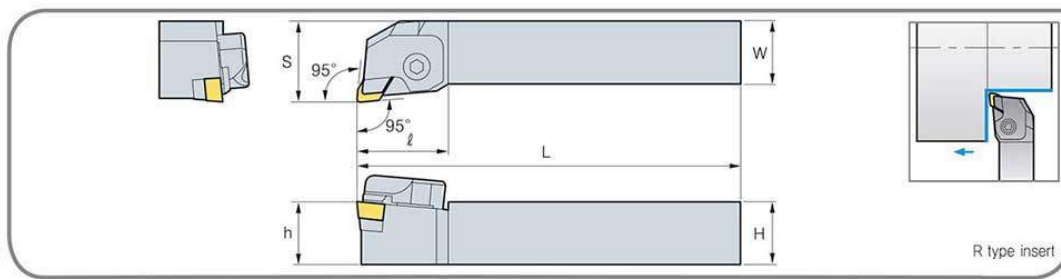
● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Coated		Uncoated		b	g	W	l	t	r	Configuration
			MU3010	MU3120	MU3225	MU2020							
Relief		GR 310R					2.0	2.0	3.1	15.9	5.0	1.0	
		GR 315R					3.0	2.9	3.1	15.9	5.0	1.5	
		GR 520R					4.0	4.0	5.1	21.9	6.0	2.0	
		GR 525R					5.0	5.0	5.1	21.8	6.0	2.5	
		GR 830R					6.0	6.0	8.1	26.8	7.0	3.0	
		GR 840R					8.0	8.0	8.1	26.7	7.0	4.0	

● : Stock item ○ : Under preparing for stock

PARTING OFF TOOLS



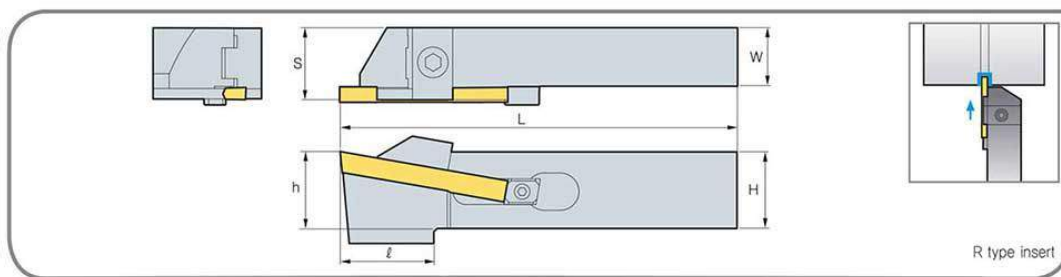
Designation		Stock	H(h)	W	L	ℓ	S	Inserts	Clamp	Clamp Screw	Chip Breaker	Shim	Shim Screw	Wrench
EH	620R	●	20	20	125	36	27	ESB 34	CTH 6R2	BHA0616	CB20	SES33C	SHX0310	HW50L HW20L
	625R	●	25	25	150	36	32							

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Uncoated		W	l	t	Configuration	
			MU1010	MU2020					
削り出し 加工		ESB 34		●	9.525	30.0	6.35		

● : Stock item ○ : Under preparing for stock



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

● : Stock item ○ : Under preparing for stock

Available Inserts

Application	Picture	Designation	Uncoated		W	l	t	Configuration
			MU1010	MU2020				
削り出し 加工		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

New Fine Tools

New Fine Tool code system

NFTIH **08** **3** **12** – **S**

minimum Diameter Overhang (ℓ/∅D) Shank Diameter Shank Type
 S : Steel, C : Carbide

Application range

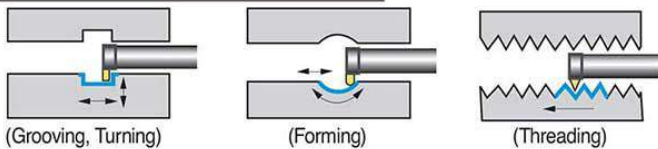
▶ Internal grooving, Profiling, Threading and Boring at ∅8mm~∅16mm

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























Recommended cutting condition

Workpiece	Grade	Cutting Condition				
		Minimum diameter for machining (∅Dmin)				
			∅8	∅11	∅14	∅16
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

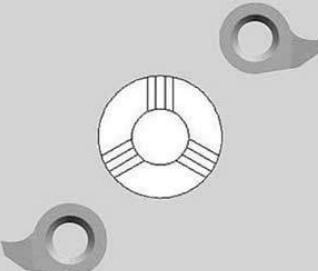
Note

- 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

Screw	Insert	Holder								
	<table border="1"> <thead> <tr> <th>R Type</th> <th>L Type</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	R Type	L Type							 Shank (Cemented carbide or Steel) Overhang (3D, 4D, 5D)
R Type	L Type									
										
										
										

• Available R/L type insert with one holder




Stable clamping according to the tripod structure



No-Spin-System design for strong clamping

NFTIH

NFTF
NFTT
NFTG

• For NFTIH14~.

R type insert

Designation	Stock	øD	ød	L	ℓ	T-MAX	H	S	Inserts	Screw	Wrench
									NFTG : Grooving NFTT : Threading NFTF : Forming		
NFTIH 08206C	●	8	6	65	-	1.0	4	4.8	NFTG08□□□R/L NFTT08□□□R/L NFTF08□□□R/L	PTKA02508	TW08P
08212C	●	8	12	70	16	1.0	10	4.8			
08312C	●	8	12	80	24	1.0	10	4.8			
08312S	●	8	12	80	24	1.0	10	4.8			
08412C	●	8	12	90	32	1.0	10	4.8			
08512C	●	8	12	100	40	1.0	10	4.8			
11208C	●	11	8	80	-	2.3	7	6.7	NFTG11□□□R/L NFTT11□□□R/L NFTF11□□□R/L	PTKA03510	TW15P
11212C	●	11	12	75	22	2.3	11	6.7			
11312C	●	11	12	95	33	2.3	11	6.7			
11312S	●	11	12	95	33	2.3	11	6.7			
11412C	●	11	12	110	44	2.3	11	6.7			
11512C	●	11	12	120	55	2.3	11	6.7			
14012C	●	14	12	75	20	4.0	11	9.0	NFTG14□□□R/L NFTT14□□□R/L NFTF14□□□R/L	PTKA0412	TW15P
14016C	●	14	16	75	20	4.0	15	9.0			
14112C	●	14	12	100	34	4.0	11	9.0			
14116C	●	14	16	100	34	4.0	15	9.0			
14212C	●	14	12	110	45	4.0	11	9.0			
14216C	●	14	16	110	45	4.0	15	9.0			
14312C	●	14	12	130	64	4.0	11	9.0	NFTG16□□□R/L NFTT16□□□R/L NFTF16□□□R/L	PTKA0512	TW20P
14312S	●	14	12	130	64	4.0	11	9.0			
14316C	●	14	16	130	64	4.0	15	9.0			
16312C	●	16	12	130	48	4.3	11	10.2			
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	NFTG16□□□R/L NFTT16□□□R/L NFTF16□□□R/L	PTKA0512	TW20P
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 B16~B18

● : Stock item ○ : Under preparing for stock


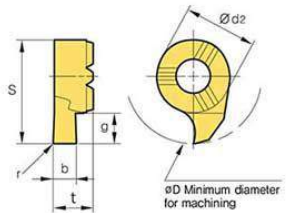

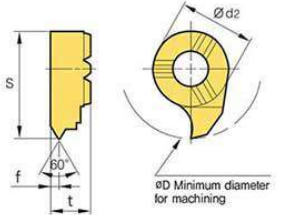
Available Inserts

Application	Picture	Designation	Coated		D	b	r	S	g	ød ₂	t	Configuration
			MU130	MU5300								
Profiling		NFTF 08082R/L	●	○	8	0.82	0.41	7.75	1.3	5.9	3.85	
		08122R/L	●	○		1.22	0.61		1.3			
		08182R/L	●	○		1.82	0.91		1.3			
		11082R/L	●	○	11	0.82	0.41	10.7	2.6	8	4.9	
		11122R/L	●	○		1.22	0.61		2.6			
		11182R/L	●	○		1.82	0.91		2.6			
		11202R/L	●	○	14	2.02	1.01	13.5	2.6	9	5.85	
		11302R/L	●	○		3.02	1.51		2.6			
		14122R/L	●	○		1.22	0.61		4.3			
		14182R/L	●	○	16	1.82	0.91	15.7	4.3	11	5.8	
		14202R/L	●	○		2.02	1.01		4.3			
		14222R/L	●	○		2.22	1.11		4.3			
		14302R/L	●	○	16	3.02	1.51	15.7	4.3	11	5.8	
		16182R/L	●	○		1.82	0.91		4.6			
		16222R/L	●	○		2.22	1.11		4.6			
		16302R/L	●	○	16	3.02	1.51	15.7	4.6	11	5.8	
16402R/L	●	○	4.02	2.01		4.6						

● : Stock item ○ : Under preparing for stock

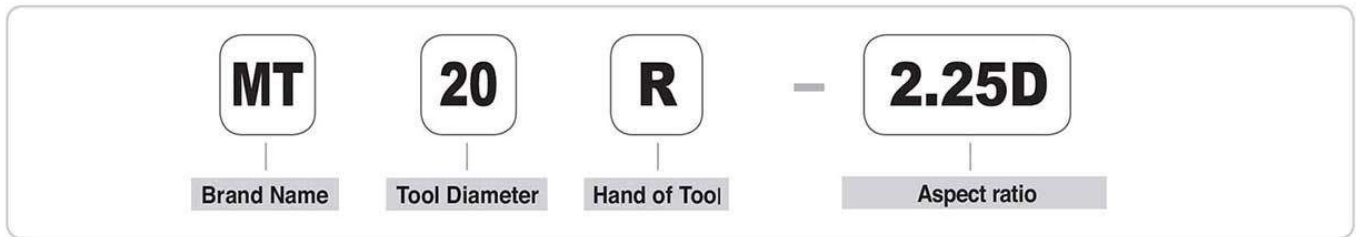
Available Inserts

(mm)

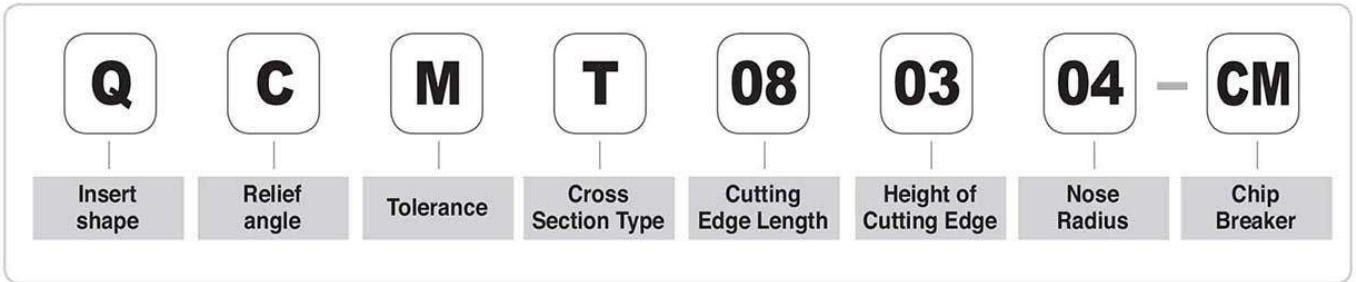
Application	Picture	Designation	Coated		øD	b	r	S	g	ød ₂	t	Pitch	f	Configuration						
			PC130	PC5300																
Grooving		NFTG	08075R/L	●	○	8	0.75	-	7.75	1.3	5.9	3.85	-	-						
			08085R/L	●	○		0.85			1.3			-	-						
			08095R/L	●	○		0.95			1.3			-	-						
			08121R/L	●	○		1.21			1.3			-	-						
			08141R/L	●	○		1.41			1.3			-	-						
			08152R/L	●	○		1.52			1.3			-	-						
			08171R/L	●	○		1.71			1.3			-	-						
			08202R/L	●	○	2.02	1.3	-	-											
			11075R/L	●	○	0.75	11	10.7	0.2	1.8	8.0	4.9	-	-						
			11085R/L	●	○	0.85				1.8			-	-						
			11095R/L	●	○	0.95				1.8			-	-						
			11121R/L	●	○	1.21				2.6			-	-						
			11141R/L	●	○	1.41				2.6			-	-						
			11152 R/L	●	○	1.52				2.6			-	-						
			11171R/L	●	○	1.71				2.6			-	-						
			11202R/L	●	○	2.02	2.6	-	-											
			11202R-02/L	●	○	2.02	14	13.5	-	2.6	9.0	5.85	-	-						
			11252R/L	●	○	2.52				2.6			-	-						
			11302R/L	●	○	3.02				2.6			-	-						
			14075R/L	●	○	0.75	16	15.7	-	1.8	11	5.8	-	-						
			14085R/L	●	○	0.85				1.8			-	-						
			14095R/L	●	○	0.95				1.8			-	-						
			14121R/L	●	○	1.21				4.3			-	-						
			14141R/L	●	○	1.41				4.3			-	-						
			14152R/L	●	○	1.52				4.3			-	-						
			14171R/L	●	○	1.71				4.3			-	-						
			14202R/L	●	○	2.02				4.3			-	-						
			14252R/L	●	○	2.52				4.3			-	-						
			14302R/L	●	○	3.02				4.3			-	-						
			16075R/L	●	○	0.75				16			-	-		1.8	-	-	-	-
			16085R/L	●	○	0.85										1.8			-	-
			16095R/L	●	○	0.95										1.8			-	-
			16121R/L	●	○	1.21										4.6			-	-
			16141R/L	●	○	1.41	4.6	-	-											
			16171R/L	●	○	1.71	4.6	-	-											
			16202R/L	●	○	2.02	4.6	-	-											
16252R/L	●	○	2.52	4.6	-	-														
16302R/L	●	○	3.02	4.6	-	-														
16352R/L	●	○	3.52	4.6	-	-														
16402R/L	●	○	4.02	4.6	-	-														
Threading		NFTT	0805MR/L	●	○	8	-	7.75	-	6	3.85	0.5	1.0							
			0810MR/L	●	○		-		-			-	1.0		1.0					
			0815MR/L	●	○		-		-			-	1.5		1.2					
			1110MR/L	●	○	11	-	10.7	-	8	4.9	1.0	1.2							
			1115MR/L	●	○		-		-			1.5	1.2							
			1120MR/L	●	○		-		-			2.0	1.2							
			1125MR/L	●	○	-	-	-	2.5	1.2										
			1410MR/L	●	○	14	-	13.5	-	9	5.85	1.0	1.2							
			1415MR/L	●	○		-		-			1.5	1.2							
			1420MR/L	●	○		-		-			2.0	1.2							
			1425MR/L	●	○	-	-	-	2.5	1.2										
			1610MR/L	●	○	16	-	15.7	-	11	5.8	1.0	1.2							
			1615MR/L	●	○		-		-			1.5	1.2							
			1620MR/L	●	○		-		-			2.0	1.2							
			1625MR/L	●	○		-		-			2.5	1.2							
			1630MR/L	●	○		-		-			3.0	1.5							
			1635MR/L	●	○		-		-			3.5	1.6							
			1640MR/L	●	○		-		-			4.0	1.8							

● : Stock item ○ : Under preparing for stock

Holder code system

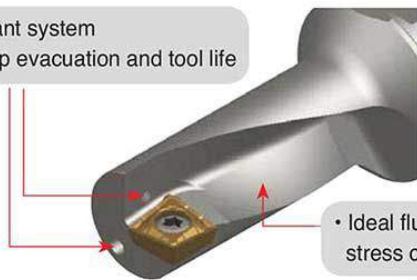


Insert code system



Tool design by FEM analysis

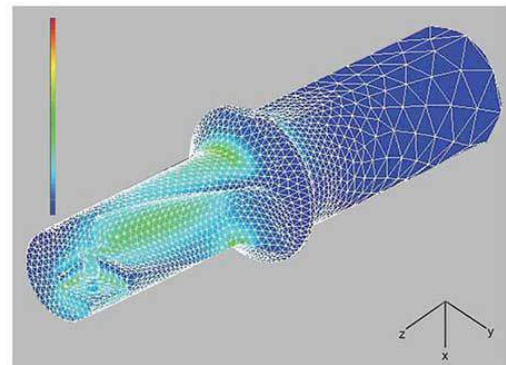
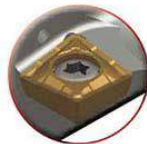
- Double coolant system
- Excellent chip evacuation and tool life



• Ideal flute design minimizing stress concentrations

Clamping tip

Correct : High cutting edge position
Wrong : Low cutting edge position



Minimized stress during cutting, prevented damage from vibration and longer tool life

Optimized design

Creative stepping cutting edge

Drilling edge (Drilling)

Turning edge (Internal, external and face turning)

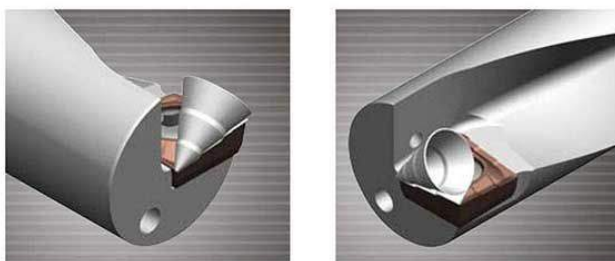
L1

L2

Multi-Turn

Competitor A

Special chip formed by edge geometry
Better chip evacuation due to small radius width of chip curl



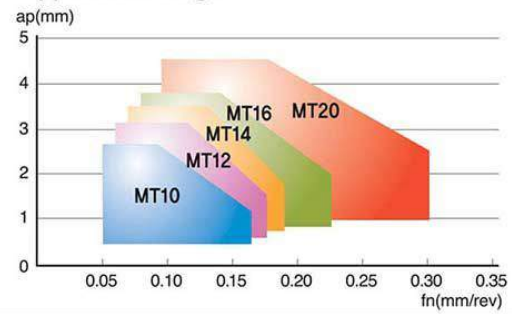
Comparison	Multi turn	Competitor A	Competitor B
f_n 0.08 (mm/rev)			
f_n 0.10 (mm/rev)			
Chip width (rate)	80%	100%	120%

User's guide

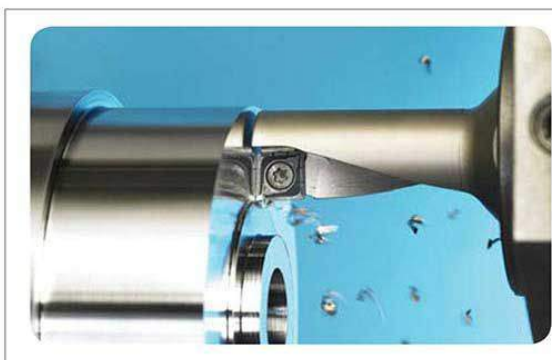
External/Internal turning



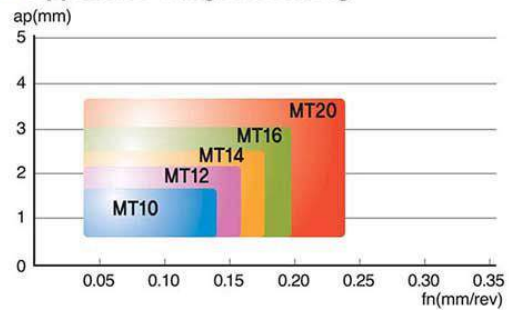
Application range



Facing



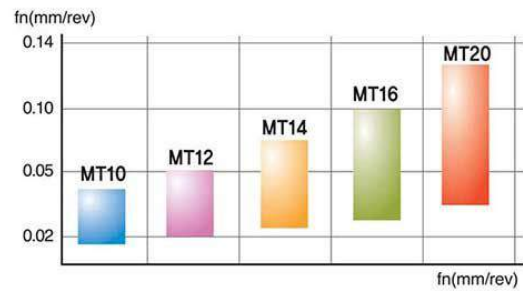
Application ranges of facing



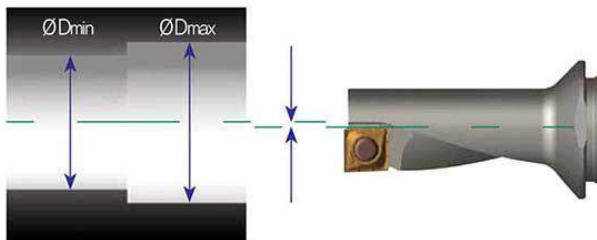
Drilling



Drilling feed range by designation



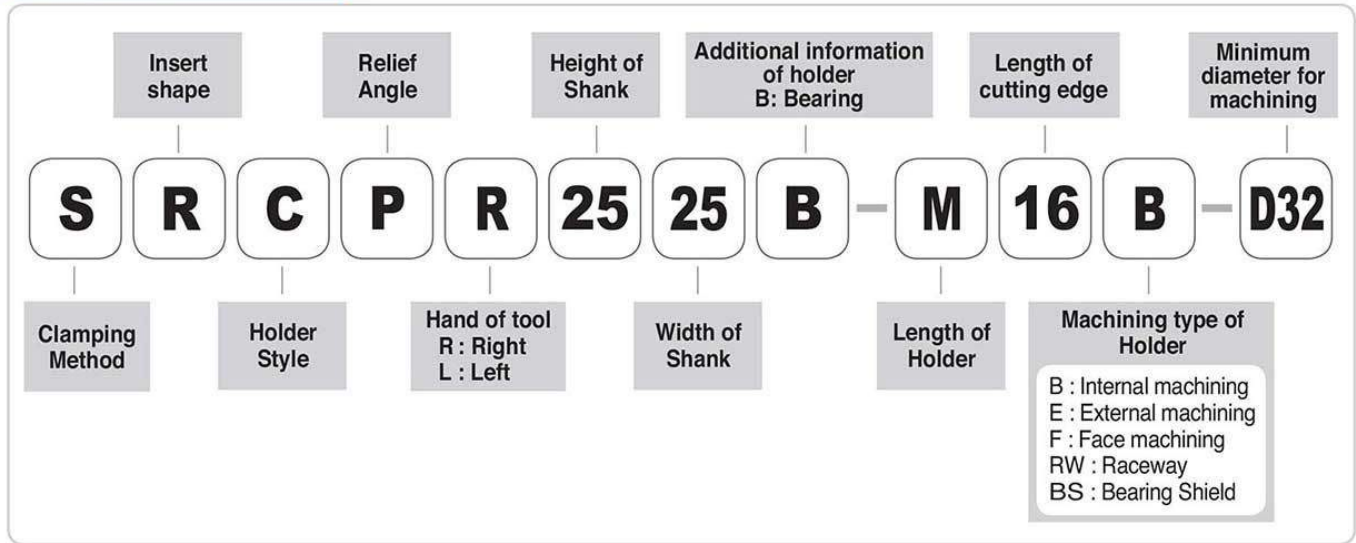
Offset (Diameter compensation)



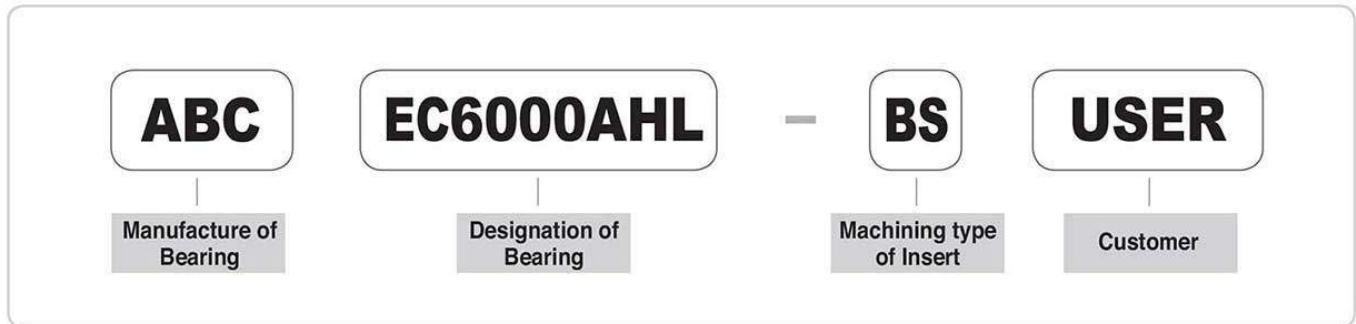
Drill diameter is adjustable by the offset compensation

Disignation	Diameter	ØDmin(mm)	ØDmax(mm)
MT10R/L-2.25D	10	9.85	10.35
MT12R/L-2.25D	12	11.85	12.35
MT14R/L-2.25D	14	13.85	14.35
MT16R/L-2.25D	16	15.85	16.35
MT20R/L-2.25D	20	19.85	20.35

Holder code system



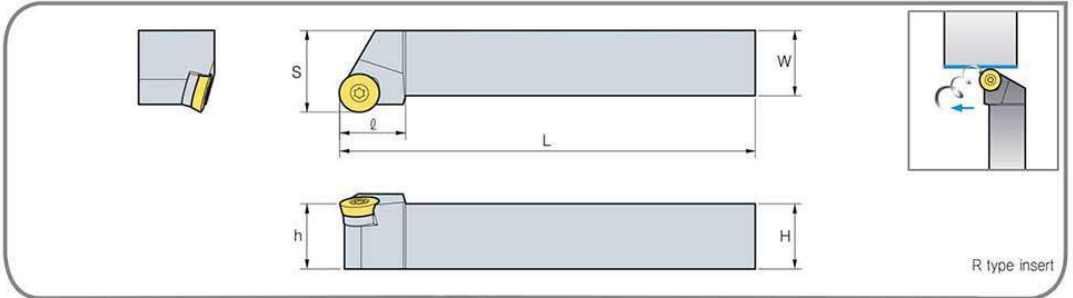
Insert code system for race way and bearing shield machining



SRGP...E Type



RPGT1203M0
RPGT1604M0
RPGT2004M0



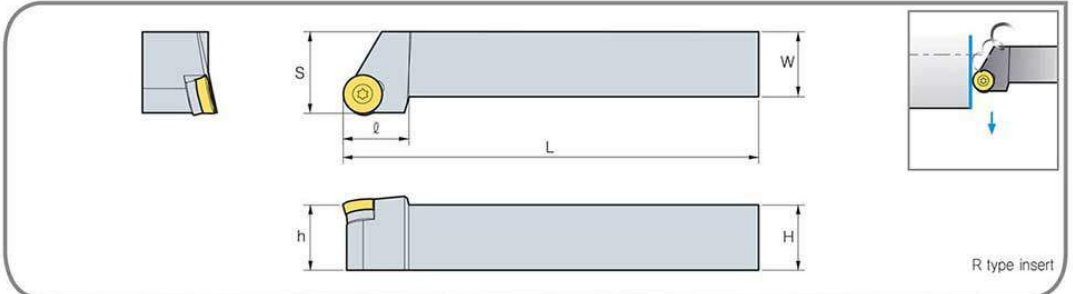
Designation	Stock		H	W	L	S	h	ℓ	Inserts	Screw	Shim	Shim Screw	Wrench
	R	L											
SRGPR/L 2020B-L12E			20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
			20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
			25	25	140	32	25	30	RPGT2004M0		SR20T3S		

● : Stock item ○ : Under preparing for stock

SRGP...F Type



RPGT1203M0
RPGT1604M0
RPGT2004M0



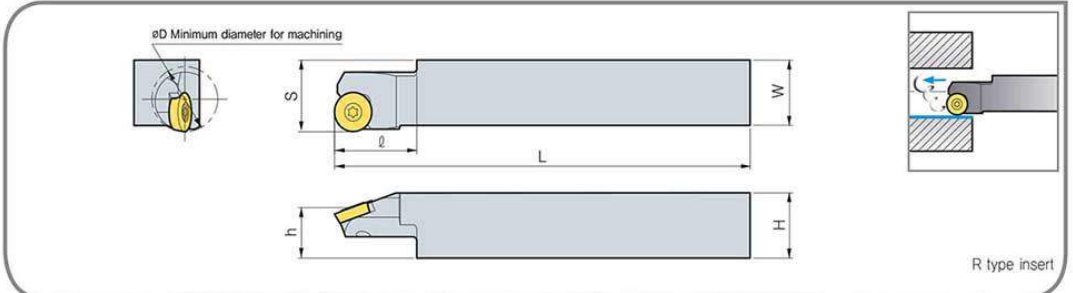
Designation	Stock		H	W	L	S	h	ℓ	Inserts	Screw	Shim	Shim Screw	Wrench
	R	L											
SRGPR/L 2020B-L12F			20	20	140	25	20	20	RPGT1203M0	FTKA0410	SR1203S	SHXN0609F	TW15P
			20	20	140	25	20	20	RPGT1604M0	FTNA0513	SR16T3S	SHXN0712F	TW20P
			25	25	140	32	25	30	RPGT2004M0		SR20T3S		

● : Stock item ○ : Under preparing for stock

SRCP...B Type



RPGT0802M0
RPGT1203M0
RPGT1604M0



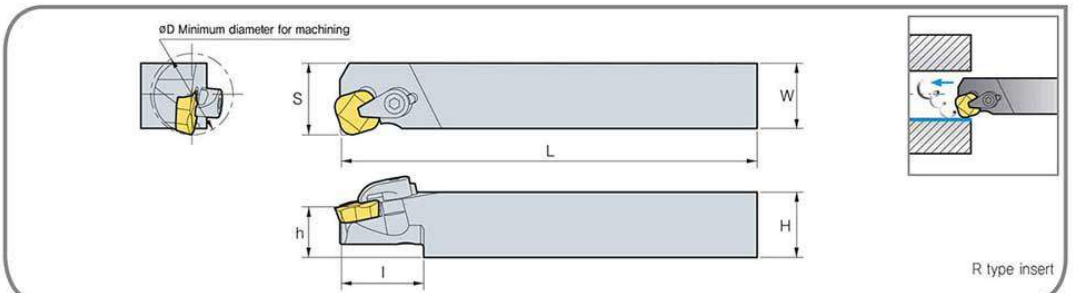
Designation	Stock		øD	H	W	L	S	h	ℓ	Inserts	Screw	Wrench
	R	L										
SRCPR/L 2020B-L08B-D12			12	20	20	140	21.5	15.5	25	RPGT0802M0	FTKA0305	TW09P
			15	19	19	140	21	16	25	RPGT1203M0	FTNA0407	TW15P
			20	20	20	140	22	15.5	25	RPGT1604M0		
			32	25	25	140	27	20	30	RPGT1604M0		

● : Stock item ○ : Under preparing for stock

CSKP...B Type



SPGR120440L



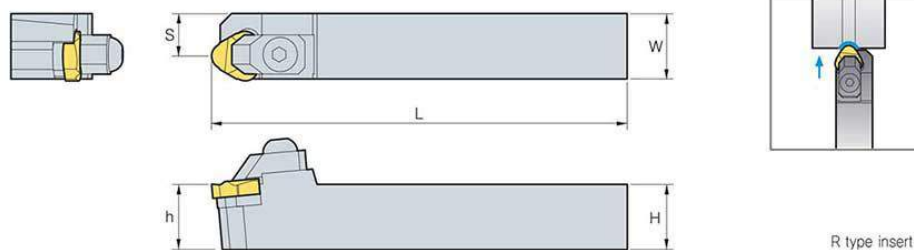
Designation	Stock		øD	H	W	L	S	h	ℓ	Inserts	Clamp	Screw	Wrench
	R	L											
CSKPR 2020B-L12B-D25			25	20	20	140	22	15.5	25	SPGR120440L	CS6R1	DHA0617	HW30L

● : Stock item ○ : Under preparing for stock

CKFN...RW Type



KORIC



(mm)

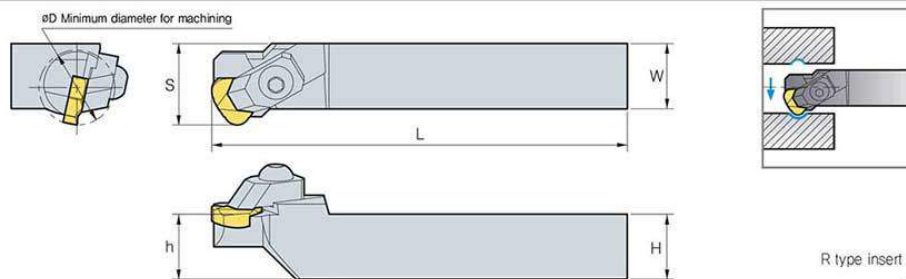
Designation	Stock		H	W	L	S	h	Inserts
	R	L						
CKFNR2020B-L22RW			20	20	140	13	20	KORIC2204 R
CKFNR2020B-L27RW			20	20	140	12	20	KORIC2704 R
CKFNR2020B-L33RW			20	20	140	10	20	KORIC3306 R
CKFNR2525B-L44RW			25	25	140	12	25	KORIC4408 R

● : Stock item ○ : Under preparing for stock

CKGN...RW Type



KORIC



(mm)

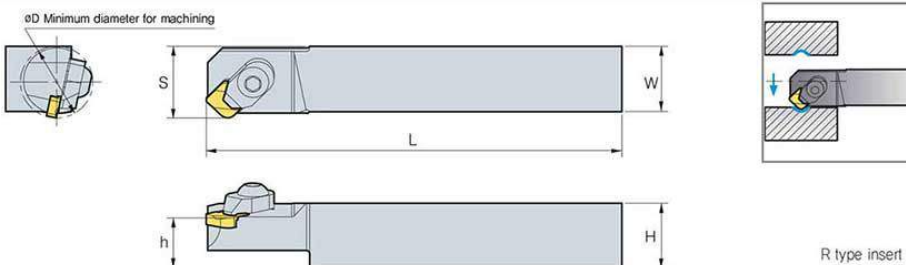
Designation	Stock		øD	H	W	L	S	h	Inserts
	R	L							
CKGNR2022B-L22RW-D23			23	20	22	140	25	20	KORIC2204 L
CKGNR2022B-L27RW-D25			25	20	22	140	25	20	KORIC2704 L
CKGNR2025B-L33RW-D38			38	20	25	140	32	20	KORIC3306 L
CKGNR2528B-L38RW-D50			50	25	28	140	40	25	KORIC3806 L
CKGNR2528B-L44RW-D52			52	25	28	140	40	25	KORIC4408 L

● : Stock item ○ : Under preparing for stock

CSGN...RW Type



SNGN

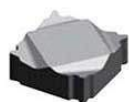


(mm)

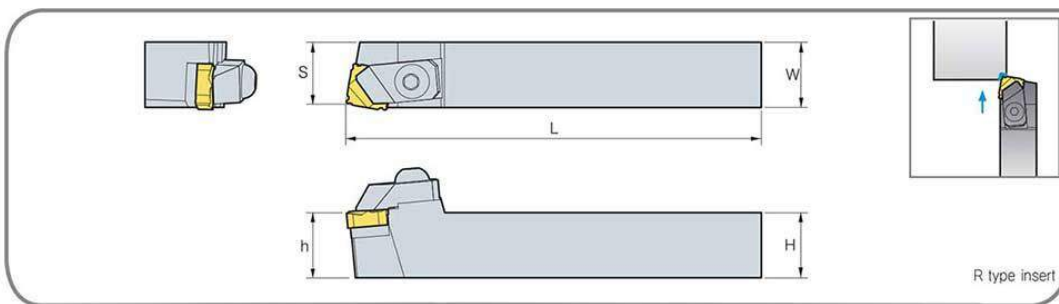
Designation	Stock		øD	H	W	L	S	h	Inserts
	R	L							
CSGNR2020B-L09RW-D15			15	20	20	140	22	20	SNGN0903WL
CSGNL2020B-L09RW-D15			15	20	20	140	22	20	SNGN0903WR
CSGNR2020B-L09RW-D22			22	20	20	140	22	15.5	SNGN0903WL
CSGNL2020B-L09RW-D22			22	20	20	140	22	15.5	SNGN0903WR

● : Stock item ○ : Under preparing for stock

CSBN...BS Type



SNGN



(mm)

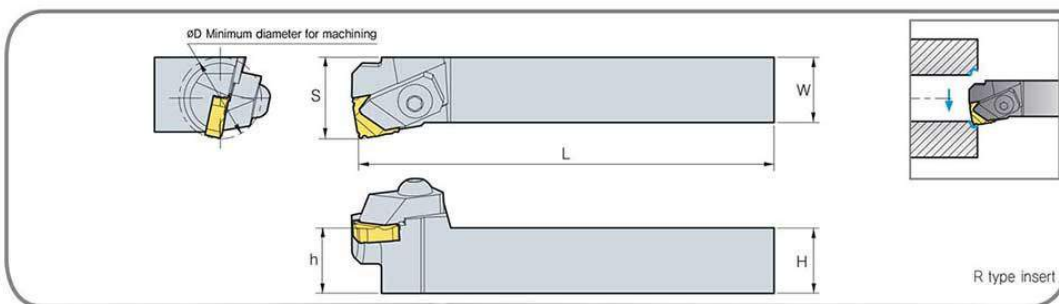
Designation	Stock		H	W	L	S	h	Inserts
	R	L						
CSBNR2020B-L12BS			20	20	140	19	20	SNGN1204SR
CSBNL2020B-L12BS			20	20	140	19	20	SNGN1204SL
CSBNR2020B-L15BS			25	25	140	24	25	SNGN1504SR
CSBNL2020B-L15BS			25	25	140	24	25	SNGN1504SR

● : Stock item ○ : Under preparing for stock

CSKN...BS Type



SNGN



(mm)

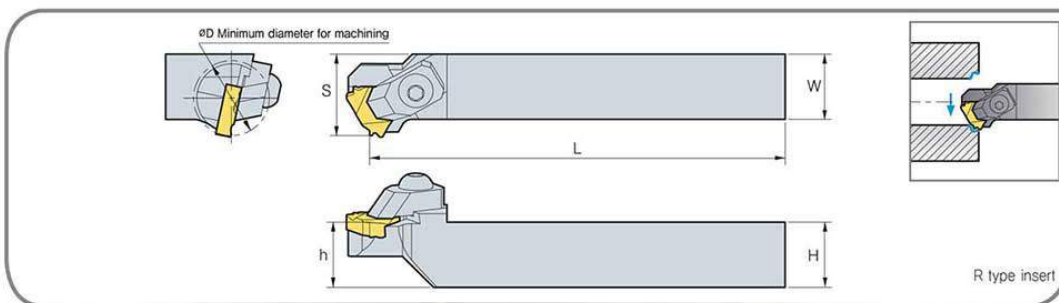
Designation	Stock		øD	H	W	L	S	h	Inserts
	R	L							
CSKNR1622B-L09BS-D14			14	16	22	140	27	16	SNGN0903SL
CSKNL1622B-L09BS-D14			14	16	22	140	27	16	SNGN0903SR
CSKNR2022B-L12BS-D26			26	20	22	140	27	20	SNGN1204SL
CSKNL2022B-L12BS-D26			26	20	22	140	27	20	SNGN1204SR
CSKNR2525B-L15BS-D35			35	25	25	140	32	25	SNGN1504SL
CSKNL2525B-L15BS-D35			35	25	25	140	32	25	SNGN1504SR

● : Stock item ○ : Under preparing for stock

CTGN...BS Type



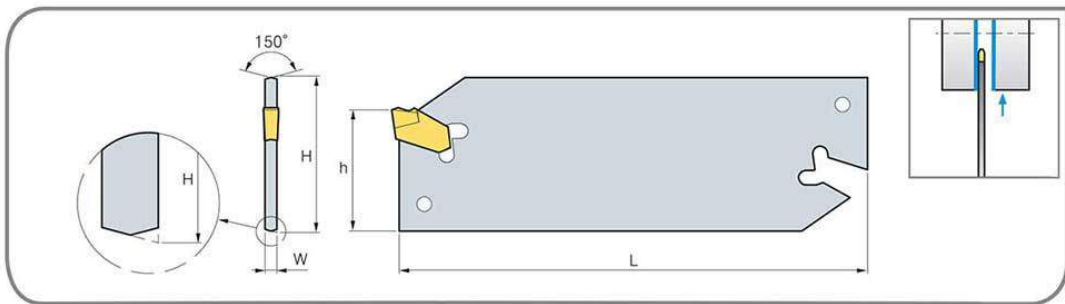
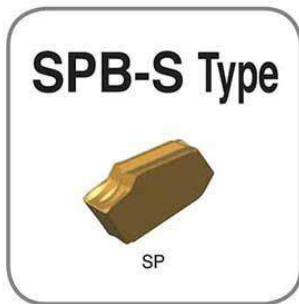
TNGN



(mm)

Designation	Stock		øD	H	W	L	S	h	Inserts
	R	L							
CTGNR2021B-K22BS-D23			23	20	21	140	28	20	TNGN2204SL
CTGNL2021B-K22BS-D23			23	20	21	140	28	20	TNGN2204SR

● : Stock item ○ : Under preparing for stock



Designation	Stock	H	W	L	h	Inserts	Wrench
SPB 1626-S		26	1.3	110	21	SP160	SW15S
1826-S		26	1.5	110	21	SP180	
226-S	●	26	1.6	110	21	SP200, SP200R/L	
326-S	●	26	2.4	110	21	SP300, SP300R/L	
426-S	●	26	3.2	110	21	SP400, SP400R/L	
526-S		26	4.0	110	21	SP500, SP500R/L	
626-S		26	5.2	110	21	SP600, SP600R/L	
1632-S		32	1.3	150	25	SP160	
1832-S		32	1.5	150	25	SP180	
232-S	●	32	1.6	150	25	SP200, SP200R/L	
332-S	●	32	2.4	150	25	SP300, SP300R/L	
432-S	●	32	3.2	150	25	SP400, SP400R/L	
532-S	●	32	4.0	150	25	SP500, SP500R/L	
632-S	●	32	5.2	150	25	SP600, SP600R/L	

● : Stock item ○ : Under preparing for stock

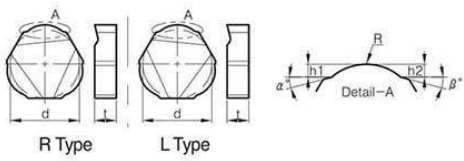
Available Inserts

Application	Picture	Designation	Stock								W	L	r	Configuration	
			MUJ3120	MUJ3030	MUM325	MUJ5330	MUJ230	MUJ500H	MUJ5300	MUJ8110					MUJ9030
Cutting		SP 160										1.6	7.8	0.16	
		180										1.8	9.3	0.16	
		200	●	●	●	●			●	●	●	2.2	9.3	0.2	
		200R		●						●	●	2.2	9.3	0.2	
		200L									●	2.2	9.3	0.2	
		300	●		●	●	●		●	●		3.1	11.3	0.2	
		300R	●	●	●					●		3.1	11.3	0.2	
		300L	●	●						●		3.1	11.3	0.2	
		400	●		●	●	●		●		●	4.1	11.3	0.25	
		400R		●						●		4.1	11.3	0.25	
		400L		●						●		4.1	11.3	0.25	
		500	●	●	●	●		●	●		●	5.1	11.4	0.3	
		500R		●								5.1	11.4	0.3	
		500L										5.1	11.4	0.3	
600				●			●		●	6.4	11.4	0.35			
600R		●								6.4	11.4	0.35			
600L										6.4	11.4	0.35			

● : Stock item ○ : Under preparing for stock

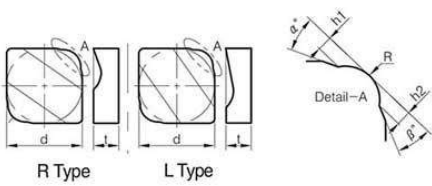
Machining Race-way

KORIC...R/L Type



	d	t	R	h ₁	h ₂	α°	β°
KORIC2204R/L	12.7	4.76					
KORIC2704R/L	15.875	4.76					
KORIC3306R/L	19.05	6.0					
KORIC3806R/L	22.225	6.0					
KORIC4408R/L	25.4	8.0					

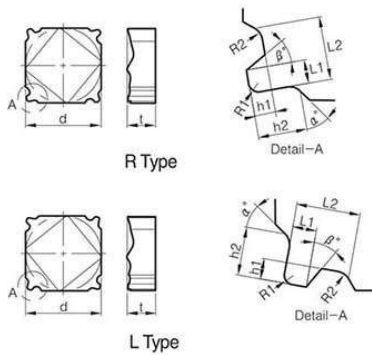
SNGN...WR/L Type



	d	t	R	h ₁	h ₂	α°	β°
SNGN0903WR/L	9.525	3.18					
SNGN1504WR/L	15.875	4.76					
SNGN1905WR/L	19.05	5.56					

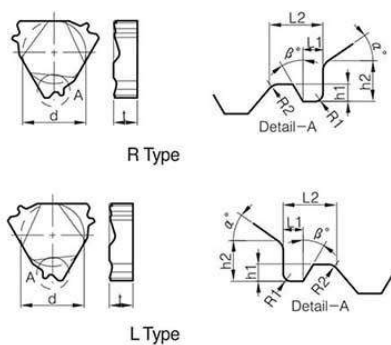
Machining for Bearing shield

SNGN...SR/L Type



	d	t	L ₁	L ₂	h ₁	h ₂	R ₁	R ₂	α°	β°
SNGN0903SR/L	9.525	3.18								
SNGN1204SR/L	12.7	4.76								
SNGN1504SR/L	15.875	4.76								

SNGN...SR/L Type



	d	t	L ₁	L ₂	h ₁	h ₂	R ₁	R ₂	α°	β°
TNGN02204SR/L	12.7	4.76								

LT - Solid Mill

The Naska, Multi-Material, Solid Carbide Milling Line



LT-40, One grade
for all materials

The advantages of LT - Solid Mill line:

- Newly developed grade LT-40, is made from fine grain powder and coated with specially developed PVD coating, to provide high hardness and at the same time high toughness.
- Special production processes allow for improved wear resistance and smoother machining.
- One grade for all materials.

What does our LT - Solid Mill line offer?

- Excellent performance at dry cutting conditions.
- Excellent performance on hardened steel (HRc 65).
- Optimized geometry for machining tough materials.
- Top performance on a large range of materials.
- Extended tool life at regular and extreme conditions.
- Superior surface finish.
- Fast chip ejection.

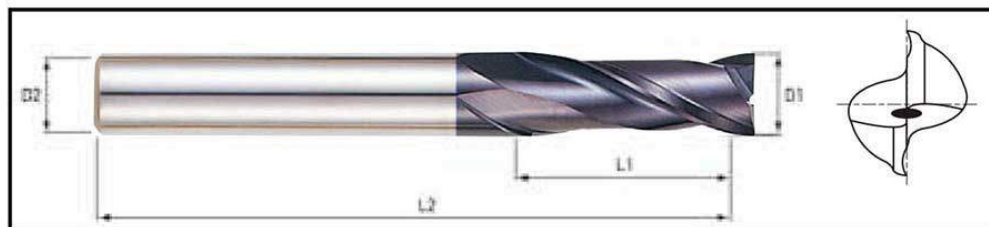
Index

Group

2 flute short 30°	SC410C SC410F
2 flute long 30°	SC415C SC415F
2 flute long 30° ball nose	SC420C SC420F
3 flute short 30°	SC425C SC425F
4 flute short 30°	SC430C SC430F
4 flute long 30°	SC435C SC435F
4 flute long 30° ball nose	SC440C SC440F
6,8 flute long 45°	SC445C SC445F
6 flute extra long 45°	SC450C SC450F
6,8 flute long 45° positive rake	SC455C SC455F
Multi flute rougher 20°	SC460C SC460F
Multi flute rougher 45°	SC465C SC465F

NASKA[®]

Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

2 FLUTE, SHORT LENGTH, 30° HELIX

SC410C Cylindrical

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000723	2 flute 2mm short 30° cyl.	2.0	-14	-28	4,0	0	-6	6,0	40,0
M4000724	2 flute 3mm short 30° cyl.	3.0	-14	-28	6,0	0	-6	8,0	45,0
M4000725	2 flute 4mm short 30° cyl.	4.0	-20	-38	6,0	0	-8	11,0	45,0
M4000726	2 flute 5mm short 30° cyl.	5.0	-20	-38	6,0	0	-8	13,0	50,0
M4000727	2 flute 6mm short 30° cyl.	6.0	-20	-38	6,0	0	-8	13,0	50,0
M4000728	2 flute 8mm short 30° cyl.	8.0	-25	-47	8,0	0	-9	19,0	60,0
M4000729	2 flute 10mm short 30° cyl.	10.0	-25	-47	10,0	0	-9	22,0	70,0
M4000730	2 flute 12mm short 30° cyl.	12.0	-32	-59	12,0	0	-11	26,0	75,0
M4000731	2 flute 16mm short 30° cyl.	16.0	-32	-59	16,0	0	-11	32,0	100,0
M4000732	2 flute 20mm short 30° cyl.	20.0	-40	-73	20,0	0	-13	38,0	105,0

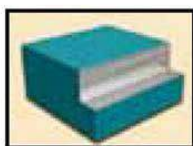
2 FLUTE, LONG LENGTH, 30° HELIX

SC415C Cylindrical

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000743	2 flute 6mm long 30° cyl.	6.0	-20	-38	6,0	0	-8	20,0	60,0
M4000744	2 flute 8mm long 30° cyl.	8.0	-25	-47	8,0	0	-9	25,0	70,0
M4000745	2 flute 10mm long 30° cyl.	10.0	-25	-47	10,0	0	-9	30,0	90,0
M4000746	2 flute 12mm long 30° cyl.	12.0	-32	-59	12,0	0	-11	30,0	90,0
M4000747	2 flute 16mm long 30° cyl.	16.0	-32	-59	16,0	0	-11	50,0	110,0
M4000748	2 flute 20mm long 30° cyl.	20.0	-40	-73	20,0	0	-13	55,0	110,0

For full machining recommendations - see pages 236 - 238

Application:



NASKA[®]
Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

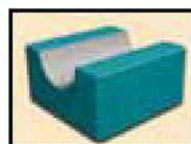
2 FLUTE, LONG LENGTH, 30° HELIX, BALL NOSE

SC420C Cylindrical ball nose

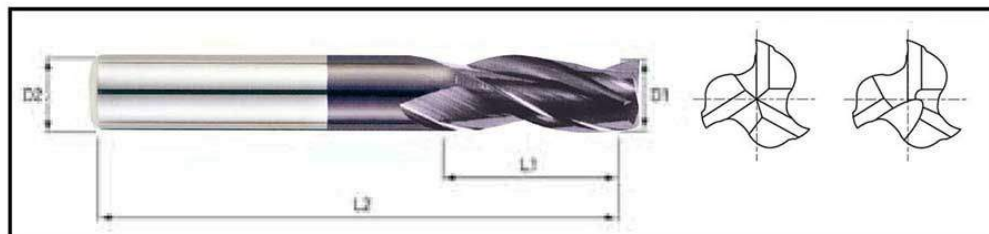
Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000755	2 flute 2mm long 30° B.N.cyl.	2.0	-14	-28	6,0	0	-6	5,0	50,0
M4000756	2 flute 3mm long 30° B.N.cyl.	3.0	-14	-28	6,0	0	-6	8,0	60,0
M4000757	2 flute 4mm long 30° B.N.cyl.	4.0	-20	-38	6,0	0	-8	8,0	70,0
M4000758	2 flute 5mm long 30° B.N.cyl.	5.0	-20	-38	6,0	0	-8	10,0	80,0
M4000759	2 flute 6mm long 30° B.N.cyl.	6.0	-20	-38	6,0	0	-8	12,0	90,0
M4000760	2 flute 8mm long 30° B.N.cyl.	8.0	-25	-47	8,0	0	-9	14,0	100,0
M4000761	2 flute 10mm long 30° B.N.cyl.	10.0	-25	-47	10,0	0	-9	18,0	100,0
M4000762	2 flute 12mm long 30° B.N.cyl. 1	2.0	-32	-59	12,0	0	-11	22,0	110,0
M4000763	2 flute 16mm long 30° B.N.cyl.	16.0	-32	-59	16,0	0	-11	30,0	140,0
M4000764	2 flute 20mm long 30° B.N.cyl.	20.0	-40	-73	20,0	0	-13	38,0	160,0

For full machining recommendations - see pages 236 - 238

Application:



NASKA[®]
Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

3 FLUTE, SHORT LENGTH, 30° HELIX

SC425C Cylindrical

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000775	3 flute 3mm short 30° cyl.	3.0	-14	-28	6,0	0	-6	10,0	50,0
M4000776	3 flute 4mm short 30° cyl.	4.0	-20	-38	6,0	0	-8	12,0	50,0
M4000777	3 flute 5mm short 30° cyl.	5.0	-20	-38	6,0	0	-8	14,0	57,0
M4000778	3 flute 6mm short 30° cyl.	6.0	-20	-38	6,0	0	-8	16,0	57,0
M4000779	3 flute 8mm short 30° cyl.	8.0	-25	-47	8,0	0	-9	20,0	63,0
M4000780	3 flute 10mm short 30° cyl.	10.0	-25	-47	10,0	0	-9	22,0	72,0
M4000781	3 flute 12mm short 30° cyl.	12.0	-32	-59	12,0	0	-11	25,0	83,0
M4000782	3 flute 16mm short 30° cyl.	16.0	-32	-59	16,0	0	-11	32,0	92,0
M4000783	3 flute 20mm short 30° cyl.	20.0	-40	-73	20,0	0	-13	38,0	105,0

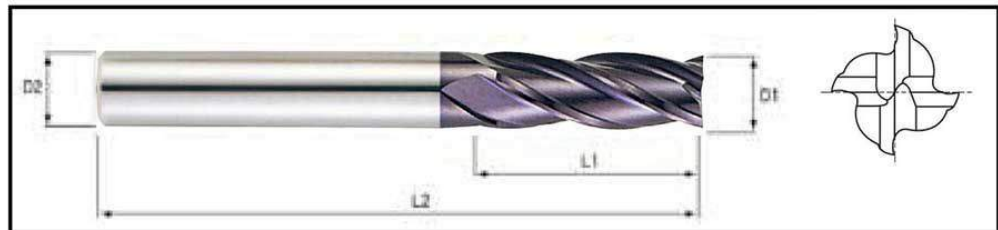
SC425F Flat

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000784	3 flute 3mm short 30° flat	3.0	-14	-28	6,0	0	-6	10,0	50,0
M4000785	3 flute 4mm short 30° flat	4.0	-20	-38	6,0	0	-8	12,0	50,0
M4000786	3 flute 5mm short 30° flat	5.0	-20	-38	6,0	0	-8	14,0	57,0
M4000787	3 flute 6mm short 30° flat	6.0	-20	-38	6,0	0	-8	16,0	57,0
M4000788	3 flute 8mm short 30° flat	8.0	-25	-47	8,0	0	-9	20,0	63,0
M4000789	3 flute 10mm short 30° flat	10.0	-25	-47	10,0	0	-9	22,0	72,0
M4000790	3 flute 12mm short 30° flat	12.0	-32	-59	12,0	0	-11	25,0	83,0
M4000791	3 flute 16mm short 30° flat	16.0	-32	-59	16,0	0	-11	32,0	92,0
M4000792	3 flute 20mm short 30° flat	20.0	-40	-73	20,0	0	-13	38,0	105,0

Application:



NASKA[®]
Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

4 FLUTE, SHORT LENGTH, 30° HELIX

SC430C Cylindrical

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000793	4 flute 2mm short 30° cyl.	2.0	-14	-28	6,0	0	-6	6,0	40,0
M4000794	4 flute 3mm short 30° cyl.	3.0	-14	-28	6,0	0	-6	8,0	45,0
M4000795	4 flute 4mm short 30° cyl.	4.0	-20	-38	6,0	0	-8	11,0	45,0
M4000796	4 flute 5mm short 30° cyl.	5.0	-20	-38	6,0	0	-8	13,0	50,0
M4000797	4 flute 6mm short 30° cyl.	6.0	-20	-38	6,0	0	-8	13,0	50,0
M4000798	4 flute 8mm short 30° cyl.	8.0	-25	-47	8,0	0	-9	19,0	60,0
M4000799	4 flute 10mm short 30° cyl.	10.0	-25	-47	10,0	0	-9	22,0	70,0
M4000800	4 flute 12mm short 30° cyl.	12.0	-32	-59	12,0	0	-11	26,0	75,0
M4000801	4 flute 16mm short 30° cyl.	16.0	-32	-59	16,0	0	-11	32,0	100,0
M4000802	4 flute 20mm short 30° cyl.	20.0	-40	-73	20,0	0	-13	38,0	105,0

4 FLUTE, LONG LENGTH, 30° HELIX

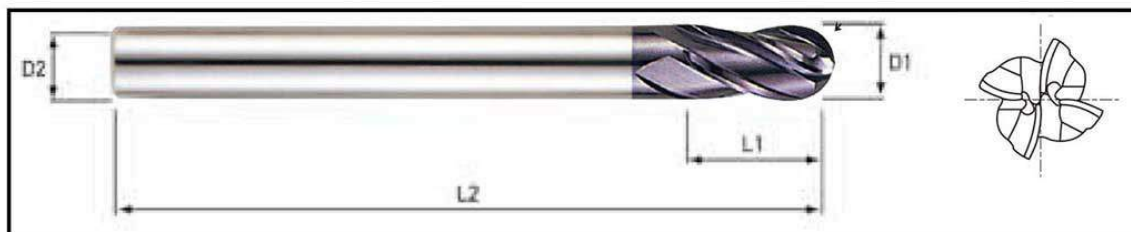
SC435C Cylindrical

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000921	4 flute 2 mm long 30° cyl.	2,0	-14	-28	6,0	0	-6	8,0	40,0
M4000922	4 flute 3 mm long 30° cyl.	3,0	-20	-38	6,0	0	-8	12,0	50,0
M4000923	4 flute 4 mm long 30° cyl.	4,0	-20	-38	6,0	0	-8	15,0	50,0
M4000924	4 flute 5 mm long 30° cyl.	5,0	-20	-38	6,0	0	-8	20,0	60,0
M4000813	4 flute 6 mm long 30° cyl.	6.0	-20	-38	6,0	0	-8	20,0	60,0
M4000814	4 flute 8 mm long 30° cyl.	8.0	-25	-47	8,0	0	-9	25,0	70,0
M4000815	4 flute 10 mm long 30° cyl.	10.0	-25	-47	10,0	0	-9	30,0	90,0
M4000816	4 flute 12 mm long 30° cyl.	12.0	-32	-59	12,0	0	-11	30,0	90,0
M4000817	4 flute 16 mm long 30° cyl.	16.0	-32	-59	16,0	0	-11	50,0	110,0

Application:



NASKA[®]
Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

4 FLUTE, LONG LENGTH, 30° HELIX, BALL NOSE

SC440C Cylindrical ball nose

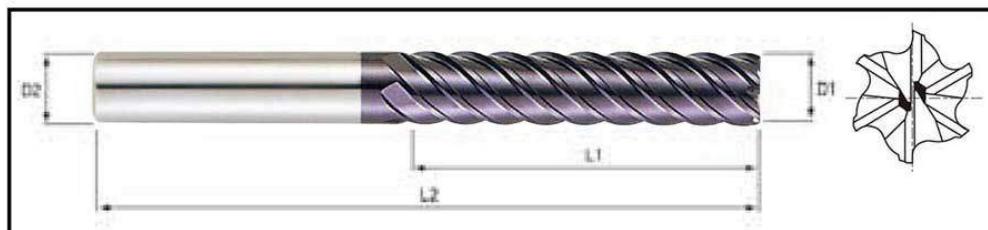
Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000825	4 flute 2mm long 30° B.N. cyl.	2.0	-14	-28	6,0	0	-6	5,0	50,0
M4000826	4 flute 3mm long 30° B.N. cyl.	3.0	-14	-28	6,0	0	-6	8,0	60,0
M4000827	4 flute 4mm long 30° B.N. cyl.	4.0	-20	-38	6,0	0	-8	8,0	70,0
M4000828	4 flute 5mm long 30° B.N. cyl.	5.0	-20	-38	6,0	0	-8	10,0	80,0
M4000829	4 flute 6mm long 30° B.N. cyl.	6.0	-20	-38	6,0	0	-8	12,0	90,0
M4000830	4 flute 8mm long 30° B.N. cyl.	8.0	-25	-47	8,0	0	-9	14,0	100,0
M4000831	4 flute 10mm long 30° B.N. cyl.	10.0	-25	-47	10,0	0	-9	18,0	100,0
M4000832	4 flute 12mm long 30° B.N. cyl.	12.0	-32	-59	12,0	0	-11	22,0	110,0
M4000833	4 flute 16mm long 30° B.N. cyl.	16.0	-32	-59	16,0	0	-11	30,0	140,0
M4000834	4 flute 20mm long 30° B.N. cyl.	20.0	-40	-73	20,0	0	-13	38,0	160,0

For full machining recommendations - see pages 236 - 238

Application:



NASKA[®]
Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

6,8 FLUTE, LONG LENGTH, 45° HELIX

SC445C Cylindrical

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000845	6 flute 6mm long 45° cyl.	6.0	-20	-38	6,0	0	-8	13,0	57,0
M4000846	6 flute 8mm long 45° cyl.	8.0	-25	-47	8,0	0	-9	19,0	63,0
M4000847	6 flute 10mm long 45° cyl.	10.0	-25	-47	10,0	0	-9	22,0	72,0
M4000848	6 flute 12mm long 45° cyl.	12.0	-32	-59	12,0	0	-11	26,0	83,0
M4000849	6 flute 16mm long 45° cyl.	16.0	-32	-59	16,0	0	-11	32,0	92,0
M4000850	8 flute 20mm long 45° cyl.	20.0	-40	-73	20,0	0	-13	38,0	104,0

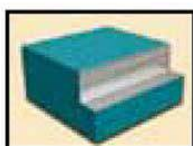
6 FLUTE, EXTRA LONG LENGTH, 45° HELIX

SC450C Cylindrical

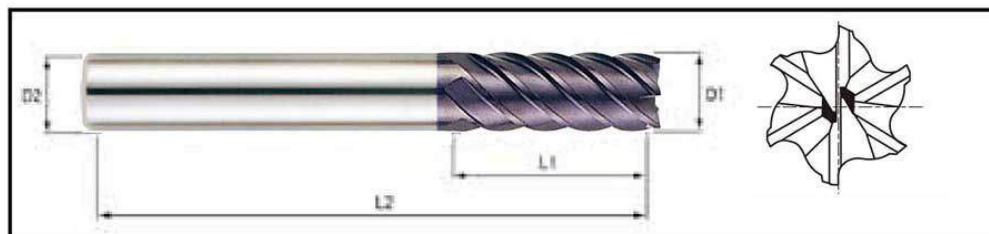
Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000857	6 flute 6mm X-long 45° cyl.	6.0	-20	-38	6,0	0	-8	26,0	70,0
M4000858	6 flute 8mm X-long 45° cyl.	8.0	-25	-47	8,0	0	-9	36,0	90,0
M4000859	6 flute 10mm X-long 45° cyl.	10.0	-25	-47	10,0	0	-9	46,0	100,0
M4000860	6 flute 12mm X-long 45° cyl.	12.0	-32	-59	12,0	0	-11	56,0	110,0
M4000861	6 flute 16mm X-long 45° cyl.	16.0	-32	-59	16,0	0	-11	66,0	130,0
M4000862	6 flute 20mm X-long 45° cyl.	20.0	-40	-73	20,0	0	-13	76,0	140,0

For full machining recommendations - see pages 236 - 238

Application:



NASKA[®]
Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

6,8 FLUTE, LONG LENGTH, 45° HELIX,

POSITIVE RAKE ANGLE

SC455C Cylindrical PR

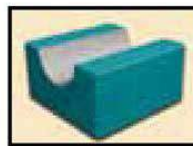
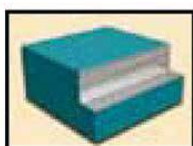
Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000869	6 flute 6mm long 45° cyl.	6.0	-20	-38	6,0	0	-8	13,0	57,0
M4000870	6 flute 8mm long 45° cyl.	8.0	-25	-47	8,0	0	-9	19,0	63,0
M4000871	6 flute 10mm long 45° cyl.	10.0	-25	-47	10,0	0	-9	22,0	72,0
M4000872	6 flute 12mm long 45° cyl.	12.0	-32	-59	12,0	0	-11	26,0	83,0
M4000873	6 flute 16mm long 45° cyl.	16.0	-32	-59	16,0	0	-11	32,0	92,0
M4000874	8 flute 20mm long 45° cyl.	20.0	-40	-73	20,0	0	-13	38,0	104,0

SC455F Flat

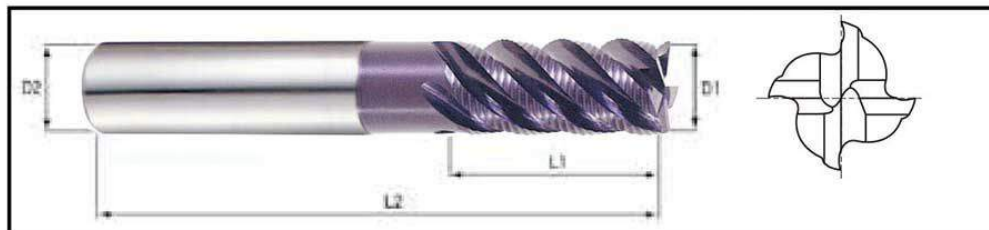
Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000875	6 flute 6mm long 45° flat	6.0	-20	-38	6,0	0	-8	13,0	57,0
M4000876	6 flute 8mm long 45° flat	8.0	-25	-47	8,0	0	-9	19,0	63,0
M4000877	6 flute 10mm long 45° flat	10.0	-25	-47	10,0	0	-9	22,0	72,0
M4000878	6 flute 12mm long 45° flat	12.0	-32	-59	12,0	0	-11	26,0	83,0
M4000879	6 flute 16mm long 45° flat	16.0	-32	-59	16,0	0	-11	32,0	92,0
M4000880	8 flute 20mm long 45° flat	20.0	-40	-73	20,0	0	-13	38,0	104,0

For full machining recommendations - see pages 236 - 238

Application:



NASKA[®]
Germany Naska company



D1: Mill Diameter D2: Shank Diameter L1: Length of cut L2: Overall length

MULTI-FLUTE, ROUGHING, LONG REACH, 45° HELIX

SC465C Cylindrical

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000893	3 flute 6mm rougher 45° L.R. Cyl.	6.0	-20	-38	6,0	0	-8	16,0	57,0
M4000894	3 flute 8mm rougher 45° L.R. Cyl.	8.0	-25	-47	8,0	0	-9	16,0	63,0
M4000895	4 flute 10mm rougher 45° L.R. Cyl.	10.0	-25	-47	10,0	0	-9	22,0	72,0
M4000896	4 flute 12mm rougher 45° L.R. Cyl.	12.0	-32	-59	12,0	0	-11	26,0	83,0
M4000897	5 flute 16mm rougher 45° L.R. Cyl.	16.0	-32	-59	16,0	0	-11	32,0	92,0
M4000898	6 flute 20mm rougher 45° L.R. Cyl.	20.0	-40	-73	20,0	0	-13	38,0	104,0

SC465F Flat

Catalog Nr.	Product designation	D1	Tolerance e8 μm		D2	Tolerance h6 μm		L1	L2
M4000899	3 flute 6mm rougher 45° L.R. flat	6.0	-20	-38	6,0	0	-8	16,0	57,0
M4000900	3 flute 8mm rougher 45° L.R. flat	8.0	-25	-47	8,0	0	-9	16,0	63,0
M4000901	4 flute 10mm rougher 45° L.R. flat	10.0	-25	-47	10,0	0	-9	22,0	72,0
M4000902	4 flute 12mm rougher 45° L.R. flat	12.0	-32	-59	12,0	0	-11	26,0	83,0
M4000903	5 flute 16mm rougher 45° L.R. flat	16.0	-32	-59	16,0	0	-11	32,0	92,0
M4000904	6 flute 20mm rougher 45° L.R. flat	20.0	-40	-73	20,0	0	-13	38,0	104,0

For full machining recommendations - see pages 236 - 238


Application:




NASKA[®]
Germany Naska company

Material Group	Group No	Material ExamPles	Brinell hardness	V _c [m/min]	
				min	max
Low Carbon Steel	1	XC12 S 250 Pb	150	250	300
			180	200	270
			210	160	250
Alloy Steel	2	42 CrMo 4 100 Cr 6 32 NiCrMo 4.5	180	160	250
			230	140	180
			280		
			320	120	170
High Alloy Steel	3	X38 CrMoV 5 X210 CrW 12 X90 CrMoV 8	220	140	180
			280	120	140
			320	100	140
			350	90	120
Austenitic Stainless Steel	4	303 / 304 304 L	210 to 250	80	100
	5	316 / 316 L	230 to 270	80	100
	6	316 T 630 (F16PH)	-----	70	90
Ferritic Stainless Steel	7	430 / 439 / 444	Annealed	80	100
Martensitic Stainless Steel	8	410 / 420	Annealed Treated	100	140
Grey Cast Iron	9	EN - GJL 200	140 to 230	200	250
		EN - GJL 250		160	200
		EN - GJL 300			
Nodular Cast Iron	10	EN - GJS 400	210	160	200
		EN - GJS 600	260	140	160
		EN - GJS 800	310	120	140
Nickel Based Alloys	11	Inconel 625	-----	40	60
		Inconel 718	-----		
		Hastelloy C	-----	40	60
Titanium Based Alloys	12	TiAl 6 V4	-----	50	100
		T40	-----	40	80
Aluminium alloys Si < 4%	13	Al99,5	-----	400	500
		AlCuMgPb	-----		
		AlZnMgCu1,5	-----		
Aluminium alloys Si 4-8%	13	G/AlSi6Cu4	-----	200	250
		G/AlSi8Cu3Fe	-----		
"Aluminium alloys Si > 8%"	14	G/AlSi12	-----	160	200
		G/AlSi12CuFe	-----		
Magnesium alloys	15	MgMn 2	-----	160	200
		MgAl9Zn	-----		
Copper alloys	16	CuZn39Pb2 M558	-----	400	500
	17	CuSn6/8	-----	200	250
		CuSn7ZnPb	-----		
	18	CuAl19Ni	-----	160	200


Icons




Profiling - Finishing




Slotting




Plunge - Slot




Profiling - Roughing




Contour - Finishing



Plunge - Slot Contouring




Contour - Slotting




Profiling thin material

As a simple starting point, we recommend to use the following cutting conditions:

Profiling 	Finishing				Semi Finishing				Roughing			
	Feed per Tooth		Width of Cut	Depth of Cut	Feed per Tooth		Width of Cut	Depth of Cut	Feed per Tooth		Width of Cut	Depth of Cut
	min	max	mm	mm	min	max	mm	mm	min	max	mm	mm
Tool Diameter (mm)												
2	0.006	0.025	0.25	2.00	0.025	0.040	0.50	2.00	0.012	0.025	1.00	2.00
3	0.012	0.040	0.38	3.00	0.040	0.050	0.75	3.00	0.025	0.040	1.50	3.00
4	0.016	0.048	0.50	4.00	0.040	0.050	1.00	4.00	0.025	0.040	2.00	4.00
5	0.020	0.050	0.63	5.00	0.050	0.070	1.25	5.00	0.040	0.065	2.50	5.00
6	0.025	0.060	0.75	6.00	0.050	0.090	1.50	6.00	0.040	0.075	3.00	6.00
8	0.030	0.075	1.00	8.00	0.065	0.120	2.00	8.00	0.050	0.100	4.00	8.00
10	0.032	0.080	1.25	10.00	0.065	0.120	2.50	10.00	0.050	0.100	5.00	10.00
12	0.040	0.100	1.50	12.00	0.065	0.130	3.00	12.00	0.065	0.120	6.00	12.00
16	0.048	0.120	2.00	16.00	0.075	0.140	4.00	16.00	0.080	0.130	8.00	16.00
20	0.050	0.150	2.50	20.00	0.090	0.170	5.00	20.00	0.090	0.160	10.00	20.00

Slotting 	Finishing				Semi Finishing				Roughing			
	Feed per Tooth		Width of Cut	Depth of Cut	Feed per Tooth		Width of Cut	Depth of Cut	Feed per Tooth		Width of Cut	Depth of Cut
	min	max	mm	mm	min	max	mm	mm	min	max	mm	mm
Tool Diameter (mm)												
2					0.012	0.020	2.00	2.00	0.016	0.040	2.00	2.00
3					0.016	0.030	3.00	3.00	0.024	0.048	3.00	3.00
4					0.020	0.032	4.00	4.00	0.032	0.050	4.00	4.00
5					0.020	0.040	5.00	5.00	0.040	0.070	5.00	5.00
6					0.024	0.048	6.00	6.00	0.048	0.085	6.00	6.00
8					0.032	0.050	8.00	8.00	0.050	0.100	8.00	8.00
10					0.035	0.055	10.00	10.00	0.060	0.110	10.00	10.00
12					0.040	0.060	12.00	12.00	0.065	0.120	12.00	12.00
16					0.045	0.075	16.00	16.00	0.080	0.130	16.00	16.00
20					0.048	0.080	20.00	20.00	0.090	0.160	20.00	20.00

contouring 	Finishing				Semi Finishing				Roughing			
	Feed per Tooth		Width of Cut	Depth of Cut	Feed per Tooth		Width of Cut	Depth of Cut	Feed per Tooth		Width of Cut	Depth of Cut
	min	max	mm	mm	min	max	mm	mm	min	max	mm	mm
Tool Diameter (mm)												
2	0.032	0.045	0.25	2.00	0.032	0.045	0.50	2.00				
3	0.036	0.050	0.38	3.00	0.036	0.050	0.75	3.00				
4	0.040	0.055	0.50	4.00	0.040	0.055	1.00	4.00				
5	0.045	0.065	0.63	5.00	0.045	0.065	1.25	5.00				
6	0.050	0.070	0.75	6.00	0.050	0.070	1.50	6.00				
8	0.060	0.080	1.00	8.00	0.060	0.080	2.00	8.00				
10	0.070	0.100	1.25	10.00	0.070	0.100	2.50	10.00				
12	0.080	0.120	1.50	12.00	0.080	0.120	3.00	12.00				
16	0.100	0.150	2.00	16.00	0.100	0.150	4.00	16.00				
20	0.120	0.200	2.50	20.00	0.120	0.200	5.00	20.00				

Formulas

$\text{rpm} = \text{sfm} * 3.82 / \text{tool diameter}$

$\text{rpm} = (\text{m/min} * 1000) / (3.14 * \text{tool diameter})$

$\text{feed per min} = \text{feed per tooth} * \text{number of teeth} * \text{rpm}$

Drill selection recommendation, according to application:

1. Profiling - finishing cut :use 4 or 6 flute mill.
2. Slotting - semi-roughing cut and high feed rates: use 3 flute mill for regular chip removal use a 2 flute mill for long chips (soft material)
use Roughing mill for maximum chip removal
3. Plunge - slot cut: use 3 flute mill for higher feed rate and 2 flute mill for soft material.
4. Profiling - roughing cut: use Roughing mill for rapid material removal and higher feed rates.
5. Contour- finishing cut: use 2 or 4 ball nose mill.
6. Slot-contouring cut: use 2 flute ball nose for maximum chip removal.
use 4 flute ball nose for finishing.
7. For profiling of thin material s: use 6 flute mill.
8. For Aluminum machining: Finishing cut - use 6 or 8 positive rake flute mill
slotting cut - use 2 flute short mill.







Machining Tips:




1. Climb milling is preferred with CNC machines.
2. Use ramping down operation to avoid vibrations.
3. When opening a pocket, helical interpolation operation is preferred.

Material Reference List

Material group	number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI/SAE
Low Carbon Steel							
1	1.0036	US137-3	-	-	FE 37BFU	-	-
1	1.0401	C15	CC12	080M15	C15 / C16	S15C	1015
1	1.0402	C22	CC20	050A20	C20 / C21	S20C / S22C	1020
1	1.0501						
1	1.0503	C45	CC45	080M46	C45	S45C / S45CM	1045
1	1.0715	9 SMn 28	S250	230M07	CF 9 SMn 28	SUM22	1213
1	1.0718	9 SMnPb 28	S 250Pb	-	CF 9 SMnPb 28	SUM22L/SUM23L	12L3
1	1.0722	10 SPb 20	-	-	-	-	-
1	1.0725	15 SMn 13	-	-	-	-	-
1	1.0726	35 S 20	-	-	-	-	-
1	1.0756	35 SPb 20	-	-	-	-	-
1	1.076	38 SMn 28	-	-	-	-	-
1	1.0762	44 SMn 28	-	-	-	-	-
1	1.0763	44 SMnPb 28	-	-	-	-	-
1	1.0764	36 SMn 14	-	-	-	-	-
1	1.0765	36 SMnPb 14	-	-	-	-	-
1	1.1121	Ck 10	XC 10	040 A10	2 C 10	S9 CK / S 10 C	1010
1	1.1133	20 Mn 5	20 M 5	120 M19	20 Mn 7	SMnC 420	1022 / 1518
1	1.1141	Ck 15	XC 12	080 M15	C16	S15 / S15CK	1015
1	1.1157	40 Mn 4	40 M 5	150 M36	-	-	1035 / 1041
1	1.1158	C25E (CK 25)	XC 25	070M25	C25	S25C / S28C	1025
1	1.1166	35 Mn 5	-	-	-	SMn 433H	1536
1	1.1170	28 Mn 6	20 M 5	(150 M8)	C 28 Mn	SCMn 1	1330
1	1.1173	30 Mn 5	35 M 5	(150 M28)	-	SMn 433H / SCMn 2	1306 / 1330
1	1.1181	C35E (CK 35)	XC 32	080 A35	C 35	S 35C	1035 / 1038
1	1.1183	Cf 35	XC 38TS	080 A35	C36 / C38	S35C / S35CM	1035
1	1.1191	C45E (Ck 45)	XC 45	080 M46 / 060 A47	C45	S45C / S48C / S45CM	1045
Alloy Steel							
2	1.0050	St 50-2	-	-	FE 50	SS50 / SS490	-
2	1.0060	St 60-2	-	-	FE 60-2	SM570 / SM58	-
2	1.0070	St 70-2	-	-	FE 70-2	FE70-2	-
2	1.0535	C55	-	070M55	C55	S55C / S55CM	1055
2	1.0601	C60	CC55	080A62	C60	S58C	1060
2	1.1203	C55E (CK 55)	XC 55	060 A57 / 070 M55	C50	S55C / S55CM	1055
2	1.1213	Cf 53	XC 48TS	060A52	C53	S50C / S50CM	1050
2	1.1221	C60E (CK 60)	XC 60	060 A62	C60	S58C / S60CM	1060 / 1064
2	1.1525	C 80 W1	C 90 E2U	-	C 80 KU	-	W 108
2	1.1545	C 105 W1	C 105 E2U	-	C 100 KU	SK3 / SUP4	W110
2	1.1563	C 125 W	C 120 E3U	-	C 120 KU	SK2	W 112
2	1.1573	C 135 W	C 140 E3U	-	C 140 KU	-	-
2	1.1625	C 80 W2	-	BW 1B	-	SK5 / SK6	W1
2	1.1750	C 75 W	-	BW 1A	-	-	W1
2	1.2330	35 CrMo 4	34 CD 4	708 A37 / (BP20)	35 CrMo 4	-	4135 / P20
2	1.2332	47 CrMo 4	-	-	40 CrMo 4	-	4142
2	1.5415	15 Mo 3	15 D 3	1501-240	16 Mo3 KW	STBA12 / STFA12	ASTM A204 GrA
2	1.5423	16 Mo 5	-	1503-245-420	16 Mo5	SB 450M / SB 480M	4520
2	1.5622	14 Ni 6	16 N 6	-	14 Ni 6	SL9N590	ASTM A350LF5
2	1.5711	40 NiCr 6	38 NC 6	-	-	3140	-
2	1.5713	13 NiCr 6	10 NC 6	-	-	3115	-
2	1.5732	14 NiCr 10	14 NC 11	-	16 NiCr 11	SNC 415(H)	3415
2	1.5752						
2	1.5919	15 CrNi 6	-	-	-	-	3115
2	1.7003						
2	1.7006	46 Cr 2	42 C 2	-	45 Cr 2	-	5045 / 5046

Material group number		 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI/SAE
Alloy Steel							
2	1.7015	15 Cr 3	15 C 2	523 M15	-	SCr 415(H)	5015 / 5115
2	1.7033	34 Cr 4	32 C 4	530 A32	34 CR 4 (KB)	SCr 430(H)	5132
2	1.7035	41 Cr 4	42 C 4	530 M40	-	SCr 440(H)(M)	5140
2	1.7045	41 Cr 4	41 C 4	530 A40	41 Cr 4	SCr 440	5140
2	1.7147	20 MnCr 5	20 MC 5	-	20 MnCr 5	SMnC 420H	5120
2	1.7176	55 Cr 3	55 C 3	527 A60	55 Cr 3	SUP9(A)	5155 / 5160
2	1.7218	25 CrMo 4	25 CD 4	708 A25	25 CrMo 4(KB)	SCM 420/SCM 430	4130
2	1.7220	34 CrMo 4	35 CD 4	708 A37	35 CrMo 4	SCCr M3/SCM 435H	4137 / 4135
2	1.7223	41 CrMo 4	42 CD 4TS	708 M40	41 CrMo 4	SCM 440	4140 / 4142
2	1.7225	42 CrMo 4	42 CD 4	708 M40	42 CrMo 4	SCM 440(H) / SNB	74140 / 4142
2	1.7227	42 CrMoS 4	-	-	-	-	-
2	1.7228	50 CrMo 4	50 CD 4	708 A47	-	SCM 445(H)	4150
2	1.7242	16 CrMo 4	-	-	18 CrMo 4	SCM 418(H)	-
2	1.7262	15 CrMo 5	12 CD 4	-	-	SCM 415(H)	-
2	1.7264	20 CrMo 5	18 CD 4	-	-	SCM 421 / SCM 420H	-
2	1.7335	13 CrMo 4 4	15 CD 3.5 / 4.5	1502 620 540	14 CrMo 3	SFVAF12	A182 A387 Gr.12
2	1.7337	16 CrMo 4 4	15 CD 4 5	-	18 CrMo 4 5 KW	-	A 387 Gr 12 Cl2
2	1.7361	32 CrMo 12	30 CD 12	722 M24	32 CrMo 12	-	-
2	1.2067	102 Cr 6	Y 100 C 6	(BL3)	-	SUJ 2	L1 / L3
2	1.2080	X210 Cr 12	Z200 C 12	BD3	X205 Cr 12KU	SKD 1	D3
2	1.2210	115 CrV 3	100 C 3	-	107 CrV3 KU	-	L2
2	1.2241	51 CrV 4	-	-	-	-	-
High Alloy Steel							
3	1.2311	40 CrMnMo 7	-	-	35 CrMo 8 KU	-	-
3	1.2343	X38 CrMoV 5 1	Z38 CDV 5	BH11	X37 CrMoV51 KU	SKD 6	H 11
3	1.2344	X40 CrMoV 5 1	Z40 CDV 5	BH13	X40 CrMoV 511KU	SKD 61	H 13
3	1.2363	X100 CrMoV 5 1	Z100 CDV 5	BA2	X100 CrMoV 5 1KU	SKD 12	A2
3	1.2365	X32 CrMoV 3 3	32 DCV 12 28	BH10	30 CrMoV 12 27KU	-	H10
3	1.2379	X155 CrVMo 12 1	Z160 CDV 12	BD2	X155 CrVMo121 KU	SKD 11	D2
3	1.2419	105 WCr 6	105 WC 13	-	107 WCr 5 KU	SKS 31 / SKS 2 / SKS 3	-
3	1.2436	X210 CrW 12	Z210 CW 12 1	-	X215 CrW 12 1 KU	SKD 2	-
3	1.2510	100 MnCrW 4	90 MWCV 5	BO1	95 MnWCr 5KU	BO 1	O1
3	1.2542	45 WCrV 7	45 WCV 20	BS1	45 WCrV 8 KU	-	S1
3	1.2550	60 WCrV 7	55 WC 20	BS1	58 WCr 9 KU	-	S1
3	1.2567	30 WCrV 17 2	Z32 WCV 5	-	X30 WCrV 5 3 KU	SKD 4	-
3	1.2581	~X30 WCrV 9 3	Z30 WCV 9	BH21	X30 WCrV 9 3 KU	SKD 5	H 21
3	1.2601	X165 CrMoV 12	-	-	X165 CrMoV 12 KU	-	-
3	1.2606	X37 CrMoW 5 1	Z35 CWDV 5	BH12	X35 CrMoW 05 KU	SKD 62	H 12
3	1.2713	55 NiCrMoV 6	55 NCDV 7	BH 244/5	-	SKT 4	L6
3	1.2721	50 NiCr 13	-	-	-	-	-
3	1.2762	75 CrMoNiW 6 7	-	-	-	-	-
3	1.2842	90 MnCrV 8	90 MV 8	BO2	88 MnV 8 KU	-	O2
3	1.2885	X32 CrMoCoV 3 3 3	-	BH 10A	-	-	(H10A)
3	1.3202	S 12-1-4-5	-	BT15	HS12-1-5-5	-	T15
3	1.3207	S 10-4-3-10	Z130 WKCDV 10 10 4 4 3	BT42	HS10-4-3-10	SKH 57	-
3	1.3243	S 6-5-2-5	Z90 KCV 6 5 5 4 2	334	HS 6-5-2-5	SKH 55	-
3	1.3246	S 7-4-2-5	Z110 WKCDV 7 5 4 4 2	-	HS 7-4-2-5	-	M 41
3	1.3247	S 2-10-1-8	Z110 DKCWV 9 8 4 2 1	BM42	HS2-9-1-8	SKH 59	M 42
3	1.3249	S 2-9-8	-	(BM34)	-	-	M33 / M34
3	1.3343	S 6-5-2	Z 85 WDCV 6 5 4 2	BM2	HS 6-5-2-5	SKH 51	M2
3	1.3344	S 6-5-3	Z130 WDCV 6 5 4 4	-	-	SKH 52 / SKH 53	M2 Class 2
3	1.3346	S 2-9-1	Z85 DCWV 8 4 2 1	BM1	-	-	H41 / M1
3	1.3401	G-X120 Mn 12	Z120 M 12	BW10	-	-	A128 75
3	1.3501	100 Cr 2	100 C 2	-	-	-	E 50100

Material group number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI/SAE
High Alloy Steel						
3	1.3505	100 Cr 6	100 C 6	534 A99	100 Cr 6	SUJ2 / SUJ4 52100
3	1.4086	G-X120 Cr 29	-	452 C11	-	-
3	1.4125	X105 CrMo 17	Z100 CD 17	-	-	SUS 440C 440C
3	1.4871	X53 CrMnNiN 21 9	Z53 CMN 21 9 Az	349 S54	X53 CrMnNiN 21 9	SUH 35 / SUH 36 EV8
3	1.4922	X20 CrMoV 12 1	-	-	X20 CrMoV 12 1	-
3	1.5662	X8 Ni 9	-	1502-502-650	X10 Ni 9	SL 9N53 / 60 A353
3	1.5680	X12 Ni 5	Z18 N 5	-	-	SL 5N 590 2515 2517
3	1.5710	36 NiCr 6	35 NC 6	640 A35	-	SNC 236 3135
3	1.5736	36 NiCr 10	30 NC 11	-	-	SNC 631(H) 3435
3	1.5755	31 NiCr 14	18 NC 13	653 M 31	-	SNC 836 -
3	1.5864	35 NiCr 18	-	-	-	-
3	1.6511	36 CrNiMo 4	40 NCD 3	817 M37	38 NiCrMo 4(KB)	- 9840 4340
3	1.6523	21 NiCrMo 2	20 NCD 2	805 M20	20 NiCrMo 2	SNCM 220(H) 8620
3	1.6546	40 NiCrMo 22	-	311-TYPE 7	40 NiCrMo 2(KB)	SNCM 240 8740
3	1.6562	40 NiCrMo 8 4	-	817 M40	40 NiCrMo 7(KB)	- E 4340
3	1.6565	40 NiCrMo 6	-	817 A37 / 818 M40	-	SNCM 439 4340 / 9850
3	1.6580	30 CrNiMo 8	30 CND 8	823 M30	30 NiCrMo 8	SNCM 431 -
3	1.6582	34 CrNiMo 6	35 NCD 6	817 M40	34 CrNiMo 6	SNCM 447 4340 / 4337
3	1.6587	17 CrNiMo 6	18 NCD 6	820 A16	-	-
3	1.6657	14 NiCrMo 34	16 NCD 13	832 M13	15 NiCrMo 13	- 9310
3	1.6746	32 NiCrMo 14 5	35 NCD 14	-	-	-
3	1.6747	30 NiCrMo 16 6	35 NCD 16	835 M30	-	-
3	1.6773	36 NiCrMo 16	-	-	-	-
3	1.7102	54 SiCr 6	54 SC 6	-	-	- 401
3	1.7108	60 SiCr 7	60 SC 7	-	60 SiCr 8	- 9262
3	1.7131	16 MnCr 5	16 MC 5	527 M17 / 590 H17	16 MnCr 5	- 5115
3	1.7238	49 CrMo 4	-	-	-	-
3	1.7362	12 CrMo 19 5	Z 10 CD 5 5	3606-625	16 CrMo 20 5	SFVAF5A / SFVAF5B -
3	1.7380	10 CrMo 9 10	10 CD 9 10	3606-622	12 CrMo 9 10	SFVAF22A:B / SCMV4 A 182 F11/A 387 Gr.22
3	1.7561	42 CrV 6	-	-	-	-
3	1.7701	51 CrMoV 4	51 CDV 4	-	51 CrMoV 4	-
3	1.7715	14 MoV 6 3	-	1503-660-440	-	-
3	1.7733	24 CrMoV 5 5	20 CDV 6	-	21 CrMoV 5 11	-
3	1.7755	GS-45 CrMoV 10 4	-	-	-	-
3	1.8070	21 CrMoV 5 11	-	-	35 NiCr 9	-
3	1.8159	50 CrV 4	51 CV 4	735 A51	50 CrV 4	SUP 10 6145 / 6150
3	1.8507	34 CrAlMo 5	30 CAD 6.12	-	34 CrAlMo 7	- A 355 Cl.D
3	1.8509	41 CrAlMo 7	40 CAD 6 12	905 M39	41 CrAlMo 7	SACM 645 / SACM 1 A 355 Cl.A / E71400
3	1.8515	31 CrMo 12	30 DC 12	722 M24	30 CrMo 12	-
3	1.8519	31 CrMoV 9	-	-	-	-
3	1.8523	39 CrMoV 13 9	-	897 M39	36 CrMoV 12	-
3	1.8550	34 CrAlNi 7	30 CAD 6 12	905 M31	-	-
Austenitic stainless Steel						
4	1.4005	X12 CrS 13	Z11 CF 13	416 S21	X12 CrS 13	SUS 416 416
4	1.4104	X14 CrMoS 17	Z13 CF 17	441 S29	X10 CrS 17	SUS 430F 430F
4	1.4113	x6 CrMoS 17 1	Z8 CD 17 01	434 S17	X8 CrMo 17	SUS 434 434
4	1.4301	X5 CrNi 18 9	Z6 CN 18 9	304 S15 / LW21 / LWCF	X5 CrNi 18 10	SUS 304 304 / 304H
4	1.4303	X4 CrNi 18 12	Z5 CN 18 11FF	305 S17 / 305 S19	X7 CrNi 18 10	SUS 305 / SUS 305J1 305 / 308
4	1.4305	X8 CrNiS18 9	Z8 CNF 18 9	303 S22 / 303 S31	X10 CrNiS 18 9	SUS 303 303
4	1.4306	X2 CrNi 18 9	Z2 CN 18 9	304 S11 / LW20 / LWCF	X3 CrNi 18 11	SUS 304L / SCS19 304L
4	1.4308	G-X5 CrNi 19 10	Z6 CN 18 10M	304 C15 / (LT196)	-	SCS 13 CF8
4	1.4310	X10 CrNi 18 8	Z12 CN 17 8	301 S21 / 301 S22	X12 CrNi 18 07	SUS 301 301
4	1.4311	X2 CrNiN 18 10	Z2 CN 18 7 Az	304 S61	X2 CrNiN 18 10	SUS 304LN 304LN
4	1.4312	G-X10 CrNi 18 8	Z10 CN18 9M	302 C25 / ANC3A	-	SCS 12 / SCS 13A -

Material group	number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI/SAE
		Austenitic stainless Steel					
4	1.4567	X3 CrNiCu 18.9.4	-	304 Cu	X3 CrNiCu 18.9.4	XM7	304Cu
4	1.4568	X7 CrNiAl 17 7	Z CNA 17 7	301 S81	-	-	-
4	1.4570	X8 CrNiCuS 18.9.2	-	303 Cu	X8 CrNiCuS 18.9.2	SUS 303Cu	303Cu
Austenitic stainless Steel							
5	1.4401	X2 CrNiMo 17 12 2	Z6 CND 17 11 2	316 S13 / 316 S31	X5 CrNiMo 17 12	SUS 316	316
5	1.4404	X2 CrNiMo 17 12 2	Z2 CND 17 12 2	316 S11 / 316 S13	X2 CrNiMo 17 12	SUS 316L	316L
5	1.4406	X2 CrNiMoN 17 11 2	Z3 CND 17 11 Az	316 S61 / 316 S63	X2 CrNiMoN 17 12	SUS 316LN	316LN
5	1.4408	G-X 5 CrNiMo 19 11 2-	-	316 C16 / (LT196) / A	-	SCS14	CF-8M
5	1.4429	X2 CrNiMoN 17 13 3	Z2 CND 17 12 Az	316 S63	X2 CrNiMoN 17 13	(SUS 316LN)	316LN
5	1.4435	X2 CrNiMo 18 14 3	Z2 CND 17 12 3	316 S11 / 316 S31	X2 CrNiMo 17 13	SUS 316L	316L
5	1.4436	X3 CrNiMo 17 13 3	Z6 CND 18 12 3	316 S19 / 316 S33 / LW	X5 CrNiMo 17 13	SUS 316	316
5	1.4438	X2 CrNiMo 18 15 4	Z2 CND 19 15 4	317 S12	X2 CrNiMo 18 16	SUS 317L	317L
5	1.4449	X3 CrNiMo 18 12 3	-	317 S16	X5 CrNiMo 18 15	SUS 317	317
Austenitic and duplex stainless Steel							
6	1.4057	X17 CrNi 16.2	Z15 CN 16 2	431 S29	X16 CrNi 16	SUS 431	431
6	1.4313	X3 CrNiMo 13 4	Z4 CND 13 4	425 C11	-	SCS 5	-
6	1.4319	X3 CrNi 17 8	-	301 S26 / 302 S26	-	SUS 302	302
6	1.434	G-X40 CrNi 27 4	-	-	-	-	-
6	1.4362	X2 CrNi 23 4	Z2 CN 23 04 AZ	-	-	-	S32304
6	1.4410	X2 CrNiMoN 25 7 4	-	-	-	-	-
6	1.4417	X2 CrNiMoSi 19 5	-	-	-	-	S31500
6	1.4460	X8 CrNiMoN 27 5 2	Z5 CND 27 5 Az	-	-	SUS 329J1	329
6	1.4462	X2 CrNiMoN 22 5 3	Z23CND 22 5 3 Az	318 S13	-	SUS 329J3L	-
6	1.4500	G-X7 NiCrMoCuNb 25 20	Z3 NCDU 25 20M	-	-	-	-
6	1.4510	X3 CrTi 17	Z4 CT 17	-	X6 CrTi 17	SUS 430LX	430 Ti / 439
6	1.4511	X3 CrNb 17	Z4 CNb 17	-	X6 CrNb 17	SUS 430LX	-
6	1.4521	X2 CrMoTi 18 2	-	-	-	SUS 444	443 / 444
6	1.4539	X1 NiCrMoCuN 25 20 3	Z2 NCDU 25 20	-	-	-	904L / UNS N08904
6	1.4541	X10 CrNiMoTi 18 10	Z6 CNT 18 10	321 S12 / 321 S51	X6 CrNiTi 18 11	SUS 321	321
6	1.4542	X5 CrNiCuNb 16 4	Z7 CNU 17 4	-	-	SUS 630 / SCS24	630
6	1.4546	X5 CrNiNb 18 10	-	347 SD31	X6 CrNiNb 18 11	-	348
6	1.455	X6 CrNiNb 18 10	Z6 CNNb 18 10	347 S20 / 347 S31	X6 CrNiNb 18 11	SUS 347	347 / 348
6	1.4552	G-X5 CrNiNb 19 11	Z4 CNNb 18 10M	347 C17	-	SCS 21	-
6	1.4558	X2 NiCrAlTi 32 20	-	NA15	-	-	N 08800
6	1.4562	X1 NiCrMoCu 32 28 7-	-	-	-	-	N 08031
6	1.4563	X1 NiCrMoCuN 31 27 4	Z 1 NCDU 31 27	-	-	-	N 08028
6	1.4571	X6 CrNiMoTi 17 12 2	Z6 CNDT 17 12	320 S18 / 320 S31	X6 CrNiMoTi 17 12	SUS 316Ti	316Ti
6	1.4580	X6 CrNiMoNb 17 12 2	Z6 CNDNb 17 12	318 S17	X6 CrNiMoNb17 12	-	(316 Cb)
6	1.4581	G-X5 CrNiMoNb 19 11 2	Z4 CNDNb 18 12M	318 C17 / ANC4C	G-X 6 CrNiMoNb 20 11	-	-
6	1.4583	X10 CrNiMoNb 18 12	-	-	X6 CrNiMoNb 17 13	-	318
6	1.4585	G-X7 CrNiMoCuNb 18-18	-	-	X6 CrNiMoSi 17 12	-	-
6	1.4747	X80 CrNiSi 20	Z80 CNS 20 2	443 S65	X80 CrNiSi 20	SUH 4	HNV6
6	1.4821	X20 CrNiSi 25 4	Z20 CNS 25 04	-	-	-	-
6	1.4823	G-X40 CrNiSi 27 4	-	-	-	-	-
6	1.4828	X15 CrNiSi 20 12	Z17 CNS 20 12	309 S24	X16 CrNi 23 14	SUH 309	309
6	1.4833	X12 CrNi 22.13	Z15 CN 24 13	309 S13	X6 CrNi 23 14	-	309S
6	1.4837	G-X40 CrNiSi 25 12	-	309 C30	G-X40 CrNiSi 25 12	SCH 17 / SCH 13A	-
6	1.4841	X15 CrNiSi 25 20	Z15 CNS 25 20	314 S25	X15 CrNiSi 25 20	SUH 310	310 / 314
6	1.4845	X12 CrNi 25 21	Z12 CN 25 20	310 S24	X6 CrNi 25 20	SUS 310	310
6	1.4848	G-X40 CrNiSi 25 20	-	310 C40 / 310 C45	G-X40 CrNiSi 26 20	SCH 21 / SCH 22	HK
6	1.4864	X 12 NiCrSi 35 16	Z12 NCS 33 16	NA17	-	SUH 330	330
6	1.4865	G-X40 NiCrSi 38 18	-	330 C11 / 330 C40	G-X50 NiCrSi 39 19	SCH 15 / SCH 16	-
6	1.4873	X45 CrNiW 18 9	Z45 CNW 18 9	-	X45 CrNiW 18 9	SUH 31	-

Material group	Material number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI/SAE	
		Austenitic and duplex stainless Steel						
6	1.4876	X10 NiCrAlTi 32 20	Z10 NC 32 21	NA15(H)	-	NCF 800(TP)	B163	
6	1.4878	X12 CrNiTi 18 9	Z6 CNT 18 10	321 S51	(X6 CrNiTi 18 11)	SUS 321	321	
6	1.4882	X50 CrMnNiNbN 21 9	Z50 CMNNb 21 9	-	-	-	-	
6	1.4958	X5 NiCrAlTi 31 20	-	-	-	-	-	
6	1.4977	X40 CoCrNi 20 20	Z42 CNKDOWNb	-	-	-	-	
Ferritic stainless Steel								
7	1.4000	X6 Cr 13	Z6 C 13	403 S17	X6Cr 13	SUS 403 / SUS 410S	403 / 410S / 429	
7	1.4001	X7 Cr 14	Z8 C 13FF	403 S17	X6 Cr 13	SUS 403 / SUS 401S	403 / 401S / 429	
7	1.4002	X6 CrAl 13	Z8 CA 12	405 S17	X6 CrAl 13	SUS 405	405	
7	1.4008	G-X 7 CrNiMo 12 1	Z12 CN 13M	410 C21	GX12 Cr 13	-	-	
7	1.4016	X8 Cr 17	Z8 C 17	430 S17 / 430 S18	X8 Cr 17	SUS 430	430	
7	1.4742	X10 CrAl 18	Z12 CAS 18	430 S15	X8 Cr 17	SUH 21	-	
7	1.4762	X10 CrAl 24	Z10 CAS 24	-	X16 Cr 26	(SUH 446)	-446	
Martensitic stainless Steel								
8	1.2083	X42 Cr 13	Z40 C 14	-	-	SUS 420J2	420	
8	1.4006	X12 Cr 13	Z10 C 13	410 S21 / 410 C21	X12 Cr 13	SUS 410	410	
8	1.4011	G-X 12 Cr 12	-	ANC1A	-	-	CA-15	
8	1.4021	X20 Cr 13	Z20 C 13	420 S37	X20 Cr 13	SUS 420J1	420	
8	1.4024	X15 Cr 13	Z15 C 13	420 S29	-	SUS 410J1	410	
8	1.4027	G-X20 Cr 14	Z20 C 13M	420 C24 / 420 C29	-	SCS 2	-	
8	1.4028	X30 Cr 13	Z30 C 13	420 S45	(G) X 30 Cr 13	SUS 420J2	420F	
8	1.4031	X39 Cr 13	Z40 C 14	-	X40 Cr 13	SUS 420J2	-	
8	1.4034	X46 Cr 13	Z44 C 14	(420 S45)	X40 Cr 14	-	-	
8	1.4531	X40 CrSiMo 10 2	Z40 CSD 10	-	-	SUH 3	-	
8	1.4718	X45 CrSi 9 3	Z45 CS 9	401 S45	X45 CrSi 8	SUH 1	HNV3	
8	1.4720	X20 CrMo13	-	-	-	-	-	
8	1.4724	X10 CrAl 13	Z10 C 13	-	X10 CrAl 12	SUS 405	405	
Gray cast Iron								
9	0.6010	EN-GJL 100 / GG 10 Ft 10D	-	-	G 10	FC 100	CLASS 20	
9	0.6015	EN-GJL 150 / GG 15 Ft 15D	-	-	GRADE 150	G 15	FC 150	CLASS 25
9	0.6020	EN-GJL 200 / GG 20 Ft 20D	-	-	GRADE 220	G 20	FC 200	CLASS 30
9	0.6025	EN-GJL 250 / GG 25 Ft 25D	-	-	GRADE 260	G 25	FC 250	CLASS 35
9	0.6030	EN-GJL 300 / GG 30 Ft 30D	-	-	GRADE 300	G 30	FC 300	CLASS 45
9	0.6035	EN-GJL 350 / GG 35 Ft 35D	-	-	GRADE 350	G 35	FC 350	CLASS 50
9	0.6040	EN-GJL 400 / GG 40 Ft 40D	-	-	GRADE 400	-	-	CLASS 55
Nodular cast Iron								
10	0.7033	EN-GJS 350/GGG 35.3	-	-	-	-	-	
10	0.7040	EN-GJS 400/GGG 40	FCS 400-12	SNG420/12	GGG 40	FCD 400	60-40-18	
10	0.7043	EN-GJS400-15/GGG 40.3	FCS 370-17	SNG370/17	-	-	-	
10	0.7050	EN-GJS 500/GGG 50	FCS 500-7	SNG500/7	GGG 50	FCD 500	80-55-06	
10	0.7060	EN-GJS 6007/GGG 60	FCS 600-3	SNG600/3	GGG 60	FCD 600	-	
10	0.7070	EN-GJS 700/GGG 70	FCS 700-2	SNG700/2	GGG 70	FCD 700	1000-70-03	
10	0.8035	GTW-35	MB35-7	W340/3	-	-	-	
10	0.8040	GTW-40	MB40-10	W410/4	GMB40	-	-	
10	0.8045	GTW-45	-	-	GMB45	-	-	
10	0.8055	GTW-55	-	-	-	-	-	
10	0.8065	GTW-65	-	-	-	-	-	
10	0.8135	GTS-35	MN35-10	B340/12	-	FCMW 330	32510	
10	0.8145	GTS-45	-	P440/7	-	FCMW 370	40010	
10	0.8155	GTS-55	MP50-5	PS10/4	-	FCMP 490	50005	
10	0.8165	GTS-65	MP60-3	P570/3	-	FCMP 540	70003	

Material group	number	DIN	AFNOR	BS	UNI	JIS	AISI/SAE
Nodular cast Iron							
10	0.8170	GTS-70	M870-2	P690/2	-	-	90001
Nickel based Alloys							
11	2.4360	NiCu 30 Fe	NU 30	NA13	-	-	Monel 400
11	2.4375	NiCu 30 Al	ND 30 AT	NA18	-	-	Monel K-500
11	2.4610	NiMo 16Cr 16Ti	-	-	-	-	Hastelloy C-4
11	2.4630	NiCr 20 Ti	NC 20 T	HR 5, 203-4	-	-	Nimonic 75
11	2.4642	NiCr 29 Fe	NC 30 Fe	-	-	-	Inconel 690
11	2.4668	NiCr 19 FeNbMo	NC 19 Fe Nb	-	-	-	Inconel 718
11	2.4669	NiCr 15 Fe7TiAl	NC 15 TNb A	-	-	-	Inconel X-750
11	2.4685	G-NiMo 28	-	-	-	-	Hastelloy B
11	2.4694	NiCr 16 Fe 7 TiAl	-	-	-	-	Inconel 751
11	2.4810	G-NiMo 30	-	-	-	-	Hastelloy C
11	2.4856	NiCr 22Mo 9Nb	NC 22 FeDNb	NA21	-	-	Inconel 625
11	2.4858	NiCr 21 Mo	NC 21 FeDU	NA16	-	-	Incoloy 825
Titanium based Alloys							
12	3.7025	Ti 1	-	2TA1	-	-	R 50250 / Titan Grade 2
12	3.7115	TiAl 5 Sn 2	-	-	-	-	-
12	3.7124	TiCu 2	-	2TA21-24	-	-	-
12	3.7145	TiAl 6 Sn 2 Zr 4 Mo 2 S	-	-	-	-	R 54620
12	3.7165	TiAl 6 V 4	TA 6 V	TA 10-13; TA28	-	-	R 56400 / Titan Grade 5
12	3.7175	TiAl 6 V 6 Sn 2	-	-	-	-	-
12	3.7185	TiAl 4 Mo 4 Sn 2	-	TA 45-51; TA 57	-	-	-
12	3.7195	TiAl 3 V 2.5	-	-	-	-	-
12	3.7225	Ti-35A 0.2PD	-	TP1	-	-	R 52250 / Titan Grade 1
12	3.7235	Ti-50A 0.2PD	-	-	-	-	Titan Grade 7
Cobalt based Alloys							
---		Stellite 6	Stellite 6	-	-	-	VF2
---		Stellite 7	Stellite 7	-	-	-	-
----		Stellite 12	Stellite 12	-	-	-	VF7
-----		Stellite F	Stellite F	-	-	-	-
Bronze							
13	2.0966	CuAl10 Ni5 Fe4	CuAl9 Ni5 Fe3 M1	CA 104	-	-	CDA / C63000
13	2.1052	CuSn12 Ni	-	1400 PB2	-	-	CDA / C 91700
13	2.1090	CuSn7 ZNPb	U-E7 Z5 Pb4	BS 1400	-	-	CDA / C 93200
13	2.1176	CuPb10 SN	U PB8	1400 LB2	-	-	CDA / C 94400
Aluminium with low Silicon							
14	3.1255	AlCuSiMn	A-U4SG	-	-	-	-
14	3.1325	AlCuMg 1	A-U4G	-	-	-	-
14	3.1645	AlCuMgPb	A-U4Pb	-	-	-	-
14	3.2153	G-AlSi7 Cu3	-	-	-	-	-
14	3.2315	AlMgSi 1	A-SGM0,7	-	-	-	-
14	3.3355	AlMg5	-	-	-	-	-
14	3.3535	AlMg 3	A-G3M	-	-	-	-
Aluminium with high Silicon							
15	3.2573	G-AlSi9	-	-	-	-	-
15	3.2581	G-AlSi12	-	-	-	-	-
15	3.2583	G-AlSi12 Cu	-	-	-	-	-

Insert reference table

Look up your existing insert designation in the left column - the compatible Naska insert is shown in the right column. Naska Milling grade LT-30 will replace the grade of the insert being used.

Reference Insert	Naska Insert	Reference Insert	Naska Insert
A		APKT 160408E	APKT 1604 PDTR
APCR 1003 PDFR-P	APLX 1003 PDTR	APKT 160408R	APKT 1604 PDTR
APCT 1003 PDR-HM	APLX 1003 PDTR	APKT 160408TR-D15	APKT 1604 PDTR
APCT 160408FR	APKT 1604 PDTR	APKT 1604PDTR-M14	APKT 1604 PDTR
APET 100 305ER	APLX 1003 PDTR	APKT 1604PDTR-ME14	APKT 1604 PDTR
APET 100 308ER	APLX 100308 PDTR	APKX 1604PDR-ME11	APMT 1604 PDTR
APET 160404 HS	APKT 1604 PDTR	APKX 1604PDR-ME12	APMT 1604 PDTR
APET 160408ER	APKT 1604 PDTR	APMT 1604 PDER	APKT 1604 PDTR
APET 160408HS	APKT 1604 PDTR	APMT 160408-M	APMT 1604 PDTR
APET 160408TR	APKT 1604 PDTR	APMW 1604 PDTR	APKT 1604 PDTR
APEX 1604 PDFR	APKT 1604 PDTR	APMX 160408TR-M14	APKT 1604 PDTR
APEX 160408FR-E07	APMT 1604 PDTR	APMX 160408TR-ME11	APMT 1604 PDTR
APEX 160408FR-E08	APMT 1604 PDTR	APPT 160408 PDER GD	APKT 1604 PDTR
APFT 1604 PDR	APKT 1604 PDTR	APPT 160408 PDSR GD	APKT 1604 PDTR
APFT 1604 PDTR	APKT 1604 PDTR	H	
APFT 1604PDR-M12	APKT 1604 PDTR	HM90 APCR 100304 PDFRDP	APLX 1003 PDTR
APFT 1604PDTR-D15	APKT 1604 PDTR	HM90 APCR 100304 PDFR-P	APLX 1003 PDTR
APFT 1604PDTR-E08	APKT 1604 PDTR	HM90 APKT 1003 PDR	APLX 1003 PDTR
APFW 1604 PDER	APKT 1604 PDTR	HM90 APKT 1003 PDTR-8M	APLX 1003 PDTR
APFW 1604 PDTR	APKT 1604 PDTR	HM90 APKT 100304 PDR	APLX 1003 PDTR
APHT 1604 PDER	APKT 1604 PDTR	O	
APHT 1604 PDFR	APKT 1604 PDTR	ODET 0605 APEN	ODMT 060508 TN
APHT 1604 PDTR	APKT 1604 PDTR	ODMT 0605 APEN	ODMT 060508 TN
APHW 100304 PDER	APLX 1003 PDTR	ODMW 060508	ODMW 060508 TN
APHW 100308 PDER	APLX 100308 PDTR	ODMW 060508T	ODMW 060508 TN
APHW 1604 PDER	APKT 1604 PDTR	ODPT 060508 ENGPW	ODMT 060508 TN
APHW 1604 PDSR	APKT 1604 PDTR	ODPW 060508 ENGN	ODMW 060508 TN
APHW 160408 PDER	APKT 1604 PDTR	OFCN 0704 TN-EMR	OFER 070405 TN
APKR 1003 PDR-HM	APLX 1003 PDTR	OFCN 0704 TN-MR	OFER 070405 TN
APKT 100 304ER	APLX 1003 PDTR	OFCR 0704 TN-EML	OFER 070405 TN
APKT 100 305ER	APLX 1003 PDTR	OFCT 05T3 AFFN-P	OFMT 05T305 TR
APKT 1003 PDER	APLX 1003 PDTR	OFCT 05T3 TN-EM	OFMT 05T305 TR
APKT 1003 PDFR	APLX 1003 PDTR	OFCT 05T3 TN-M	OFMT 05T305 TR
APKT 1003PDRB	APLX 1003 PDTR	OFEN 070405TN-D18	OFER 070405 TN
APKT 1003 PDR-HM	APLX 1003 PDTR	OFER 070405N-E07	OFER 070405 TN
APKT 1003 PDR-HM90	APLX 1003 PDTR	OFER 070405N-M10	OFER 070405 TN
APKT 1003 PDRJ	APLX 1003 PDTR	OFER 070405TN-M16	OFER 070405 TN
APKT 1003 PDTR-76	APLX 1003 PDTR	OFER 070405TN-ME10	OFER 070405 TN
APKT 1003 PDTR-RM	APLX 1003 PDTR	OFER 070405TN-ME15	OFER 070405 TN
APKT 100308 PDTR-RM	APLX 100308 PDTR	OFET 070405TN-M16	OFMT 070405 TR
APKT 1003PDTR-8M	APLX 1003 PDTR	OFET 070405TN-ME10	OFMT 070405 TR
APKT 1604 PDER	APLX 1003 PDTR	OFET 070405TN-ME15	OFMT 070405 TR
APKT 1604 PDER-M61	APKT 1604 PDTR	OFEX 05T305N-E04	OFMT 05T305 TR
APKT 1604 PDRB	APKT 1604 PDTR	OFEX 05T305N-M05	OFMT 05T305 TR
APKT 1604 PDR-HM	APKT 1604 PDTR	OFEX 05T305TN-D09	OFMT 05T305 TR
APKT 1604 PDTR	APKT 1604 PDTR		
APKT 160404R	APKT 1604 PDTR		

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Reference Insert	Naska Insert	Reference Insert	Naska Insert
OFEX 05T305TN-M08	OFMT 05T305 TR	SEET 1204 AFER	SEKT 1204 AFTN
OFEX 05T305TN-ME07	OFMT 05T305 TR	SEEX 1203AFTN-M13	SEKN 1203 AFTN
OFMR 0704 AER-76	OFER 070405TN	SEHN 1203 AFEN	SEKN 1203 AFTN
OFMR 0704 AER-M	OFER 070405TN	SEHN 1204 AFEN	SEKN 1204 AFTN
OFMR 0704 AETN	OFER 070405TN	SEHN1504 AFSN	SEKN 1504 AFTN
OFMR 070405TR-ME13	OFER 070405TN	SEHT 1204 AFN	SEKT 1204 AFTN
OFMT 050405TR-M14	OFMT 050405TR	SEKN 1203 AFEN	SEKN 1203 AFTN
OFMT 050405TR-ME12	OFMT 050405TR	SEKN 1203 AFFN	SEKN 1203 AFTN
OFMT 05T3 AFN-HR	OFMT 05T305 TR	SEKN 1203 AFSN	SEKN 1203 AFTN
OFMT 05T3 TN-ML	OFMT 05T305 TR	SEKN 1203 AFTN	SEKN 1203 AFTN
OFMT 05T305 TN-76	OFMT 05T305 TR	SEKN 1204 AFTN	SEKN 1204 AFTN
OFMT 070405TN-M15	OFMT 070405 TR	SEKN 1504 AFEN D66	SEKN 1504 AFTN
OFMT 070405 TN-ME13	OFMT070405 TR	SEKN 1504 AFSN	SEKN 1504 AFTN
R		SEKR 1203 AFEN	SEKR 1203 AFTN
R245-12T3 E-KL	SEKT 12T3 AFTN	SEKR 1203 AFEN-U	SEKR 1203 AFTN
R245-12T3 E-ML	SEKT 12T3 AFTN	SEKR 1204 AFSN 6GP	SEKR 1204 AFTN
R245-12T3 E-PL	SEKT 12T3 AFTN	SEKT 1204 AFER	SEKT 1204 AFTN
R245-12T3 K-MM	SEKT 12T3 AFTN	SELT 1204 EN	SEKT 1204 AFTN
R245-12T3 M-KH	SEKT 12T3 AFTN	SEMN 1203 AFN	SEKN 1203 AFTN
R245-12T3 M-KL	SEKT 12T3 AFTN	SEMR 1203 AFSN	SEKR 1203 AFTN
R245-12T3 M-KM	SEKT 12T3 AFTN	SEMR 1203 AFTN	SEKR 1203 AFTN
R245-12T3 M-KM	SEKT 12T3 AFTN	SEMT 13T3 AGSN-JH	SEKT 12T3 AFTN
R245-12T3 M-PH	SEKT 12T3 AFTN	SEMT 13T3 AGSN-IM	SEKT 12T3 AFTN
R245-12T3 M-PL	SEKT 12T3 AFTN	SENN 1203 AFEN	SEKN 1203 AFTN
R245-12T3 M-PM	SEKT 12T3 AFTN	SENN 1204 AFEN	SEKN 1204 AFTN
r290-12T308	SPMT 12T308	SENN 1504 AFTN	SEKN 1504 AFTN
S		SEPN 1203 AFEN 6GN	SEKN 1203 AFTN
SDCW 1204 AEEN	SDKT 1204 AETN	SEPN 1204 AFEN 6GN	SEKN 1204 AFTN
SDCW 1204 AEFN	SDKT 1204 AETN	SEPN 1504 AFEN 6GN	SEKN 1504 AFTN
SDCW 1204 AETN	SDKT 1204 AETN	SPER 1203 AFEN 6GB	SEKR 1203 AFTN
SDGT 1204 AFFN	SDKT 1204 AETN	SPER 1204 AFEN 6GB	SEKR 1204 AFTN
SDHT 1204 AEEN	SDKT 1204 AETN	SEPT 13T3 AGEN GD	SEKT 12T3 AFTN
SDHT 1204 AETN	SDKT 1204 AETN	SMKN 1203 E2 R	SPKN 1203 EDTR
SDKT 1204 AEEN	SDKT 1204 AETN	SMKN 1204 E2 R	SPKN 1204 EDTR
SDMT 1204 AFPN P63	SDKT 1204 AETN	SPCN 1203 SFR	SPKN 1203 EDTR
SEAN 1203 AFEN 6LN	SEKN 1203 AFTN	SPEN 1203 EDR	SPKN 1203 EDTR
SEAN 1204 AFEN 6LN	SEKN 1204 AFTN	SPER 1204 ENGB	SPKR 1204 EDTR
SEAN 1504 AFEN 6LN	SEKN 1504 AFTN	T	
SECN 1203 AFFN	SEKN 1203 AFTN	TPCN 160308	TPUN 160308
SEEN 1203 AFEN	SEKN 1203 AFTN	TPKN 1603 PP-R-42	TPK 1603 PDTR
SEEN 1504 AFEN	SEKN 1504 AFTN	TPKN 2204 P2R	TPKN 2204 PDTR
SEER 1203 AZ-WL	SEKR 1203 AFTN	TPMN 160308	TPUN 160308
SEER 1203 AZ-WM	SEKR 1203 AFTN		
SEER1204 AFEN	SEKR 1204 AFTN		
SEER 1204 AFER	SEKR 1204 AFTN		
SEET 13T3 AGEN-JL	SEKT 12T3 AFTN		

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