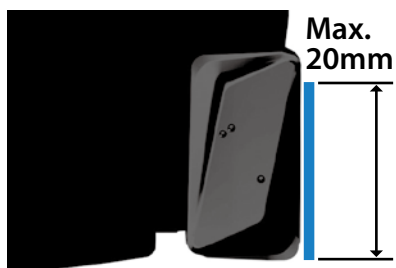


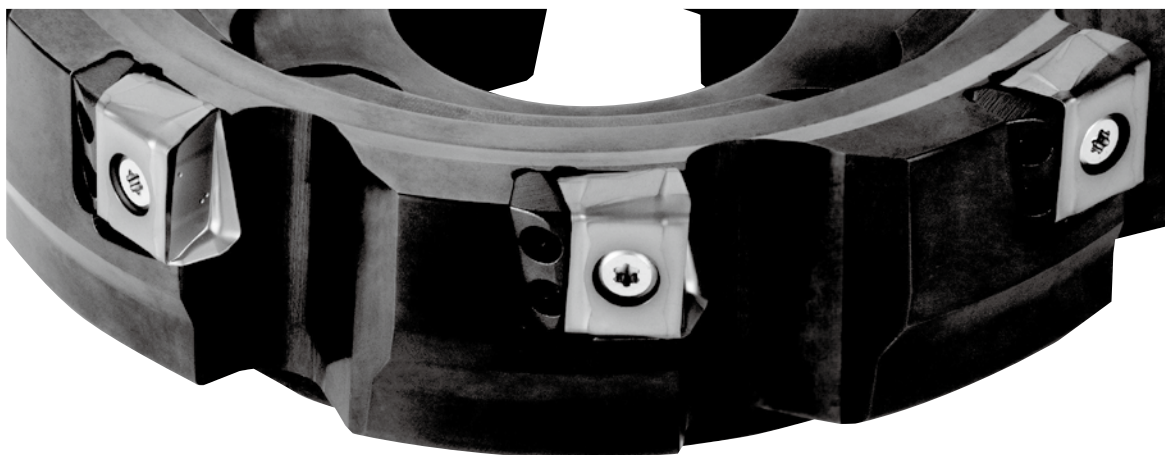
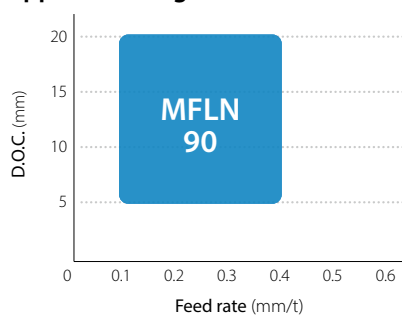
2 Large D.O.C. and high feed rates

MFLN90

Cutting edge angle 90°



Applicable range



Chip comparison (Internal evaluation)

Helix-shaped chips prevent chip recutting and provide stable machining at high feed rates.

MFLN90

Stable



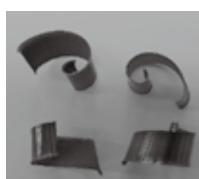
fz = 0.3 mm/t



fz = 0.4 mm/t

Competitor A

Unstable



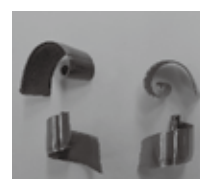
fz = 0.3 mm/t



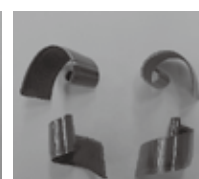
fz = 0.4 mm/t

Competitor B

Unstable



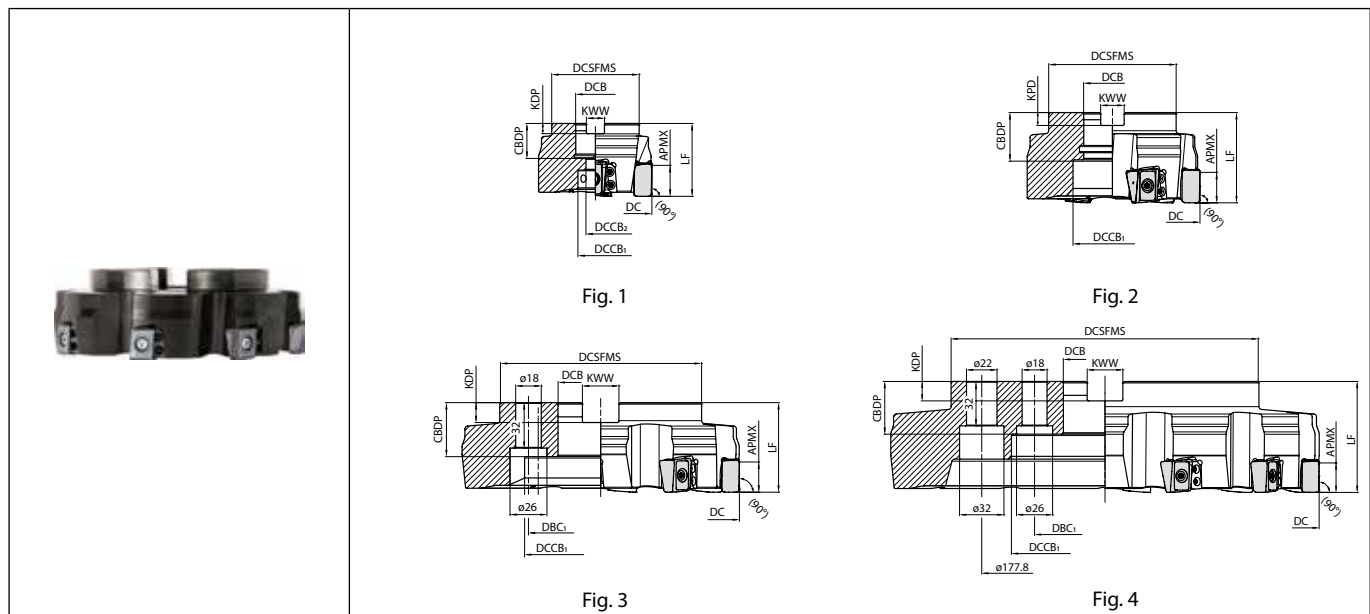
fz = 0.3 mm/t



fz = 0.4 mm/t

Cutting conditions: Vc = 150 m/min. ap × ae = 10 × 100 mm. fz = 0.3, 0.4 mm/t. ø125 (1 insert). drv. workpiece: S50C

MFLN90



Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)											A.R. max (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M153
					R	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DBC ₁	LF	CBDP	KDP	KWW							
Metric	MFLN	90080R-4T-M	●	4	80	60	27	24	13	-	50	24	7	12.4	20	+4.5	-16.5	5970	1	1	LOGU221616ER-GM LOGU2216PAER-GM	
		90100R-4T-M	●		100	70	32	45	66.7		30	8	14.4	-14.5			Yes	4780	1.5	2		
		90125R-6T-M	●	6	125	89	40	55		63	33	9	16.4	-13.5			No	3820	2.9	2		
		90160R-7T-M	●	7	160	110		90	101.6		38	14	25.7				-13	No	2990	4.5		3
		90200R-8T-M	●	8	200	142	132	80		1910				10.3				3				
		90250R-10T-M	●	10	250		60		172		1520	20.9	4									
		90315R-12T-M	MTO	12	315	222	205															
Bore dia. inch spec	MFLN	90080R-4T	●	4	80	60	25.4	24	13	-	50	27	6	9.5	20	+4.5	-16.5	5970	1	1	LOGU221616ER-GM LOGU2216PAER-GM	
		90100R-4T	●		100	70	31.75	45	63		34	8	12.7	-14.5			Yes	4780	1.6	2		
		90125R-6T	●	6	125	89	38.1	55		38	10	15.9	-13.5	No			3820	3	2			
		90160R-7T	●	7	160	110	50.8	90	101.6		14	25.4					-13	No	2990	4.6		2
		90200R-8T	●	8	200	142	132	80		1910			10.5	3								
		90250R-10T	●	10	250		47.625		172		1520	21.8					4					
		90315R-12T	MTO	12	315	222	205															

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

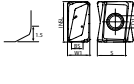
Spare parts

Description	Parts						
	Clamp screw	Wrench	Shim	Clamp screw	Wrench	Anti-seize compound	Arbor bolt
MFLN ○○080R-4T(-M)							
MFLN ○○100R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15	P-37	HH12X35
MFLN ○○315R-12T(-M)	Tightening torque for clamping insert 6.0 N·m		Tightening torque for clamping shim 3.5 N·m				-

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item MT0 : Made to order

LOGU

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel	☆	★	☆	P				
		Mold and die steel	☆	★	☆					
		Austenitic stainless steel				M				
		Martensitic stainless steel								
		Precipitation hardening stainless steel								
		Gray cast iron	☆	★	☆	K				
		Nodular cast iron	☆	★	☆					
		Non-ferrous metals				N				
		Heat-resistant alloy				S				
		Titanium alloy								
		Hard materials				H				
Insert	Description	Dimension (mm)						Carbide	Applicable toolholder ➡ M152 M44 M45	
		S	D1	RE	W1	INSL	BS	PVD		
								PR1525 PR1535 PR1825 PR1835		
	 Corner-R	LOGU 221616ER-GM	16.6	6.8	1.6	12.5	22.8	6.3	○ ● ● ●	MFLN90... MFLN45... MFLN70...
	 Corner Chamfer	LOGU 2216PAER-GM	16.9	6.8	-	12.5	22.8	4.8	○ ● ● ●	MFLN90...

Recommended cutting conditions ● M154

About applicable insert

	LOGU221616ER-GM (Corner-R)	LOGU2216PAER-GM (Corner chamfer)
MFLN 90	✓	✓

● : Standard item ○ : Will be replaced with a new product

M



Milling

Recommended cutting conditions

	Workpiece material	D.O.C. (mm)		fz: mm/t	Recommended insert grades (Vc: m/min)	
		Width of cut ≤0.5×DC	Width of cut >0.5×DC		MEGACOAT NANO EX (MEGACOAT NANO)	
					PR1825 (PR1525)	PR1835 (PR1535)
MFLN 90	Carbon steel	~18	~15	0.1 – 0.2 – 0.4	★ 100 – 150 – 180	☆ 80 – 120 – 150
	Alloy steel				★ 100 – 150 – 180	☆ 80 – 120 – 150
	Mold steel				★ 80 – 120 – 150	☆ 70 – 100 – 120
	Gray cast iron	~20	~18	0.1 – 0.2 – 0.4	★ 100 – 150 – 180	☆ 80 – 120 – 150
	Nodular cast iron				★ 100 – 150 – 180	☆ 80 – 120 – 150

The table above provides recommendations based on product specifications. Before using the product, check the machine's specifications such as power. The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation. Dry machining is recommended.

★ : 1st recommendation ☆ : 2nd recommendation

M



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

How to mount an insert

1. Completely eliminate chips and dust from the insert mounting side.
2. After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1,2)
3. Make sure that the identification on the top of the insert is the same in each pocket.(Fig.3)
4. Tighten the wrench (TTP-20) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 N·m)
6. After tightening, check that there is no gap between the insert and the surface of the shim, or between the side surface of insert and the holder surface. If there is a gap, remount the insert using the directions above.

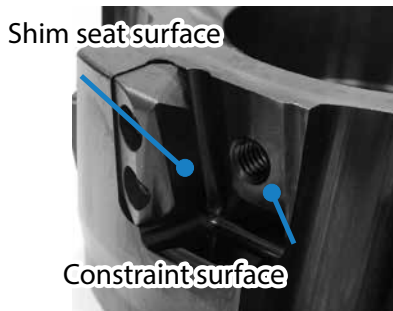


Fig.1

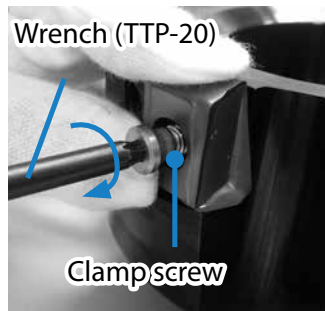


Fig.2

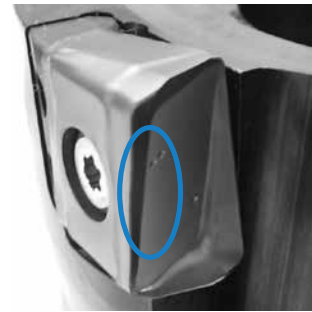


Fig.3

How to replace a shim

1. Completely eliminate chips and dust from the shim mounting side.
2. Coat medium strength screw locking adhesive on the screws.
3. Tighten the screw keeping the shim pushed against the pocket surface of toolholder.
4. After tightening both screws temporarily, tighten them with appropriate torque. (Recommended torque: 3.5 N·m)
5. Please check that there is no gap between the shim and the pocket surfaces of toolholder.



Fig.1

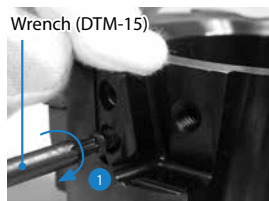


Fig.2

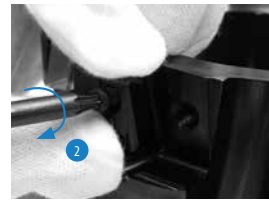


Fig.3



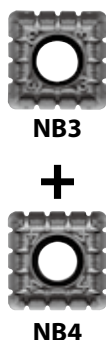
Fig.4

M



Milling

Face mill for heavy milling MSRS90

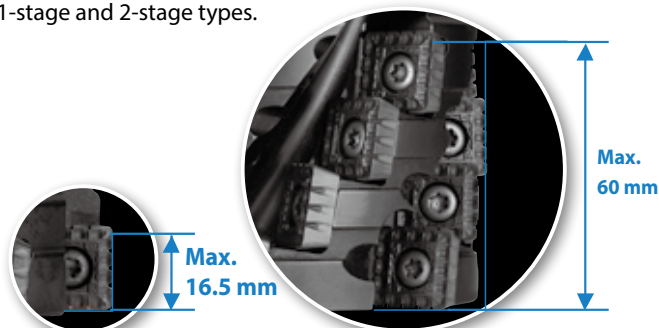


High efficiency, low cutting force and stable machining without chattering
Neutral and corner-R insert

Applicable to shouldering (Cutting edge angle: 90°),
 high feed milling (Cutting edge angle: 30°), plunging, and side cutter.

Wide selection of cutting edge length according to cutting conditions

4-stage type (ø80, ø100) is added to the standard lineup as well as 1-stage and 2-stage types.

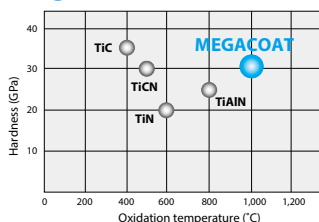


Custom-ordered milling cutter with high performance notched neutral inserts provides various applications



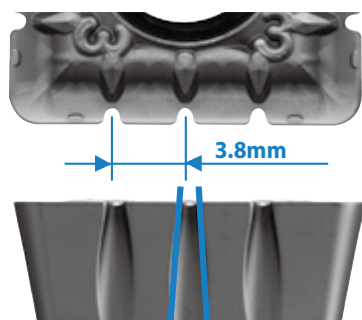
Neutral insert with corner-R is available to various applications

Long tool life: MEGACOAT



High hardness and high oxidation resistance long tool life: MEGACOAT

Notched insert SPMT180616EN

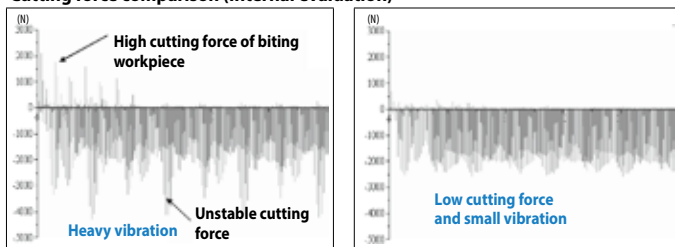


The notched insert breaks chips into small pieces and reduces cutting force.
 The second land near the cutting edge improves edge strength.

For neutral (Right/Left) hand
 Applicable for various cutting edge angle.
 Cutting edge length: 18mm

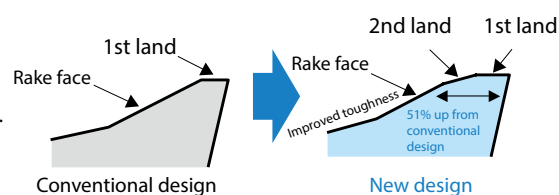
Low cutting force (Notched insert benefit)

Cutting force comparison (Internal evaluation)



Competitor A

MSRS90



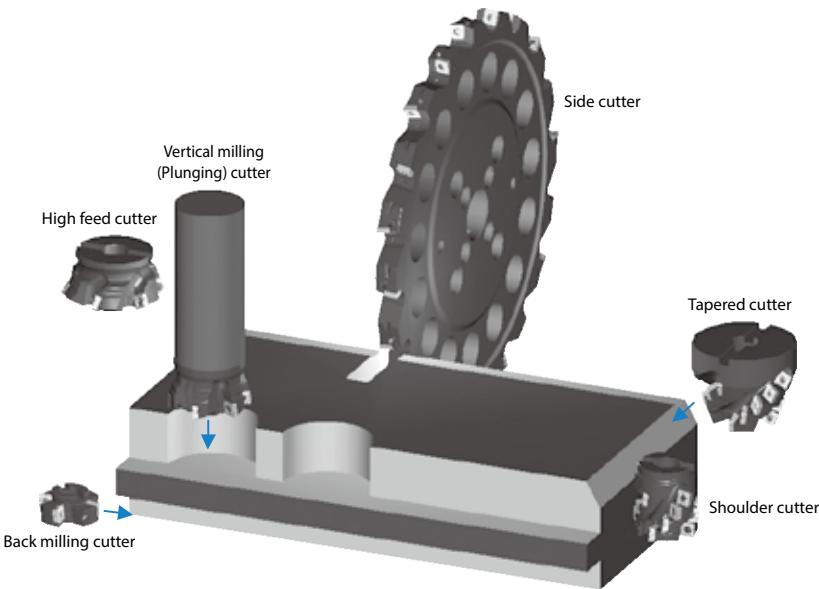
Edge preparation

Notched insert realizes lower cutting force and smaller vibration

Applicable inserts: Available for various applications

Applications	Chipbreaker selection	3-notched	4-notched	Without notch
General purpose	Standard	 + 		
Low cutting force	Low cutting force	 + 		
Edge strength oriented	Without notch (Usable with notched inserts)	( or ) + 		

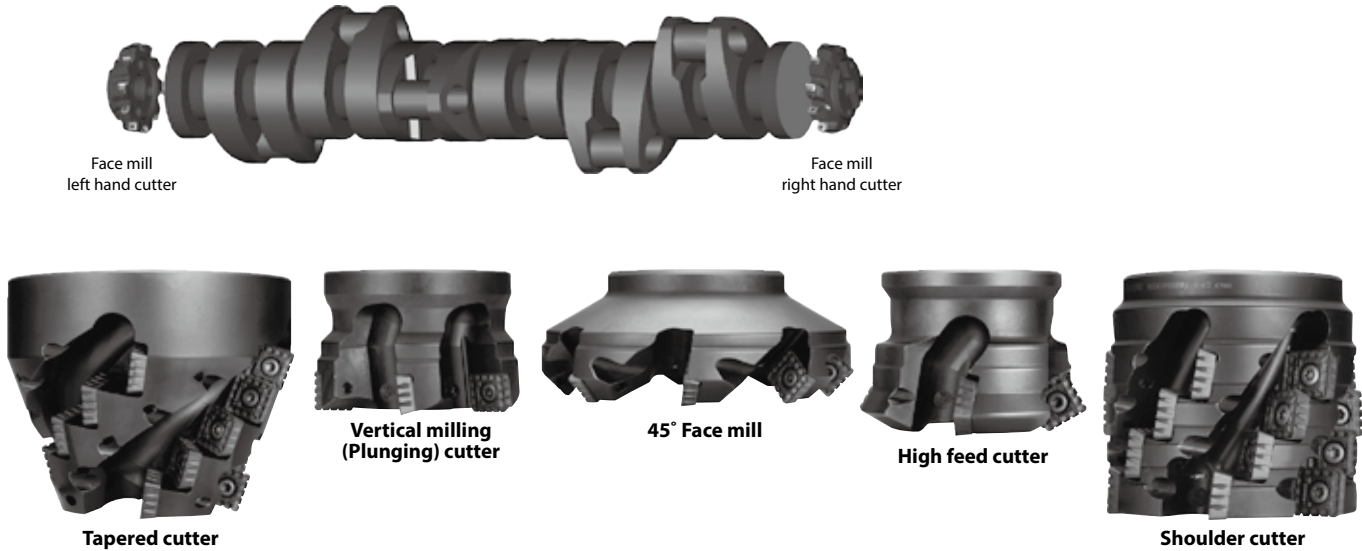
Various expansive possibilities (Custom-ordered and standard milling cutter)



The custom-ordered milling cutter can be customized for your requirements such as diameter, Cutting edge angle, number of insert stages.



Shaft length determination



MSRS90

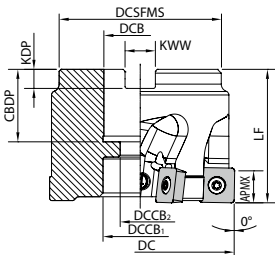


Fig. 1

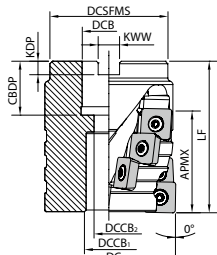


Fig. 3

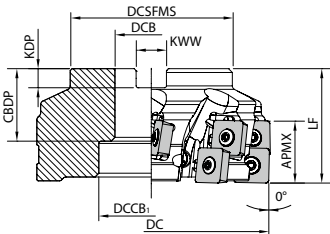


Fig. 5

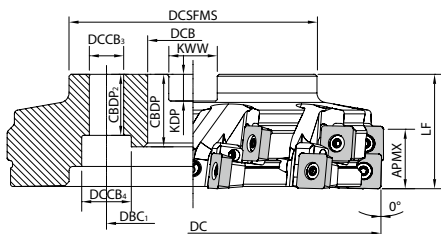


Fig. 7

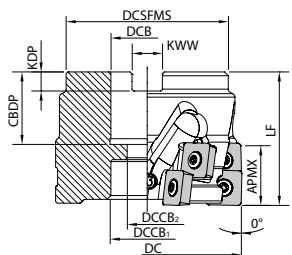


Fig. 2

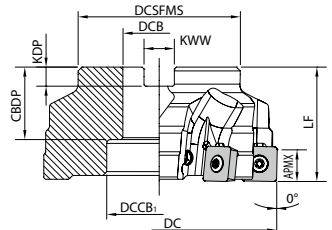


Fig. 4

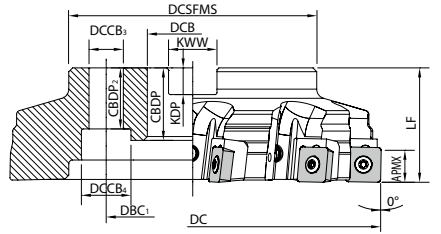


Fig. 6

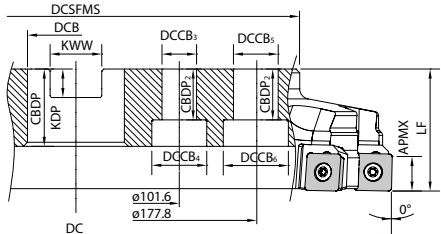


Fig. 8

M

Milling

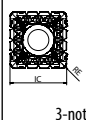
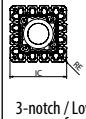
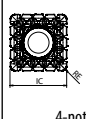
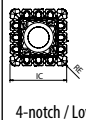
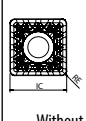
Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Toolholder dimensions

Description			Availability	Inserts	Flutes	Stages	Dimension (mm)															A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts ➡ M160
			R				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	DBC ₁	LF	CBDP	CBDP ₂	KDP	KWW						
Metric	MSRS	90080R-1-4T-M	● 4	4	1	80	70	27	20	13						60	24	7	12.4	16.5	+7	-10	No	1.3	1	SPMT180616EN-...	
		90080R-2-4T-M	● 8																	2				31	1.1		2
		90080R-4-4T-M	● 16																	4				60	1.4		3
		90100R-1-6T-M	● 6	6	100	32	45		-	-	-	70	30	-	8	14.4	16.5	2.2	1								
		90100R-2-6T-M	● 12														2	31	2	2							
		90100R-4-6T-M	MTO 24														4	85	60	3.1	3						
		90125R-1-8T-M	● 8	8	125	40	55		-	-			33	9	16.4	16.5	2.6	4									
		90125R-2-8T-M	MTO 16													2	31	2.4	5								
		90160R-1-8T-M	● 8													1	160	110	16.5	4.2	6						
		90160R-2-8T-M	MTO 16	2			-	14	20	66.7		28	31	4	7												
		90200R-1-10T-M	● 10	10	200						60						16.5	6.7	6								
		90200R-2-10T-M	MTO 20														2	140	31	6.6	7						
		90250R-1-12T-M	● 12	12	250	60	-			18	26		101.6	40	14	25.7	16.5	12.6	6								
		90250R-2-12T-M	MTO 24														2	31	12.5	7							
		90315R-1-14T-M	● 14	14	315	220				17	27	22	32	-		25	16.5	16.1	8								
		90315R-2-14T-M	MTO 28														2	31	16								
Bore dia. inch spec	MSRS	90080R-1-4T	● 4	4	1	80	70	31.75	27	18						60	32	8	12.7	16.5	+7	-10	No	1.4	1	SPMT180616EN-...	
		90080R-2-4T	● 8													2				31				1.2	2		
		90080R-4-4T	● 16													4				60				1.5	3		
		90100R-1-6T	● 6	6	100	39	21	-	-	-	70		-		10	15.9	16.5	2.3	1								
		90100R-2-6T	● 12														2	31	2.1	2							
		90100R-4-6T	MTO 24														4	85	38.1	60	3.2	3					
		90125R-1-8T	● 8	8	125	55		-	-	-							16.5	2.6	4								
		90125R-2-8T	MTO 16														2	31	2.4	5							
		90160R-1-8T	● 8														1	160	100	50.8	70	16.5	4.3	4			
		90160R-2-8T	MTO 16	2						38		11	19.1	31	4.1	5											
		90200R-1-10T	● 10	10	200			-			60						16.5	6.7	6								
		90200R-2-10T	MTO 20														2	130	31	6.6	7						
		90250R-1-12T	● 12	12	250	47.625	-			18	26		101.6		32	14	25.4	16.5	12.6	6							
		90250R-2-12T	MTO 24															2	31	12.5	7						
		90315R-1-14T	● 14	14	315	220				17	27	22	32	-		25	16.5	16.1	8								
		90315R-2-14T	MTO 28														2	31	16								

● : Standard item MTO : Made to order

SPMT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel				★	P			
		Mold and die steel				★				
		Austenitic stainless steel					M			
		Martensitic stainless steel								
		Precipitation hardening stainless steel								
		Gray cast iron				★	K			
		Nodular cast iron				★				
		Non-ferrous metals					N			
		Heat-resistant alloy					S			
		Titanium alloy								
		Hard materials					H			
Insert	Description	No. of edges	Dimension (mm)				Angle (°)	Carbide	Applicable toolholder ➡ M159	
			IC	S	D1	RE	AN	PVD		
								PR1810		PR1835
	 3-notch	4	18	6.35	6.8	1.6	11	● ●	MSRS90...	
	 3-notch / Low cutting force	4	18	6.35	6.8	1.6	11	● ●	MSRS90...	
	 4-notch	4	18	6.35	6.8	1.6	11	● ●	MSRS90...	
	 4-notch / Low cutting force	4	18	6.35	6.8	1.6	11	● ●	MSRS90...	
	 Without notch	4	18	6.35	6.8	1.6	11	● ●	MSRS90...	

Recommended cutting conditions ➡ M161

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

● : Standard item

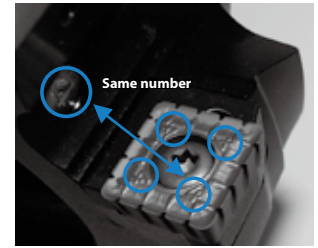
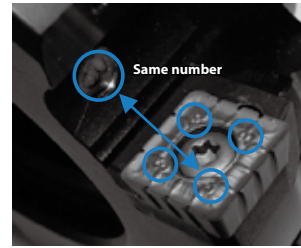
M160

Caution when installing notched insert

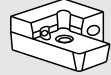
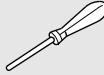
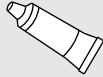
It is important to install the appropriate notched insert into the correct position. If it is installed in incorrect position, the tool cannot cut the workpiece and it may damage the toolholder body. For MSRS90, notched insert location indicator is marked at insert installed pocket of the cutter body.

Description	No. of inserts	No. of flutes	No. of stages	No. of inserts	
				Notched	
				NB3(P)	NB4(P)
MSRS 90100R-1-6T	6	6	1	3	3
	12		2	6	6
	24		4	12	12

When installing the inserts, match the number on the top surface of insert to the number of the cutter body.



Spare parts

Description		Spare parts								
		Clamp screw	Wrench	Cartridge		Clamp screw	Wrench	Anti-seize compound	Mounting bolt	
				MAP-1806M 	MAP-1806S  (Bottom edge only)					
Without cartridge	MSRS	90080R-○-4T-M	SB-60120TR	TT-25L	-	-	-	-	P-37	HH12X35
		90100R-○-6T-M			-	-	-	-		-
		90125R-○-8T-M			-	-	-	-		-
With cartridge	MSRS	90160R-○-8T-M	MAP-1806M*1	MAP-1806S*2	SB-40140TR	DT-15	Recommended tightening torque for cartridge clamp 3.5N·m		P-37	-
	?	90315R-○-14T-M								
Without cartridge	MSRS	90080R-○-4T	Recommended tightening torque for insert clamp 7.5N·m		-	-	-	-		
		90100R-○-6T			-	-	-	-	HH20X55	
		90125R-○-8T			-	-	-	-		
With cartridge	MSRS	90160R-○-8T			MAP-1806M*1	MAP-1806S*2	SB-40140TR	DT-15	Recommended tightening torque for cartridge clamp 3.5N·m	
	?	90315R-○-14T								

Notes: *1: MAP-1806M is only for the bottom edge (1st stage) of MSRS90..R-1.

*2: MAP-1806S is only for the bottom edge (1st stage) of MSRS90..R-2... Use it only for the bottom edge (1st stage).

How to attach the cartridge: You need to tighten 2 clamp screws to fix the cartridge. Tighten the slant screw first and then tighten the other screw.



Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended cutting conditions

Workpiece material	fz (mm/t)		Vc (m/min)	
	Standard NB3+NB4	Low cutting force NB3P+NB4P	MEGACOAT NANO EX	
			PR1810	PR1835
Soft steel	0.1~0.2~0.25	0.1~0.2~0.25	-	★ 120~150~220
Carbon steel	0.1~0.2~0.25	0.1~0.2~0.25	-	★ 100~150~200
Alloy steel	0.1~0.15~0.2	0.1~0.15~0.2	-	★ 100~150~200
Mold steel	0.1~0.15~0.2	0.1~0.12~0.15	-	★ 100~150~180
Gray cast iron	0.1~0.2~0.3	0.1~0.2~0.25	★ 100~180~250	-
Nodular cast iron	0.1~0.2~0.25	0.1~0.18~0.2	★ 100~180~220	-
Stainless steel	Not recommended			
Aluminum/Copper	Not recommended			

★ : 1st Recommendation ☆ : 2nd Recommendation

Cutting conditions (Shouldering)

In case of MSRS90100R-1-6T

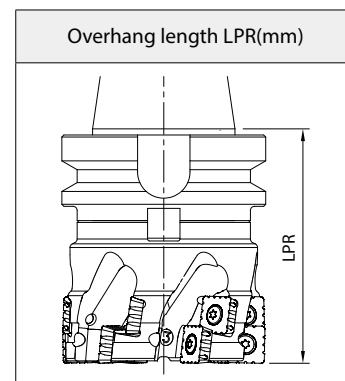
Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 120mm	180	0.2	15 × 80	826
	120~200mm	180	0.2	15 × 40	413
	201mm and over	230	0.1	15 × 40	263
Carbon steel	Less than 120mm	150	0.2	15 × 80	689
	120~200mm	150	0.2	15 × 40	344
	201mm and over	200	0.1	15 × 40	229

In case of MSRS90100R-2-6T

Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 120mm	180	0.2	30 × 50	1,032
	120~200mm	180	0.2	30 × 30	619
	201mm and over	230	0.1	30 × 25	329
Carbon steel	Less than 120mm	150	0.2	30 × 50	861
	120~200mm	150	0.2	30 × 30	517
	201mm and over	200	0.1	30 × 25	287

In case of MSRS90100R-4-6T

Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 140mm	180	0.2	60 × 20	826
	140~200mm	180	0.2	60 × 10	413
	201mm and over	230	0.1	60 × 10	263
Carbon steel	Less than 140mm	150	0.2	60 × 20	689
	140~200mm	150	0.2	60 × 10	344
	201mm and over	200	0.1	60 × 10	229



Case studies

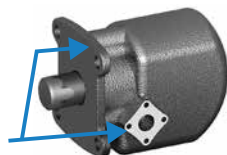
FCD450

Industrial parts

- Vc=150m/min
- ap x ae=6 x 65mm
- fz=0.15mm/t (Vf=430mm/min)

MSRS90100R-1-6T(ø100 -6 flutes)
SPMT180616EN-NB3/NB4
(PR1210)

Machined portion



MSRS90(PR1210)

Chip evacuation rate = 258cc/min

Competitor B

107cc/min

- MSRS90 more than doubled the machining efficiency compared with competitor B.
- Competitor B machined with 2 passes (ap x ae=3 x 65mm).
- MSRS90 machined with only 1 pass.
- Cutting time was reduced.

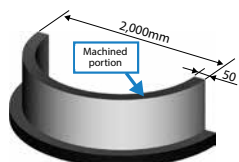
(User evaluation)

Mold steel

Shipbuilding parts

- Vc=150m/min
- ap x ae=10 x 10~50mm
- fz=0.1mm/t (Vf=240mm/min)

MSRS90160R-1-8T(ø160 -8 flutes)
SPMT180616EN-NB3/NB4
(PR1230)



MSRS90(PR1230)

Chip evacuation rate = 120cc/min

Competitor D

60cc/min

- MSRS90 more than doubled the machining efficiency compared with competitor D.
- Competitor D machined with ap x ae=5 x 10~50mm
- Low cutting force of MSRS90 enabled twice as large ap as that of competitor.
- It can double the ap as well as increase the cutting speed (Vc=100 → 150).
- Machining efficiency was improved by MSRS90 (by achieving reduction in cutting time).

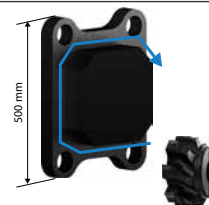
(User evaluation)

SCM420

Construction machine part

- Vc=200m/min
- ap x ae=10 x 50mm
- fz=0.1mm/t (Vf=400mm/min)

MSRS90125R-1-8T(ø125 -8 flutes)
SPMT180616EN-NB3/NB4
(PR1230)



MSRS90(PR1230)

Chip evacuation rate = 200cc/min

Competitor C

153cc/min

- MSRS90 improved the machining efficiency to 1.3 times that of competitor C.
- Competitor C machined with ap x ae=5 x 50mm
- Tool cost is reduced to 1/3 although competitor C is expensive using 2-corner insert.
- MSRS90 reduced machining cost as well as improved machining efficiency.

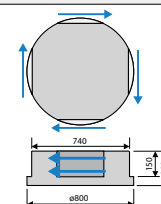
(User evaluation)

Alloy steel

Power generation parts

- Vc=160m/min
- ap x ae=10 x 0~20mm
- fz=0.15mm/t (Vf=500mm/min)

MSRS90125R-1-8T(ø125 -8 flutes)
SPMT180616EN-NB3/NB4
(PR1230)



MSRS90(PR1230)

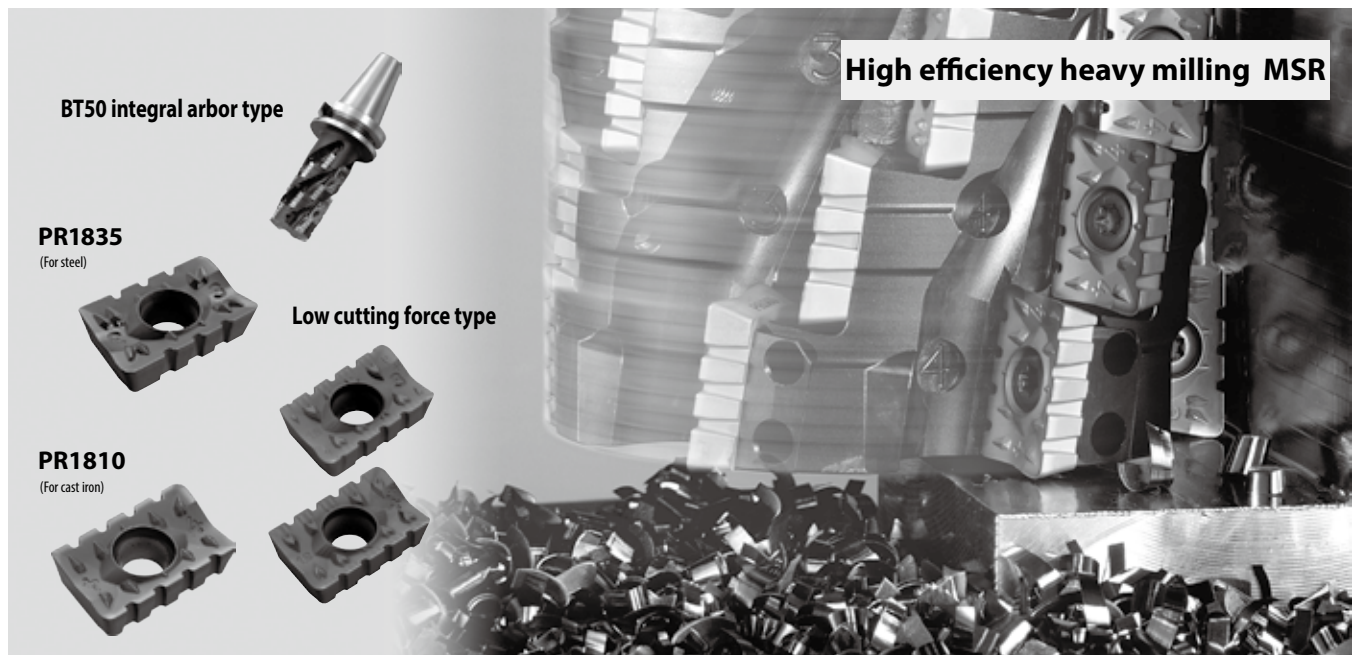
12 surfaces/edge

Competitor E

8 surfaces/edge

- MSRS90 showed 1.5 times longer tool life than that of competitor E.
- Competitor E machined with 2 passes on a side (ap x ae=12 x 0 to 10mm).
- Competitor E was poor in feed rate (Vf=400mm/min). → Machining efficiency was improved by MSRS90 (by achieving reduction in cutting time).
- Although competitor E is load due to high cutting force, MSRS90 operates fairly quietly.

(User evaluation)



High efficiency heavy milling MSR

BT50 integral arbor type

PR1835
(For steel)

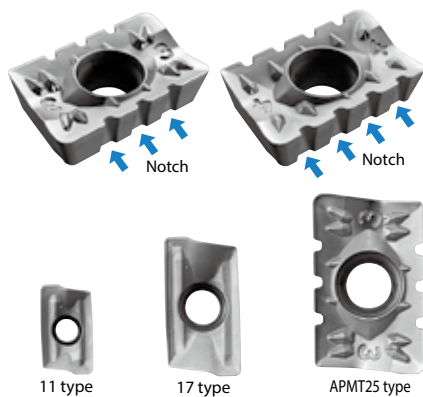
Low cutting force type

PR1810
(For cast iron)

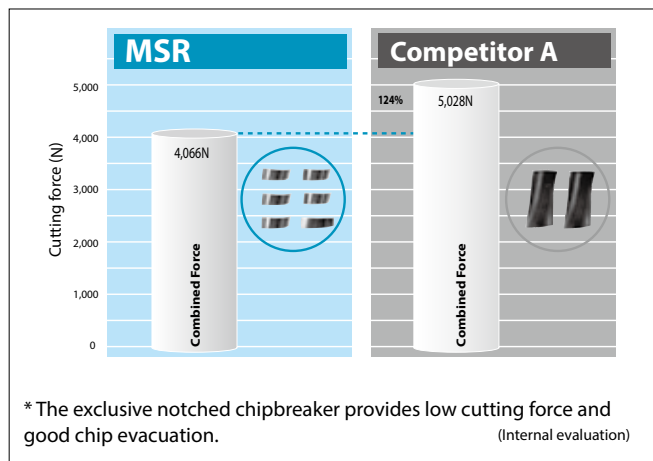
Notched insert reduces cutting force, and enables high feed rates by reducing chattering. Improved chip evacuation and low cutting force with the special chipbreaker. Enables heavy milling and deep cutting, and also drastically improves machining efficiency. (Reduction of cutting time)

Notched insert

Size comparison (full-scale)



Cutting force comparison



MSR (Face mill)

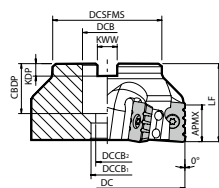
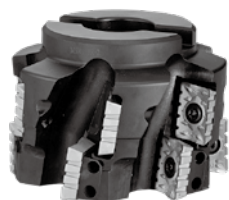


Fig. 1

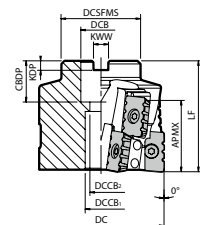


Fig. 3

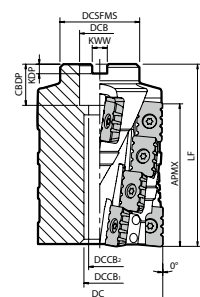


Fig. 5

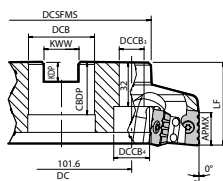


Fig. 7

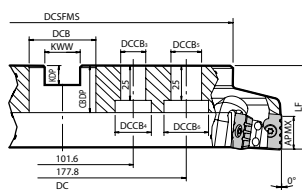


Fig. 9

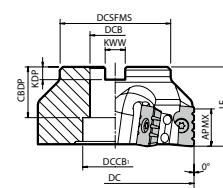


Fig. 2

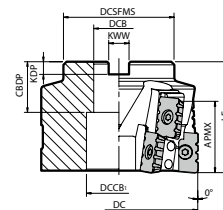


Fig. 4

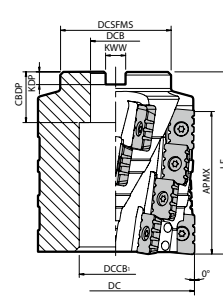


Fig. 6

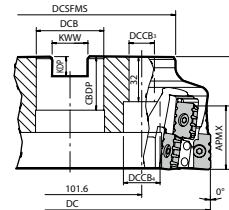


Fig. 8

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

Toolholder dimensions

Description			Availability	Inserts	Flutes	Stages	Dimension (mm)															A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts ➡ M167							
			R				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	LF	CBDP	KDP	KWW	APMX														
Metric	MSR	063R-1M	●	4	4	1	63	50	27	20	14					65	22	7.2	12.4	23.5	-8			0.7	1	APMT2506...								
		063R-2M	●	8		2																		85				45	0.9	3				
		080R-1M	●	4		1																		50				23.5	1	1				
		080R-2M	●	8		2	80	55																70				45	1.5	3				
		080R-4M	●	16		4																		115				90	2.5	5				
		100R-1M	●	6	6	1			32	42	-	-			50	28	8	14.4	23.5	+9	No		1.5	2										
		100R-2M	●	12		2	100	70															70				45	2	4					
		100R-4M	●	24		4																	115				90	3.2	6					
		125R-1M	●	6		1																	60				23.5	3.4	2					
		125R-2M	●	12		2	125	85															70		9		45	3.7	4					
		125R-4M	●	24	4			40	58				30	16.4	90	-5			6	6														
		160R-1M	●	8	1	160	100								68					60		10	23.5	6.1	2									
		160R-2M	●	16	2						70			45	6.8	4																		
		200R-1M	●	10	10	1								60	35		23.5				7	7												
		200R-2M	●	20		2	200									18	26					80			45		9.9	8						
		250R-1M	●	12	12	1		130	60	-				60	15	25.4	23.5				10.3	7												
		250R-2M	●	24		2	250															80			45		14.2	8						
		315R-1M	MT0	14	14	1	315	230					17	27	22	32	60	35		23.5			15.5	9										
Bore dia. inch spec	MSR	063R-1	●	4	4	1	63	50	25.4	20	14					65	26	6	9.5	23.5	-8			0.8	1	APMT2506...								
		063R-2	●	8		2																		85				45	1	3				
		080R-1	●	4		1																		50				23.5	1.1	1				
		080R-2	●	8		2																		70				45	1.6	3				
		080R-2-31.75	●	8		80	70	31.75																	32		8	12.7	1.7	3				
		080R-4	●	16	4		55	25.4	20	14	18					115	26	6	9.5	90	+9	No		2.6	5									
		080R-4-31.75	●	16																														
		100R-1	●	6		1													50						23.5		1.6	2						
		100R-2	●	12		2	100												70						45		2.2	4						
		100R-4	●	24		4													115						90		3.6	6						
		125R-1	●	6	6	1			31.75	42	-	-				60	10	15.9	23.5	+9				3.5	2									
		125R-2	●	12		2	125	85																			70			45	3.8	4		
		125R-4	●	24		4																					115			90	6.1	6		
		160R-1	●	8		1																					60			23.5	5.8	2		
		160R-2	●	16		2	160	100																			70			45	6.4	4		
		160R-4	●	32	8	4			50.8	68	-	-				115	38	11	19	90	-5				10.7		6							
		200R-1	●	10		1																						60			23.5	7.5	7	
		200R-2	●	20		2	200																		18		26		80			45	10.4	8
		250R-1	●	12		1		130																				60			23.5	10.9	7	
		250R-2	●	24		2	250																					80			45	14.7	8	
		315R-1	MT0	14	14	1	315	220					17	27	22	32	60	35		23.5			16	9										

Spare Parts (Bore Dia. : common to Metric type / Inch type)

Description	Spare Parts					
	Clamp Screw	Wrench	Shim	Clamp Screw	Wrench	Anti-seize Compound
MSR 063R-□	SB-60120TR	TT-25L	-	-	-	P-37
MSR 080R-□			MAP-2506	SB-40140TR	DT-15	
315R-□			for Shim Clamp			

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Shim is not available for MSR063R (DC=63).

Mounting bolt (HH12X35) is included for MSR063R / MSR080R (Metric).

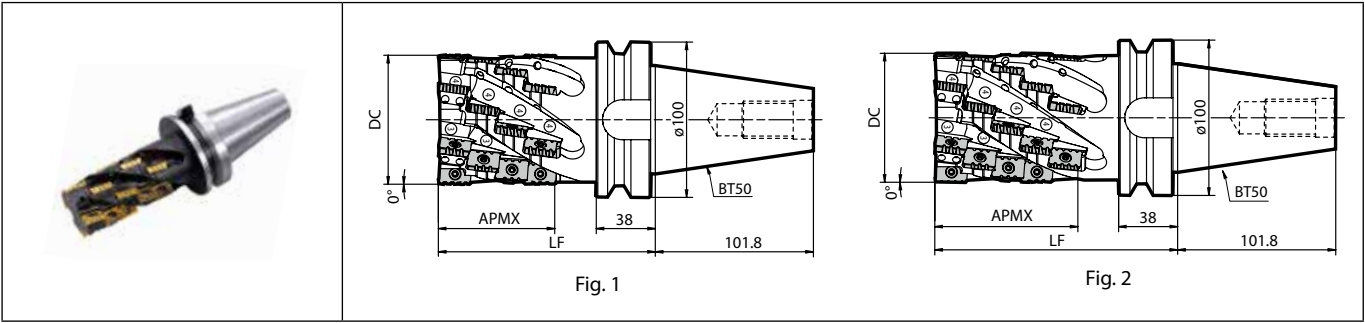
Mounting bolt (HH12X40) is included for MSR063R / MSR080R (Bore dia. inch spec).

Mounting bolt (HH16X45) is included for MSR080R-□-31.75.

It is not recommended using only top edge part (under ap=30mm) for 4 stages type. If ap is small, use 1 stage or 2 stages type.

Deep slotting is not recommended for this cutter.

MSR (Integral arbor type)



Toolholder dimensions

Description		Availability		Inserts	Flutes	Stages	Dimension (mm)			A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Spare parts						Applicable inserts  M167		
		R					DC	LF	APMX						Anti-seize compound 	Cartridge 	Screw 	Wrench 	Screw 	Wrench 			
MSR	063R-BT50-4	●	16	4	4	63	160	90	+9	-8	No	5.7	1	P-37	-	-	-	SB-60120TR	TT-25L	APMT2506...			
	063R-BT50-5	●	20		5		180	111				6.2	2										
	080R-BT50-4	●	16		4	80	160	90				6.9	1										
	080R-BT50-5	●	20		5	180	111	7.4				2											
	100R-BT50-4	●	24	6	4	100	160	90				9.6	1										
	100R-BT50-5	●	30		5	180	111	10.5				2											

Shim is not available for MSR063R (DC=63).

It is not recommended using only top edge part (under ap=30mm) for 4 stages / 5 stages type. If ap is small, use previous page's 1 stage type or 2 stages type.

Deep slotting is not recommended for this cutter.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

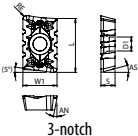
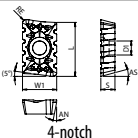
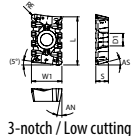
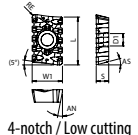
M


Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item

APMT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)			Carbon steel / Alloy steel							★	P	
			Mold and die steel							★		
			Austenitic stainless steel								M	
			Martensitic stainless steel									
			Precipitation hardening stainless steel									
			Gray cast iron							★	K	
			Nodular cast iron							★		
			Non-ferrous metals								N	
			Heat-resistant alloy								S	
			Titanium alloy									
Hard materials									H			
Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide	Applicable toolholder ➡ M165 M166
				S	D1	RE	L	W1	AN	AS	PVD	
											PR1810 PR1835	
	 3-notch	APMT 250608ER-NB3 250616ER-NB3 250640ER-NB3	2	6.35	6.5	0.8 1.6 4	25	15.875	11	15	●●●	MSR...
		APMT 250616EL-NB3	2	6.35	6.5	1.6	25	15.875	11	15	●	-
	 4-notch	APMT 250608ER-NB4 250616ER-NB4 250640ER-NB4	2	6.35	6.5	0.8 1.6 4	25	15.875	11	15	●●●	MSR...
		APMT 250616EL-NB4	2	6.35	6.5	1.6	25	15.875	11	15	●	-
	 3-notch / Low cutting force	APMT 250616ER-NB3P	2	6.35	6.5	1.6	25	15.875	11	15	●●	MSR...
	 4-notch / Low cutting force	APMT 250616ER-NB4P	2	6.35	6.5	1.6	25	15.875	11	15	●●	MSR...

Handed insert shows Right-hand

Recommended cutting conditions ➡ M168

Caution when installing notched insert (MSR)

It is important to install the appropriate notched insert into the correct position. If it is installed in incorrect position, the tool cannot cut the workpiece and it may damage the toolholder body. For MSR, notched insert location indicator is marked at insert installed area.

Please bear the following in mind when installing inserts to toolholders.

(Indication is marked near the insert pocket for MSR.)

- (3) is for APMT250600ER-NB3
- (4) is for APMT250600ER-NB4

(No. of inserts – example)

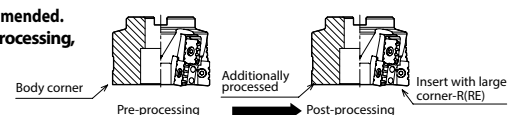
Description	No. of inserts	No. of flutes	No. of inserts	
			Notched	
			NB3	NB4
MSR 100R-1	6	6	3	3
	12		6	6
	24		12	12

Caution when installing the insert with corner-R(RE) 4.0

When using inserts with corner-R(RE) 4.0mm, additional modifications of the cutter body will be necessary. Ref. to the table below for the recommended modifications.

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
4.0	R2.0

* Round-shaped additional processing is recommended.
When applying chamfer shaped additional processing,
do not cut away too much.



● : Standard item

M



Milling

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Cutting speed Vc: m/min)	
	Low cutting force	General purpose	MEGACOAT NANO EX	
	NB3P+NB4P	NB3+NB4	PR1810	PR1835
Carbon steel	0.15	0.2	-	★ 100~150~200
Cast iron	0.15	0.2	★ 100~150~200	-
Stainless steel	Not recommended			
Aluminum/Copper	Not recommended			

* For MSR, cutting speed should be carefully adjusted depending on the length of toolholder protruding from the end of machine spindle.
 • When the overhang length of toolholder is small, → set the cutting speed to slightly higher than the recommended cutting conditions.
 • When the overhang length of toolholder is long, → set the cutting speed to slightly lower than the recommended cutting conditions.

★ : 1st Recommendation
 ☆ : 2nd Recommendation

Cutting conditions

1. Shouldering

In case of MSR100R-1

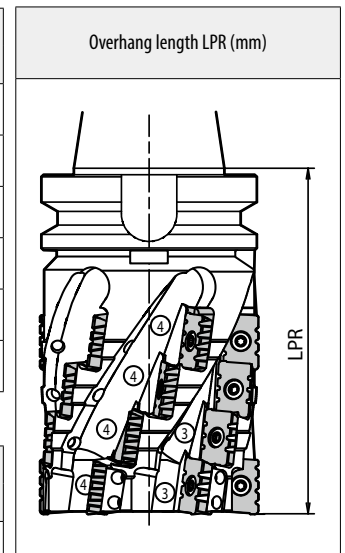
Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	20 x 80	920
	100~200mm	150	0.2	20 x 40	460
	201mm and over	100	0.2	20 x 30	228
Cast iron	Less than 100mm	180	0.2	20 x 80	1,100
	100~200mm	180	0.2	20 x 40	550
	201mm and over	120	0.2	20 x 30	276

In case of MSR100R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	40 x 40	920
	130~230mm	150	0.2	40 x 20	460
	231mm and over	100	0.2	40 x 20	304
Cast iron	Less than 130mm	180	0.2	40 x 40	1,100
	130~230mm	180	0.2	40 x 20	550
	231mm and over	120	0.2	40 x 20	368

In case of MSR100R-4

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 180mm	150	0.2	75 x 20	863
	180~280mm	150	0.2	75 x 10	431
	281mm and over	100	0.2	75 x 10	285
Cast iron	Less than 180mm	180	0.2	75 x 20	1,035
	180~280mm	180	0.2	75 x 10	518
	281mm and over	120	0.2	75 x 10	345



M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

2. Slotting

In case of MSR100R-1

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	7 x 100	403
	100~200mm	120	0.2	4 x 100	184
	201mm and over	100	0.2	3 x 100	114
Cast iron	Less than 100mm	180	0.2	14 x 100	966
	100~200mm	150	0.2	7 x 100	403
	201mm and over	120	0.2	4 x 100	184

In case of MSR100R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	7 x 100	403
	130~230mm	120	0.2	4 x 100	184
	231mm and over	100	0.2	3 x 100	114
Cast iron	Less than 130mm	180	0.2	14 x 100	966
	130~230mm	150	0.2	7 x 100	403
	231mm and over	120	0.2	4 x 100	184

In case of MSR160R-1

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	5 x 160	384
	100~200mm	120	0.2	3 x 160	182
	201mm and over	100	0.2	2 x 160	102
Cast iron	Less than 100mm	180	0.2	10 x 160	928
	100~200mm	150	0.2	5 x 160	384
	201mm and over	120	0.2	4 x 160	243

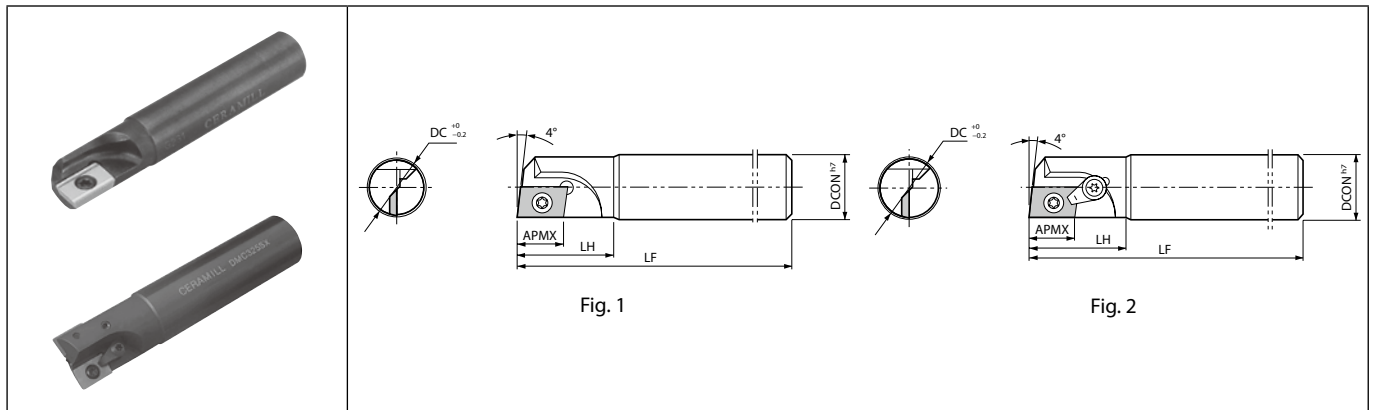
In case of MSR160R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	5 x 160	384
	130~230mm	120	0.2	3 x 160	182
	231mm and over	100	0.2	2 x 160	102
Cast iron	Less than 130mm	180	0.2	10 x 160	928
	130~230mm	150	0.2	5 x 160	384
	231mm and over	120	0.2	4 x 160	243

Notes: MSR...-4 (No. of stage)
Slotting is not recommended.



DMC-SX



Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)					A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts  M172
				DC	DCON	LF	LH	APMX								
DMC 316SXT 320SX 325SX 332SX 340SX		1	16	16	90	30	14	+3	-3	No	1	-	SB-4060TR	FT-15	NDCT1503... NDCW1503...	
			20	20	110	2										
		2	25	25	120	2					CPS-2TR	SB-4065TR				
			32	32	130	2										
			40	40	150	2										
																
DMC 320SX-200 325SX-220 332SX-250		1	20	20	200	50	14	+3	-3	No	1	-	SB-4065TR	FT-15	NDCT1503... NDCW1503...	
		2	25	25	220	60					1					
			32	32	250	80					1					

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

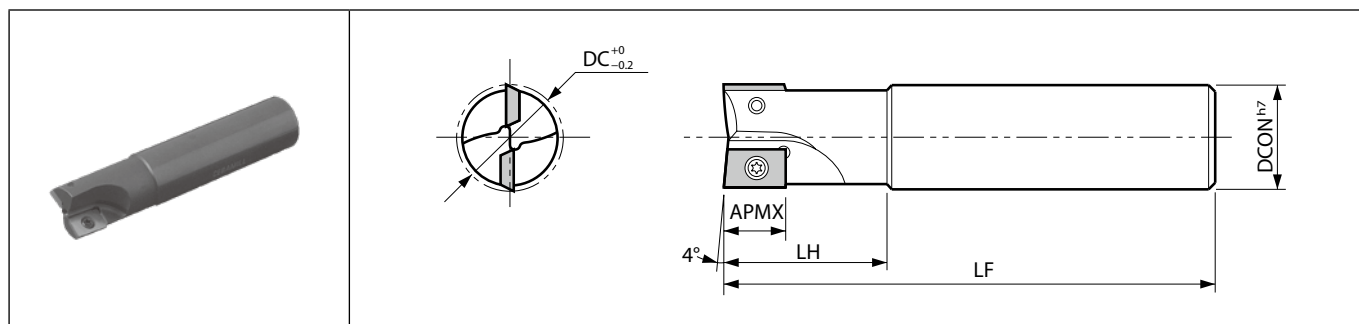
Ball-nose
Radius

Others

● : Standard item

M170

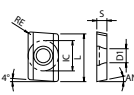
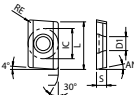
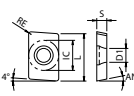
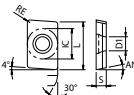
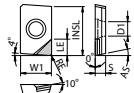
DMC-H



Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)					A.R. (°)	R.R. (°)	Coolant hole	Spare parts		Applicable inserts ➡ M172			
												Screw	Wrench				
																	
DMC	316H	●	1	16	16	90	30	14	+5	-3.5	No	SB-4060TR	FT-15	NDCT1503...X NDCW1503...X...			
	320H	●		20	20	110			+6	-2		SB-4065TR					
	325H	●	2	25	25	120	40		+8	0							
	332H	●		32	130												
	340H	●		40	150												

NDCT/NDCW

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel											■				P	
		Mold and die steel											■					
		Austenitic stainless steel															M	
		Martensitic stainless steel																
		Precipitation hardening stainless steel																
		Gray cast iron										☆					K	
		Nodular cast iron																
		Non-ferrous metals										★	□	■		N		
		Heat-resistant alloy																
		Titanium alloy										☆	□	■		S		
Hard materials																		
Insert		Description	No. of edges	Dimension (mm)								Angle (°)		Carbide	Cement	PCD	Applicable toolholder ➡ M170 M171	
				IC	S	D1	RE	L	INSL	LE	W1	AN	AS	-	-	-		
														KW10	TN100M	RPD001		RPD010
		NDCT 150308FR	2	9.525	3.18	4.5	0.8	15	-	-	-	15	-	●				DMC...SX(...)
		NDCT 150308TR	2	9.525	3.18	4.5	0.8	15	-	-	-	15	-	●				
		NDCT 150308TRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-	●				DMC...SX(...) DMC...H
		NDCW 150302TR	2	9.525	3.18	4.5	0.2	15	-	-	-	15	-	●				DMC...SX(...)
		150304TR					0.4							●				
		150308TR					0.8							●				
		150320TR					2							●				
		150330TR					3							●				
		150340TR	4	●														
		NDCW 150308TRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-	●				DMC...SX(...) DMC...H
		NDCW 150308FRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-	●				
		NDCW 150302FRX 150302FRX-NE	1	-	3.18	4.4	0.2	-	15	5.7 5.1	9.525	-	15		●	●	●	DMC...SX(...) DMC...H

Handed insert shows Right-hand

Recommended cutting conditions ➡ M173

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

● : Standard item

M172

CBN & PCD Inserts are
sold in 1 piece boxes

Recommended cutting conditions (DMC-SX)

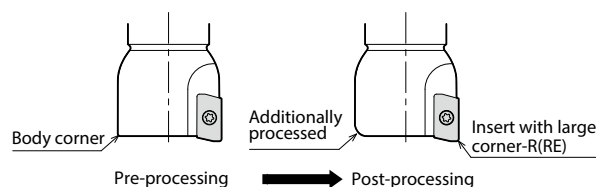
Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)		Max. ap (mm)		
		Cermet	Carbide	Cutting dia. (DC)	Slotting (ap)	Shouldering (apxae)
		TN100M	KW10			
Carbon steel	~0.2	★ 120~200		ø16~	3	9x3
Alloy steel	~0.2	★ 100~180		ø16~	3	9x3
Mold steel	~0.15	★ 100~180		ø16~	3	9x3
Stainless steel	~0.15	☆ 120~200		ø16~	2	6x2
Cast iron	~0.2		★ 80~150	ø16~	3	9x3
Non-ferrous metals	~0.2		★ 100~300	ø16~	3	9x3

When using inserts with corner-R(RE) 2.0 or larger, additional modifications of the cutter body will be necessary.
Additional modifications for the body will be necessary. Ref. to the chart below for the recommended modifications.
(Additional grind off is not necessary when corner-R(RE) is 0.8 mm or less.)

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
2.0	R1.0
3.0	R1.6
4.0	R2.0

* Round-shaped additional processing is recommended.

When applying chamfer shaped additional processing, do not cut away too much.



Recommended cutting conditions (DMC-H)

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				Max. ap (mm)		
		Cermet	Carbide	PCD		Cutting Dia. (DC)	Slotting (ap)	Shouldering (apxae)
		TN100M	KW10	KPD230 (KPD001)	KPD010			
Carbon steel	~0.2	★ 120~200				~ø20	4	8x4
						ø25~	8	14x6
Alloy steel	~0.2	★ 100~180				~ø20	4	8x4
						ø25~	8	13x6
Mold steel	~0.15	★ 100~180				~ø20	3	5x2
						ø25~	6	10x3
Stainless steel	~0.15	☆ 120~200				~ø20	3	6x2
						ø25~	6	13x3
Cast iron	~0.2		★ 80~150			~ø20	4	8x4
						ø25~	6	14x6
Non-ferrous metals	~0.2		★ 100~300	★ 300~500	☆ 300~500	~ø20	4	8x4
						ø25~	6	14x6

★: 1st Recommendation ☆: 2nd Recommendation

NDCW1503○○TR and NDCT1503○○(T/F)R inserts are not applicable for DMC-H end mill.

Toolholder	DMC-SX		DMC-H	
	Insert	Toolholder description	Insert	Toolholder description
DMC-SX	NDCT...TRX NDCW...(T/F)RX	No interference of relief surface	NDCT...TRX NDCW...(T/F)RX	No interference of relief surface
	NDCT...TR NDCT...(T/F)R	No interference of relief surface	NDCT...TR NDCT...(T/F)R	Less relief ap must be under 5mm.
DMC-H	NDCT...TRX NDCW...(T/F)RX	No interference of relief surface	NDCT...TRX NDCW...(T/F)RX	No interference of relief surface
	NDCT...TR NDCT...(T/F)R	Less relief ap must be under 5mm.	NDCT...TR NDCT...(T/F)R	Less relief ap must be under 5mm.

High efficiency milling cutter for finishing aluminum alloys

MFAH

Low cutting force minimizes burrs and chipping for high quality machining

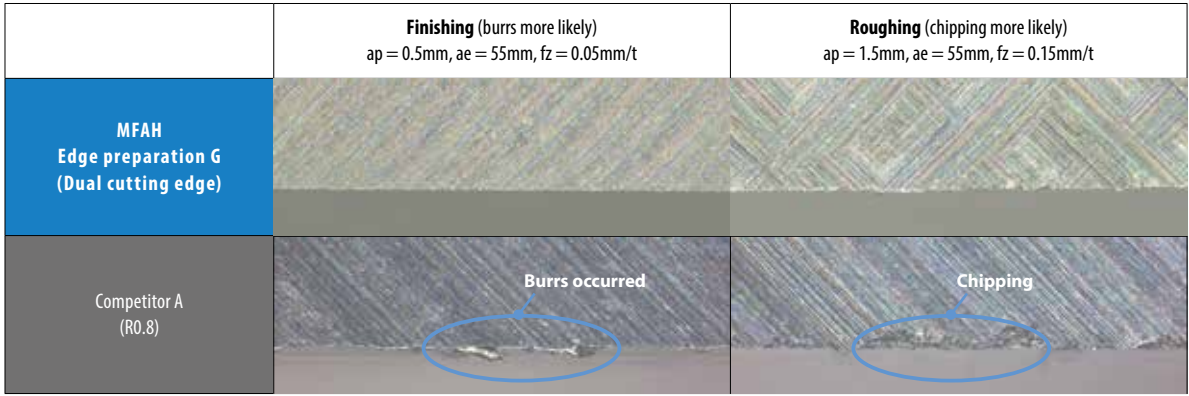
Easily adjust blade runout

2 body types and 3 inserts for a variety of milling applications

1 Low cutting force minimizes burrs for high quality machining

Large true rake angle and dual cutting edge insert designs

Burr and chipping comparison (Internal evaluation)

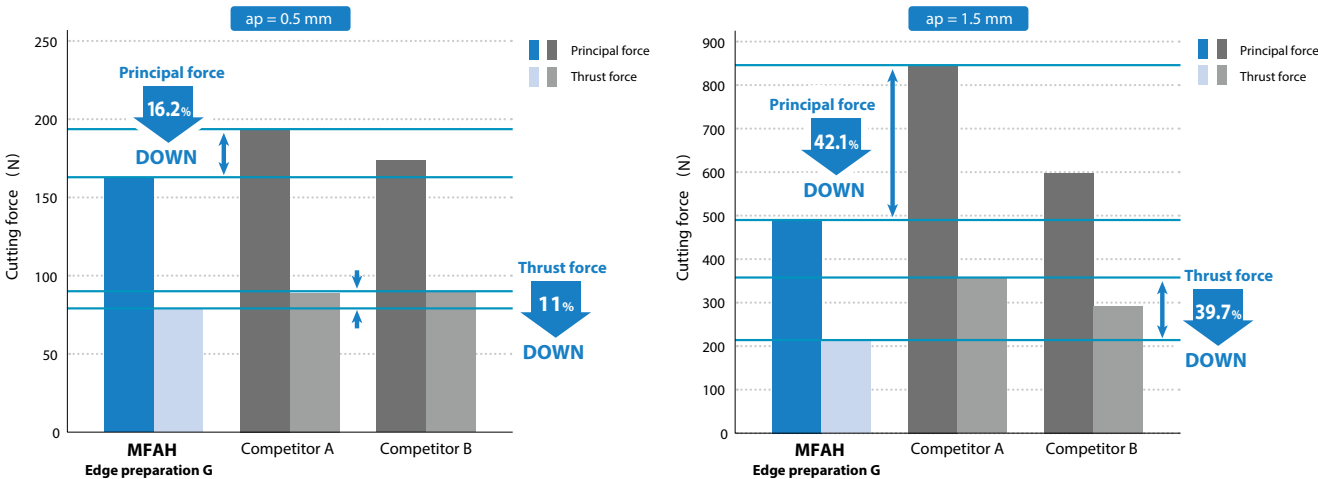


Cutting conditions: $V_c = 2,500\text{ m/min}$, Wet, Cutter dia. $\phi 80$
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece material: ADC12

2 Low cutting force design

Low cutting force, reduced chattering and high efficiency machining

Cutting force comparison (Internal evaluation)



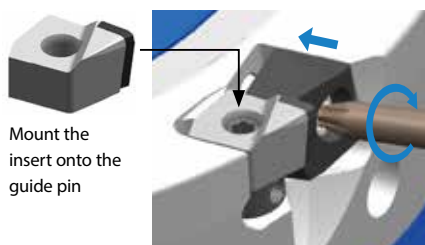
Cutting conditions: $V_c = 2,500\text{ m/min}$, $ae = 55\text{ mm}$, $fz = 0.1\text{ mm/t}$, Wet, Cutter dia. $\phi 80$
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece material: ADC12

3 Adjustable blade runout

Easily install inserts and adjust blade runout

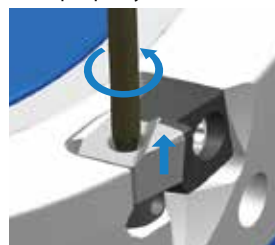
Easy insert installment

Guide pin allows for easier positioning



Easily adjust blade runout

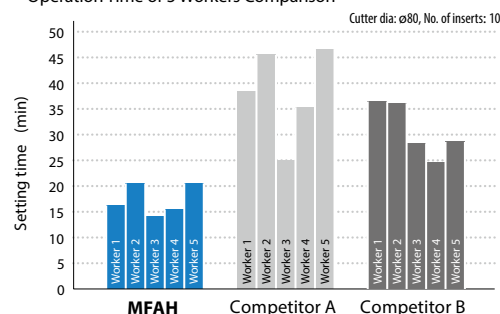
Adjustable from both the front and outer periphery



Blade runout setting time comparison

(Internal evaluation)

* Operation Time of 5 Workers Comparison



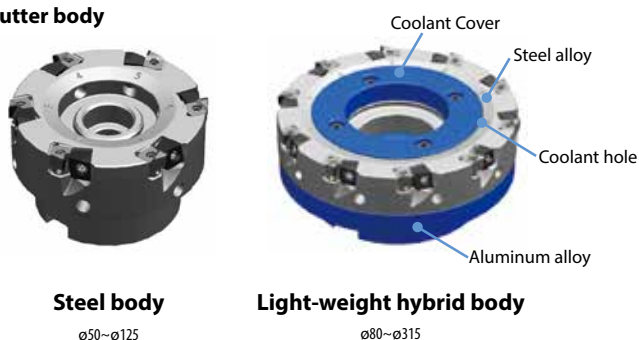
The MFAH can drastically shorten the setting time

4 Large tooling lineup

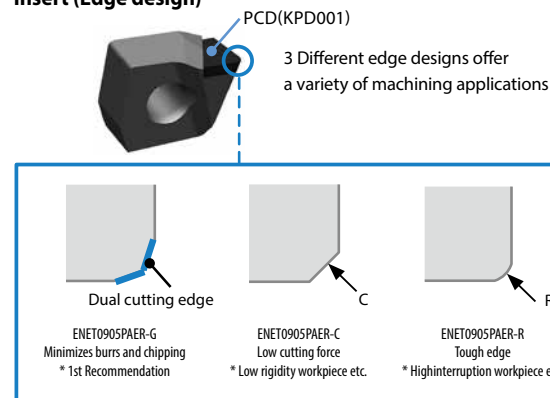
Steel body and light-weight hybrid body with internal coolant available

3 different edge designs offer a variety of machining applications

Cutter body



Insert (Edge design)

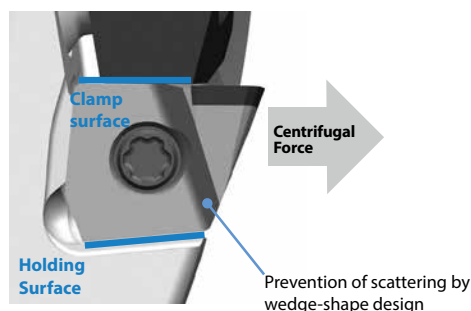


5 Safety enhancements during high-speed revolution

Scattering prevention mechanism

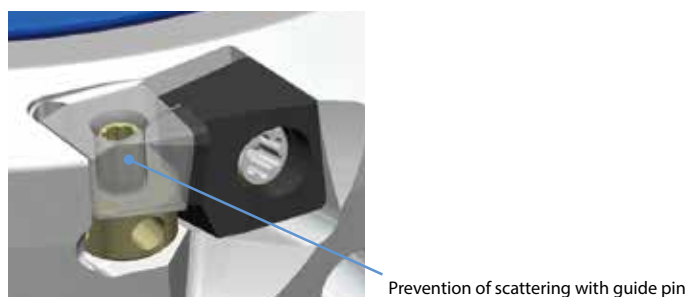
1 Prevention of scattering by wedge-shape design

New wedge-shape feature holds insert firmly in place and reduces chattering



2 Prevention of scattering with guide pin

Guide pins improve safety during high-speed rotation



M



Milling

MFAH (Light-weight Hybrid body)

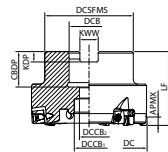


Fig. 1

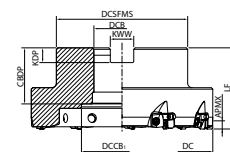


Fig. 2

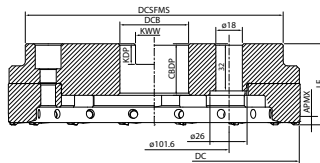


Fig. 3

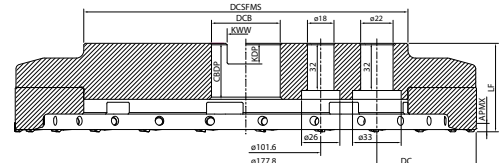


Fig. 4

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)										Coolant hole	Coolant hole Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M179										
			R		DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX					Mounting bolt (Attachment)	Coolant cover (Attachment)	Coolant cover (sold separately)											
Metric	MFAH	080RA-6T-M-SF	● 6	80	62	27	20	13	27	7	12.4	4.6	Yes	14600	0.82	1	HH12X35HC	-	-	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R												
		080RA-10T-M-SF	● 10												0.78	1																
		100RA-8T-M27-SF	● 8												100	1.2					1	13000	1.32	2								
		100RA-8T-M-SF	● 8													1.15					1		1.15	1								
		100RA-12T-M27-SF	● 12	1.27	2	1.27	2																									
		100RA-12T-M-SF	● 12	1.8	1	1.8	1																									
		125RA-10T-M27-SF	● 10	125	2.1	2	11400	2.1	2	CC-125-MFAH	-																					
		125RA-10T-M-SF	● 10		1.73	1		1.73	1																							
		125RA-16T-M27-SF	● 16		2.1	2		2.1	2																							
		125RA-16T-M-SF	● 16		3.5	2		3.5	2																							
		160RA-12T-M-SF	● 12	160	125	40	57	33	9	16.4	8000			HF20X53HA	CC-160-MFAH	-																
		160RA-20T-M-SF	● 20														5600	3.4			2	4.7	3									
		200RA-16T-M-SF	MT0 16															200			175	126	55	35	14	25.7	4500	6.8	3	-	-	CC-200-MFAH
		200RA-24T-M-SF	MT0 24																													6.9
		250RA-20T-M-SF	MT0 20	250	140	60	165	60	38	35	14			25.7	3500	11.7																4
		250RA-32T-M-SF	MT0 32														6.8															
		315RA-24T-M-SF	MT0 24														315	220			220	60	38	35	14	25.7	3500	11.5	4	CC-315-MFAH		
		315RA-40T-M-SF	MT0 40																													

Confirm the total weight of the cutter and the arbor is within the machine's acceptable range.

● : Standard item MT0 : Made to order

M176

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)										Coolant hole	Coolant hole Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M179									
			R		DC	DCS _{FMS}	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX					Mounting bolt (Attachment)	Coolant cover (Attachment)	Coolant cover (sold separately)										
Bore dia. inch spec	MFAH	080RA-6T-SF	●	6	80	62	25.4	20	13	50	27	6	9.5	4.6	Yes	14600	0.83	1	HH12X35HC	-	-	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R									
		080RA-10T-SF	●	10													0.78	1													
		100RA-8T-254-SF	●	8													1.21	1	HH12X35HC												
		100RA-8T-SF	●	8	100	85	31.75	42	-	34	8	12.7	1.33	2	HF16X44HC	-	-														
		100RA-12T-254-SF	●	12		62	25.4	20	13	24	6	9.5	1.16	1	HH12X35HC																
		100RA-12T-SF	●	12		85	31.75	42	-	34	8	12.7	1.29	2	HF16X44HC																
		125RA-10T-254-SF	●	10	60	25.4	20	13	24	6	9.5	1.8	1	HH12X35H	CC-125-MFAH	-															
		125RA-10T-SF	●		89	38.1	55	-	55	38	10	15.9	2	2			HF20X53HA														
		125RA-16T-254-SF	●		16	60	25.4	20	13	50	24	6	9.5	1.74			1	HH12X35H													
		125RA-16T-SF	●	160	89	38.1	55	38	11	19.1	10	15.9	1.95	2	HF20X53HA	CC-160-MFAH	-														
		160RA-12T-SF	●		12																										
		160RA-20T-SF	●		20																										
		200RA-16T-SF	MT0	16	200	175	126	55	35	14	25.4	4.9	3	5600	4.8	3	-	-	CC-200-MFAH												
		200RA-24T-SF	MT0	24															250	140	47.625		165	60	38	7	3	4500	6.9	3	CC-250-MFAH
		250RA-20T-SF	MT0	20																											
		250RA-32T-SF	MT0	32	315	220	220	60	38	11.7	4	3500	11.5	4	CC-315-MFAH																
		315RA-24T-SF	MT0	24																											
		315RA-40T-SF	MT0	40																											

Confirm the total weight of the cutter and the arbor is within the machine's acceptable range.

MFAH (Steel body)

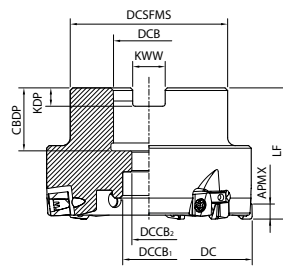


Fig. 1

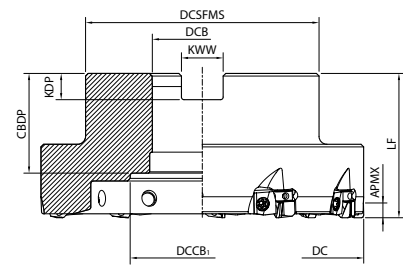


Fig. 2

Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M179
				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KOP	KWW	APMX					
Metric	MFAH	●	4	50	48	16	13.6	9		19	5.6	8.4		No	19200	0.44	1	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R
			5						40							0.43	1	
			6	63	61	22	23	11		21	6.3	10.4			16800	0.69	1	
			6													0.68	1	
			6	80	60	27	20	13		24	7	12.4			14600	1.16	1	
			10						50							1.11	1	
			8	100	70	32	45			30	8	14.4			13000	1.56	2	
			12													1.51	2	
			10	125	89	40	55		55	33	9	16.4			11400	2.6	2	
			16													2.5	2	
Bore dia. inch spec	MFAH	●	6	80	50	25.4	20	13		27	6	9.5		No	14600	1.02	1	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R
			10						50							0.98	1	
			8	100	70	31.75	45			34	8	12.7			13000	1.59	2	
			12													1.55	2	
			10	125	89	38.1	55		55	38	10	15.9			11400	2.63	2	
			16													2.56	2	

M



Milling

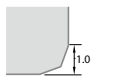
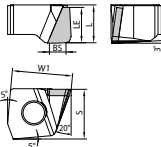
Spare parts

Description		Wedge	Wedge screw	Wrench	Adjust screw	Wrench	Anti-seize compound	Applicable inserts
Light-weight hybrid body	MFAH080RA- ... MFAH315RA- ...	C08R	W5X13L	TTW-15	AJ-4170	DTPM-8	P-37	ENET0905...
Steel body	MFAH050RS- ... MFAH125RS- ...							

● : Standard item

M178

ENET

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)			Carbon steel / Alloy steel					P				
			Mold and die steel									
			Austenitic stainless steel					M				
			Martensitic stainless steel									
			Precipitation hardening stainless steel									
			Gray cast iron					K				
			Nodular cast iron									
			Non-ferrous metals					■ N				
			Heat-resistant alloy					S				
			Titanium alloy									
			Hard materials					H				
Insert			Description			Dimension (mm)					PCD	Applicable toolholder ➡ M176~M178
						S	L	LE	W1	BS	KPD001	
			ENET 0905PAER-G	7.9	6.02	5.6	9.61	2.6	●	MFAH...RA...-SF MFAH...RS...-SF		
			ENET 0905PAER-C	7.9	6.02	5.6	9.61	3	●	MFAH...RA...-SF MFAH...RS...-SF		
			ENET 0905PAER-R	7.9	6.02	5.6	9.61	3.1	●	MFAH...RA...-SF MFAH...RS...-SF		

Recommended cutting conditions M180

M



Milling

● : Standard item

 CBN & PCD Inserts are
sold in 1 piece boxes

M179

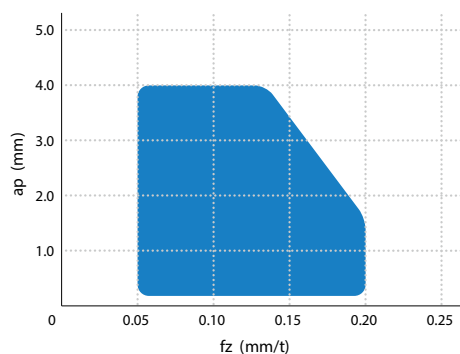
Recommended cutting conditions

Workpiece material	Property	Vc (m/min)	fz (mm/t)	Recommended insert grades
Aluminum alloys	Si Ratio 12.5% or less	1,000 - 2,500 - 3,000	0.05 - 0.10 - 0.20	KPD001
	Si Ratio 12.5% and over	400 - 600 - 800	0.05 - 0.10 - 0.20	

Recommended cutting conditions are reference values.
Please adjust cutting speed and feed rate according to actual machining conditions taking into account machine and workpiece rigidity.
Do not use the cutter at speeds exceeding the maximum cutting speed limit.

Cutting performance

BT50 M/C (Machine power 30kw)



Cutting conditions: Vc = 2,500 m/min, ae = 55mm, Wet, Cutter dia. ø80
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece material: ADC12

M



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

Ball-nose
Radius

Others

Cautions

While in use

! Caution

Please use within recommended cutting conditions

Do not run the cutter at revolutions exceeding the printed maximum revolution limit of the cutter body
Inserts or cutter body may be damaged due to the centrifugal force and cutting load

Please do not use under the following conditions:

When cutter is not fully loaded with inserts

If the body and/or clamp is damaged

If a clamp or clamp screw is removed

If inserts that have different regrind amounts are mounted

Please wear protective equipment such as protective glove when

changing inserts or adjusting edge fluctuation

Injury can occur when touching the cutting edge

Dynamic balance

Balance adjustment on the cutter is completed before shipping

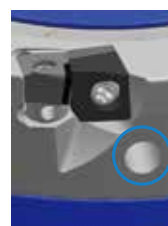
Balance adjustment has been made with special high precision inserts to be ISO balance quality grade (ISO 1940-1) G2.5

Do not operate the balance adjustment screw at the outer periphery of cutter

→ This could lead to improper dynamic balance

Do not completely remove clamp and clamp screw from cutter

→ This requires additional balance adjustment

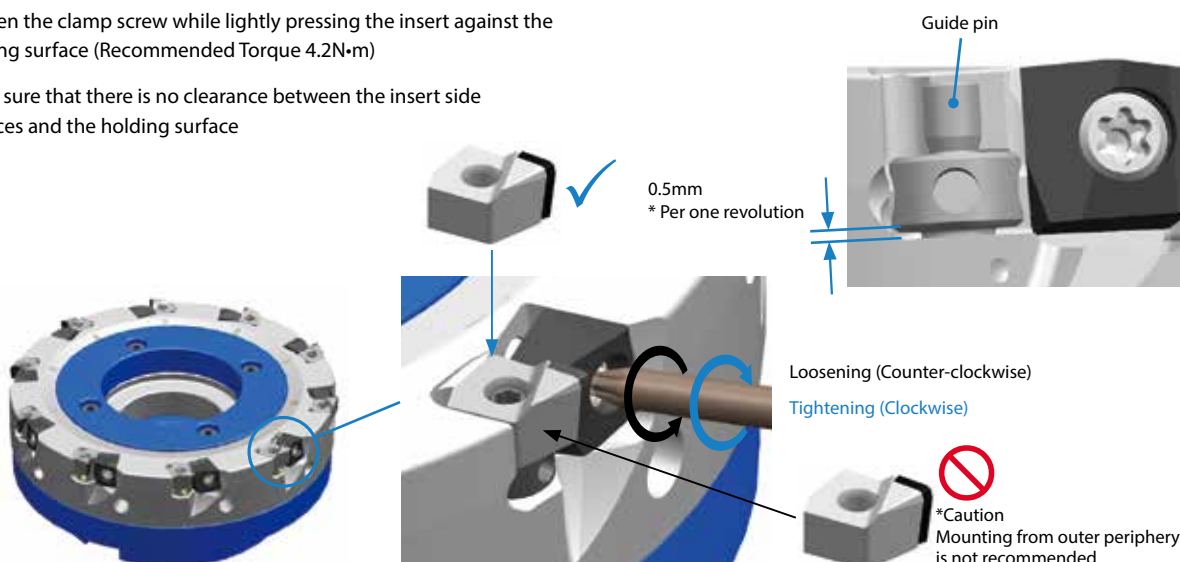


Balance adjustment screw is mounted at the necessary point

* Do not operate

How to mount insert

- 1 Adjust the clearance between adjustment screw for cutting edge and the surface of insert to be 0.5mm
- 2 Mount insert on guide pin
(Be sure to install from the head. Mounting from outer periphery is not recommended)
- 3 Tighten the clamp screw while lightly pressing the insert against the holding surface (Recommended Torque 4.2N·m)
- 4 Make sure that there is no clearance between the insert side surfaces and the holding surface



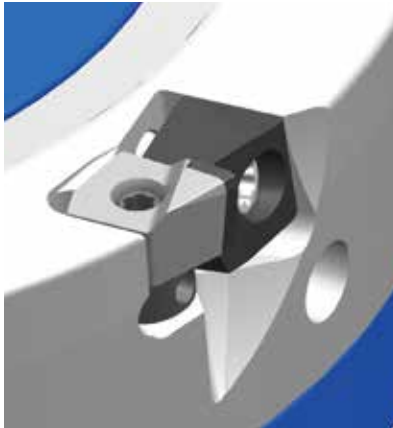
M



Milling

How to adjust blade runout

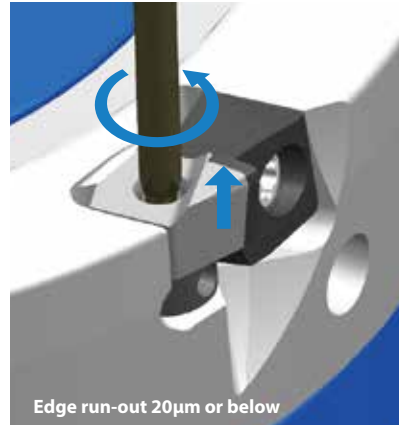
1 Install an insert



2 Partially tighten



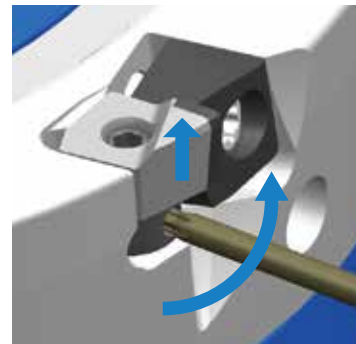
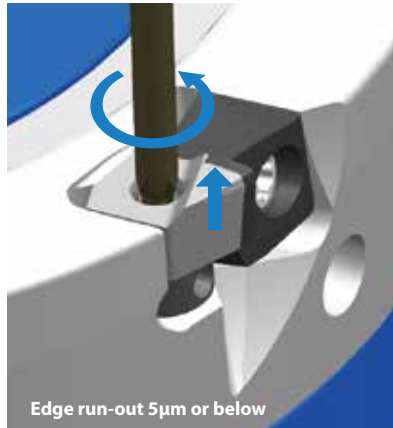
3 Adjustable blade runout



4 Fully tighten



5 Adjustable blade runout

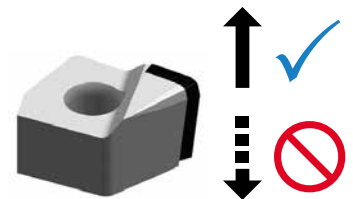


M



Milling

- 1 Install inserts into all pockets
- 2 Partially tighten the clamp screw (Recommended Torque 2.0N·m)
- 3 Turn the screw with the wrench to adjust and make sure that all screw heights are within 20μm of each other (Recommended)
- 4 Fully tighten the clamp screw with tightening torque 4.2 N·m
- 5 Slightly adjust position of cutting edge (Recommended position difference: 5μm or below)
* All inserts should be fine-tuned



* Caution
Do not adjust cutting edge to lower position

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

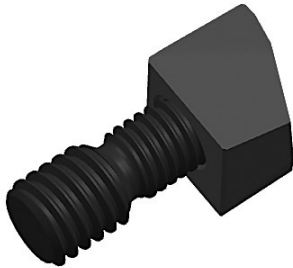
Ball-nose
Radius

Others

Precaution for changing clamp

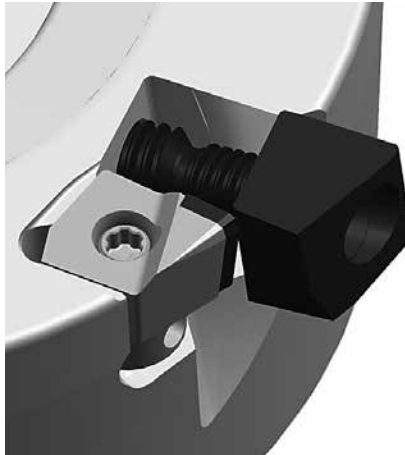
How to mount a clamp on a holder

1 Attach clamp screw into clamp first



Attaching clamp screw into clamp
(about 1 revolution)

2 Mounting



Mount it to the holder

3 Fastening



Fasten with recommended torque
(Completed)

Mount position of clamp screw



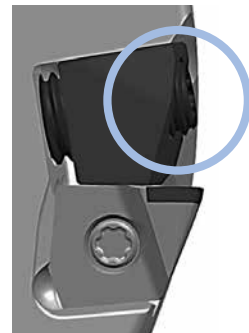
Right position

(Screw head does not come out)



Wrong position

(Screw head comes out)



Confirm if clamp screw is not coming out after fastening clamp screw with recommended torque

Re-mount if the clamp screw is coming out

Adjust the balance is needed after mounting in case removing a clamp screw completely such as clamp change

For aluminum alloys high efficiency end mill

MEAS

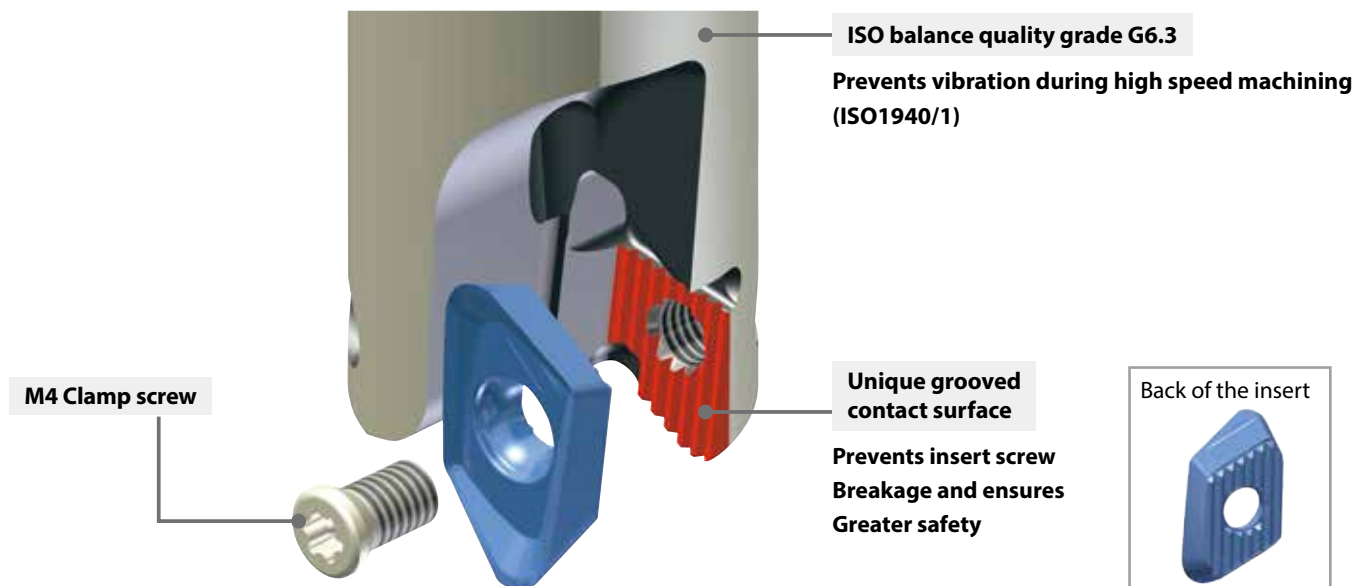
Excellent scatter prevention to ensure stable, high speed aluminum machining

Large ramping angle delivers a wide range of machining applications

1 High reliability and high efficiency machining

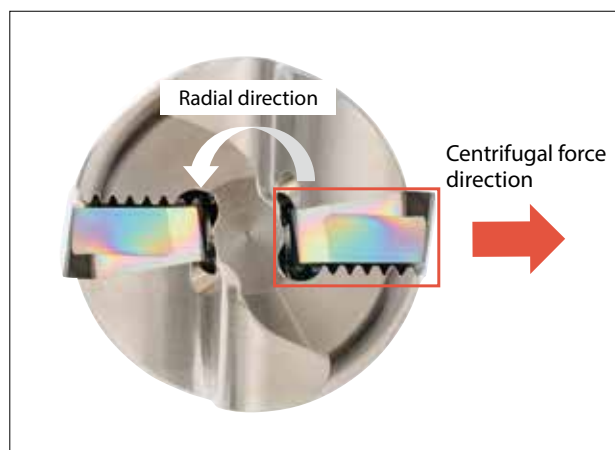
Grooved connection between the insert and holder

Provides high speed aluminum machining ($\phi 32$: Recommended max. cutting speed $V_c = 3,000\text{m/min}$)

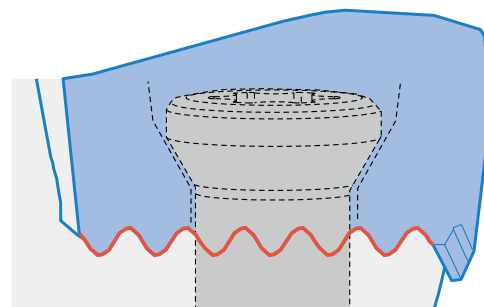


Grooved insert pocket

Centrifugal force is applied across the grooved surface to reduce pressure on the insert screw
Prevents insert screw breakage and safely secures the insert during high-speed revolutions



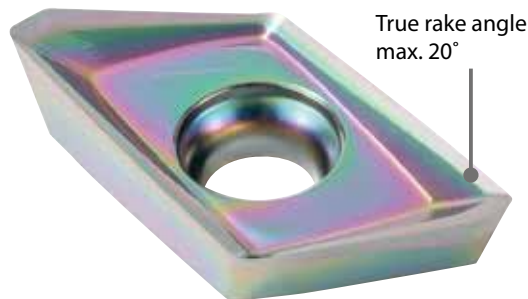
Grooved contact surface



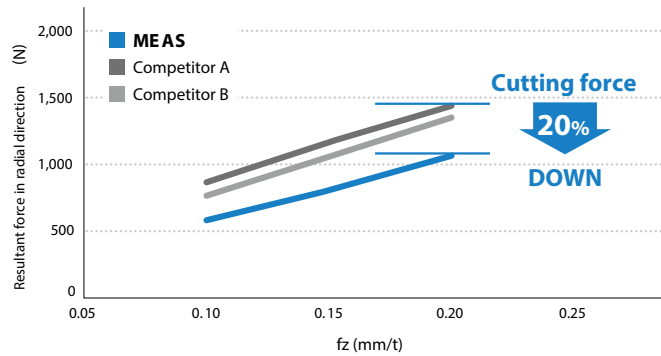
2 Low cutting force with sharp cutting edge

True rake angle max. 20°

Low cutting force and excellent chattering resistance



Cutting force comparison (Internal evaluation)

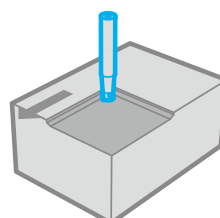


Cutting conditions: $V_c = 390$ m/min, $a_p \times a_e = 8 \times 5$ mm, Dry
Cutter dia. $\phi 25$ mm (2 Flutes) Workpiece material: A7075

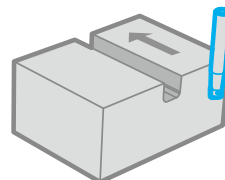
3 Applicable to a wide range of application

Max. ramping angle 20° ($\phi 25$)

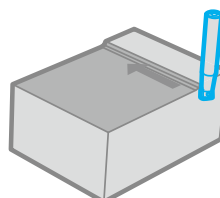
The MEAS can be used for shouldering, slotting, ramping, and helical milling applications



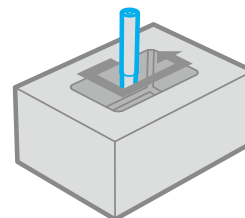
Facing, Shouldering



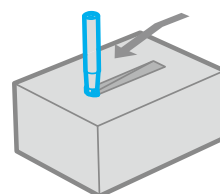
Slotting



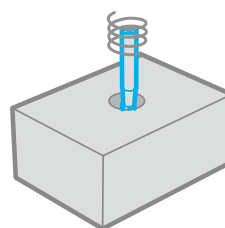
Contouring



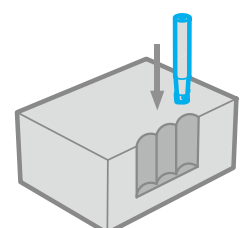
Pocketing



Ramping



Helical milling



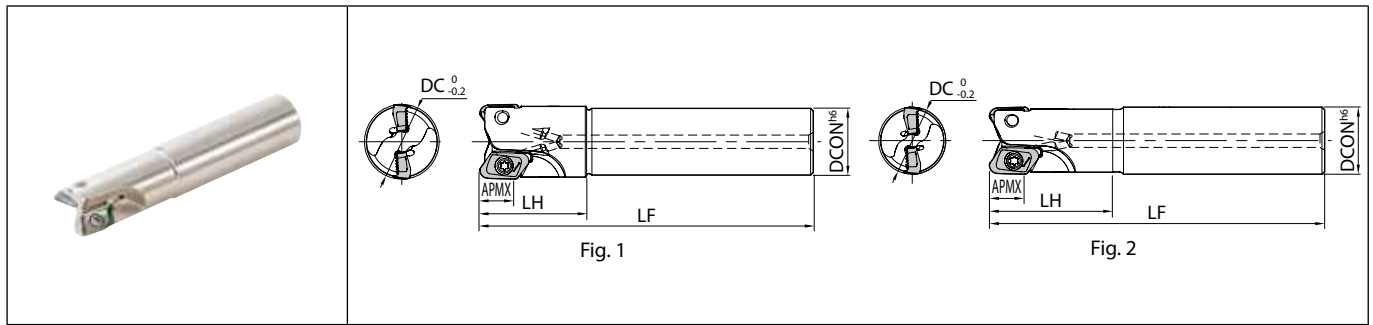
Vertical milling (Plunging)

M



Milling

MEAS (End mill)



Toolholder dimensions

Description				Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M187
																	Anti-seize compound	Screw	Wrench	
																				
Cylindrical	Standard shank	MEAS	28-S25-13-2T	●	2	28	25	125	40	12	+10	-13	Yes	54000	0.4	1	P-37	SB-4090TRP	DTPM-15	KCGT1305...
			35-S32-13-2T	●		35	32	150	50					46000	0.9	1				
			40-S32-13-3T	●		3	40							42000		1				
	Same shank	MEAS	25-S25-13-2T	●	2	25	25	125	49	12	+10	-14	Yes	59000	0.4	2	P-37	SB-4075TRP	DTPM-15	KCGT1305...
			32-S32-13-2T	●		32	32	150	69					49000	0.8	2				
	Long shank	MEAS	25-S25-13-2T-170	●	2	25	25	170	89	12	+10	-14	Yes	49000	0.5	2	P-37	SB-4075TRP	DTPM-15	KCGT1305...
32-S32-13-2T-200			●	32		32	200	119	39000					1.1	2					

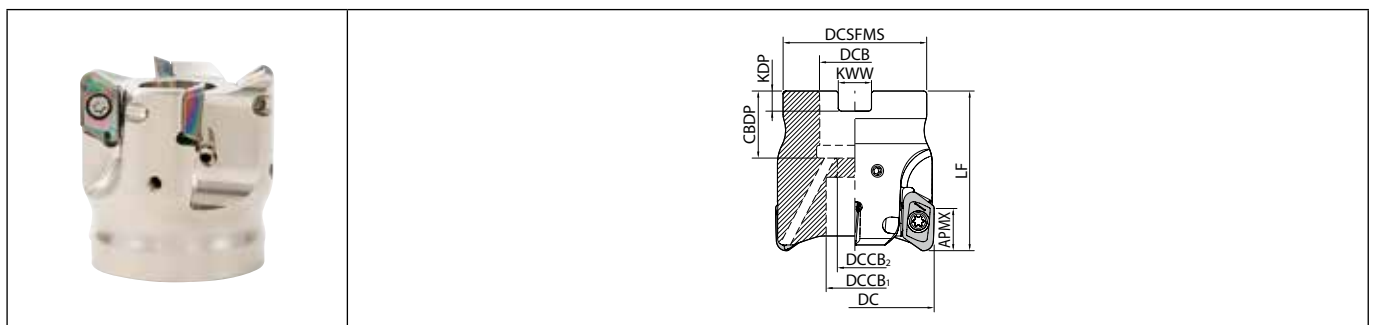
When using inserts with a corner-R(RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended tightening torque for insert clamp : 3.5N·m

M

MEAS (Face mill)



Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)												A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts				Applicable inserts ➡ M187
				R	DC	DCSfMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	Anti-seize compound						Mounting bolt	Screw	Wrench		
MEAS	050R-13-4T-M	●	4	50	45	22	18	11	50	21	6.3	10.4	12	+10	-11	Yes	36000	0.4					KCGT1305...		

When using inserts with a corner-R(RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended tightening torque for insert clamp : 3.5N·m

● : Standard item

M186

KCGT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel					P					
		Mold and die steel										
		Austenitic stainless steel					M					
		Martensitic stainless steel										
		Precipitation hardening stainless steel										
		Gray cast iron					K					
		Nodular cast iron										
		Non-ferrous metals					★ N					
		Heat-resistant alloy					S					
		Titanium alloy										
Hard materials					H							
Insert		Description		No. of edges	Dimension (mm)					Carbide	Applicable toolholder M186	
					S	D1	RE	L	W1			DLC
	 Non-ferrous metals	KCGT	130504FR-AL	2	5.1	4.4	0.4	14.1	9.9	●	MEAS...	
			130508FR-AL				0.8	13.9		●		
			130512FR-AL				1.2	13.8		●		
			130516FR-AL				1.6	13.3		●		
			130520FR-AL				2	13.3		●		
			130524FR-AL				2.4	13.3		●		
			130530FR-AL				3	13.3		●		
			130532FR-AL				3.2	12.8		●		
			130540FR-AL				4	12.8		●		
			130550FR-AL				5	12.8		●		
	 Tough edge	KCGT	130504ER-AM	2	5.1	4.4	0.4	13.7	9.9	●	MEAS...	
			130508ER-AM				0.8	13.7		●		
			130516ER-AM				1.6	13.3		●		
			130525ER-AM				2.5	13.3		●		
			130530ER-AM				3	13.3		●		
			130540ER-AM				4	12.8		●		

Handed insert shows Right-hand

Recommended cutting conditions

Workpiece material		Chip breaker	Vc (m/min)	ae (mm)	fz (mm/t)	
				DC	ap = 0.5 mm (Reference value)	
					Cutting Dia. ø28 or less	Cutting Dia. ø32 or more
Aluminum alloys	Si Ratio 12.5% or less	AL	200~1,000~3,000	≤ 0.5DC	0.05~0.15~0.25	
				0.5DC <		
		AM	200~1,000~5,000	≤ 0.5DC	0.05~0.15~0.3	0.05~0.2~0.35
				0.5DC <	0.05~0.15~0.25	0.05~0.15~0.3
	Si Ratio 12.5% and over	AL	200~300~400	≤ 0.5DC	0.05~0.1~0.2	
				0.5DC <		
		AM	200~300~800	≤ 0.5DC	0.05~0.15~0.3	0.05~0.2~0.35
				0.5DC <	0.05~0.15~0.25	0.05~0.15~0.3

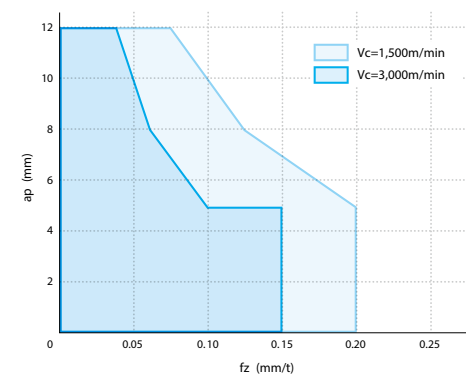
- Recommended cutting conditions are reference values.
Please adjust cutting speed and feed rate according to actual machining conditions taking into account machine and workpiece rigidity
- Do not use the cutter at speeds exceeding the maximum cutting speed limit (See page M189)
- Regularly changing the insert clamp screw is recommended
Use appropriate safety covers to protect from tool breakage and chip scattering
- When using at a higher revolution (10,000min⁻¹ or over), refer to the table below to adjust the balance of the MEAS and arbor

Revolution (min ⁻¹)	ISO balance quality grade ISO 1940-1/8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

● : Standard item

MEAS Cutting performance

ø50 (4 flutes) Shouldering ae = 25mm Workpiece material: A7075



Reduce the feed rate when machining at high speeds

M



Milling

Reference data for ramping

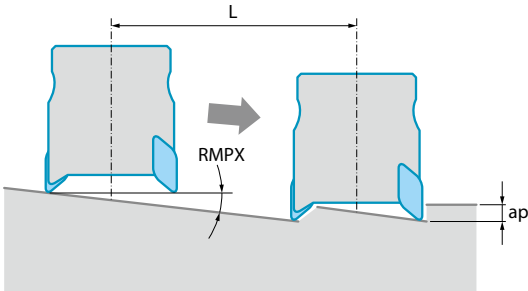
Cutter dia. DC (mm)	25	28	32	35	40	50
Max. ramping angle RMPX	20°	16°	12.5°	11°	8.5°	6°
tan RMPX	0.363	0.287	0.221	0.194	0.149	0.105

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Reduce recommended feed rate by 50%

Formula of the cutting length
"L" at Max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



Vertical milling (Plunging)

* For vertical milling (plunging), reduce feed rate to fz=0.1mm/t or less.

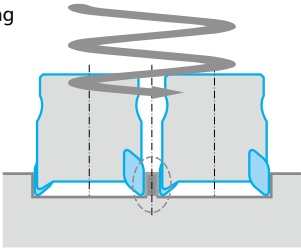
Insert description	Max. width of cut (ae)
KCGT13 type	8mm

Helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

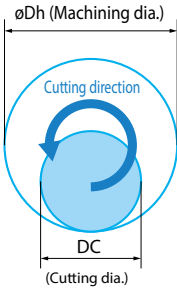
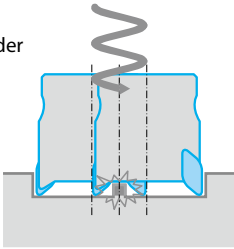
Over max. cutting dia.

Center core part remains after machining



Under min. cutting dia.

Center core part interferes with toolholder



Description	Min. cutting dia.	Max. cutting dia.	Maximum ramping depth per cycle
MEAS...13...	2×DC-16	2×DC-3	3.5

Unit: mm

- Down-cut milling is recommended (refer to the figure above)
- Feed rate should be under 50% of the recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

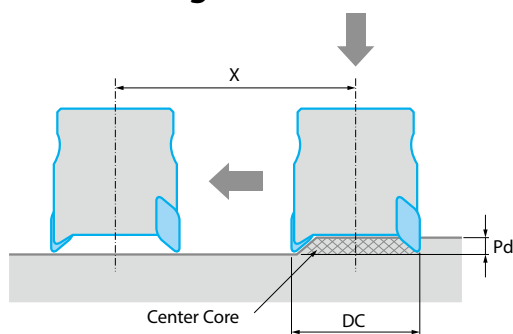
Multi-Function

Slot Mill

Ball-nose Radius

Others

Guide for drilling



Drilling depth

Please refer to Pd (Max. drilling depth) in the chart.

Traversing after drilling

1. It is recommended to reduce feed by $f_z = 0.15$ (mm/t) or less until the center core is removed.
2. When drilling, reduce feed rate per revolution to $f = 0.1$ mm/rev or under.

Description	Max. Cutting depth Pd	Min. cutting length X for flat bottom surface
MEAS...-13-...	3.5	DC-16

Unit: mm

How to mount inserts

1. Be sure to remove dust and chips from the insert mounting pocket.
2. Insert screw
 - Coat anti-seize compound thinly on portion of taper and thread.
 - Attach screw to the magnetized wrench tip and tighten while gently pressing the outside edge of the insert toward the insert pocket surface (grooved surface) (see the picture on the right) (Recommended Torque 3.5N·m)

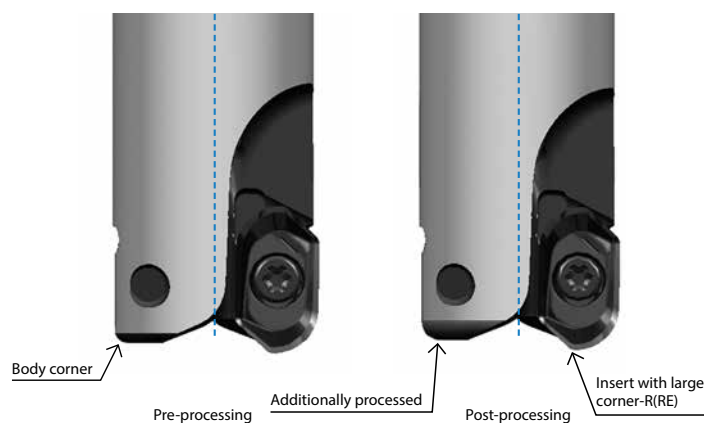


When using inserts with a corner-R(RE) of 3.2 or larger

When using inserts with corner-R(RE) 3.2 or larger, additional modifications of the cutter body will be necessary. Additional modifications for the body will be necessary. Ref. to the chart below for the recommended modifications. (If corner-R is 3.0 mm or smaller, additional modifications are not needed)

Insert Corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
3.2	R2.0
4.0	R2.5
5.0	R3.0

* Round- shaped additional processing is recommended. When applying chamfer shaped additional processing, do not cut away too much.



Cautions

While in Use



Please use within recommended cutting conditions

Do not run the cutter at revolutions exceeding the printed maximum revolution limit of the cutter body

Do not use the end mill at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Please do not use under the following conditions :

- When cutter is not fully loaded with inserts
- If the body is damaged

Please wear protective equipment such as protective glove when changing inserts

Injury can occur when touching the cutting edge

Dynamic balance

Balance adjustment on the cutter is completed before shipping

Balance adjustment to be ISO balance quality grade (ISO 1940-1) G6.3

When using at a higher revolution ($10,000 \text{ min}^{-1}$ or over), refer to the table below to adjust the balance of MEAS and arbor

Do not operate the balance adjustment screw on the outer periphery of the cutter. This could lead to improper dynamic balance

Revolution (min^{-1})	ISO balance quality grade ISO 1940-1/8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

M



Milling

High-precision cutter for finishing applications

MFF

Cutter body design provides excellent reliability
Molded wiper inserts increases machining efficiency

1 Our solution for finishing operations

Designed with a unique insert combination of semi-finishing and finishing, the MFF drastically improves productivity by reducing quality issues.



SOLUTION

Increase feed to $f = 5.0$ mm/rev
Achieved $0.8 \mu\text{m}$ Ra surface finish
No grinding required
Achieved $5 \mu\text{m}$ flatness

The above is the result of a field test. Actual results will depend on machining environment, workpiece rigidity, machine, etc.

M

Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

MFF Machining solutions

Can be used on a wide variety of parts
and workpieces

Part name

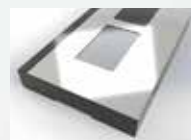
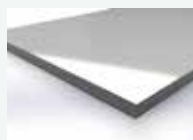
Plate / Frame / Case
Cylinder pump / Rail
Turbine housing
Casing / Mold base

Workpiece material

Rolled Steel for general structure /
Gray cast iron / Spheroidal graphite cast iron
Ni-resist cast iron
Mold steel
Carburized and hardened steel (60 HRC)

Industry

Industrial machining / Machine tools
Shipbuilding / Automotive
Construction machinery / Molds



2 Molded wiper insert for high-quality surface finish



Kyocera's unique molded insert technology realizes high feed rates and excellent surface finish



Low cutting force with special edge preparation

Micro-honing
Good sharpness

Wiper edge

Large S-curve shape developed for higher feed rates

Edge temperature simulation comparison (Internal evaluation)

MFF Conventional tool After 2 sec machining



MEGACOAT NANO Cermet **PV60M**

For high-speed machining
Recommended $V_c = \sim 350$ m/min



High-quality surface finish

Molded TT chipbreaker

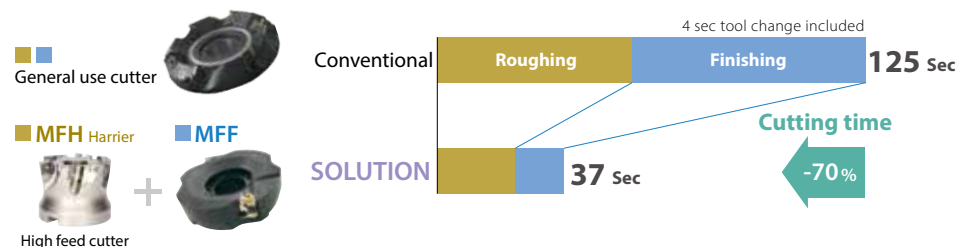
Reduces chip clogging
High feed machining



Comprehensive machining solutions

From roughing to finishing machining improvements (Internal evaluation)

Combine with Kyocera's MFH high feed cutter to improve quality and efficiency



Cutting Conditions

Conventional ø200 (6 inserts)
 $V_c = 200$ m/min
 Roughing : $V_f = 286$ mm/min ($f_z = 0.15$ mm/t), $a_p = 1.2$ mm
 Finishing : $V_f = 230$ mm/min ($f_z = 0.12$ mm/t), $a_p = 0.3$ mm

SOLUTION

Roughing : MFH Harrier ø63 (6 inserts)
 $V_c = 200$ m/min
 $V_f = 7,300$ mm/min ($f_z = 1.2$ mm/t), $a_p = 0.7$ mm
 Finishing : MFF ø200 (2 inserts)
 $V_c = 300$ m/min
 $V_f = 2,400$ mm/min ($f = 5.0$ mm/rev), $a_p = 0.1$ mm

Surface finish quality after machining

SOLUTION



Excellent surface finish (0.27 µm Ra)

Conventional machining



Cloudy surface finish (1.01 µm Ra)

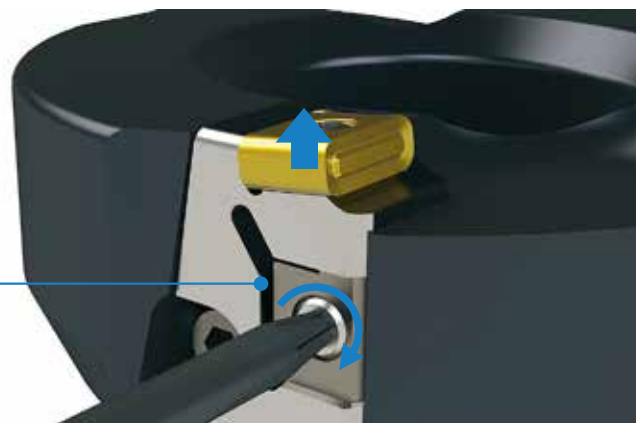
3 Adjustable cutting edge for increased usability

Cartridge height comes pre-adjusted and should not be necessary.

Adjustment is not required after replacing insert.

Easy-to-adjust cutting edge

Cutting edge height can be adjusted easily with one screw



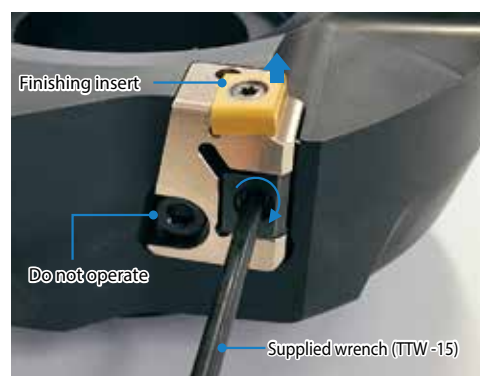
Included adjustment wrench

Edge adjustment

If D.O.C. is ap 0.1 ~ 0.2 mm, no adjustment is necessary (Pre-adjusted before holder is shipped).

Cutting edge adjustment is NOT required when replacing inserts.

If D.O.C. is less than 0.1 mm or if you prefer a different edge height, use the following method:



Adjusting the cutting edge

Use the supplied TTW-15 wrench to rotate the screw and easily adjust the cutting edge position.

Procedure

To adjust, start with the screw turned counterclockwise about two rotations (lowering the cutting edge).

Tighten the screw clockwise (raising the cutting edge) to adjust the amount of protrusion.

*Use a dial gauge to measure protrusion amount.

Precautions

Make sure to lower the cutting edge below the desired height first (turning screw counterclockwise) and then raise the edge up to the final height (turning screw clockwise).

If cutting edge is simply lowered to the final edge height, chattering or loosening of the screw may occur due to backlash.

Make sure the measurement position of the cutting edge is the same machining diameter.

Standard Cutting Edge Height

ap = 0.05 mm → protrusion against rough edge : 0.03 mm

ap = 0.10 mm ~ → protrusion against rough edge : 0.06 mm *Pre-adjusted before shipment

M



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

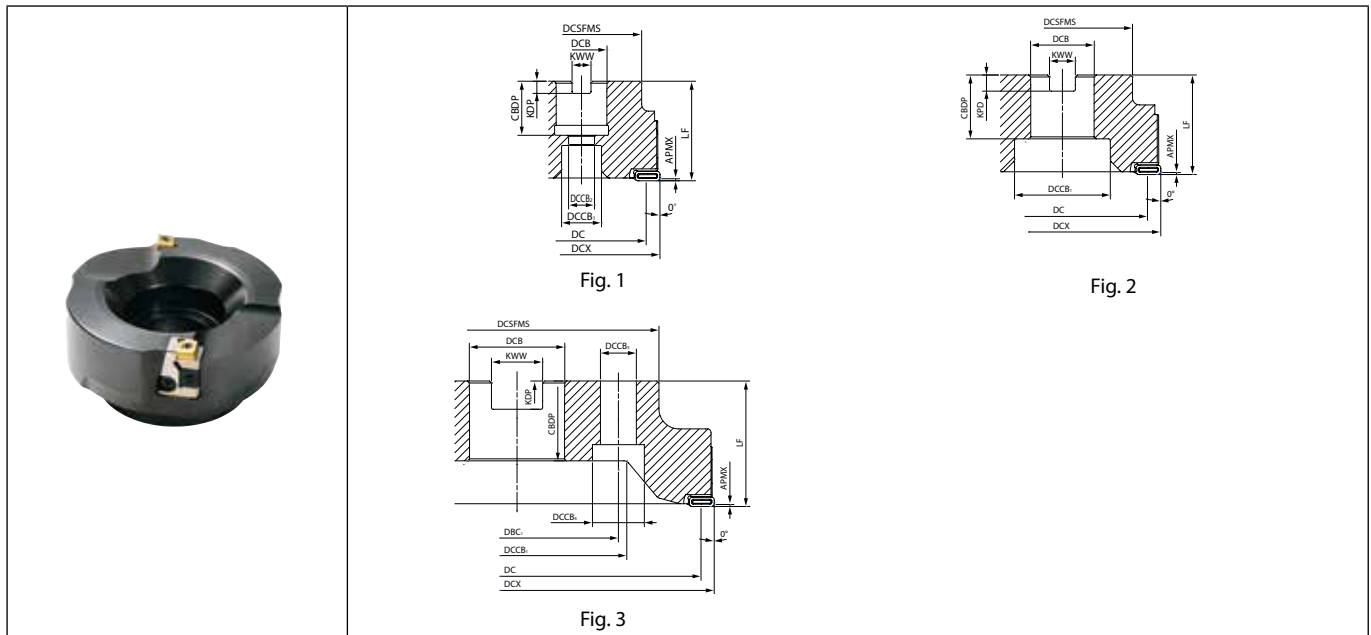
Multi-
Function

Slot Mill

Ball-nose
Radius

Others

MFF



Toolholder dimensions

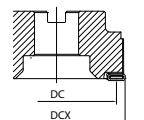
Description			Availability	Inserts	Dimension (mm)													A.R. (°)	R.R. (°) (Medium-Finishing Insert)	R.R. (°) (Finishing Insert)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M194	
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	DBC ₁	LF	CBDP	KDP	KWW									APMX
Metric	MFF	080R-M-SF	MT0	67.3	80	60	27	20	13	-	-	-	50	24	7	12.4	0.3	-8	-9	-20	No	2000	1.3	1	LNGX120916R-TT LNGX120916	
		100R-M-SF	MT0	87.3	100	70	32	48	32				8	14.4	1600	1.8						2				
		125R-M-SF	MT0	112.3	125	87	40	55	33				9	16.4	1300	3.5						2				
		160R-M-SF	MT0	147.3	160	102		72							-	1000						5.9	2			
		200R-M-SF	MT0	187.3	200	142	60	110	18				26	101.6	40	14						25.7	800	7.7		3
		250R-M-SF	MT0	237.3	250																		10.5	3		
Bore dia. inch spec	MFF	080R-SF	MT0	67.3	80	60	25.4	20	13	-	-	-	50	27	6	9.5	0.3	-8	-9	-20	No	2000	1.3	1	LNGX120916R-TT LNGX120916	
		100R-SF	MT0	87.3	100	70	31.75	48	32				8	12.7	1600	1.8						2				
		125R-SF	MT0	112.3	125	87	38.1	58	38				10	15.9	1300	3.5						2				
		160R-SF	MT0	147.3	160	102	50.8	72							-	1000						5.9	2			
		200R-SF	MT0	187.3	200	142	47.625	110	18				26	101.6	40	14						25.4	800	8.1		3
		250R-SF	MT0	237.3	250																		10.8	3		

*ø250 sizes have holes for lighter weight.

Max. Revolution

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece on page M195. Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Surface Finish
The surface will be finished flat within the range of DC shown on the right.

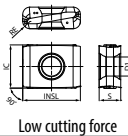
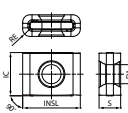


Spare parts

Spare Parts							
Clamp screw	Wrench	Wedge	Cartridge	Cartridge clamp screw	Wrench	Adjustment screw	Anti-seize Compound
							
SB-3592TR	DTM-10	AD-MFF	CR-MFF	HH5X15L	TTW-15	W6X18N	P-37
Recommended tightening torque for insert clamp 1.2N·m							

MT0 : Made to order

LNGX

Insert		Description	No. of edges	Dimension (mm)					Cermet	Carbide		Applicable toolholder M193 M38
				IC	S	D1	RE	INSL	PVD	PVD		
									PV60M	PR1525	PR1825	
		LNGX 120916R-TT	4	9.525	4.76	4.2	1.6	12.7	MT0	MT0	MT0	MFF...-SF MFSE45...-W MFSE45...-W-M
		LNGX 120916	4	9.525	4.76	4.2	1.6	12.7	MT0	MT0	MT0	MFF...-SF MFSE45...-W MFSE45...-W-M

Recommended cutting conditions M195

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

MT0 : Made to order

M194

Recommended cutting conditions

Chipbreaker	Workpiece material	f (mm/rev)	ap (mm)	Recommended insert grades (Vc : m/min)	
				PV60M	PR1825 (PR1525)
TT	Structural steel	1.5 – 4.0 – 5.0	0.03 – 0.1 – 0.3	★ 230 – 280 – 350	☆ 230 – 280 – 350
	Carbon steel	1.0 – 4.0 – 5.0		★ 200 – 250 – 350	☆ 200 – 250 – 350
	Alloy steel	1.0 – 4.0 – 5.0		★ 200 – 250 – 350	☆ 200 – 250 – 350
	Mold steel	1.0 – 2.0 – 4.0	0.03 – 0.1 – 0.2	☆ 120 – 200 – 250	★ 120 – 200 – 250
	Mold steel (50HRC ~)	0.6 – 1.0 – 1.2	0.03 – 0.05 – 0.1	-	★ 50 – 70 – 80
	Stainless steel (Austenitic related)*	1.0 – 2.0 – 4.0	0.03 – 0.1 – 0.2	☆ 120 – 200 – 250	★ 120 – 200 – 250
	Stainless steel (Martensitic related) *	1.0 – 3.0 – 4.0		☆ 150 – 200 – 300	★ 150 – 200 – 300
Standard	Gray cast iron	1.0 – 2.0 – 4.0	0.03 – 0.1 – 0.3	☆ 200 – 250 – 350	★ 200 – 250 – 350
	Nodular cast iron	1.5 – 2.0 – 4.0		☆ 150 – 250 – 300	★ 150 – 250 – 300

★: 1st Recommendation ☆: 2nd Recommendation

*Machining with coolant is recommended for stainless steel

The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

MFH Harrier

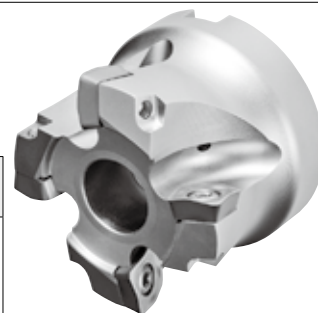
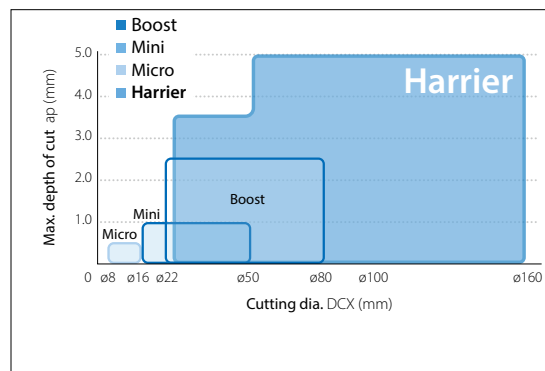
Anti chattering

Applicable to various applications with 4 types of inserts

Increased chip evacuation and shortened cutting time

1 Large chipbreaker lineup for various machining applications

4 types of inserts according to your application



	GM type (General purpose)	GH type (Tough edge)	LD type (Large D.O.C.)	FL type (Low cutting force)
Shape				
Applications	1st recommendation for general purpose → Facing, Pocketing, Helical milling	Excellent fracture resistance → Available for facing, ramping and helical milling	Max. ap=5 mm → Applicable for scale removal at high efficiency	Wiper edge with low cutting force → Applicable for both roughing and finishing, for small machining center

M

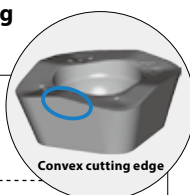
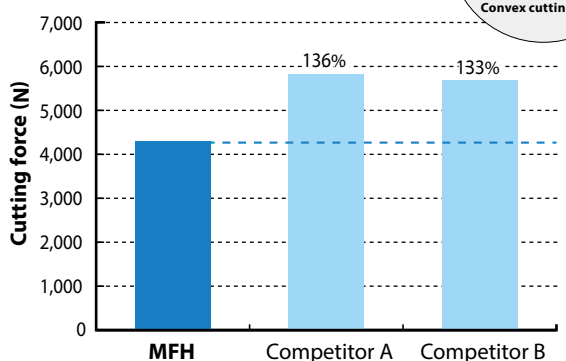


Milling

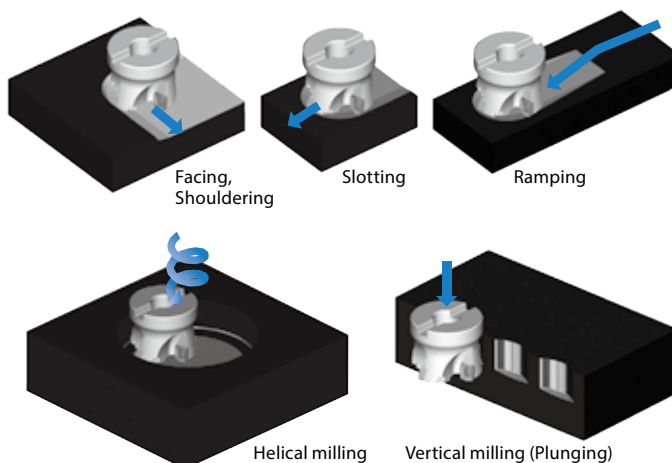
2 3D convex cutting edge reduces shock of biting workpiece

Cutting force (Shock) comparison when biting workpiece (Internal evaluation)

Cutting with the ae that receives the maximum impact



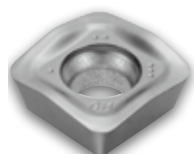
3 Multi-functional cutter



* GM type is applicable for all the above applications

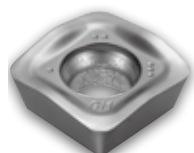
* LD type and FL type are not applicable for helical milling, Plunging and contouring of rising wall (Please refer to M206, M207)

4 Applicable for variety of workpieces from steel to heat-resistant alloys



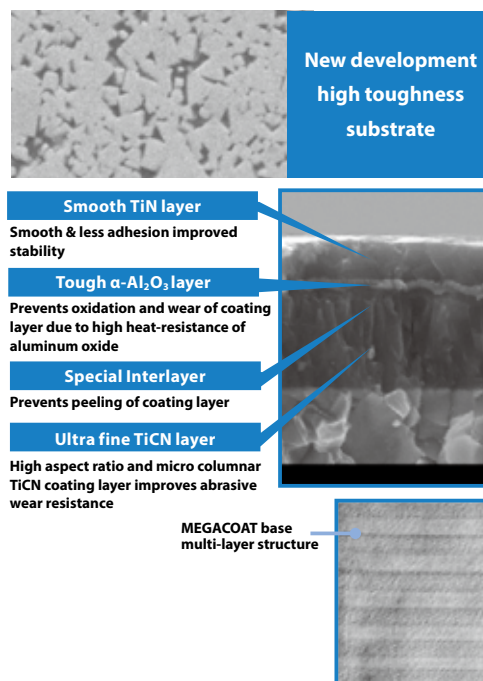
CA6535

For Martensitic stainless steel and Ni-base heat-resistant alloys high heat resistance and wear resistance with CVD coating
Improved stability due to thin layer coating technology



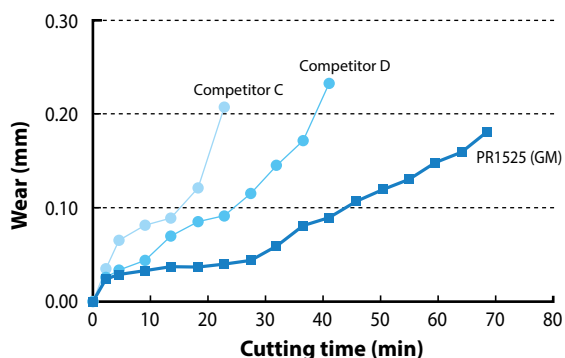
PR1835

For Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
Stable and longer tool life by special nano coating layer
MEGACOAT NANO EX



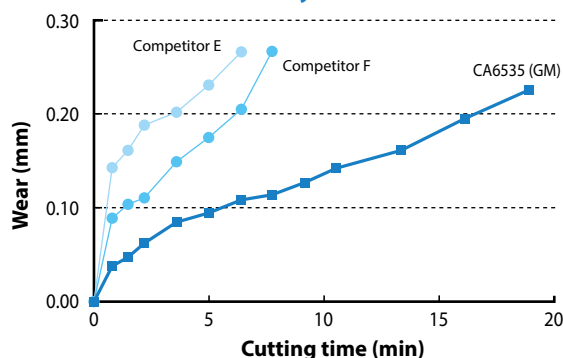
Wear resistance comparison (Internal evaluation)

SKD11



<Cutting conditions> Vc=150m/min, apxae=1.0x16mm, fz=1.5mm/t, Dry

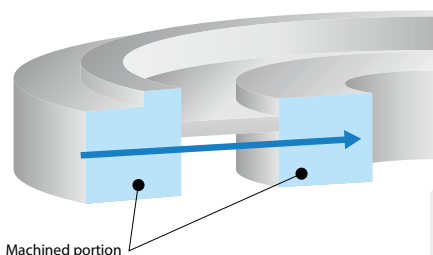
Ni-base heat-resistant alloys



<Cutting conditions> Vc=30m/min, apxae=1.0x40mm, fz=0.8mm/t, Wet

Case studies

SFVAF22B (Forged alloy steel)



Machining efficiency
3 times increase

- Turbine parts • Vc=160m/min • apxae=1.5xmax.160mm
- fz=1.17mm/t • Dry
- MFH160R-14-8T (8 Flutes) • SOMT140520ER-GM (PR1525)

PR1525

Chip evacuation rate = 720cc/min

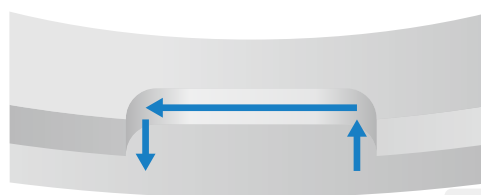
Competitor G

Chip evacuation rate = 240cc/min

- Small machining noise even at 3 times higher feed rate
- Good edge condition without chipping and stable machining

(User evaluation)

SUS304F



Chattering reduced
Machining efficiency
1.6 times

- Clutch • Vc=120m/min • apxae=1.0x20mm
- fz=1.2mm/t • Dry
- MFH32-S32-10-2T (2 Flutes) • SOMT100420ER-GM (PR1535)

PR1535

Chip evacuation rate = 58cc/min

Competitor H

Chip evacuation rate = 36cc/min

- Competitor H caused chattering but MFH realized stable machining
- Good edge condition and long tool life

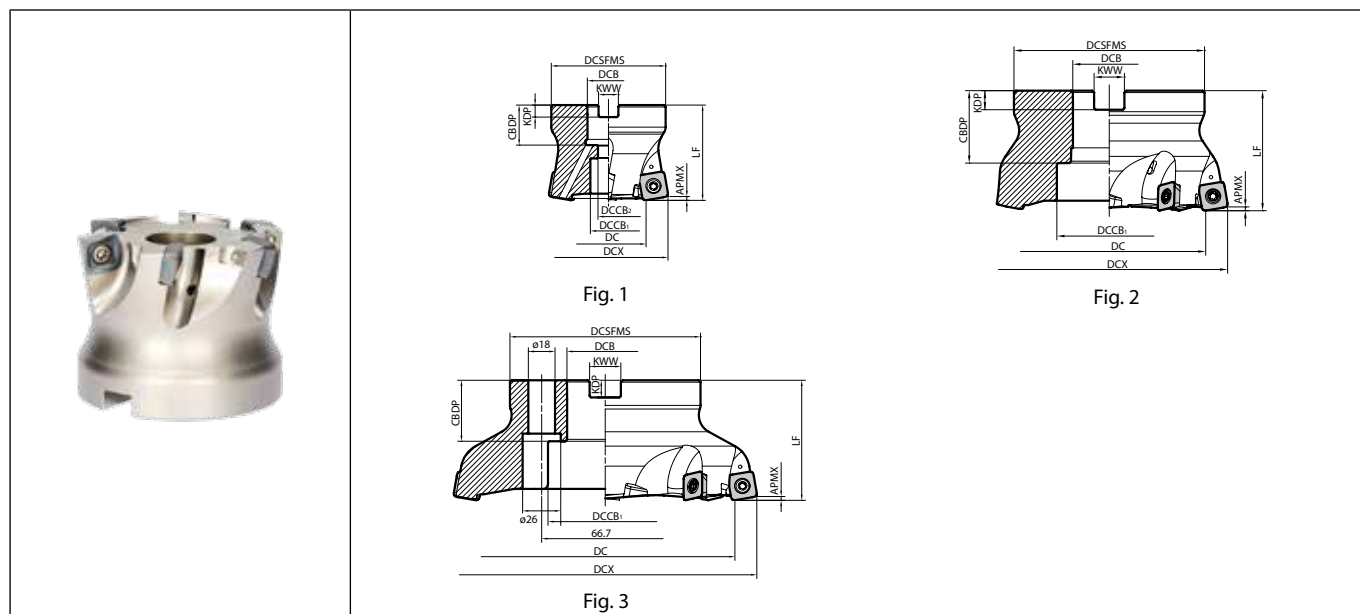
(User evaluation)

M



Milling

MFH Harrier (Face mill)



Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)												A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M203		
					R	DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP							KWW	APMX
Metric	MFH	050R-10-4T-M	●	4	50	33	37.5	36.5	47	22	19	11	50	21	6.3	10.4	1.5 (3.5)	1.2	+10	Yes	10000	0.4	1	SOMT1004...
		050R-10-5T-M	●	5																				
		063R-10-5T-22M	●	5	63	46	50.5	49.5	60	27	20	13	24	7	12.4									
		063R-10-5T-27M	●							22	19	11	21	6.3	10.4									
		063R-10-6T-22M	●	6	27	20	13	63	24	7	12.4													
		063R-10-6T-27M	●																					
		080R-10-7T-M	●	7	80	63	67.5	66.5	76															
Bore dia. inch spec	MFH	050R-10-4T	●	4	50	33	37.5	36.5	47	22.225	19	11	50	19	5	8.4	1.5 (3.5)	1.2	+10	Yes	10000	0.4	1	SOMT1004...
		050R-10-5T	●	5																				
		063R-10-5T	●	6	63	46	50.5	49.5	60															
		063R-10-6T	●																					
		080R-10-7T	●	7	80	63	67.5	66.5	76	31.75	26	17	63	32	8	12.7								

For APMX₂, refer to the figure in **M199**The values (APMX = 3.5) and (APMX₂ = 1.2) are valid in case of LD-Type usage.

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)													A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M203				
					R	DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW							APMX	APMX ₂		
Metric	MFH	050R-14-4T-M	●	4	50	27	33	32	47	22	12	-	50	21	6.3	10.4	2 (5)	2	+10	Yes	8800	0.4	1	SOMT1405...			
		063R-14-4T-22M	●		63	40	46	45	60		19	11		24	7	12.4					7400	0.6	1				
		063R-14-4T-27M	●								27	20		13	21	6.3									10.4		
		063R-14-5T-22M	●	5	27	20	13	24	7	12.4	2	2	+10	Yes	6400	1.4	1	2									
		063R-14-5T-27M	●																								
		080R-14-5T-M	●	5	80	57	63	62	76	27	20	13	63	28	8	14.4	2	2	+10	Yes	5600	2.4	2				
		080R-14-6T-M	●																						6	100	77
		100R-14-6T-M	●	7	125	102	108	107	100	40	55	-	32	19	11	50	19	5	8.4	2	2	+10	Yes				
		100R-14-7T-M	●																						8	160	137
		125R-14-7T-M	●	8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
160R-14-8T-M	●	8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2	+10	Yes	5600	2.4	1					
		8	160																				137	143	142	100	38.1
				8	160	137	143	142	100	38.1	55	-	38	11	19.1	2	2										

For APMX₂, refer to the figure below

The values (APMX = 5) and (APMX₂ = 2) are valid in case of LD-Type usage.

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

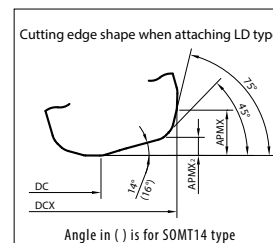
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Spare parts (MFH Harrier - Face mill)

Description		Spare parts				Applicable inserts			
		Clamp screw	Wrench		Anti-seize compound		Mounting bolt		
			DTPM 	TTP 					
MFH	050R-10-...	SB-4090TRPN	DTPM-15		P-37	HH10X30	SOMT100420ER-GM SOMT100420ER-LD SOMT100420ER-FL SOMT100420ER-GH		
	050R-10-...-M								
	063R-10-...								
	063R-10-...-22M								
	063R-10-...-27M								
	080R-10-...								
080R-10-...-M	Recommended tightening torque for insert clamp 3.5N·m				HH12X35				
080R-10-...-M					HH16X40				
MFH	050R-14-...	SB-50120TRP	TTP-20		P-37	HH12X35			
	050R-14-...-M					W10X31			
	063R-14-...					HH10X30			
	063R-14-...-22M					HH12X35			
	063R-14-...-27M					HH16X40			
	080R-14-...					HH12X35			
	080R-14-...-M					HH16X40			
	100R-14-...								
	100R-14-...-M					Recommended tightening torque for insert clamp 4.5N·m			
	125R-14-...								
	125R-14-...-M								
	160R-14-...								
	160R-14-...-M								

Recommended tightening torque for insert clamp 3.5N·m

Recommended tightening torque for insert clamp 4.5N·m

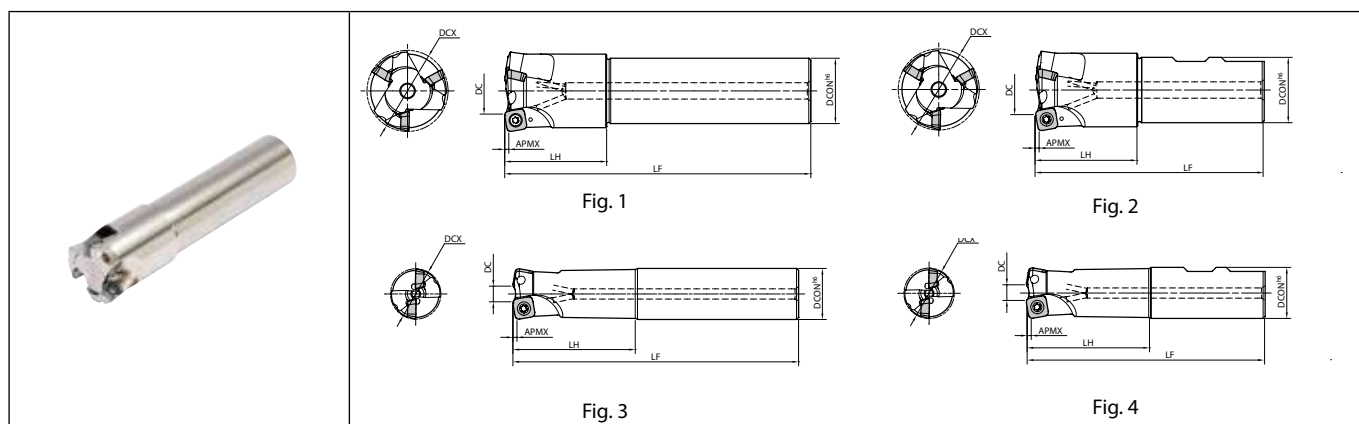


Max. revolution

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MFH Harrier (End mill)



Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)								A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M203		
					DCX	DCON	DC (GM/GH)		DC (LD)	DC (FL)	LF	LH						APMX	APMX ₂	Anti-seize compound		Screw	Wrench
Cylindrical	MFH	25-S25-10-2T	●	25	25	8	12.5	11.5	140	60	1.5 (3.5)	1.2	+10	Yes	17000	0.4	3				SOMT1004...		
		28-S25-10-2T	●	28	11	15.5	14.5	40	15500	0.5					1								
		32-S32-10-2T	●	32	15	19.5	18.5	70	14000	0.8					3								
		32-S32-10-3T	●	3	1																		
		35-S32-10-2T	●	2	35	32	18	22.5	21.5	150					50	13000	1						
		35-S32-10-3T	●	3	1																		
		40-S32-10-3T	●	40	23	27.5	26.5	11500	0.9	1													
		40-S32-10-4T	●	4	1																		
Weldon	MFH	25-W25-10-2T	●	25	25	8	12.5	11.5	117	60	1.5 (3.5)	1.2	+10	Yes	17000	0.4	4				SOMT1004...		
		32-W32-10-3T	●	32	15	19.5	18.5	131	70	14000					0.7	4							
		40-W32-10-3T	●	40	32	23	27.5	26.5	112	50					11500	2							
		40-W32-10-4T	●	4	2																		
Long Shank	MFH	25-S25-10-2T-200	●	25	25	8	12.5	11.5	120	1.5 (3.5)	1.2	+10	Yes	17000	0.6	3				SOMT1004...			
		28-S25-10-2T-200	●	28	11	15.5	14.5	200	40					15500	0.7	1							
		32-S32-10-2T-200	●	32	15	19.5	18.5	120	14000					1	3								
		35-S32-10-2T-200	●	35	32	18	22.5	21.5	50					13000	1.4	1							
		40-S32-10-4T-250	●	4	40	23	27.5	26.5	250					11500	1.5	1							
		Extra Long Shank	MFH	25-S25-10-2T-300	●	25	25	8	12.5					11.5	180	1.5 (3.5)					1.2	+10	Yes
28-S25-10-2T-300	●			28	11	15.5	14.5	40	15500	1.1	1												
32-S32-10-2T-300	●			32	15	19.5	18.5	300	180	14000	1.6	3											
35-S32-10-2T-300	●			35	32	18	22.5	21.5	50	13000	1.7	1											
40-S32-10-4T-300	●			4	40	23	27.5	26.5	11500	1.8	1												

For APMX₂, refer to the figure in M199The values (APMX = 3.5) and (APMX₂ = 1.2) are valid in case of LD-Type usage.

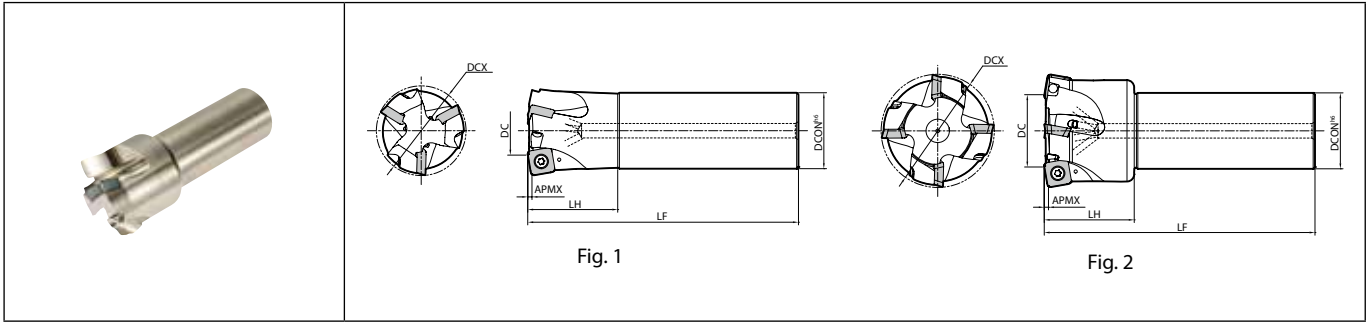
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item

M200

MFH Harrier (End mill)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)										A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts  M203	
			DCX	DCON	DC (GM/GH)			DC (LD)	DC (FL)	LF	LH	APMX						APMX ₂				
MFH 50-S42-14-3T 63-S42-14-4T 80-S42-14-5T	●	3	50		27	33	32					2	2	+10	Yes	8800	1.4	1	P-37	SB-50120TRP	TTP-20	SOMT1405...
	●	4	63	42	40	46	45	150	50			2 (5)				7400	1.7	2	Recommended tightening torque for insert clamp 3.5N·m			
	●	5	80		57	63	62									6400	2.3	2				

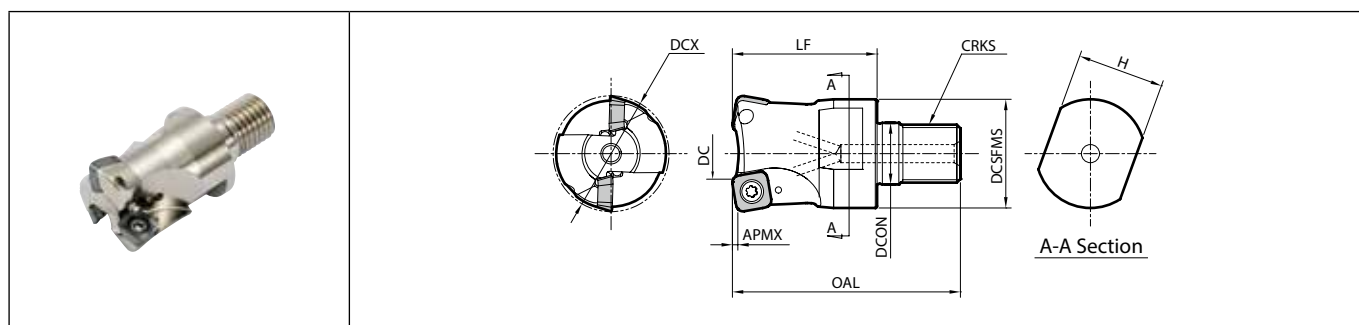
For APMX₂, refer to the figure in **M199**

The values (APMX = 5) and (APMX₂ = 2) are valid in case of LD-Type usage.

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MFH Harrier (Modular type)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)											A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts ➡ M203		
			DCX	DCON	DC (GW/GH)		DC (LD)	DC (FL)	DCSFMS	OAL	LF	APMX	APMXs				CRKS	H				
MFH	25-M12-10-2T	●	25	12.5	8	12.5	11.5	23	57	35	1.5 (3.5)	1.2	M12x1.75	19	+10	Yes	17000	P-37	SB-4075TRP	DTPM-15	SOMT1004...	
	28-M12-10-2T	●	2		28	11	15.5						14.5									
	32-M16-10-2T	●	3	32	15	19.5	18.5									14000						
	32-M16-10-3T	●		2																		
	35-M16-10-2T	●	35	17	18	22.5	21.5	30	62	40		M16x2.0	24	13000								
	35-M16-10-3T	●	3																			
	40-M16-10-3T	●	4	40	23	27.5	26.5									11500						
	40-M16-10-4T	●																				

For APMX₂, refer to the figure in **M199**

The values (APMX = 3.5) and (APMX₂ = 1.2) are valid in case of LD-Type usage.

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

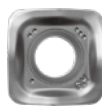
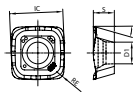
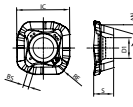
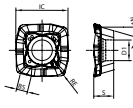
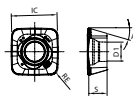
Ball-nose
Radius

Others

● : Standard item

M202

SOMT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel													☆		★	☆	P	
		Mold and die steel													☆		★	☆		
		Austenitic stainless steel														☆		★	M	
		Martensitic stainless steel										★						☆		
		Precipitation hardening stainless steel														☆		★		
		Gray cast iron												☆			★		K	
		Nodular cast iron												☆			★			
		Non-ferrous metals																	N	
		Heat-resistant alloy										★							☆	S
		Titanium alloy														☆		★		
		Hard materials											★							H
Insert		Description	No. of edges	Dimension (mm)					Angle (°)	Carbide							Applicable toolholder ➡ M198~M202			
				IC	S	D1	RE	BS	AN	CVD	PVD									
											CA635	PR015S	PR1510	PR1525	PR1535	PR1810		PR1825	PR1835	
	 General purpose	SOMT 100420ER-GM	4	10.3	4.58	4.6	2	-	16	●		□	○	●	●	●	●	MFH...-10-..		
		SOMT 140520ER-GM	4	14.14	5.56	5.8	2	-	16	●		□	○	●	●	●	●	MFH...-14-..		
	 Large D.O.C.	SOMT 100420ER-LD	4	10.45	4.58	4.6	2	0.9	16	●		□	○	●	●	●	●	MFH...-10-..		
		SOMT 140520ER-LD	4	14.76	5.56	5.8	2	1.6	16	●		□	○	●	●	●	●	MFH...-14-..		
	 With wiper edge	SOMT 100420ER-FL	4	10.44	4.58	4.6	2	1.4	16	●		□	○	●	●	●	●	MFH...-10-..		
		SOMT 140514ER-FL	4	14.57	5.56	5.8	1.4	3.1	16	●		□	○	●	●	●	●	MFH...-14-..		
	 Tough edge	SOMT 100420ER-GH	4	10.43	4.57	4.55	2	-	16		●	□	○	●	●	●	●	MFH...-10-..		
		SOMT 140520ER-GH	4	14.17	5.56	5.8	2	-	16		●	□	○	●	●	●	●	MFH...-14-..		

Handed insert shows Right-hand

Recommended cutting conditions ➡ M204, M205

Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t)			Recommended insert grades (Vc: m/min)				
		MFH25-...	MFH32-...	MFH40-...	MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide
					PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR015S	CA6535
GM GH	Carbon steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	★ 100~160~220	☆ 100~160~220	-	-
	Mold steel (~40HRC)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	☆ 80~140~180	☆ 80~140~180	GH★ 80~140~180	-
	Mold steel (40~50HRC)	0.15~ 0.3 ~0.5(ap≤1.0mm) 0.15~ 0.2 ~0.25(ap≤1.5mm)	0.2~ 0.5 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.45(ap≤1.5mm)	0.2~ 0.6 ~0.9(ap≤1.0mm) 0.2~ 0.5 ~0.7(ap≤1.5mm)	-	☆ 60~100~130	-	GH★ 60~100~130	-
	Mold steel (50~55HRC)	0.15~ 0.25 ~0.4(ap≤1.0mm)	0.15~ 0.35 ~0.6(ap≤1.0mm)	0.15~ 0.4 ~0.7(ap≤1.0mm)	-	☆ 50~70~100	-	GH★ 50~70~100	-
	Mold steel (55~60HRC)	0.03~ 0.06 ~0.1(ap≤1.0mm) Recommended only for GH chipbreaker			-	-	-	GH☆ 50~60~70	-
	Stainless steel (Austenitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	GM☆ 100~160~200	GM☆ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	★ 90~120~150	-	-
	Gray cast iron	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	★ 120~180~250	-	-	-	-
	Nodular cast iron	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	★ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	-	-	☆ 20~30~50	-	★ 20~30~50
	Titanium alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	GM☆ 30~50~70	-	GM★ 40~60~80	-	-
LD	Carbon steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.06~ 0.15 ~0.3(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.06~ 0.15 ~0.3(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	-	★ 100~160~220	☆ 100~160~220	-	-
	Mold steel (~40HRC)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	★ 80~140~180	☆ 80~140~180	-	-
	Mold steel (40~50HRC)	0.2~ 0.3 ~0.5(ap≤1.0mm) 0.03~ 0.05 ~0.1(ap≤3.5mm)	0.2~ 0.5 ~0.8(ap≤1.0mm) 0.03~ 0.08 ~0.15(ap≤3.5mm)	0.2~ 0.6 ~0.9(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	-	★ 60~100~130	☆ 60~100~130	-	-
	Stainless steel (Austenitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	☆ 100~160~200	★ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	-	☆ 150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	-	★ 90~120~150	-	-
	Gray cast iron	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.06~ 0.15 ~0.3(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	★ 120~180~250	-	-	-	-
	Nodular cast iron	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	★ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.03~ 0.05 ~0.1(ap≤3.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.03~ 0.08 ~0.15(ap≤3.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	-	-	☆ 20~30~50	-	★ 20~30~50
	Titanium alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.03~ 0.08 ~0.15(ap≤3.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.03~ 0.08 ~0.15(ap≤3.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	☆ 30~50~70	-	★ 40~60~80	-	-
	Carbon steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	★ 100~160~220	☆ 100~160~220	-	-
FL	Mold steel (~40HRC)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	★ 80~140~180	☆ 80~140~180	-	-
	Mold steel (40~50HRC)	0.15~ 0.3 ~0.5(ap≤1.0mm) 0.15~ 0.2 ~0.25(ap≤1.5mm)	0.2~ 0.5 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.45(ap≤1.5mm)	0.2~ 0.6 ~0.9(ap≤1.0mm) 0.2~ 0.5 ~0.7(ap≤1.5mm)	-	★ 60~100~130	☆ 60~100~130	-	-
	Stainless steel (Austenitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	☆ 100~160~200	★ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	☆ 150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	★ 90~120~150	-	-
	Gray cast iron	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	★ 120~180~250	-	-	-	-
	Nodular cast iron	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	★ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	-	-	☆ 20~30~50	-	★ 20~30~50
	Titanium alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	☆ 30~50~70	-	★ 40~60~80	-	-
	Carbon steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	★ 120~180~250	☆ 120~180~250	-	-

★: 1st Recommendation ☆: 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

* The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* When finishing with LD type and FL type inserts, recommended feed rate for SOMET14 LD type: f=1.5(mm/rev) or less/for SOMET10 LD type: f=0.9(mm/rev) or less for SOMET14 FL type: f=3.0(mm/rev) or less/for SOMET10 FL type: f=1.4(mm/rev) or less

* For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.

* For slotting, internal coolant is recommended.

Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t)		Recommended insert grades (Vc: m/min)				
		MFH...R-10-...	MFH...R-14-...	MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide
				PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR015S	CA6535
GM GH	Carbon steel	0.5~ 1.5 ~2.0		-	★ 120~ 180 ~250	☆ 120~ 180 ~250	-	-
	Alloy steel	0.5~ 1.5 ~2.0		-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-	-
	Mold steel (~ 40HRC)	0.5~ 1.2 ~1.8		-	☆ 80~ 140 ~180	☆ 80~ 140 ~180	GH★ 80~ 140 ~180	-
	Mold steel (40 ~ 50HRC)	0.2~ 0.7 ~1.0		-	☆ 60~ 100 ~130	-	GH★ 60~ 100 ~130	-
	Mold steel (50 ~ 55HRC)	0.2~ 0.5 ~0.8		-	☆ 50~ 70 ~100	-	GH★ 50~ 70 ~100	-
	Mold steel (55 ~ 60HRC)	0.03~ 0.06 ~0.1(ap≤1.0mm) Recommended only for GH chipbreaker		-	-	-	GH☆ 50~ 60 ~70	-
	Stainless steel (Austenitic related)	0.5~ 1.2 ~1.8		-	GM☆ 100~ 160 ~200	GM☆ 100~ 160 ~200	-	-
	Stainless steel (Martensitic related)	0.5~ 1.2 ~1.8		-	-	☆ 150~ 200 ~250	-	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.5~ 1.2 ~1.8		-	-	90~ 120 ~150	-	-
	Gray cast iron	0.5~ 1.5 ~2.0		★ 120~ 180 ~250	-	-	-	-
	Nodular cast iron	0.5~ 1.2 ~1.8		★ 100~ 150 ~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~ 0.8 ~1.2		-	-	☆ 20~ 30 ~50	-	★ 20~ 30 ~50
	Titanium alloys	0.2~ 0.8 ~1.2		GM☆ 30~ 50 ~70	-	GM★ 40~ 60 ~80	-	-
LD	Carbon steel	0.5~ 1.5 ~2.0(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	0.5~ 1.5 ~2.0(ap≤2.0mm) 0.06~ 0.2 ~0.4(ap≤5.0mm)	-	★ 120~ 180 ~250	☆ 120~ 180 ~250	-	-
	Alloy steel	0.5~ 1.5 ~2.0(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	0.5~ 1.5 ~2.0(ap≤2.0mm) 0.06~ 0.2 ~0.4(ap≤5.0mm)	-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-	-
	Mold steel (~ 40HRC)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤2.0mm) 0.06~ 0.15 ~0.3(ap≤5.0mm)	-	★ 80~ 140 ~180	☆ 80~ 140 ~180	-	-
	Mold steel (40 ~ 50HRC)	0.2~ 0.7 ~1.0(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	0.2~ 0.7 ~1.0(ap≤2.0mm) 0.03~ 0.1 ~0.2(ap≤5.0mm)	-	★ 60~ 100 ~130	☆ 60~ 100 ~130	-	-
	Stainless steel (Austenitic related)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤2.0mm) 0.06~ 0.15 ~0.3(ap≤5.0mm)	-	☆ 100~ 160 ~200	★ 100~ 160 ~200	-	-
	Stainless steel (Martensitic related)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤2.0mm) 0.06~ 0.15 ~0.3(ap≤5.0mm)	-	-	☆ 150~ 200 ~250	-	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤2.0mm) 0.06~ 0.15 ~0.3(ap≤5.0mm)	-	-	90~ 120 ~150	-	-
	Gray cast iron	0.5~ 1.5 ~2.0(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	0.5~ 1.5 ~2.0(ap≤2.0mm) 0.06~ 0.2 ~0.4(ap≤5.0mm)	★ 120~ 180 ~250	-	-	-	-
	Nodular cast iron	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤2.0mm) 0.06~ 0.15 ~0.3(ap≤5.0mm)	★ 100~ 150 ~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~ 0.8 ~1.2(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	0.2~ 0.8 ~1.2(ap≤2.0mm) 0.03~ 0.1 ~0.2(ap≤5.0mm)	-	-	☆ 20~ 30 ~50	-	★ 20~ 30 ~50
	Titanium alloys	0.2~ 0.8 ~1.2(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	0.2~ 0.8 ~1.2(ap≤2.0mm) 0.03~ 0.1 ~0.2(ap≤5.0mm)	☆ 30~ 50 ~70	-	★ 40~ 60 ~80	-	-
FL	Carbon steel	0.5~ 1.5 ~2.0		-	★ 120~ 180 ~250	☆ 120~ 180 ~250	-	-
	Alloy steel	0.5~ 1.5 ~2.0		-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-	-
	Mold steel (~ 40HRC)	0.5~ 1.2 ~1.8		-	★ 80~ 140 ~180	☆ 80~ 140 ~180	-	-
	Mold steel (40 ~ 50HRC)	0.2~ 0.7 ~1.0		-	★ 60~ 100 ~130	☆ 60~ 100 ~130	-	-
	Stainless steel (Austenitic related)	0.5~ 1.2 ~1.8		-	☆ 100~ 160 ~200	★ 100~ 160 ~200	-	-
	Stainless steel (Martensitic related)	0.5~ 1.2 ~1.8		-	-	☆ 150~ 200 ~250	-	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.5~ 1.2 ~1.8		-	-	90~ 120 ~150	-	-
	Gray cast iron	0.5~ 1.5 ~2.0		★ 120~ 180 ~250	-	-	-	-
	Nodular cast iron	0.5~ 1.2 ~1.8		★ 100~ 150 ~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~ 0.8 ~1.2		-	-	☆ 20~ 30 ~50	-	★ 20~ 30 ~50
	Titanium alloys	0.2~ 0.8 ~1.2		☆ 30~ 50 ~70	-	★ 40~ 60 ~80	-	-

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★: 1st Recommendation ☆: 2nd Recommendation

* The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

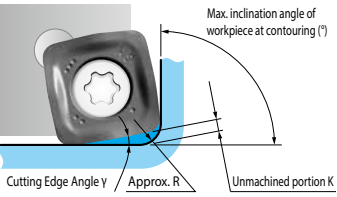
* When finishing with LD type and FL type inserts, recommended feed rate for SOMET14 LD type: f=1.5(mm/rev) or less/for SOMET10 LD type: f=0.9(mm/rev) or less for SOMET14 FL type: f=3.0(mm/rev) or less/for SOMET10 FL type: f=1.4(mm/rev) or less

* For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.

* For slotting, internal coolant is recommended.



Note for machining program (Approx. R)

Shape	Description	Insert type	Cutting edge angle γ	Approx. R (mm)	Unmachined portion K (mm)	Max. inclination angle of workpiece at contouring
	MFH...-10-...	GM / GH	10°	3.0	0.85	90°
		FL	14°	3.0	0.89	80°
		LD	14°	3.5	0.69	65°
	MFH...-14-...	GM / GH	10°	3.5	1.37	90°
		FL	13°	3.0	1.36	80°
		LD	16°	5.0	1.06	65°

Reference data for ramping

MFH...-10-...

Cutter dia. DCX (mm)	25	28	32	35	40	50	63	80
Max. ramping angle RMPX	5°	4.5°	4°	3.5°	3°	2.5°	2°	1°
tan RMPX	0.087	0.078	0.070	0.061	0.052	0.043	0.035	0.017

MFH...-14-...

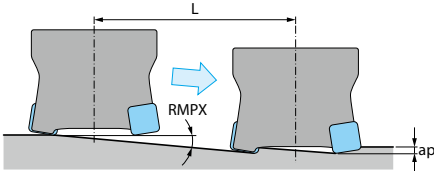
Cutter dia. DCX (mm)	50	63	80	100	125	160
Max. ramping angle RMPX	2°	1.8°	1°	0.5°	0.4°	0.2°
tan RMPX	0.035	0.031	0.017	0.009	0.007	0.003

Guide for ramping (Slant milling)

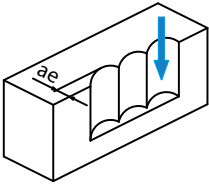
Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length
“L” at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



Vertical milling (Plunging)

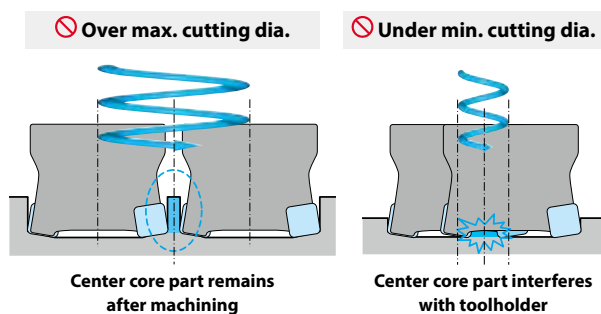


Insert description	Max. width of cut (ae)
SOMT10	8mm
SOMT14	11.5mm

*Vertical milling (Plunging) is available only with GM/GH type insert.
(LD type and FL type are not applicable)
For vertical milling (plunging), reduce feed rate to fz=0.2mm/t or less.

Guide for helical milling

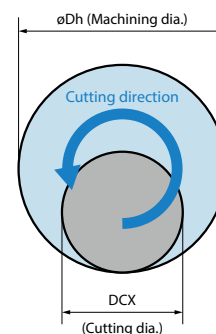
For helical milling, use between min. cutting dia. and max. cutting dia.



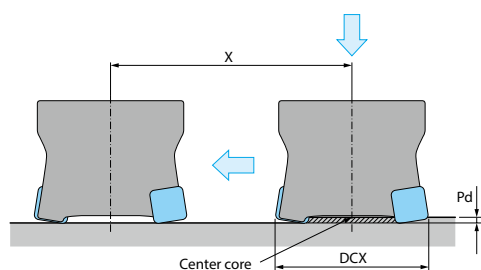
Description	Min. cutting dia.	Max. cutting dia.
MFH...-10-...	2×DCX-18	2×DCX-2
MFH...-14-...	2×DCX-25	2×DCX-2

Unit: mm

- Sinking depth (h) at helical milling should be under max. depth of cut (APMX) in the cutter dimension chart.
- Down-cut milling is recommended. (Ref. to the right figure)
- Feed rate should be under 50% of the recommended cutting conditions.
- Use caution to eliminate incidences caused by producing long chips.



Guide for drilling



3D machining

Insert type	Ramping	Contouring (Rising wall angle)	Vertical	Helical milling	Pocketing
GM / GH	✓	✓ (90°)	✓	✓	✓
LD	✓	△ (65°)	×	×	×
FL	✓	△ (80°)	×	×	×

- Some applications are not available depending on insert type.
- For FL and LD type, there is a limit of rising wall angle at contouring.

Description	GM type / GH type		LD type		FL type	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH...-10-...	1.5	DCX-18	1.5	DCX-14	1.5	DCX-15
MFH...-14-...	2	DCX-24	2	DCX-18	2	DCX-19

[Drilling depth] Please refer to Pd (Max. cutting depth) in the chart.

[When traversing after drilling]

1. Reduce feed rate 25% or less of the recommended conditions until the center core part (Unmachined part) is removed.
2. When drilling, reduce feed rate per revolution to $f=0.2\text{mm/rev}$ or under.

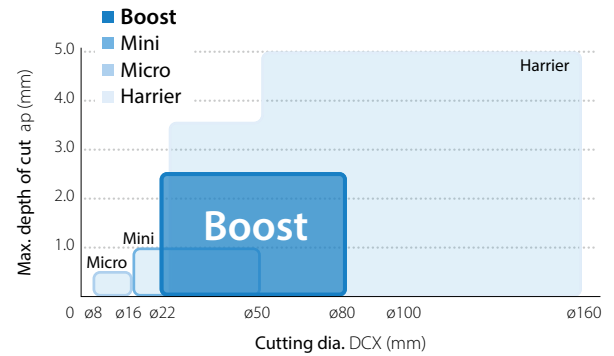
Unit: mm



High feed and large depth of cut milling

MFH Boost

Large D.O.C. for greater milling capabilities
Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds



1 High feed milling with large depth of cut capabilities

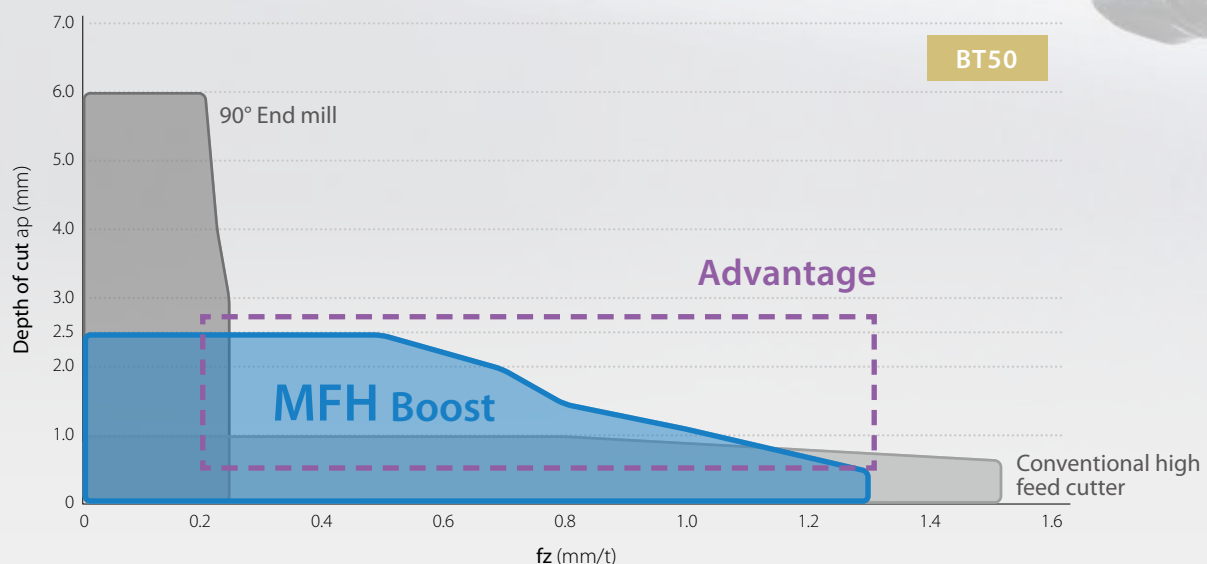
A small 04 size insert (4-edge, double-sided insert) supports depths of cut up to 2.5 mm with cutting dia. available from $\varnothing 22$ mm.

Achieves high efficiency machining in various shouldering, slotting, helical milling, and ramping applications.

4-edge, double-sided insert

Max. depth of cut
2.5 mm

MFH Boost Advantage



2 Available for a variety of machining applications and environments

1 Solutions for 90° end mills (Rough to medium-finish machining)

High feed rates dramatically improve machining efficiency

Machining efficiency simulation example

Pocketing: $V_c = 150$ m/min, $a_e = 12.5$ mm

MFH Boost
ø 25 (3 Inserts)

100 cc/min

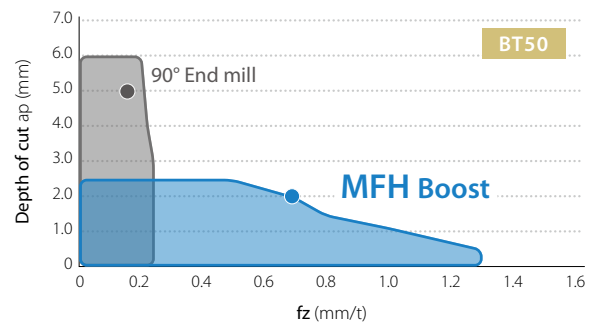
$a_p = 2.0$ mm, $f_z = 0.7$ mm/t

Conventional
90° end mill
ø 25 (3 Inserts)

54 cc/min

$a_p = 5.0$ mm, $f_z = 0.15$ mm/t

Machining
efficiency
x 1.8



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison
(Internal evaluation)

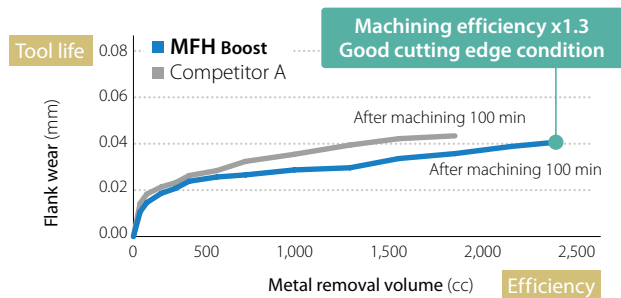
Cutting edge condition after 100 min machining

MFH Boost

$a_p = 1.6$ mm, $f_z = 0.6$ mm/t

Competitor A 90° end mill

$a_p = 5.0$ mm, $f_z = 0.15$ mm/t



Cutting conditions: $V_c = 150$ m/min, $a_e = 12.5$ mm, dry, SCM440(H), ø 25 (1 Insert) BT50

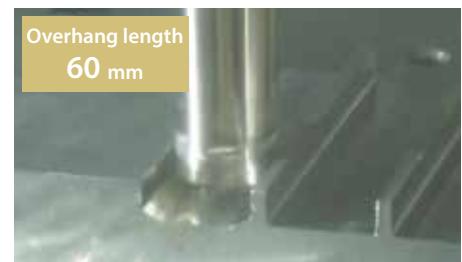
High stability in unstable machining environment

Chatter resistance comparison (Internal evaluation)

Slotting

ø 25 (3 Inserts)
External air
S50C
BT50

Video



Machining efficiency

MFH Boost

103 cc/min

$V_c = 120$ m/min, $a_p = 1.5$ mm, $f_z = 0.6$ mm/t

Machining
efficiency
x 4.5

Competitor A
90° End Mill

31 cc/min

Chattering (Machining was impossible)

$V_c = 80$ m/min, $a_p = 2$ mm, $f_z = 0.2$ mm/t

23 cc/min

$V_c = 80$ m/min, $a_p = 2$ mm, $f_z = 0.15$ mm/t

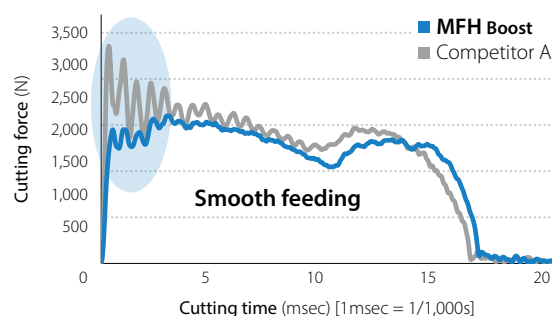
High efficiency and stable machining designs

Kyocera's original technology

Convex cutting edge design reduces
impact when entering workpiece



Cutting force when entering workpiece (Internal evaluation)



Cutting conditions:
 $V_c = 150$ m/min, $a_p = 2.0$ mm,
 $a_e = 25$ mm, $f_z = 0.7$ mm/t,
dry, S50C, ø 50 (1 Insert), BT50

M



Milling

2 Better solution than conventional high feed cutters

Large D.O.C. dramatically improves machining efficiency

Machining efficiency simulation example

Multistage machining (Depth 30 mm): $V_c = 150$ m/min, $a_e = 12.5$ mm

MFH Boost
ø 25 (3 Inserts)

100 cc/min

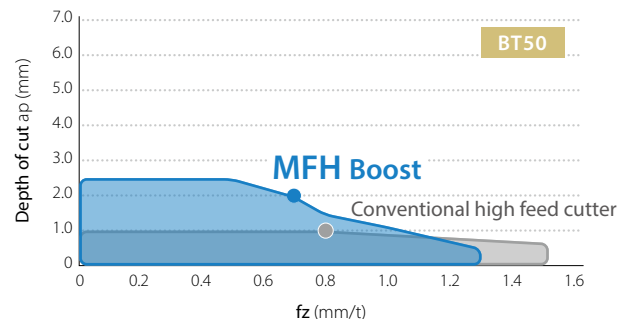
$a_p = 2.0$ mm, $f_z = 0.7$ mm/t

Machining
efficiency
x 1.3

Conventional
high feed cutter
ø 25 (3 Inserts)

76 cc/min

$a_p = 1.0$ mm, $f_z = 0.8$ mm/t



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison (Internal evaluation)

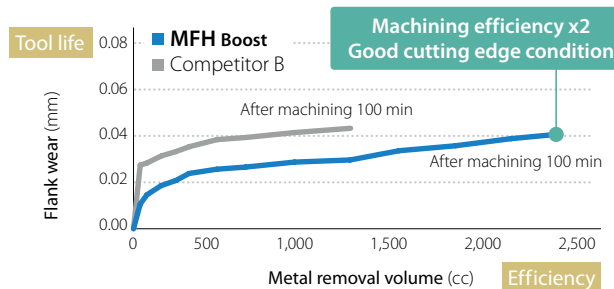
Cutting edge condition after 100 min machining

MFH Boost

$a_p = 1.6$ mm, $f_z = 0.6$ mm/t

Competitor B High feed type

$a_p = 0.8$ mm, $f_z = 0.6$ mm/t



Cutting conditions: $V_c = 150$ m/min, $a_e = 12.5$ mm, dry, SCM440H, ø 25 (1 Insert), BT50

Excellent wall accuracy

Machining efficiency and wall accuracy comparison (Internal evaluation)

Pocketing (Depth 12mm)

MFH Boost
ø 25 (3 Inserts)



$a_p = 1.5$ mm × 8 passes
 $Q = 115$ cc/min

Cutting conditions: $V_c = 200$ m/min, $a_e = 12.5$ mm, $f_z = 0.8$ mm/t, dry, S50C, BT50

Competitor B High feed type
ø 25 (4 Inserts)



$a_p = 0.8$ mm × 15 passes
 $Q = 81$ cc/min

Cutting conditions: $V_c = 200$ m/min, $a_e = 12.5$ mm, $f_z = 0.8$ mm/t, dry, S50C, BT50

Superior wall accuracy



Wiper on outer
periphery

Reduction of wall level variation
in multi-pass machining

3 Solutions for machining difficult-to-cut materials

Dramatic improvement in machining efficiency with titanium alloy, stainless steel machining, etc.

Machining efficiency comparison (Internal evaluation)

Titanium alloy pocketing (Depth 6 mm)

MFH Boost

Approx. 1' 30"

$a_p = 1.5$ mm × 4 passes ($f_z = \sim 0.35$ mm/t)

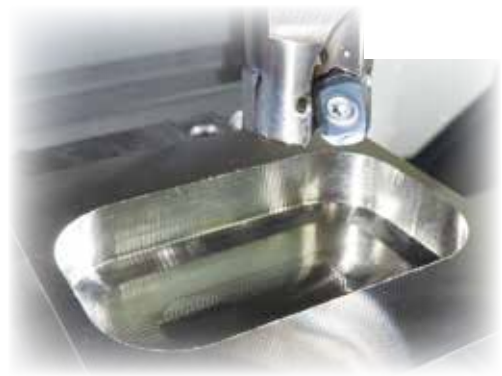
Machining
efficiency
x 1.8

Competitor C
High feed type

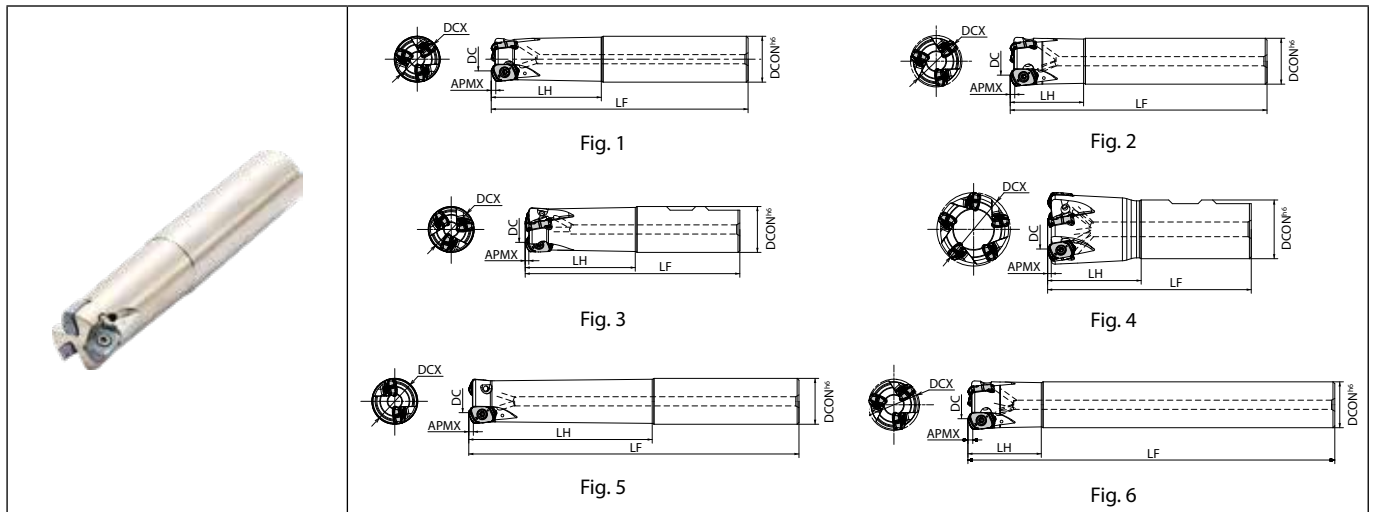
Approx. 2' 50"

$a_p = 0.6$ mm × 10 passes ($f_z = \sim 0.4$ mm/t)

Cutting conditions: $V_c = 50$ m/min, $a_e = 12.5$ mm ($a_e/DCX = 50\%$), Ramping angle 3°, Ti-6Al-4V, wet, ø 25 (3 inserts), BT50



MFH Boost (End mill)

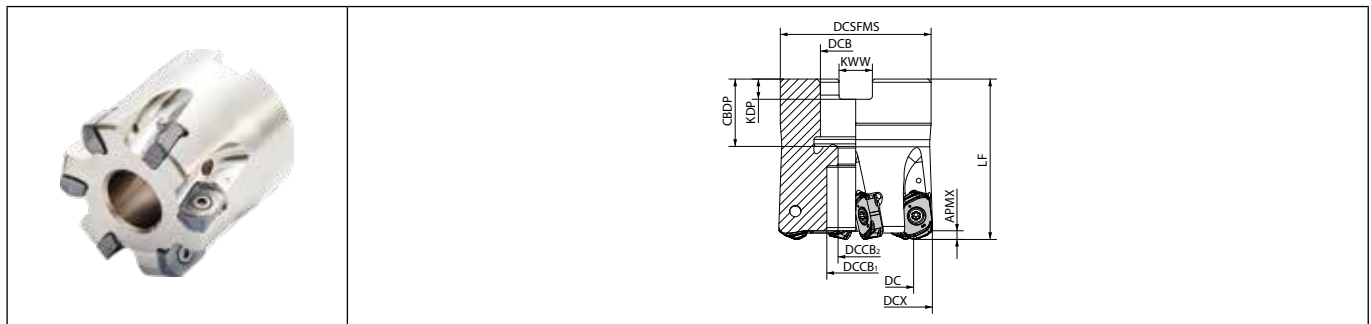


Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)							A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➔ M214
					DC	DCX	DCON	LF	LH	APMX	Anti-seize compound						Screw	Wrench		
Cylindrical	Same shank	MFH	25-S25-04-2T	● 2	14	25	25	140	60	2.5	-10	Yes	12700	0.5	1				LOMU040410ER-GM	
			25-S25-04-3T	● 3											1					
			32-S32-04-4T	● 4	21	32	32	150	70				11200	0.8	1					Recommended tightening torque for insert clamp 2.0N·m
			32-S32-04-5T	● 5											1					
	Standard shank	MFH	22-S20-04-2T	● 2	11	22	20	130	30	2.5	-10	Yes	13600	0.3	2				LOMU040410ER-GM	
			28-S25-04-3T	● 3	17	28	25	140	40				12000	0.5	2					
			28-S25-04-4T	● 4	24	35	32	150	50				10700	0.8	2					Recommended tightening torque for insert clamp 2.0N·m
			35-S32-04-4T	● 4											2					
			35-S32-04-5T	● 5	29	40	10000	0.9	2											
			40-S32-04-5T	● 5					2											
			40-S32-04-6T	● 6	2															
			Long Shank	MFH	25-S25-04-2T-180	● 2	14	25	25				180	100	2.5					-10
	25-S25-04-3T-180	● 3			5															
	28-S25-04-3T-200	● 4			17	28	200	120	11200	1.1	6	Recommended tightening torque for insert clamp 2.0N·m								
	32-S32-04-4T-200	● 4									6									
	35-S32-04-4T-200	● 5			24	35	32	250	50	10000	1.5	6								
	40-S32-04-5T-250	● 5										6								
	Weldon	MFH	25-W25-04-2T	● 2	14	25	25	117	60	2.5	-10	Yes	12700	0.4	3				LOMU040410ER-GM	
25-W25-04-3T			● 3	3																
32-W32-04-4T			● 4	21	32	131	70	11200	0.7				3	Recommended tightening torque for insert clamp 2.0N·m						
32-W32-04-5T			● 5										3							
40-W32-04-5T			● 5	29	40	111	50	10000	0.7				4							
40-W32-04-6T			● 6										4							

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MFH Boost (Face mill)



Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)										A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➡ M214		
					R	DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP					KWW	APMX				
Metric	MFH	040R-04-5T-M	●	5	29	40	38	16	15	9	40	19	5.6	8.4	2.5	-10	Yes	10000	0.2	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM	
		040R-04-6T-M	●	6	39	50	47	22	18	11	50	21	6.3	10.4				9000	0.4					
		050R-04-6T-M	●	7														8800	0.5					
		050R-04-7T-M	●	6	41	52	52	63	60	22	18	11	24	7				12.4	8000					0.8
		052R-04-6T-M	●	7	27	20																		
		052R-04-7T-M	●	9	69	80	76	27	20	13	63	24	7	12.4				0.7						
		063R-04-7T-M	●															0.8						
		063R-04-7T-27M	●	10	69	80	76	27	20	13	63	24	7	12.4				1.8						
		063R-04-9T-M	●															1.7						
		063R-04-9T-27M	●	10	69	80	76	27	20	13	63	24	7	12.4				1.7						
080R-04-8T-M	●	1.7																						
080R-04-10T-M	●	10	69	80	76	27	20	13	63	24	7	12.4	1.7											
Bores dia. inch spec	MFH	080R-04-8T	●	8	69	80	76	31.75	26	17	63	32	8	12.7	2.5	-10	Yes	7100	1.6	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM	
		080R-04-10T	●	10	7100	1.6																		

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

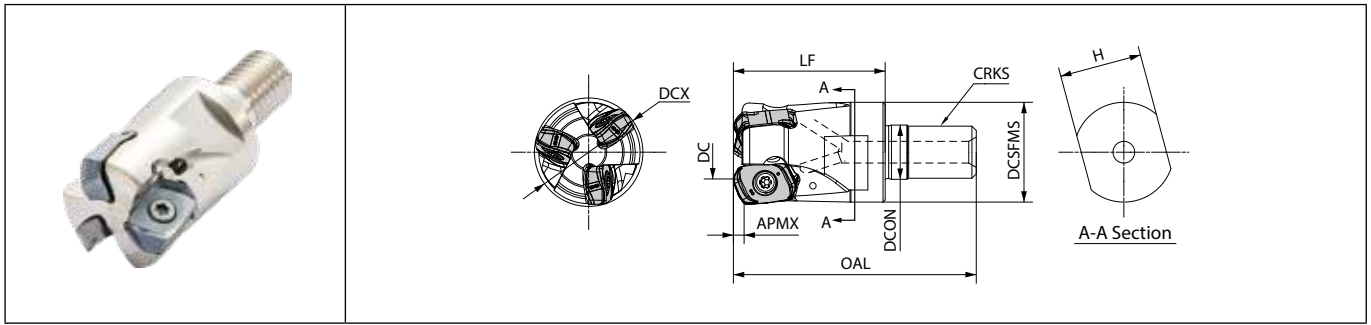
Slot Mill

Ball-nose
Radius

Others

● : Standard item

M212

MFH Boost (Modular type)

Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)								A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts ➡ M214	
				DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS				H	Anti-seize compound	Screw		Wrench
MFH	22-M10-04-2T	●	2	11	22	10.5	18.7	48	30		M10X1.5	15		13600	P-37 SB-3575TRP DTPM-10 Recommended tightening torque for insert clamp 2.0N·m	LOMU040410ER-GM			
	25-M12-04-2T	●		14	25								12700						
	25-M12-04-3T	●	3			12.5	23	56	35		M12X1.75	19		12000					
	28-M12-04-3T	●		17	28														
	28-M12-04-4T	●	4											11200					
	32-M16-04-4T	●		21	32					2.5			-10	Yes					
	32-M16-04-5T	●	5																
	35-M16-04-4T	●	4	24	35									10700					
	35-M16-04-5T	●	5			17	30	62	40		M16X2.0	24		10000					
	40-M16-04-5T	●		29	40														
	40-M16-04-6T	●	6																
	42-M16-04-5T	●	5	31	42									9800					
	42-M16-04-6T	●	6																

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

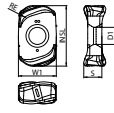
M



Milling

LOMU

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)	Carbon steel / Alloy steel					☆	☆	★	P
	Mold and die steel					☆	☆	★	
	Austenitic stainless steel					☆	☆	★	M
	Martensitic stainless steel					★	☆		
	Precipitation hardening stainless steel					☆	★		
	Gray cast iron					☆	★		K
	Nodular cast iron					☆	★		
	Non-ferrous metals								N
	Heat-resistant alloy					★	☆		
	Titanium alloy					☆	★		S
Hard materials								H	

Insert	Description	No. of edges	Dimension (mm)					Carbide						Applicable toolholder ➡ M211~M213
			S	D1	RE	W1	INSL	CVD	PVD					
									CA6535	PR1510	PR1525	PR1535	PR1810	
	 General purpose	4	4.4	4.1	1	9.1	14.5	●	□	○	●	●	●	MFH...-04-..

Handed insert shows Right-hand

Recommended cutting conditions ➡ M215

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

● : Standard item ○ : Will be replaced with a new product □ : Expected to be discontinued in September 2026

M214

Recommended cutting conditions ★ 1st recommendation ☆ 2nd recommendation

Chipbreaker	Workpiece	Toolholder description and feed (fz: mm/t)		Recommended insert grade (Vc: m/min)			
		ap(mm)	MFH...04...	MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coating
				PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535
GM	Carbon steel (~ 280HB)	≤ 0.5	0.20 – 0.80 – 1.30	–	★ 120 – 160 – 220	☆ 120 – 160 – 220	–
		≤ 1.0	0.20 – 0.70 – 1.10				
		≤ 1.5	0.20 – 0.60 – 0.80				
		≤ 2.0	0.20 – 0.40 – 0.70				
		≤ 2.5	0.20 – 0.30 – 0.50				
	Alloy steel (~ 350HB)	≤ 0.5	0.20 – 0.75 – 1.20	–	★ 100 – 150 – 200 (Dry machining recommended)	☆ 100 – 150 – 200 (Dry machining recommended)	–
		≤ 1.0	0.20 – 0.65 – 1.00				
		≤ 1.5	0.20 – 0.55 – 0.70				
		≤ 2.0	0.20 – 0.40 – 0.55				
		≤ 2.5	0.20 – 0.25 – 0.35				
	(~ 40HRC)	≤ 0.5	0.20 – 0.60 – 1.10	–	★ 80 – 120 – 160 (Dry machining recommended)	☆ 80 – 120 – 160 (Dry machining recommended)	–
		≤ 1.0	0.20 – 0.50 – 0.90				
		≤ 1.5	0.20 – 0.40 – 0.65				
		≤ 2.0	0.20 – 0.30 – 0.55				
		≤ 2.5	0.20 – 0.25 – 0.35				
	Mold steel (40 ~ 50HRC)	≤ 0.5	0.10 – 0.30 – 0.50	–	★ 60 – 100 – 130 (Dry machining recommended)	–	–
		≤ 1.0	0.10 – 0.25 – 0.40				
		≤ 1.5	0.10 – 0.20 – 0.30				
		≤ 2.0	–				
		≤ 2.5	–				
	(50 ~ 55HRC)	≤ 0.5	0.10 – 0.20 – 0.40	–	★ 50 – 70 – 100 (Dry machining recommended)	–	–
		≤ 1.0	0.10 – 0.15 – 0.25				
		≤ 1.5	–				
		≤ 2.0	–				
		≤ 2.5	–				
	Austenitic stainless steel	≤ 0.5	0.20 – 0.60 – 1.00	–	☆ 100 – 140 – 180	★ 100 – 140 – 180	–
		≤ 1.0	0.20 – 0.50 – 0.90				
		≤ 1.5	0.20 – 0.45 – 0.60				
		≤ 2.0	0.20 – 0.30 – 0.50				
		≤ 2.5	0.20 – 0.25 – 0.40				
	Martensitic stainless steel	≤ 0.5	0.20 – 0.60 – 1.00	–	–	☆ 100 – 150 – 200	★ 150 – 200 – 300
		≤ 1.0	0.20 – 0.50 – 0.90				
		≤ 1.5	0.20 – 0.45 – 0.60				
		≤ 2.0	0.20 – 0.30 – 0.50				
		≤ 2.5	0.20 – 0.25 – 0.40				
	Precipitation hardened stainless steel	≤ 0.5	0.10 – 0.30 – 0.50	–	–	★ 90 – 120 – 150	–
		≤ 1.0	0.10 – 0.25 – 0.45				
		≤ 1.5	0.10 – 0.15 – 0.25				
		≤ 2.0	–				
		≤ 2.5	–				
	Gray cast iron	≤ 0.5	0.20 – 0.80 – 1.30	★ 120 – 160 – 220	–	–	–
		≤ 1.0	0.20 – 0.70 – 1.10				
		≤ 1.5	0.20 – 0.60 – 0.80				
		≤ 2.0	0.20 – 0.40 – 0.70				
		≤ 2.5	0.20 – 0.30 – 0.50				
	Nodular cast iron	≤ 0.5	0.20 – 0.60 – 1.00	★ 100 – 150 – 200	–	–	–
		≤ 1.0	0.20 – 0.50 – 0.90				
		≤ 1.5	0.20 – 0.40 – 0.70				
		≤ 2.0	0.20 – 0.30 – 0.60				
		≤ 2.5	0.20 – 0.25 – 0.40				
	Ni-base heat-resistant alloy	≤ 0.5	0.10 – 0.30 – 0.45	–	–	☆ 20 – 30 – 50	★ 20 – 30 – 50
		≤ 1.0	0.10 – 0.25 – 0.40				
		≤ 1.5	0.10 – 0.15 – 0.20				
		≤ 2.0	–				
		≤ 2.5	–				
	Titanium alloy	≤ 0.5	0.10 – 0.30 – 0.50	–	–	★ 40 – 60 – 80	–
		≤ 1.0	0.10 – 0.25 – 0.45				
		≤ 1.5	0.10 – 0.15 – 0.25				
		≤ 2.0	–				
		≤ 2.5	–				

· The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

· Machining with coolant is recommended for precipitation hardened stainless steel, Ni-base heat-resistant alloy and titanium alloy.

· Wet machining may have a lower tool life than dry machining. Set the cutting speed, feed rate and D.O.C. lower than recommended conditions.

· Machining with BT30 or equivalent, feed rate should be reduced to 80% or less of recommended cutting conditions. Slotting is not recommended.

· Center through air is recommended for slotting.

· Slotting or pocketing are not recommended for face mill type.

· For face mill type cutters, it is recommended that width of cut should be set to 75% or less of the cutting diameter.

· It is recommended to set the long shank to 75% or less of the recommended conditions for both ap and feed.

Approximate programming radius adjustment

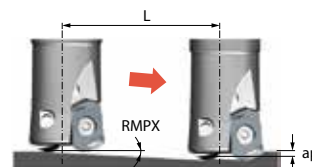
Shape	Programmable R (mm)	Over machined radius portion (mm)	Non-machined portion (mm)
	1.5	0	1.42
	2.0	0	1.24
	3.0 (Recommended)	0	0.87
	3.5	0.06	0.69

Ramping tips

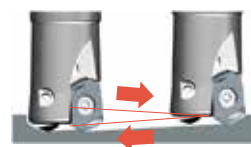
- Ramping angle should be under RMPX
- Reduce recommended feed rate in cutting conditions above by 70%

Formula for max. cutting Length (L) at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



- When ramping both forth and back direction alternately, set the maximum ramping angle RMPX to 50%.



Reference data for ramping

Description	Cutter dia. DCX (mm)	22	25	28	32	35	40	42	50	52	63	80
MFH...-04-...	Max. ramping angle RMPX	3.9°	3.0°	2.4°	2.0°	1.7°	1.4°	1.3°	1.0°	1.0°	0.8°	0.6°
	tan RMPX	0.068	0.052	0.042	0.035	0.029	0.024	0.022	0.018	0.017	0.013	0.010

Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

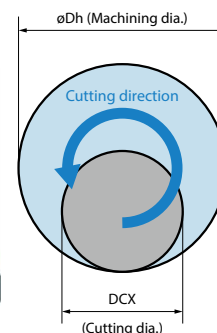
⊘ Exceeding max. cutting dia.

Center core part remains after machining



⊘ Under min. cutting dia.

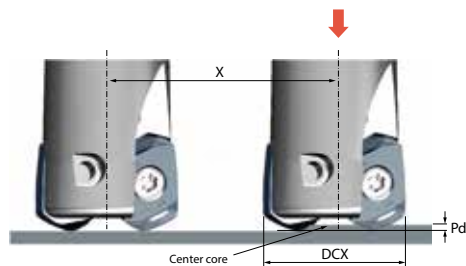
Center core part interferes with toolholder



Description	Min. cutting dia. (mm)	Max. cutting dia. (mm)
MFH...-04-...	2×DCX-11	2×DCX-2

- Maximum ramping depth per cycle to be under maximum D.O.C. ap (2.5 mm)
- Use climb milling. (Refer to the above figure)
- Feed rates should be reduced to 50% of recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

Guide for drilling

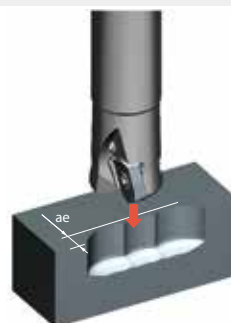


Description	GM type	
	Max. drilling depth Pd (mm)	Min. cutting length X for flat bottom surface (mm)
MFH...-04-...	0.6	DCX-12

- It is recommended to reduce feed by 25% of recommendation until the center core is removed
- Axial feed rate recommendation per revolution is $f \leq 0.2 \text{ mm/rev}$

Vertical milling (Plunging)

Vertical milling (Plunging)



Insert description	Maximum width of cut (ae)
LOMU04 Type	5.0 mm

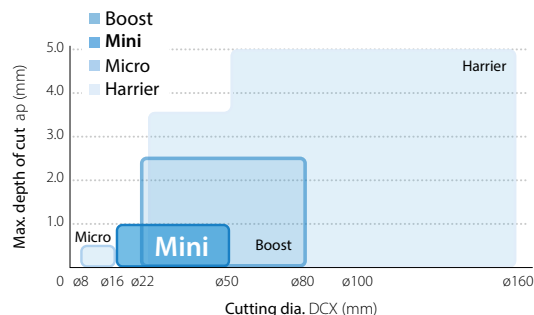
- Reduce feed rate to $f_z \leq 0.2 \text{ mm/t}$ when plunging

MFH Mini

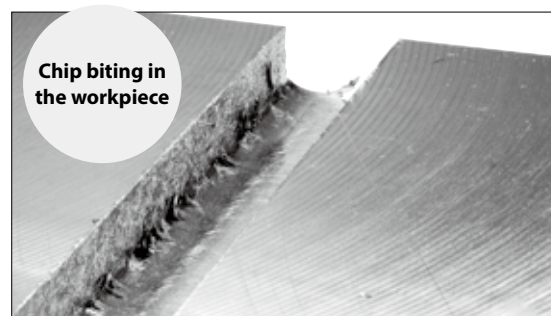
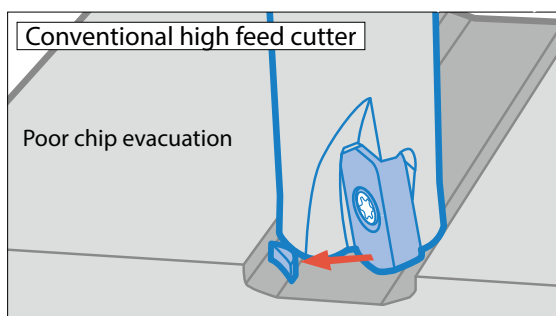
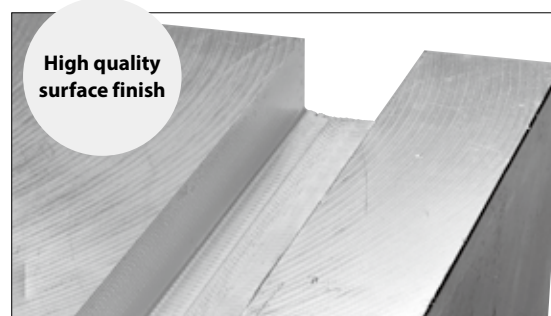
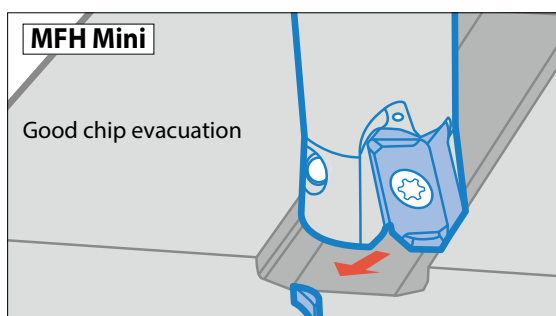
Cutter dia. $\phi 16 \sim \phi 50$

Economical double-sided 4-edge insert

High efficiency and high feed machining at small dia.
machining and small machining center



1 Excellent chip evacuation



Chips clings to the insert

(Internal evaluation)

MFH Mini controls chip biting with 3D convex cutting edge

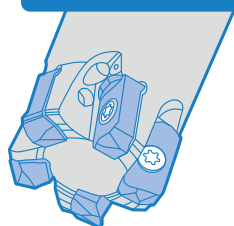
Cutting conditions: Workpiece material SS400 Cutter dia. $\phi 16$ $V_c = 150$ m/min $a_p \times a_e = 10$ mm (0.5 mm $\times 20$ passes) 16 mm $f_z = 0.6$ mm/t Dry



2 Multi edge design enables high efficiency machining

Cutter Dia. $\phi 25$

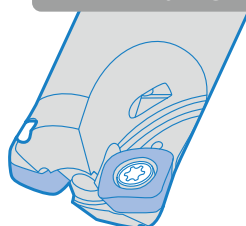
MFH Mini



5 flutes

MFH25-S25-03-5T

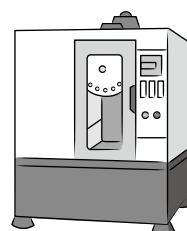
MFH Harrier



2 flutes

MFH25-S25-10-2T

3 High efficiency and high feed machining at small machining center (BT30/BT40)



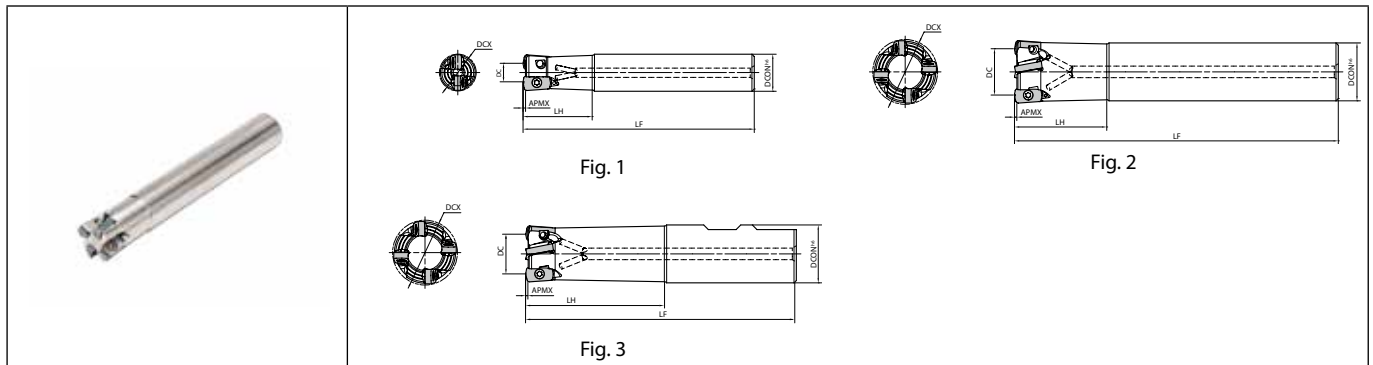
Suitable for roughing of mold

M



Milling

MFH Mini (End mill)



Toolholder dimensions

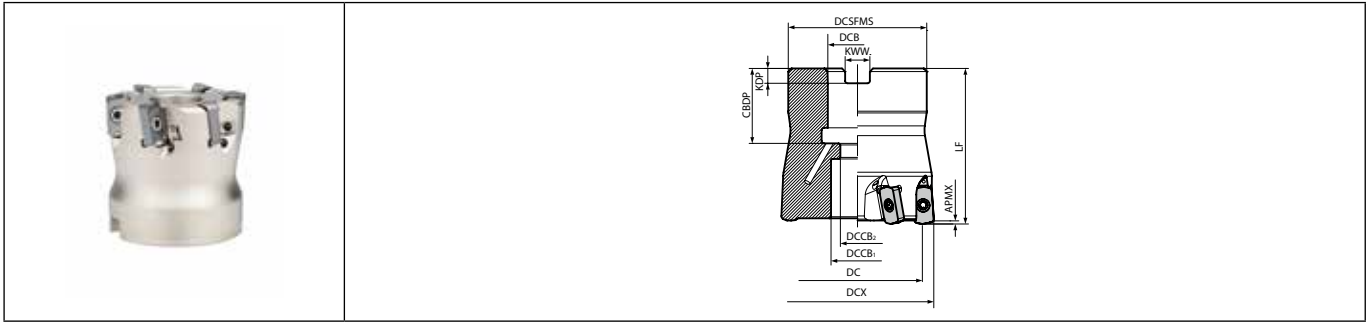
Description			Availability	Inserts	Dimension (mm)						A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M221		
																Anti-seize compound	Screw	Wrench			
																					
Cylindrical	Same shank	MFH	16-S16-03-2T	●	2	8	16	16	100	30	1	-10	Yes	18800	0.1	1	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH	
			20-S20-03-3T	●	3	12	20	20	130	50				15700	0.3	1					
			20-S20-03-4T	●	4	17	25	25	140	60				13400	0.5	1					
			25-S25-03-4T	●																	
			25-S25-03-5T	●	5	24	32	32	150	70				11400	0.8	1					
			32-S32-03-5T	●																	
			32-S32-03-6T	●	6																
	Standard shank	MFH	17-S16-03-2T	●	2	9	17	16	100	20	1	-10	Yes	17900	0.1	2	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH	
			18-S16-03-2T	●	2	10	18							17000		2					
			22-S20-03-3T	●	3	14	22	20	130	30				14700	0.3	2					
			22-S20-03-4T	●	4	20	28	25	140	40				12400	0.5	2					
			28-S25-03-4T	●																	
			28-S25-03-5T	●	5																
			Long Shank	MFH	16-S16-03-2T-150	●	2	8	16	16				150	50	1					-10
	20-S20-03-3T-160	●			3	12	20	20	160	80	15700	0.3	1								
	25-S25-03-4T-180	●			4	17	25	25	180	100	13400	0.6	1								
	32-S32-03-5T-200	●			5	24	32	32	200	120	11400	1.1	1								
	Weldon	MFH	16-W16-03-2T	●	2	8	16	16	79	30	1	-10	Yes	18800	0.1	3	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH	
20-W20-03-3T			●	3	12	20	20	101	50	15700				0.2	3						
20-W20-03-4T			●	4	17	25	25	117	60	13400				0.4	3						
25-W25-03-4T			●																		
25-W25-03-5T			●	5	24	32	32	131	70	11400				0.7	3						
32-W32-03-5T			●																		
32-W32-03-6T			●	6																	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item

M218

MFH Mini (Face mill)



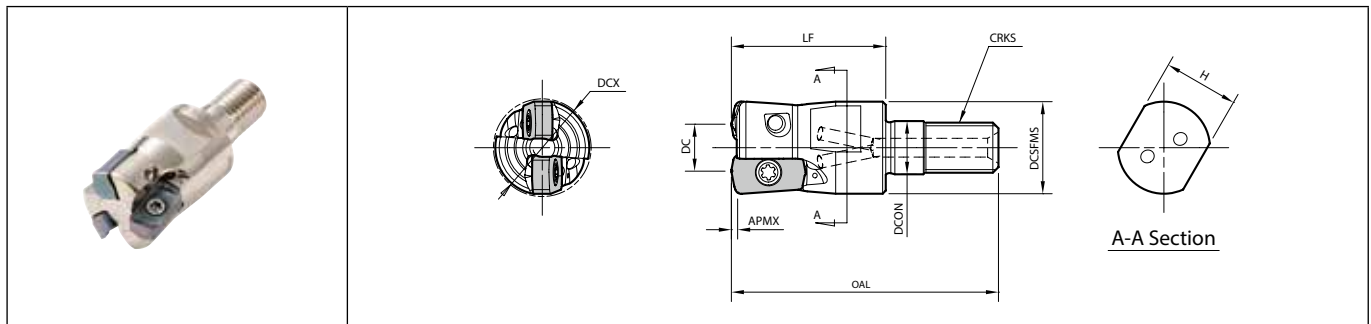
Toolholder dimensions

Description		Availability	Inserts	Dimension (mm)										A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts  M221		
																		Anti-seize compound	Screw	Wrench			
				R	DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP					KWW	APWX				
MFH	040R-03-ST-M	●	5	32	40	38	16	15	9	40	19	5.6	8.4	1	-10	Yes	9900	0.2	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH	
	040R-03-6T-M	●	6																				
	050R-03-8T-M	●	8	42	50	47	22	19	11	50	21	6.3	10.4				8600	0.5	Recommended tightening torque for insert clamp 1.2N·m				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item

MFH Mini (Modular type)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)									A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts ➡ M221
			DC	DCX	DCON	DCSfMS	OAL	LF	APMX	CRKS	H				Anti-seize compound 	Screw 	Wrench 	
MFH 16-M08-03-2T	●	2	8	16	8.5	14.7	42	25	1	M8x1.25	12	-10	Yes	18880	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
17-M08-03-2T	●		9	17										17900	Recommended tightening torque for insert clamp 1.2N-m			
18-M08-03-2T	●		10	18										17000				
MFH 20-M10-03-3T	●	3	12	20	10.5	18.7	48	30	1	M10x1.5	15	-10	Yes	15700	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
20-M10-03-4T	●	4												14700	Recommended tightening torque for insert clamp 1.2N-m			
22-M10-03-3T	●	3																
22-M10-03-4T	●	4	14	22														
MFH 25-M12-03-4T	●	4	17	25	12.5	23	56	35	1	M12x1.75	19	-10	Yes	13400	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
25-M12-03-5T	●	5												12400	Recommended tightening torque for insert clamp 1.2N-m			
28-M12-03-4T	●	4																
28-M12-03-5T	●	5	20	28														
MFH 32-M16-03-5T	●	5	24	32	17	30	62	40	1	M16x2.0	24	-10	Yes	11400	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
32-M16-03-6T	●	6													Recommended tightening torque for insert clamp 1.2N-m			

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

M



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

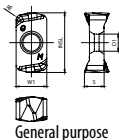
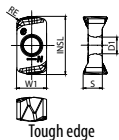
Ball-nose
Radius

Others

● : Standard item

M220

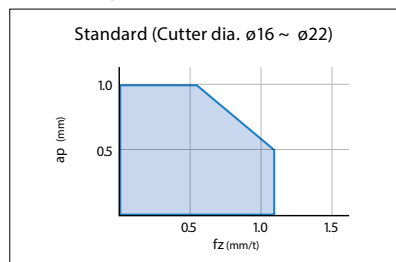
LOGU

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel								☆		★	☆	P			
		Mold and die steel								☆		★	☆				
		Austenitic stainless steel									☆		☆	★	M		
		Martensitic stainless steel					★						☆				
		Precipitation hardening stainless steel									☆		★				
		Gray cast iron								☆			★		K		
		Nodular cast iron								☆			★				
		Non-ferrous metals													N		
		Heat-resistant alloy					★							☆			
		Titanium alloy										☆		★	S		
Hard materials						★											
Insert		Description		No. of edges	Dimension (mm)					Carbide						Applicable toolholder ➡ M218~M220	
					S	D1	RE	INSL	W1	CVD	PVD						
											CA6535	PR0155	PR1510	PR1525	PR1535		PR1810
	 General purpose	LOGU 030310ER-GM	4	3.96	3.45	1	11.9	6.2	●	□	○	●	●	●	●	MFH...-03-..	
	 Tough edge	LOGU 030310ER-GH	4	3.96	3.45	1	11.9	6.2	●	●	□	○	●	●	●	MFH...-03-..	

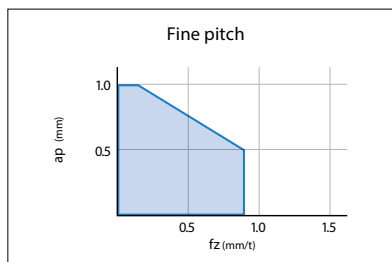
Handed insert shows Right-hand

Recommended cutting conditions ➡ M222

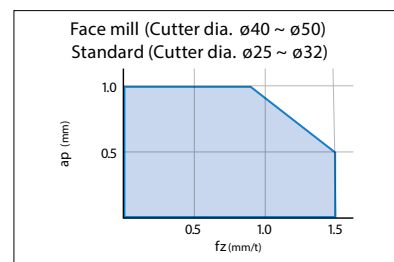
Cutting performance



MFH16-...-2T, MFH17-...-2T, MFH18-...-2T
MFH20-...-3T, MFH22-...-3T



MFH20-...-4T, MFH22-...-4T, MFH25-...-5T
MFH28-...-5T, MFH32-...-6T



MFH25-...-4T, MFH28-...-4T, MFH32-...-5T
MFH040R-..., MFH050R-...

When using fine pitch type, reduce the cutting conditions compared with standard type.

Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t) * Recommended feed rate (Reference value): ap=0.5mm								Recommended insert grades (Vc: m/min)				
		MFH16 ~...-2T	MFH20 ~...-3T	MFH20 ~...-4T	MFH25 ~...-4T	MFH25 ~...-5T	MFH32 ~...-5T	MFH32 ~...-6T	MFH ~...-R-03	MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide
										PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR0155	CA6535
GM GH	Carbon steel	0.2~0.7~1.2		0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.2~0.7~1.2		0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	-	★ 100~160~220	☆ 100~160~220	-	-
	Mold steel (~ 40HRC)	0.2~0.5~0.9		0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.4~1.2	-	☆ 80~140~180	☆ 80~140~180	GH ★ 80~140~180	-
	Mold steel (40 ~ 50HRC)	0.2~0.3~0.5		0.2~0.25~0.3	0.2~0.3~0.6	0.2~0.25~0.3	0.2~0.3~0.6	0.2~0.25~0.3	0.2~0.25~0.6	-	☆ 60~100~130	-	GH ★ 60~100~130	-
	Mold steel (50 ~ 55HRC)	0.1~0.3~0.5		0.1~0.2~0.3	0.1~0.3~0.5	0.1~0.2~0.3	0.1~0.3~0.5	0.1~0.2~0.3	0.1~0.3~0.5	-	☆ 50~70~100	-	GH ★ 50~70~100	-
	Mold steel (55 ~ 60HRC)	0.03~0.06~0.1 (* Recommended only for GH chipbreaker)								-	-	-	GH ☆ 50~60~70	-
	Stainless steel (Austenitic related)	0.2~0.5~0.9		0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.4~0.6	-	GM ☆ 100~160~200	GM ★ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.2~0.5~0.9		0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.4~0.6	-	-	☆ 150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.2~0.5~0.9		0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.4~0.6	-	-	★ 90~120~150	-	-
	Gray cast iron	0.2~0.7~1.2		0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.5~0.8	★ 120~180~250	-	-	-	-
	Nodular cast iron	0.2~0.5~0.9		0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.4~0.6	★ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~0.3~0.6		0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.25~0.4	-	-	☆ 20~30~50	-	★ 20~30~50
	Titanium alloys	0.2~0.3~0.6		0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.25~0.4	GM ☆ 30~50~70	-	GM ★ 40~60~80	-	-

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.

For slotting, internal coolant or center through coolant is recommended.

Slotting and pocketing are not recommended for face mill type.

Standard Fine pitch

★: 1st Recommendation ☆: 2nd Recommendation

Note for machining program (Approx. R)

Shape	Approx. R (mm)	Max. over machining of radius (mm)	Max. unmachined portion (mm)
	R1.0	0	0.51
	R1.5	0	0.41
	R1.6 (Recommended)	0	0.39
	R2.0	0.09	0.31

Cutting edge angle: 12°

Reference data for ramping

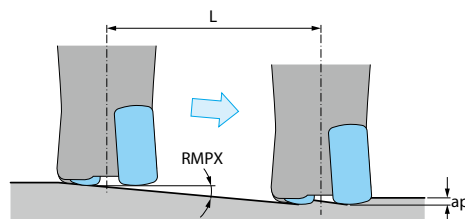
Description	Cutter dia. DCX (mm)	16	17	18	20	22	25	28	32	40	50
MFH ...-03-...	Max. ramping angle RMPX	2.8°	2.5°	2.1°	1.7°	1.4°	1.2°	1°	0.8°	0.5°	0.4°
	tan RMPX	0.049	0.042	0.037	0.03	0.024	0.021	0.017	0.014	0.009	0.007

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length
"L" at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

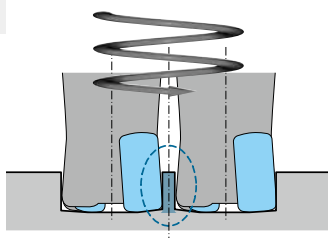


Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

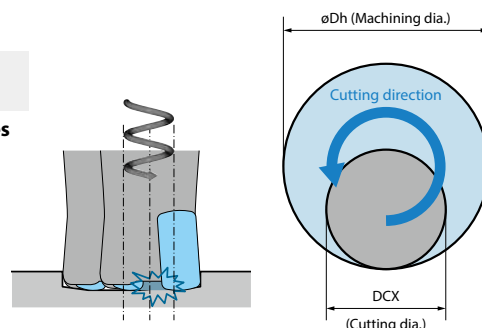
⊘ Over max. cutting dia.

Center core part remains
after machining



⊘ Under min. cutting dia.

Center core part interferes
with toolholder

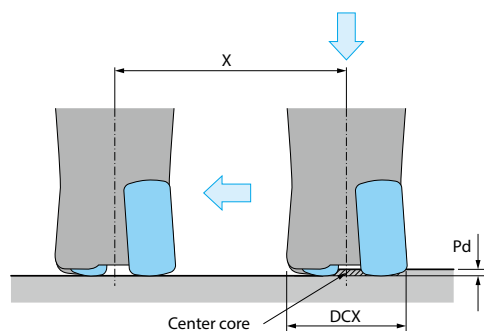


Description	Min. cutting dia.	Max. cutting dia.
MFH...-03-...	2×DCX-8	2×DCX-2

Unit: mm

- Sinking depth at helical milling should be max. ap (1mm) or under.
- Down-cut milling is recommended. (refer to the figure above)
- Feed rate should be under 50% of the recommended cutting conditions.
- Be careful to machine in a safe environment to avoid accident caused by long chips.

Guide for drilling



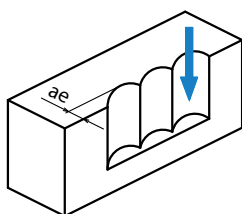
Description	GM type / GH type	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH...-03-...	1.0	DCX-9

Unit: mm

- * When traversing directly after drilling, set the table feed at up to 25% of the recommended cutting conditions.
- * When drilling, reduce feed rate per revolution to f=0.2 mm/rev or under.

Vertical milling (Plunging)

Vertical milling (Plunging)



Available for vertical milling (plunging).

Insert description	Max. width of cut
LOGU03 type	3.5mm

For vertical milling (plunging),
reduce feed rate to fz=0.2mm/t or less.

M



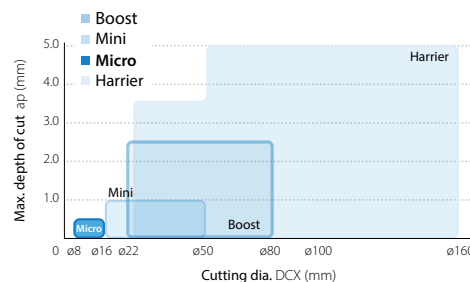
Milling

MFH Micro

Cutter dia. $\phi 8 \sim \phi 16$

Low resistance and durable against chatter for highly efficient machining. Max. ap 0.5mm.

Stable high feed machining on a wide range of applications



1 Stable machining with chattering resistance

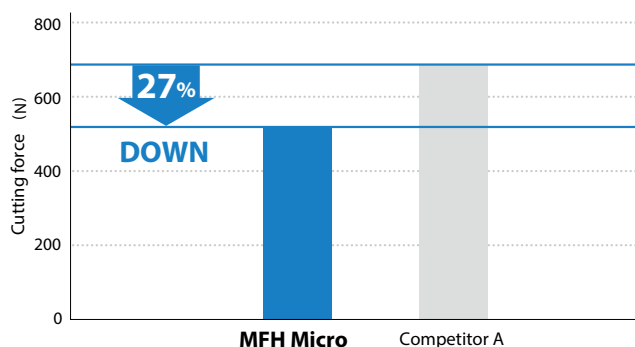
3D convex cutting edge controls initial impact when entering the workpiece

3D convex cutting edge



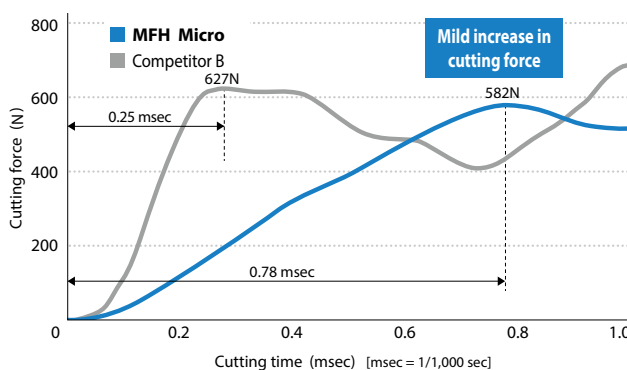
High precision G class insert

Cutting force comparison (Internal evaluation)



Cutting conditions: $V_c = 120$ m/min, $a_p = 0.4$ mm, $f_z = 0.6$ mm/t
Cutter dia. $\phi 10$ mm, slotting, dry workpiece material: S50C

Increase in cutting force when entering workpiece (Internal evaluation)



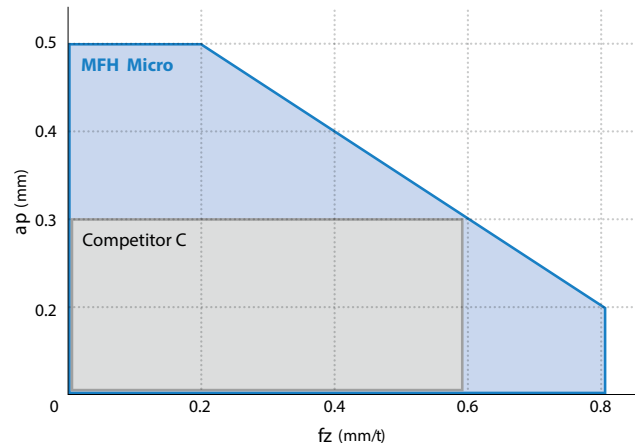
Cutting conditions: $V_c = 120$ m/min, $a_p \times a_e = 0.4 \times 5$ mm, $f_z = 0.6$ mm/t
Cutter dia. $\phi 10$ mm, dry workpiece material: S50C

2 Wide range of machining applications

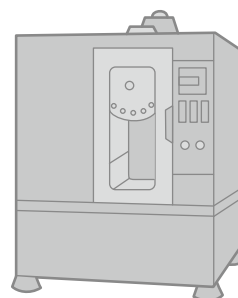
Wide range of machining applications at a maximum depth of cut of 0.5mm

Stable machining even with small machining centers

Cutting performance map (Cutter dia. $\phi 10$ mm)



(Internal evaluation)

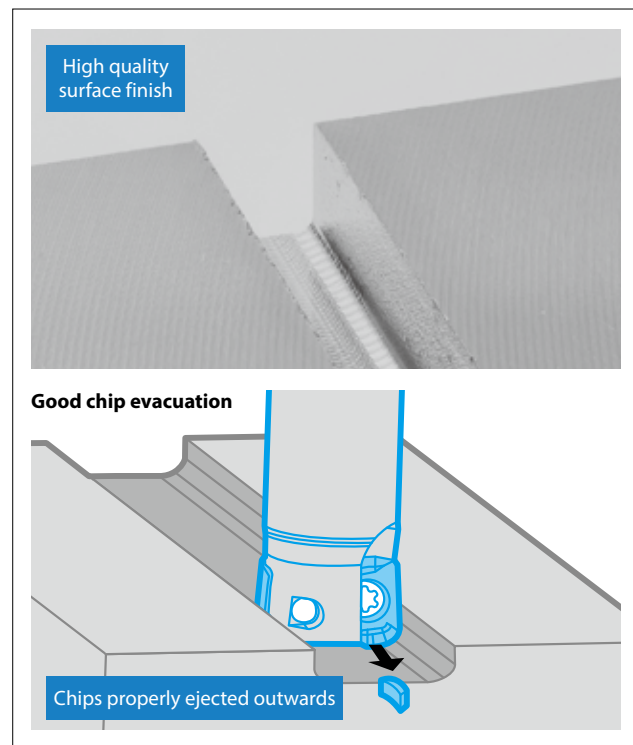


Applicable for BT30/ BT40

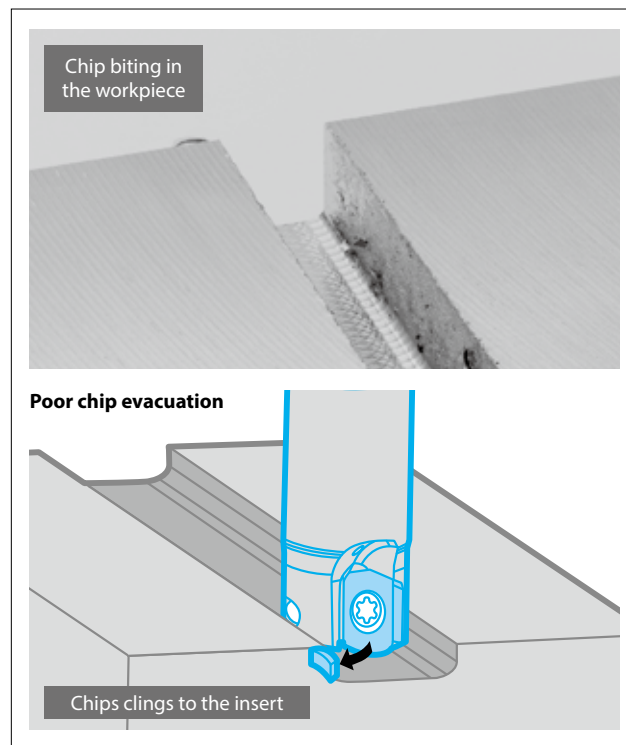
3 Excellent chip evacuation

Controls chip biting with convex cutting edge

MFH Micro



Competitor F



Cutting conditions: Cutter dia. DCX = $\phi 10$ mm, $V_c = 120$ m/min, $a_p = 0.4$ mm (25pass), $f_z = 0.6$ mm/t Total 10mm, Dry workpiece material: S5400

(Internal evaluation)

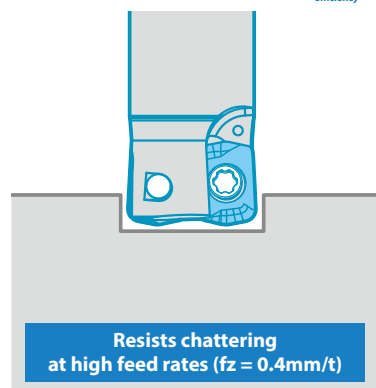
4 Replaces solid end mills to reduce machining costs

Suppresses chattering and increases milling efficiency

MFH Micro compared to solid end mills

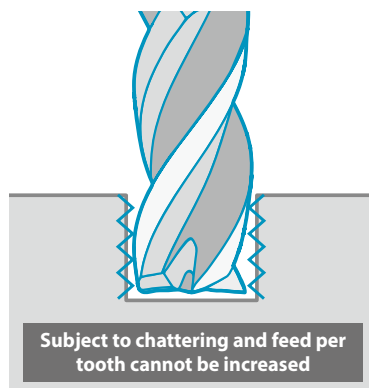
MFH Micro $Q = 15.3$ cc/min

$V_c = 150$ m/min, $f_z = 0.4$ mm/t
 $a_p \times a_e = 0.4 \times 10$ mm, dry
 MFH10-S10-01-2T (2 flutes)
 LPGT010210ER-GM (PR1525)

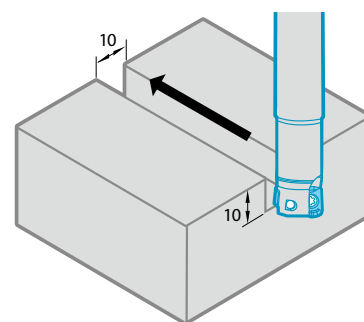


Solid end mill $Q = 12.2$ cc/min

$V_c = 80$ m/min, $f_z = 0.04$ mm/t
 $a_p \times a_e = 3 \times 10$ mm, dry
 $\phi 10$ (4 flutes)



Machine part slotting workpiece material: S50C



(User evaluation)

M



Milling

[illegible]

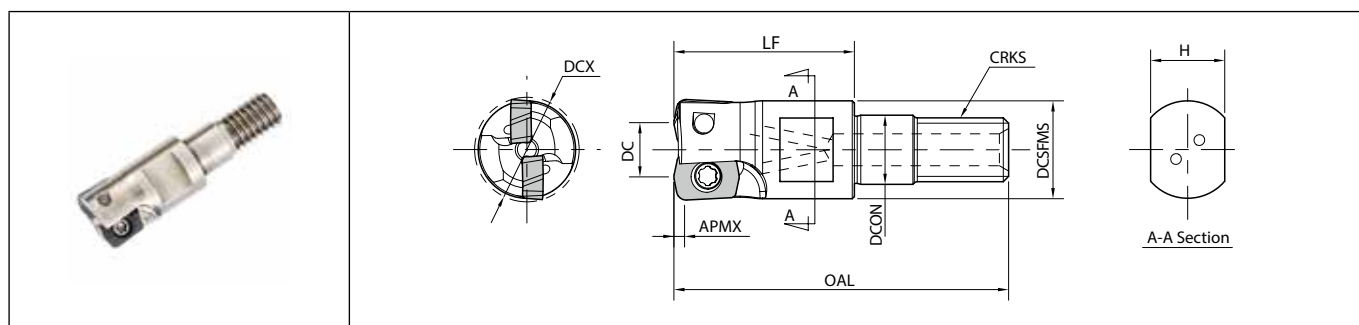
Description			Availability	Inserts	Dimension (mm)							A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➡ M226
					DC	DCX	DCON	LF	LH	APMX	Anti-seize compound 						Screw 	Wrench 		
Cylindrical	MFH	08-S10-01-1T	●	1	4.2	8	10	75	16	0.5	+5	Yes	20000	0.04	1	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
		10-S10-01-2T	●	2	6.2	10	80	20	16200				0.03	1						
		12-S12-01-3T	●	3	8.2	12			12				14000	0.06	1					
		16-S16-01-4T	●	4	12.2	16	16	90	25				11400	0.12	1					
	MFH	14-S12-01-3T	●	3	10.2	14	12	80	20	0.5	+5	Yes	12500	0.07	3	P-37	SB-1840TRP	FTP-6		
Weldon	MFH	08-W10-01-1T	●	1	4.2	8	10	58	16	0.5	+5	Yes	20000	0.03	2	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
		10-W10-01-2T	●	2	6.2	10	60	20	16200				0.03	2						
		12-W12-01-3T	●	3	8.2	12			12				14000	0.05	2					
		16-W16-01-4T	●	4	12.2	16	16	73	25				11400	0.1	2					
	MFH	14-W12-01-3T	●	3	10.2	14	12	65	20	0.5	+5	Yes	12500	0.05	4	P-37	SB-1840TRP	FTP-6		

Recommended tightening torque for insert clamp : 0.5N·m

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel					☆	☆	☆	P	
		Mold and die steel					☆	☆	☆		
		Austenitic stainless steel						☆	☆	M	
		Martensitic stainless steel					★		☆		
		Precipitation hardening stainless steel						☆	★		
		Gray cast iron								K	
		Nodular cast iron									
		Non-ferrous metals								N	
		Heat-resistant alloy					★		☆	S	
		Titanium alloy						☆	★		
Hard materials								H			
Insert	Description	Dimension (mm)					Carbide				Applicable toolholder M226 M227
		S	D1	RE	W1	INSL	CVD	PVD			
							CA6535	PR1525	PR1535	PR1825	
General purpose	LPGT 010210ER-GM	2.19	2.1	1	4.19	6.26	●	○	●	●	MFH...-01--

Recommended cutting conditions ➡ M228

M226

MFH Micro (Modular type)**Toolholder dimensions**

Description		Availability	Inserts	Dimension (mm)								A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts ➡ M226	
				DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS				H	Anti-seize compound	Screw		Wrench
MFH	08-M06-01-1T	●	1	4.2	8	6.5	9.2	30.5	17	0.5	M6x1.0	7	+5	Yes	20000	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM
	10-M06-01-2T	●	2	6.2	10		16200												
	12-M06-01-3T	●	3	8.2	12		14000												
	14-M06-01-3T	●		10.2	14		12500												
MFH	16-M08-01-4T	●	4	12.2	16	8.5	14.7	39	22	0.5	M8x1.25	12	+5	Yes	11400	P-37	SB-1840TRP	FTP-6	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Please use commercial shanks for cutting diameter from ø8 to ø14 (Screw size : M6 x 1.0)

Check screw specifications for the shank in use.

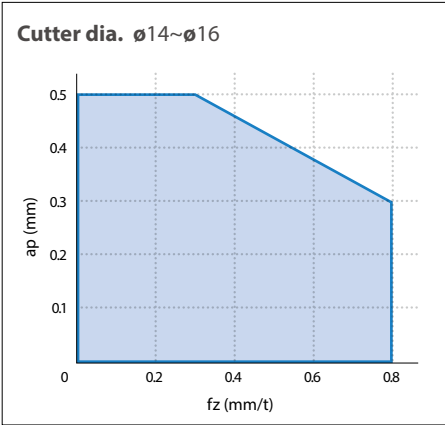
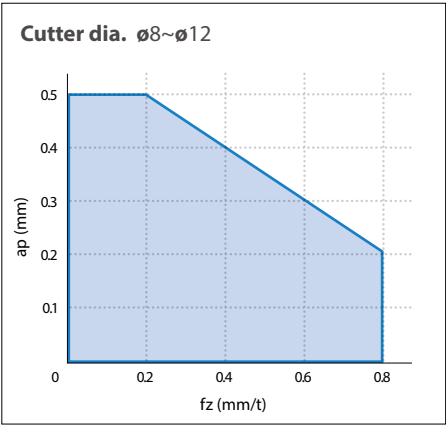
Recommended tightening torque for insert clamp : 0.5N·m

Actual End Mill depth (MFH16-M08-01-4T)

	Arbor Description	Applicable End Mill (Head)			Actual End Mill depth (mm)
		Description	Cutting Dia.	Dimension	
			DC	LF	LUX
	BT30K-M08-45	MFH16-M08-01-4T	16	22	28.8
	BT40K-M08-55	MFH16-M08-01-4T	16	22	28.7

See page **M82** for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Cutting performance



Recommended cutting conditions

Insert type	Workpiece material	Recommended feed rate (fz: mm/t): ap: 0.3mm (Reference value)					Recommended insert grades (Cutting speed Vc: m/min)		
		MFH08- ...-1T	MFH10- ...-2T	MFH12- ...-3T	MFH14- ...-3T	MFH16- ...-4T	MEGACOAT NANO EX (MEGACOAT NANO)		CVD Coated carbide
							PR1825 (PR1525)	PR1835 (PR1535)	CA6535
GM	Carbon steel	0.2~ 0.4 ~0.6			0.2~ 0.5 ~0.8		★ 120~ 180 ~250	☆ 120~ 180 ~250	-
	Alloy steel						★ 100~ 160 ~220	☆ 100~ 160 ~220	-
	Mold steel (~ 40HRC)	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		★ 80~ 140 ~180	☆ 80~ 140 ~180	-
	Mold steel (40 ~ 50HRC)	0.2~ 0.25 ~0.3			0.2~ 0.25 ~0.4		★ 60~ 100 ~130	☆ 60~ 100 ~130	-
	Stainless steel (Austenitic related)	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		☆ 100~ 160 ~200	★ 100~ 160 ~200	-
	Stainless steel (Martensitic related)						-	☆ 150~ 200 ~250	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)						-	★ 90~ 120 ~150	-
	Gray cast iron	0.2~ 0.4 ~0.6			0.2~ 0.5 ~0.8		★ 120~ 180 ~250	-	-
	Nodular cast iron	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		★ 100~ 150 ~200	-	-
	Ni-base heat-resistant alloys	0.2~ 0.25 ~0.3			0.2~ 0.25 ~0.4		-	☆ 20~ 30 ~50	★ 20~ 30 ~50
	Titanium alloys						-	★ 40~ 60 ~80	-

Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.
The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Internal coolant is recommended for slotting.

★ : 1st Recommendation ☆ : 2nd Recommendation

Note for machining program (Approx. R)

Shape	Approx. R (mm)	Max. over machining of radius (mm)	Max. unmachined portion (mm)
	R1.0	0	0.21
	R1.2 (Recommended)	0	0.17
	R1.5	0.08	0.1
	R2.0	0.28	0.01

Cutting edge angle: 12°

Reference data for ramping

Description	Cutter dia. DCX (mm)	8	10	12	14	16
MFH...-01-...	Max. ramping angle RMPX	4.0°	3.0°	2.0°	1.5°	1.2°
	tan RMPX	0.070	0.052	0.035	0.026	0.021

Decrease ramping angle if chips become excessively long.

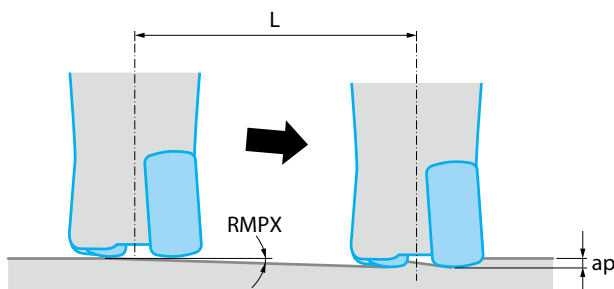
Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.

Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length
"L" at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

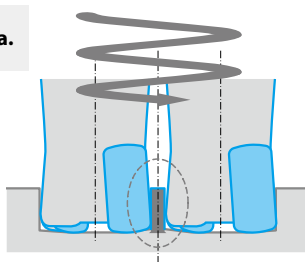


Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

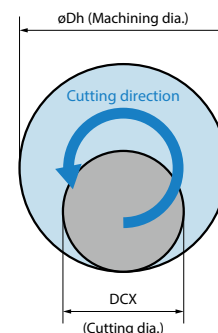
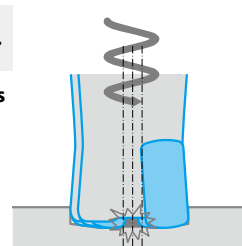
⊘ Exceeding max. cutting dia.

Center core part remains
after machining



⊘ Under min. cutting dia.

Center core part interferes
with toolholder

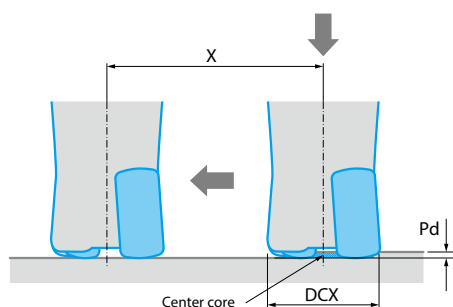


Description	Min. cutting dia.	Max. cutting dia.
MFH...-01-...	2×DCX-3.5	2×DCX-2

Unit: mm

- Sinking depth at helical milling should be max. ap (0.5mm) or under.
- Down-cut milling is recommended (refer to the figure above).
- Feed rate should be under 50% of the recommended cutting conditions.
- Be careful to machine in a safe environment to avoid accident caused by long chips.

Guide for drilling



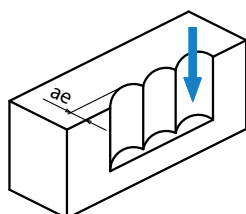
Description	GM type	
	Max. cutting depth	Min. cutting length X for flat bottom surface
MFH...-01-...	0.5	DCX-3.5

Unit: mm

- * When traversing directly after drilling, set the table feed at up to 25% of the recommended cutting conditions.
- * When drilling, reduce feed rate per revolution to under f=0.2mm/rev.

Vertical milling (Plunging)

Vertical milling (Plunging)



Available for vertical milling (plunging).

Insert description	Max. width of cut
LOGT01 type	1.7mm

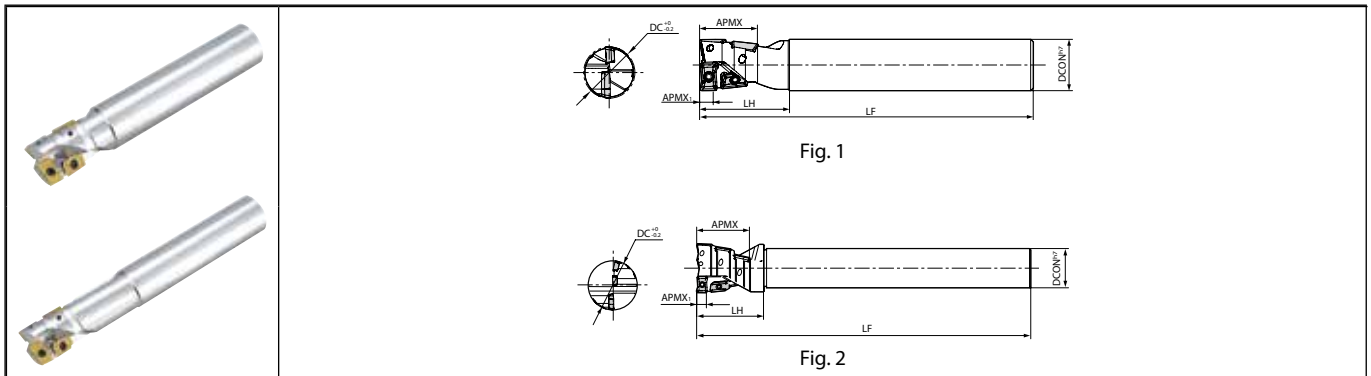
For vertical milling (plunging),
reduce feed rate to fz=0.2mm/t or less.

M



Milling

MEY



Toolholder dimensions

Description			Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➡ M232			
						DC	DCON	LF	LH	APMX	APMX ₁					Anti-seize compound	Screw	Wrench				
Standard	MEY	16-S16	●	4	2	16	16	120	31	19	4.5	+11	-11	No	P-37				Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D			
		17-S16	●			17	16	120	31	19	4.5	+11	-11						1	SB-2040TRG	DTM-6	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D
		20-S20	●			20	20	130	35	22	6	-9	-9						1	SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		21-S20	●			21	20	130	35	22	6	-9	-9						1	SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		25-S25	●			25	25	140	40	28	7.5	-11	-11						1	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		26-S25	●			26	25	140	40	28	7.5	-11	-11						1	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		32-S32	●			32	32	150	50	36	9.5	+13	-9						1	SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
		33-S32	●			33																
		40-S32	●			7	40	160	55	42	7.5	-11	-11						2	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		50-S42	●				50															
Long head	MEY	16-S16-140H	●	4	2	16	16	140	51	19	4.5	+11	-11	No	P-37				Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D			
		20-S20-150H	●			20	20	150	53	22	6	-9	-9						1	SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		25-S25-170H	●			25	25	170	70	28	7.5	+13	-11						1	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		32-S32-180H	●			32	32	180	80	36	9.5	-9	-9						1	SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
Long shank	MEY	16-S16-190	●	4	2	16	16	190	61	19	4.5	+11	-11	No	P-37				Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D			
		17-S16-190	●			17	16	190	61	19	4.5	+11	-11						1	SB-2040TRG	DTM-6	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D
		20-S20-200	●			20	20	200	63	22	6	-9	-9						1	SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		21-S20-200	●			21	20	200	63	22	6	-9	-9						1	SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D
		25-S25-220	●			25	25	220	80	28	7.5	-11	-11						1	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		26-S25-220	●			26	25	220	80	28	7.5	-11	-11						1	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		32-S32-230	●			32	32	230	90	36	9.5	+13	-9						1	SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
		33-S32-230	●			33																
		40-S32-240	●			7	40	240	55	42	7.5	-11	-11						2	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D
		50-S42-250	●				50															

APMX₁ shows the edge length of the complete 2-insert part.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item

M230

M

Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

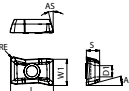
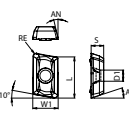
Ball-nose Radius

Others

Applicable Inserts

Description		Applicable Inserts  M232			
					
		Side Edge	No. of Inserts	Center Edge	No. of Inserts
MEY	16-S16(-...)	JOMT08T208ER-D	3	GOMT08T208ER-D	1
	17-S16(-...)				
	20-S20(-...)			GOMT100308ER-D	
	21-S20(-...)	JOMT100308ER-D		GOMT100308ER-D	
	25-S25(-...)	JOMT13T308ER-D		GOMT13T308ER-D	
	26-S25(-...)			GOMT13T308ER-D	
	32-S32(-...)	JOMT160408ER-D		GOMT160408ER-D	
	33-S32(-...)	JOMT160408ER-D		GOMT160408ER-D	
	40-S32(-...)	JOMT13T308ER-D	6	GOMT13T308ER-D	
	50-S42(-...)	JOMT160408ER-D		GOMT160408ER-D	

GOMT/JOMT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)			Carbon steel / Alloy steel								★	P	
			Mold and die steel								★		
			Austenitic stainless steel								☆	M	
			Martensitic stainless steel										
			Precipitation hardening stainless steel										
			Gray cast iron								★	K	
			Nodular cast iron								★		
			Non-ferrous metals									N	
			Heat-resistant alloy									S	
			Titanium alloy										
			Hard materials									H	
Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbi- de	Applicable toolholder ➡ M230	
				S	D1	RE	L	W1	AN	AS	PVD		
											PRI810		PRI825
		GOMT 08T208ER-D	2	2.78	2.3	0.8	8.7	5.21	17	13	● ●	MEY16-S16(-...) MEY17-S16(-...)	
		GOMT 100308ER-D	2	3.3	2.8	0.8	10.7	6.56	17	13	● ●	MEY20-S20(-...) MEY21-S20(-...)	
		GOMT 13T308ER-D	2	3.85	3.4	0.8	13.2	8.36	17	13	● ●	MEY25-S25(-...) MEY26-S25(-...) MEY40-S32(-...)	
		GOMT 160408ER-D	2	4.76	4.4	0.8	16.7	10.03	17	13	● ●	MEY32-S32(-...) MEY33-S32(-...) MEY50-S42(-...)	
		JOMT 08T208ER-D	2	2.78	2.3	0.8	8.5	5.14	13	17	● ●	MEY16-S16(-...) MEY17-S16(-...)	
		JOMT 100308ER-D	2	3.18	2.8	0.8	10.2	6.41	13	17	● ●	MEY20-S20(-...) MEY21-S20(-...)	
		JOMT 13T308ER-D	2	3.7	3.4	0.8	13.2	8.07	13	17	● ●	MEY25-S25(-...) MEY26-S25(-...) MEY40-S32(-...)	
		JOMT 160408ER-D	2	4.5	4.4	0.8	16.7	9.72	13	17	● ●	MEY32-S32(-...) MEY33-S32(-...) MEY50-S42(-...)	

Handed insert shows Right-hand

Recommended cutting conditions ➡ M233

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

● : Standard item

M232

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)	
			MEGACOAT NANO EX	
	Drilling	Shouldering, slotting	PR1810	PR1825
Carbon steel	0.08~0.15	0.05~0.25	-	★ 120~250
Alloy steel	0.08~0.15	0.05~0.25	-	★ 100~220
Mold steel	0.08~0.12	0.05~0.15	-	★ 80~180
Stainless steel	0.08~0.12	0.05~0.15	-	★ 120~220
Cast iron	0.05~0.20	0.05~0.25	★ 100~220	-

★: 1st Recommendation ☆: 2nd Recommendation

Caution of drilling

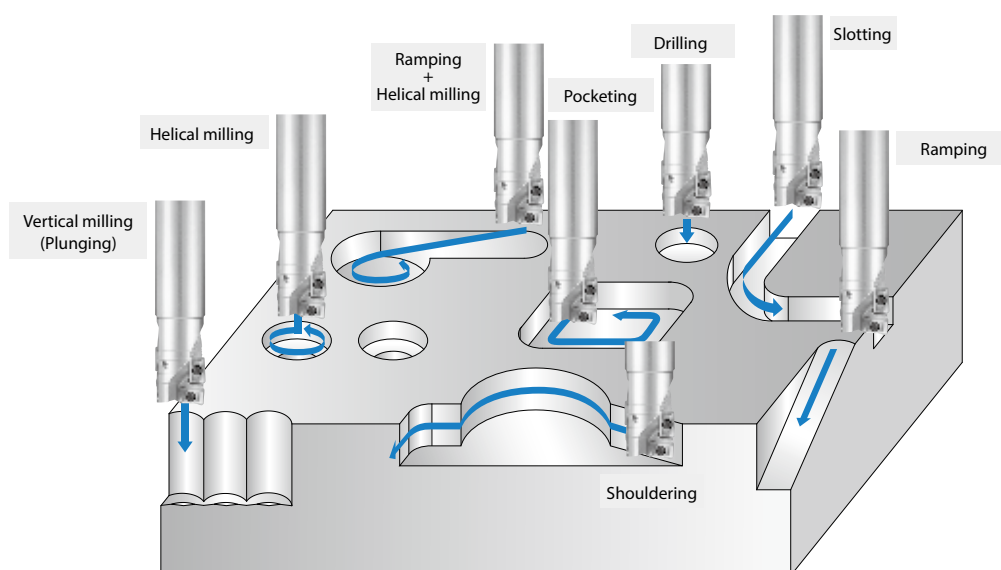
- Drilling conditions should be calculated as one flute line.
- Use compressed air during drilling.
- Carbon steel other than low carbon steel can be drilled to a depth of 0.5D without step feeding.
For soft steel or sticky material such as stainless steel, Step feed drilling (0.5 ~ 1.0mm) is recommended.
- For stainless steel drilling, coolant is recommended.
- Please refer to right list for maximum hole depth.

Cutting dia. (DC)	Max. hole depth (mm)
ø16	13
ø17	13
ø20	17
ø21	17
ø25	22
ø26	22
ø32	29
ø33	29
ø40	36
ø50	40

Shape of the bottom of the drilled hole

Cutting dia.	a (mm)	Shape of the bottom
ø16, ø17	0.5	
ø20, ø21	0.64	
ø25, ø26	0.85	
ø32, ø33	1.12	
ø40	1.54	
ø50	1.65	

Examples of MEY multi-function machining

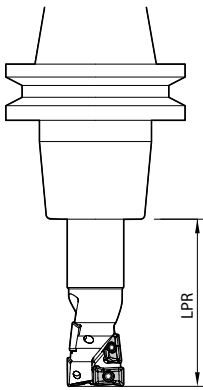


M

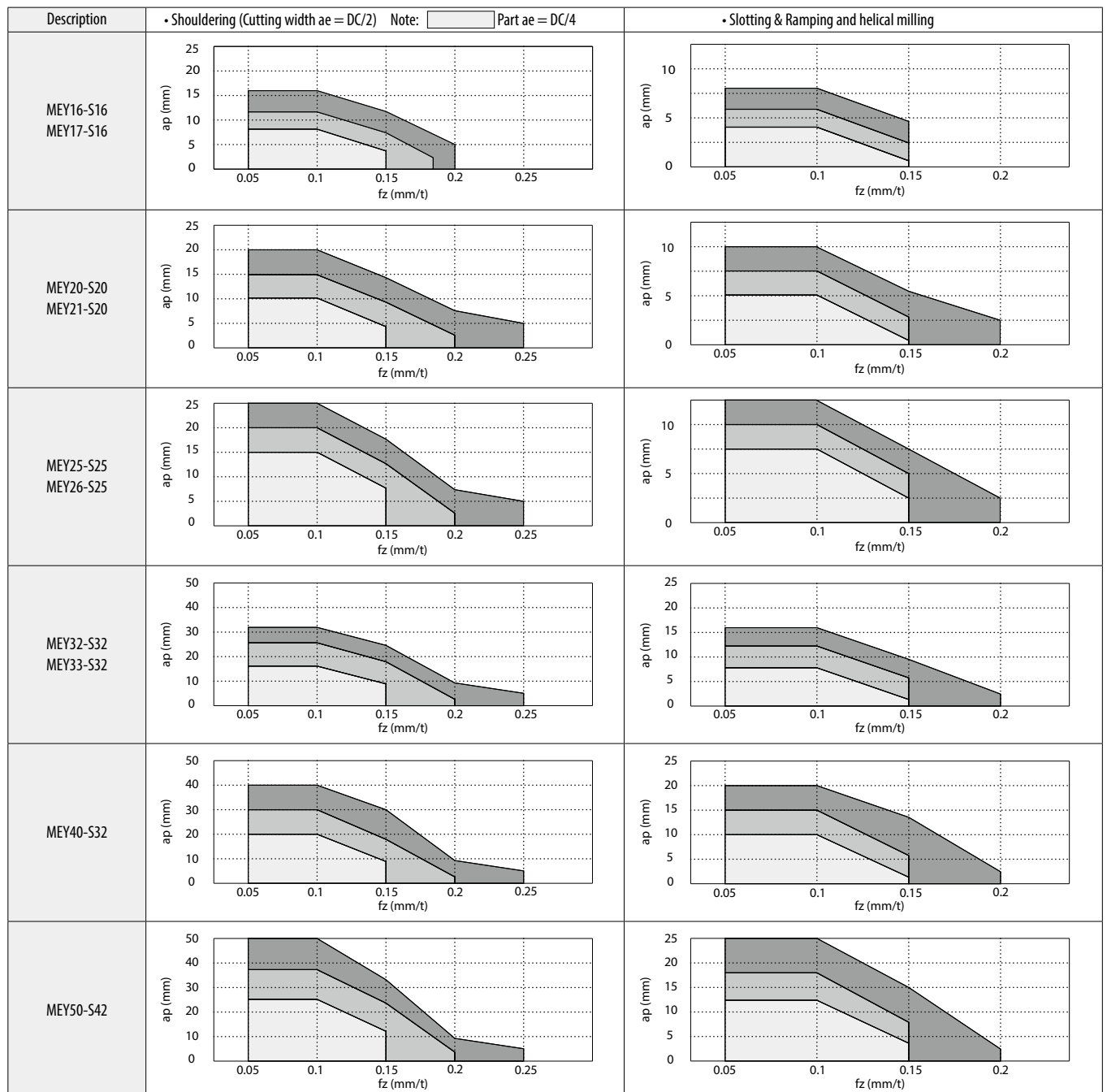
Milling

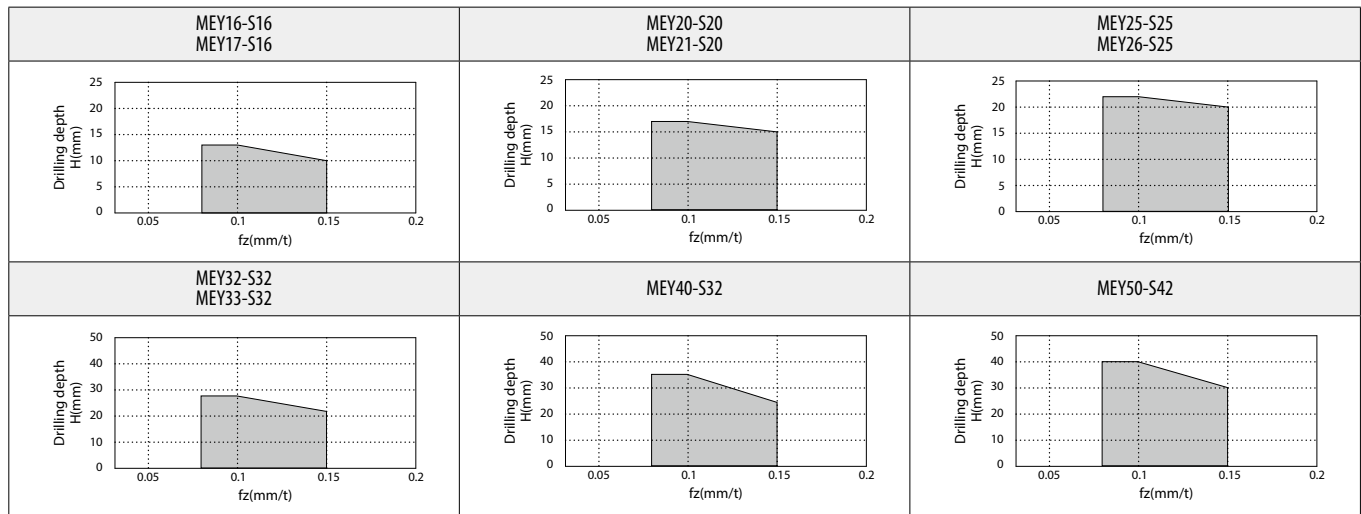
Cutting performance of MEY

Workpiece material: S50C

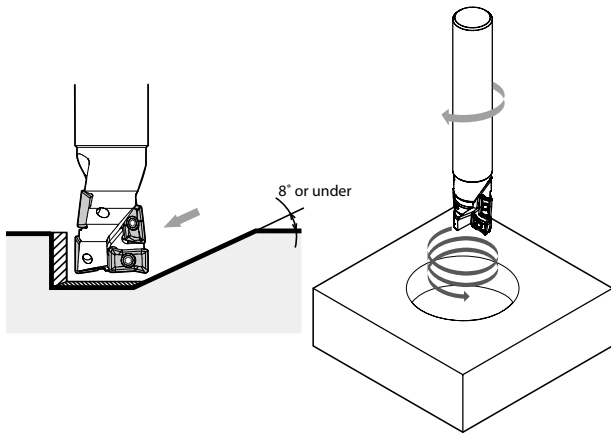
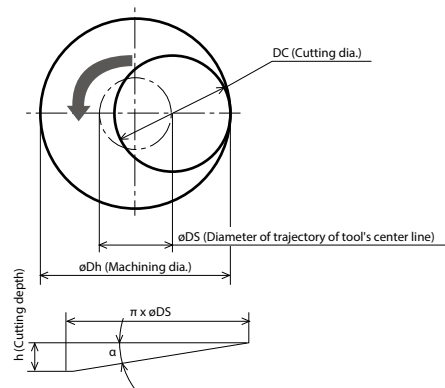
Cutting dia.	Description	Overhang length LPR (mm)			Cutting dia.	Description	Overhang length LPR (mm)			Shape
ø16	MEY16-S16	31	[~61]	(Not recommended)	ø25	MEY25-S25	40	[~70]	(Not recommended)	
	MEY16-S16-140H	-	~61	[~91]		MEY25-S25-170H	-	70	[~100]	
	MEY16-S16-190	-	61	~91		MEY25-S25-220	-	~80	~100	
ø17	MEY17-S16	31	[~61]	(Not recommended)	ø26	MEY26-S25	40	[~70]	(Not recommended)	
	MEY17-S16-190	31	~61	~91		MEY26-S25-220	40	~70	~100	
ø20	MEY20-S20	35	[~65]	(Not recommended)	ø32	MEY32-S32	50	[~80]	(Not recommended)	
	MEY20-S20-150H	-	~65	[~95]		MEY32-S32-180H	-	~80	[~110]	
	MEY20-S20-200	-	65	~95		MEY32-S32-230	-	90	~110	
ø21	MEY21-S20	35	[~65]	(Not recommended)	ø33	MEY33-S32	50	[~80]	(Not recommended)	
	MEY21-S20-200	35	~65	~95		MEY33-S32-230	50	~80	~110	
ø40	MEY40-S32	55	[~85]	[~115]	ø50	MEY50-S42	70	[~100]	[~130]	
	MEY40-S32-240	55	~85	~115		MEY50-S42-250	70	~100	~130	

When using in [] dimension, be careful that the chucking length to the shank may get too short.



Drilling (Standard/long head/long shank: S50C)**How to use MEY effectively****Ramping/Helical milling**

- Ramping angle is recommended to be 8° or under.
- Sinking depth per revolution when helical milling should be 1/2DC or under.
- Use compressed air during machining.

**Helical milling factors**

øDS (How to find diameter of trajectory of tool's center line)

$$\text{øDS} = \text{øDh} - \text{DC}$$

h How to find "h"

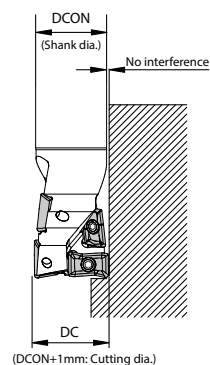
$$h = \pi \times \text{øDS} \times \tan \alpha$$

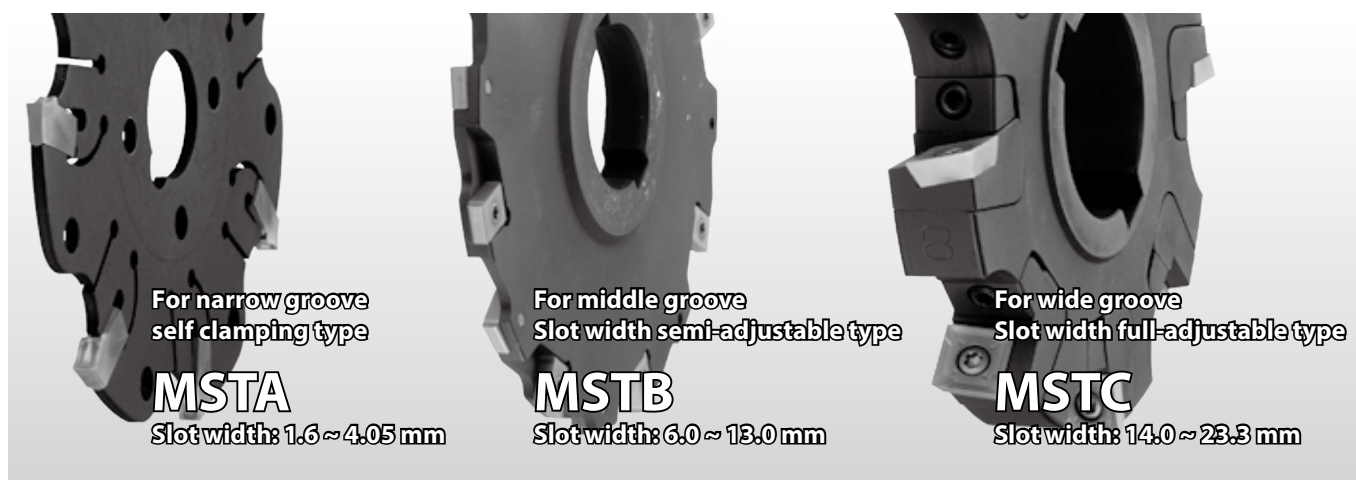
(α should be 8° or under)

Shouldering

- Tools with 1mm larger cutting diameter than shank diameter are available.
- High wall shouldering is possible.

Lineup	(mm)	
Description	DC	DCON
MEY17-S16	17	16
MEY21-S20	21	20
MEY26-S25	26	25
MEY33-S32	33	32
MEY17-S16-190	17	16
MEY21-S20-200	21	20
MEY26-S25-220	26	25
MEY33-S32-230	33	32





Full range from 1.6 mm to 23.3 mm in 3 types

Lineup of MST series slot mills

Type	Applicable inserts	Features	Slot width (mm)													
			1.6	2.2 (2.25)	3.05	4.05	6	8	10	13	14	16	18	20	22	24
MSTA	SLT..	1.6 ~ 4.05 mm fixed	●	●	●	●										
MSTB	LNEU12..	6 ~ 13 mm semi-adjustable					* Adjustable in 0.5mm increments between 6mm and 13mm with the combination of inserts									
MSTC	SP..10T3..	14 ~ 18 mm full-adjustable									* Adjustable between 14mm and 18mm					
	SD..1204...	18 ~ 23.3 mm full-adjustable									* Adjustable between 18mm and 23.3mm					

Slot mill MSTA (Slot width 1.6, 2.2(2.25), 3.05, 4.05 mm)

Self-clamping type slot mill

MSTA slot mills have simple self-clamping system to allow for easy attachment by just installing the insert.

High rigidity clamping system

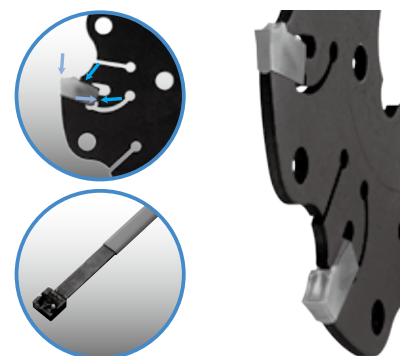
Owing to the high rigidity clamping system – with an end – stopper, the toolholder enable high operability and stable slotting by maintaining an accurate edge position.

Double-prism clamping system

High replacement precision with the double-prism clamping system

Easy replacement

The replacement of inserts is easy and quick by using special wrench.



Wrench is not attached. Please purchase it separately.

Slot mill MSTB (Slot width 6.0 ~ 13.0mm)

Up-right type/semi-adjustable slot width

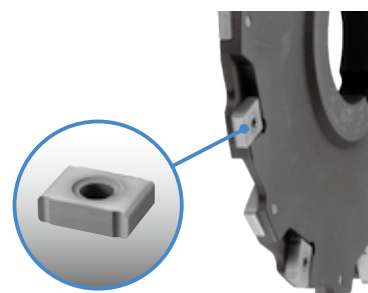
Easy and secure screw holding

Inserts can be attached to the MSTB slot mills very easily by using clamp screws.

Economical inserts with 4 cutting edges

Applicable to a variety of slotting by choosing different inserts

By changing the thickness of inserts, it's applicable to various slotting widths up to max 13mm in 0.5mm increments.



Slot mill MSTC (Slot width 14.0 ~ 23.3 mm)

Lay-down type/full-adjustable slot width

Applicable to various slotting needs. Slotting widths: 14.0mm to 23.3mm.

Cutter dia.: from 100mm to 160mm

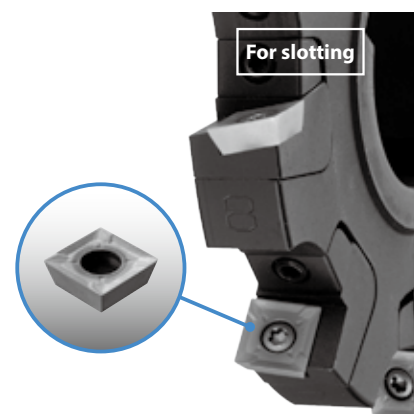
Smooth slotting width adjustment is possible owing to unique cam style adjustment mechanism.

Economical 4-edge Insert

A wide range of corner-R is suitable for various work.

Owing to the wiper edge insert, an excellent surface finish can be expected.

Owing to numerous insert geometries and grades, they are applicable for various types of workpiece machining.



*Change to silver coating in sequence.

Features of insert grades

Insert shape			
Symbol	SB	SD	SE
Rake angle			
Shape			

CA0835

- TiN+TiCN+Al₂O₃ based CVD coated carbide
- For carbon steel, alloy steel, stainless steel and nodular cast iron.
- For middle to high speed machining.

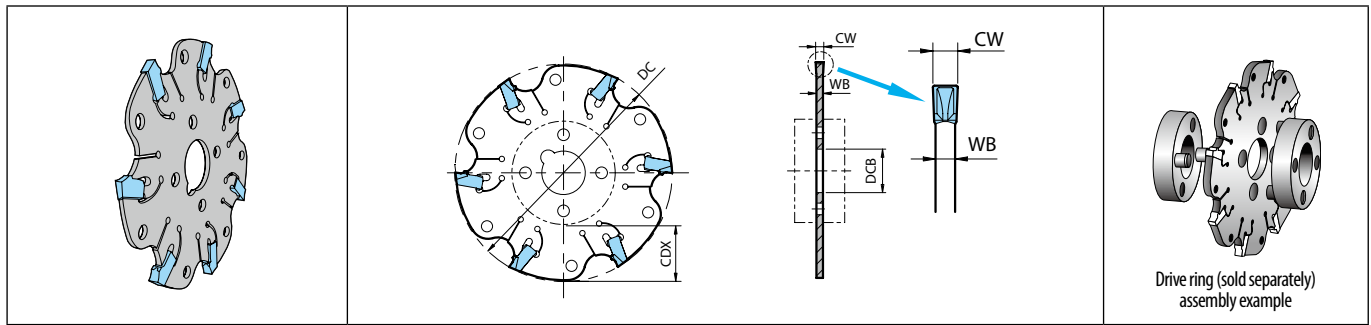
PR0725

- TiN+TiCN+TiN based multi-layer PVD coated carbide
- For carbon steel, alloy steel, stainless steel, heat-resistant alloys and cast iron.
- For middle speed machining.

PR0110

- TiB₂ based PVD coated carbide
- For non-ferrous metals such as aluminum alloys (Si<10%) and titanium alloys.
- For high speed machining.

MSTA



Toolholder dimensions (Metric)

Description	Availability	N	Dimension (mm)					Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Applicable inserts M240
			DC	DCB	CDX	WB	CW				
MSTA 63N16-5T	●	5	63	16	15	1.3	1.6	No	5100	0.03	SLT...SKB SLT...SKD
80N16-7T	●	7	80	21					4000	0.04	
100N16-9T	●	9	100	22	27				3200	0.07	
125N16-11T	●	11	125	32	35				2600	0.1	
MSTA 63N22-5T	●	5	63	16	15	1.8	2.2 (2.25)	No	5100	0.03	SLT...SKB SLT...SKD
80N22-7T	●	7	80	21					4000	0.05	
100N22-9T	●	9	100	22	27				3200	0.08	
125N22-11T	●	11	125	32	35				2600	0.12	
160N22-14T	●	14	160	40	40				2000	0.3	
MSTA 63N30-4T	●	4	63	16	15	2.4	3.05	No	5100	0.05	SLT...SKB SLT...SKD
80N30-6T	●	6	80	21					4000	0.08	
100N30-9T	●	9	100	22	27				3200	0.13	
125N30-11T	●	11	125	32	35				2600	0.2	
160N30-14T	●	14	160	40	40				2000	0.35	
MSTA 63N40-4T	●	4	63	16	15	3.4	4.05	No	5100	0.06	SLT...SKB SLT...SKD
80N40-6T	●	6	80	21					4000	0.1	
100N40-9T	●	9	100	22	27				3200	0.15	
125N40-11T	●	11	125	32	35				2600	0.25	
160N40-14T	●	14	160	40	40				2000	0.4	

Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold singularly.

Please purchase two drive rings per one MSTA slot mill.

Do not exceed the max. revolution.

Do not operate cutting on reverse revolution.

Wrench (MS-FRW1) is not attached. Please purchase it separately.

Drive ring (For Metric)

Shape	Description	Availability	Dimension (mm)					Drawing	Applicable toolholders
			DCB	DIOUT	WB	KWW	DCON		
	DR16-32A	●	16	32	8	4.1	3	Fig. 2	MSTA 63N16-5T 63N22-5T
	DR16-32B	●		32			4	Fig. 1	MSTA 63N30-4T 63N40-4T
	DR16-38	●	22	38	10	6.1	5	Fig. 3	MSTA 80N...-OT
	DR22-46	●		46			6		MSTA 100N...-OT
	DR32-55	●		55			8.1		MSTA 125N...-OT
	DR40-80	●		80			10.1		MSTA 160N...-OT

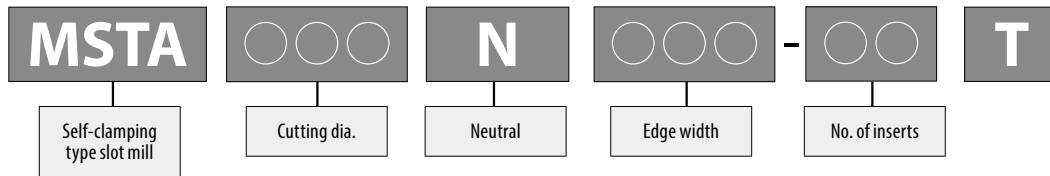
● : Standard item

M238



Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Identification system MSTA toolholder



Toolholder dimensions (inch spec)

Description		Availability	Inserts	Dimension (in , (mm))					Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Applicable inserts ➡ M240
				DC	DCB	CDX	CW	WB				
MSTA	02N063-5T	○	5	2.5 (63.5)	0.625 (15.875)	0.625 (15.875)	0.063 (1.6)	0.051 (1.3)	No	5100	0.03	SLT...SKB SLT...SKD
	03N063-7T	○	7	3 (76.2)		0.875 (22.225)				4000	0.04	
	04N063-9T	○	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.07	
	05N063-11T	○	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.1	
MSTA	03N089-7T	○	7	3 (76.2)	0.625 (15.875)	0.875 (22.225)	0.089 (2.2) (2.25)	0.071 (1.8)	No	4000	0.05	SLT...SKB SLT...SKD
	04N089-9T	○	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.08	
	06N089-14T	○	14	6 (152.4)	1.25 (31.75)	1.438 (36.525)				2000	0.3	
MSTA	02N126-4T	○	4	2.5 (63.5)	0.625 (15.875)	0.625 (15.875)	0.120 (3.05)	0.095 (2.4)	No	5100	0.05	SLT...SKB SLT...SKD
	03N126-6T	○	6	3 (76.2)		0.875 (22.225)				4000	0.08	
	04N126-9T	○	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.13	
	05N126-11T	○	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.2	
	06N126-14T	○	14	6 (152.4)		1.438 (36.525)				2000	0.35	
MSTA	03N164-6T	○	6	3 (76.2)	0.625 (15.875)	0.875 (22.225)	0.160 (4.05)	0.134 (3.4)	No	4000	0.1	SLT...SKB SLT...SKD
	04N164-9T	○	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.15	
	05N164-11T	○	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.25	

Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold singularly.

Please purchase two drive rings per one MSTA slot mill.

Do not exceed the max. revolution.

Do not operate cutting on reverse revolution.

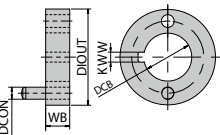
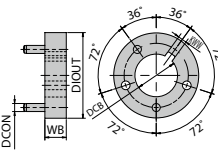
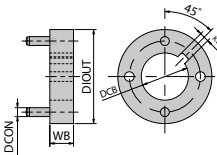
Wrench (MS-FRW1) is not attached. Please purchase it separately.

M



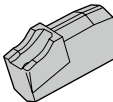
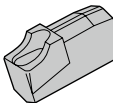
Milling

Drive ring (For Inch spec)

Shape			Description	Availability	Dimension (inch)					Drawing	Applicable toolholders
					DCB	DIOUT	WB	KWW	DCON		
			DR0625-1250A	○					.158 (4mm)	Fig. 1	MSTA 02N126-4T
			DR0625-1250B	○	.625 (15.875mm)	1.250 (31.75mm)	.315 (8mm)	.130 (3.3mm)	.120 (3mm)	Fig. 2	MSTA 02N063-5T
			DR0625-1250C	○						Fig. 3	MSTA 03N○○○-T
DR1000-1875	○	1.000 (25.4mm)	1.875 (47.625mm)	.394 (10mm)	.256 (6.5mm)	.200 (5mm)	MSTA 04N○○○-T				
DR1250-2250	○	1.250 (31.75mm)	2.250 (57.15mm)	.319 (8.1mm)	.240 (6mm)		MSTA 05N○○○-T				
DR1250-3125	○	1.250 (31.75mm)	3.125 (79.375mm)	.472 (12mm)	.319 (8.1mm)	.472 (12mm)	MSTA 06N○○○-T				

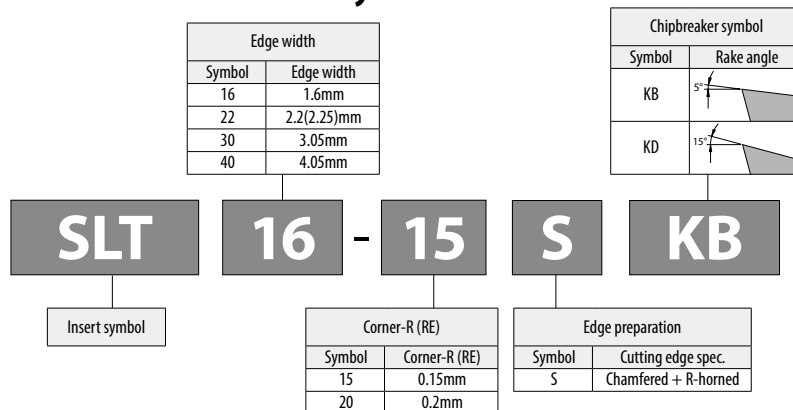
○ : Will be replaced with a new product

SLT

Classification of usage ● : 1st Choice ○ : 2nd Choice				Carbon steel / Alloy steel		●	○	P			
				Mold and die steel							
				Stainless steel		○	●	M			
				Gray cast iron		○					
				Nodular cast iron		○		K			
				Non-ferrous metals							
				Heat-resistant alloy			●	S			
				Titanium alloy							
				Hard materials				H			
Insert		Description		Dimension (mm)		Angle (°)	Tolerance (mm)		Carbide		Applicable toolholder M238 M239
				CW	RE		GAN	CW min.	CW max.	CVD CA0835	
	SLT	16-15SKB	1.6	0.15	5	-0.1	0	●	●	MSTA...	
	SLT	22-20SKB	2.2	0.2	5	-0.05	+0.08	●	●		
	SLT	30-20SKB	3.05	0.2	5	0	+0.15	●	●		
	SLT	40-20SKB	4.05	0.2	5	0	+0.15	●	●		
 Low cutting force	SLT	16-15SKD	1.6	0.15	15	-0.1	0	●	●		
	SLT	22-20SKD	2.25	0.2	15	0	+0.15	●	●		
	SLT	30-20SKD	3.05	0.2	15	0	+0.15	●	●		
	SLT	40-20SKD	4.05	0.2	15	0	+0.15	●	●		

Recommended cutting conditions ➡ M241

Inserts identification system



Selection of chipbreaker

KB chipbreaker ... general purpose chipbreaker for steel and cast iron

KD chipbreaker ... low cutting force chipbreaker for stainless steel

Features of insert grades

CA0835

- TiN+TiCN+Al₂O₃ based CVD Coated carbide
- For carbon steel, alloy steel, stainless steel and cast iron
- For middle to high speed machining

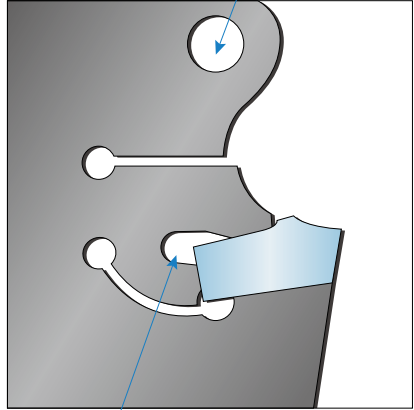
PR0735

- TiN base PVD Coated carbide
- For stainless steel, heat-resistant alloys, etc.
- For low to middle speed machining

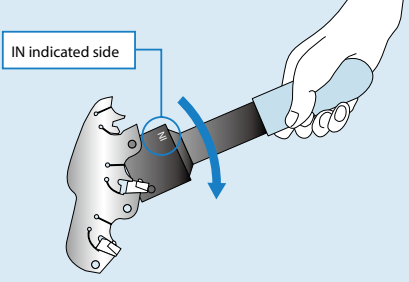
● : Standard item

M240

Set up

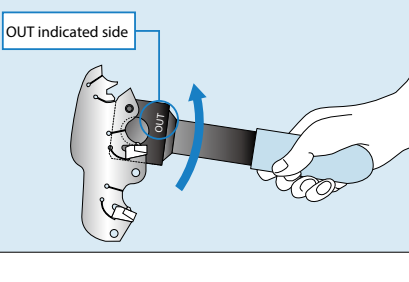


How to attach inserts



1. Put insert inside the slot mill.
2. Insert one of the pins on the wrench (on IN indicated side) into the wrench support hole.
3. Using the other pin, push the front relief surface of the insert.
4. Rotate the wrench until insert's back end makes contact with slot mill.

How to detach inserts



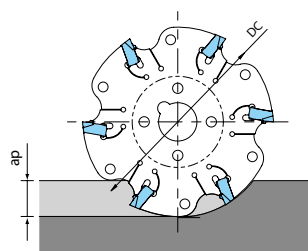
1. Insert one of the pins on the wrench (on OUT indicated side) into the wrench support hole, and insert other pin into the insert releasing hole.
2. Insert can be uninstalled by rotating the wrench counterclockwise. (A magnet is installed on OUT indicated side.)

Note: Use appropriate wrench for set up.

Recommended cutting conditions

Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)		fz (mm/t)				Remarks
			CVD coated carbide	PVD coated carbide	Edge width (mm)				
			CA0835	PR0735	1.6	2.2(2.25)	3.05	4.05	
Low carbon steel	SS400 S10C ~ S25C	125	250~310	200~250	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	Coolant
Carbon steel	S30C ~ S58C (Annealed)	190	160~190	130~160	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	S30C ~ S58C (Heat treated)	250	140~180	110~150	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
Alloy steel	SCM, SCr (Annealed)	180	140~180	110~150	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	SCM, SCr (Heat treated)	275	120~160	100~130	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
High carbon alloy	SKD11, SKD61, etc.	280	100~140	80~120	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
Stainless steel	Austenitic related SUS304, SUS316, SUH310, etc.	220	150~190	80~120	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
	Martensitic related SUS403, SUS410, SUH430F, etc.	300	140~180	60~80	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
Gray cast iron	FC250 ~ FC350	260	160~200	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	Dry
Nodular cast iron	FCD400 ~ FCD500	160	130~160	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	FCD600 ~ FCD800	250	110~140	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	

Note: 1. Use down-cut machining.
2. If a_p is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.

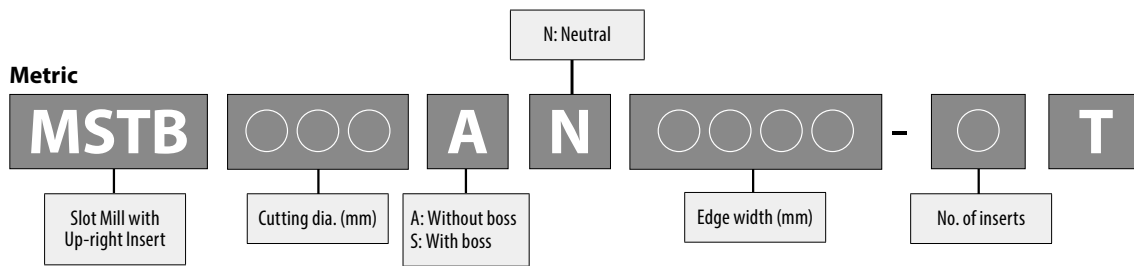


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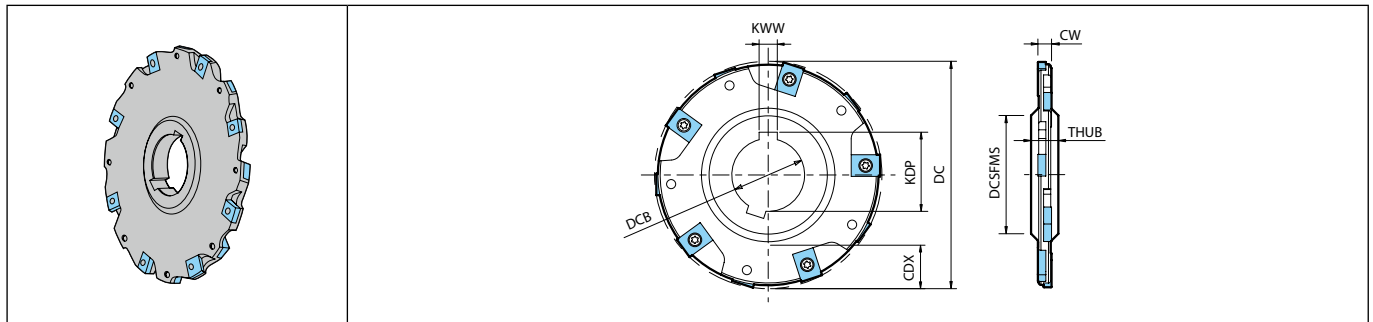


Milling

Identification system toolholder MSTB



MSTB (Without Boss, Metric)



In order to be used in combination with two or more mills, this slot mill has 2 key slots.

Toolholder dimensions

Description		Availability	Inserts		Edge line		Dimension (mm)								Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➔ M245
																		Anti-seize compound	Screw	Wrench	
		N	DC	DCSFS	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.										
MSTB	80AN0607-4T	●	8	4	80	44	27	29.8	7	15					No	9240	0.3	P-37	SE-40050TRN	TT-15	LNEU12...
	100AN0607-5T	●	10	5	100	52	32	34.8	8	21	12	6	7	No	8270	0.4					
	125AN0607-6T	●	12	6	125		63	40	43.5	10	28					7390	0.7				
	160AN0607-8T	●	16	8	160						45.5					6540	1.1				
MSTB	80AN0809-4T	●	8	4	80	44	27	29.8	7	16					No	9240	0.4	P-37	SE-40068TR	TT-15	LNEU12...
	100AN0809-5T	●	10	5	100	52	32	34.8	8	22	12	8	9	No	8270	0.5					
	160AN0809-8T	●	16	8	160	63	40	43.5	10	45.5						6540	1.3				
MSTB	125AN1011-4T	●	12	4	125		63	40	43.5	10	30	12	10	11	No	7390	0.9	P-37	SE-40068TR	TT-15	LNEU12...
	160AN1011-5T	●	15	5	160						47.5					6540	1.6				
MSTB	160AN1213-5T	●	15	5	160	63	40	43.5	10	48.5	12	12	13	No	6540	1.6	P-37	SE-40090TR	TT-15	LNEU12...	

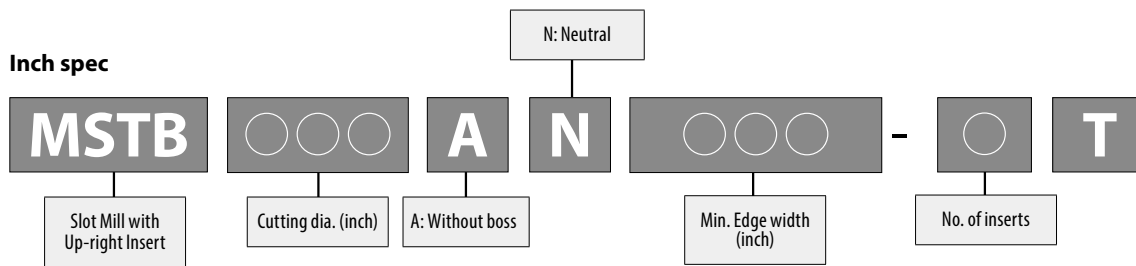
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item

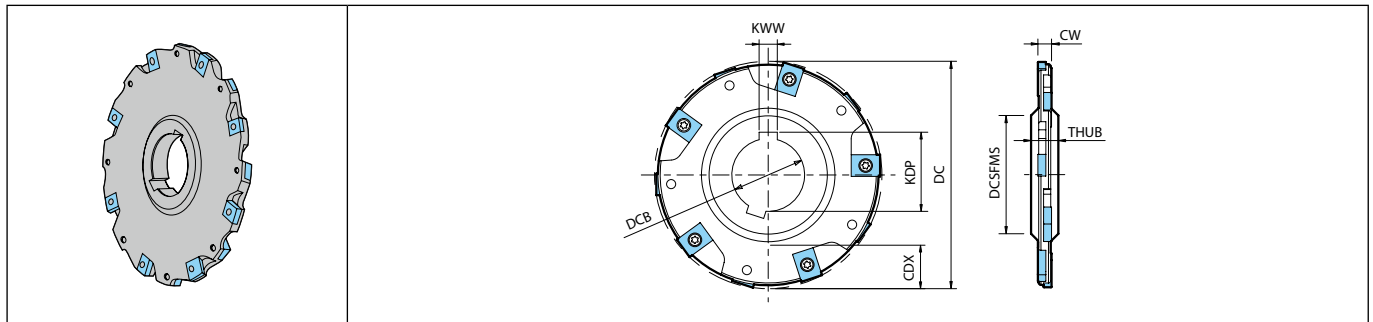
M242

Identification system toolholder MSTB

Inch spec



MSTB (Without Boss, Inch spec)



In order to be used in combination with two or more mills, this slot mill has 2 key slots.

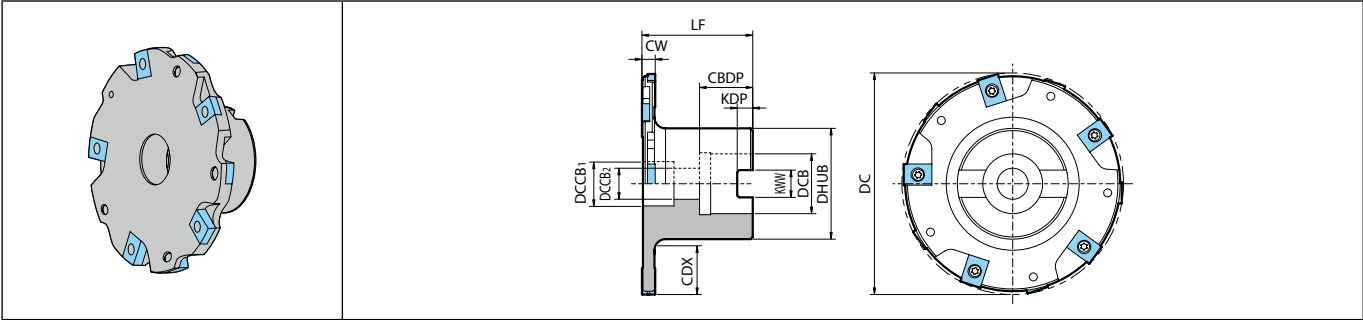
Toolholder dimensions

Description	Availability	Inserts	Edge line	Dimension (in , (mm))										Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➡ M245
	N			DC	DCSfMS	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.	Anti-seize compound				Screw	Wrench		
																				
MSTB 3000AN250-4T 4000AN250-5T 5000AN250-6T 6000AN250-8T	○	8	4	3 (76.2)	1.5 (38.1)	1 (25.4)	1.106 (28.1)	0.25 (6.35)	0.625 (15.875)	0.5 (12.7)	0.25 (6.35)	0.289 (7.34)	No	9470	0.3	P-37	SE-4005STR	TT-15	LNEU12...	
	○	10	5	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	0.935 (23.8)					8200						0.7
	○	12	6	5 (127)					1.435 (36.4)					7300						
	○	16	8	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.75 (44.45)					6700						
MSTB 4000AN312-5T 5000AN312-6T 6000AN312-8T	○	10	5	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	0.966 (24.5)	0.5 (12.7)	0.312 (7.92)	0.351 (8.91)	No	7400	0.5	P-37	SE-40068TR	TT-15	LNEU12...	
	○	12	6	5 (127)					1.466 (37.2)					6600						0.8
	○	16	8	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.781 (45.2)					6000						
MSTB 4000AN375-3T 5000AN375-4T 6000AN375-5T	○	9	3	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	1 (25.4)	0.5 (12.7)	0.375 (9.525)	0.414 (10.52)	No	7400	0.5	P-37	SE-40068TR	TT-15	LNEU12...	
	○	12	4	5 (127)					1.5 (38.1)					6600						0.8
	○	15	5	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.812 (46)					6000						
MSTB 4000AN500-3T 5000AN500-4T 6000AN500-5T	○	9	3	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	1.06 (26.9)	0.5 (12.7)	0.5 (12.7)	0.539 (13.69)	No	4900	0.6	P-37	SE-40090TR	TT-15	LNEU12...	
	○	12	4	5 (127)					1.56 (39.6)					4400						1.1
	○	15	5	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.875 (47.6)					4000						

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

○ : Will be replaced with a new product

MSTB (With Boss, Metric)



Toolholder dimensions

Description	Availability		Inserts	Edge line	Dimension (mm)												Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts				Applicable inserts ➡ M245
	N	DC			DCB	DCB ₁	DCB ₂	LF (min.)	CDBP	KDP	KWW	CDX	DHUB	CW min.	CW max.									
MSTB 80SN0607-4T 100SN0607-5T 160SN0607-8T	●	8	4	80	22	18	12	50	23	6.3	10.4	16	40	6	7	No	9240	0.7	P-37	HH10X35	SE-40050TRN	TT-15	LNEU12...	
	●	10	5	100	27	20	14		24	7	12.4	21	50				8270	1		HH12X35				
	●	16	8	160	40	33	22		28	9	16.4	41	70				6540	1.9		HH20X40				
MSTB 80SN0809-4T 100SN0809-5T 160SN0809-8T	●	8	4	80	22	18	12	50	23	6.3	10.4	16	40	8	9	No	9240	0.8	P-37	HH10X35	SE-40068TR	TT-15	LNEU12...	
	●	10	5	100	27	20	14		24	7	12.4	21	50				8270	1.2		HH12X35				
	●	16	8	160	40	33	22		28	9	16.4	41	70				6540	2.2		HH20X40				
MSTB 125SN1011-4T 160SN1011-5T	●	12	4	125	40	33	22	50	28	9	16.4	26	70	10	11	No	7390	2	P-37	HH20X40	SE-40068TR	TT-15	LNEU12...	
	●	15	5	160								43					6540	2.5						

LF (min.) dimension shows in case of minimum of edge width (CW).
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

M

Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

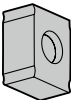
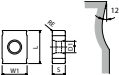
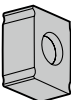
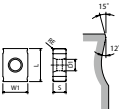
Slot Mill

Ball-nose
Radius

Others

● : Standard item

LNEU

Classification of usage ● : 1st Choice ○ : 2nd Choice				Carbon steel / Alloy steel		●	P		
				Mold and die steel					
				Stainless steel		●	M		
				Gray cast iron		○			
				Nodular cast iron		○	K		
				Non-ferrous metals					
				Heat-resistant alloy		●	S		
				Titanium alloy		○			
				Hard materials			H		
Insert		Description	No. of edges	Dimension (mm)			Carbide PVD PR0725	Applicable toolholder ➡ M242~M244	Applicable clamp screw
				S	D1	RE			
	 With honing	LNEU 1235-03-4	4	3.5	4.4	0.3	●	MSTB...	SE-40050TRN
		LNEU 1240-08-4	4	4	4.4	0.8	●		SE-40055TR
		LNEU 1245-04 1245-08	4	4.5	4.2	0.4 0.8	● ●		SE-40068TR
		LNEU 1250-04 1250-08	4	5	4.2	0.4 0.8	● ●		SE-40080TR
		LNEU 1255-04 1255-08	4	5.5	4.2	0.4 0.8	● ●		SE-40090TR
		LNEU 1260-04	4	6	4.2	0.4	●		SE-40100TR
	 Tough edge	LNEU 1235-03S-4	4	3.5	4.4	0.3	●	MSTB...	SE-40050TRN
		LNEU 1240-03S-4	4	4	4.4	0.3	●		SE-40055TR
		LNEU 1245-04S 1245-08S	4	4.5	4.2	0.4 0.8	● ●		SE-40068TR
		LNEU 1250-04S 1250-08S	4	5	4.2	0.4 0.8	● ●		SE-40080TR

Please select the applicable clamp screw depending on each insert description.

See page M246 for insert description and applicable clamp screw depending on edge width.

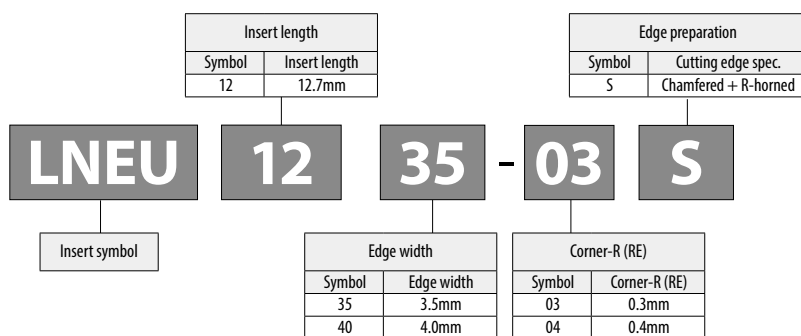
Recommended cutting conditions ➡ M247

M



Milling

Inserts identification system



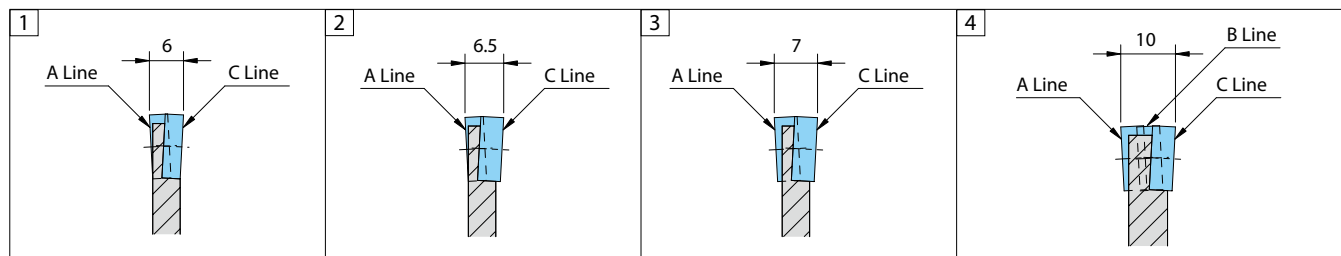
● : Standard item

Combination of applicable inserts

Description			Clamp screw (Standard attachment parts)	Edge width		A Line		B Line		C Line		Wrench for clamp screw	Tightening torque (N·m)		
				mm	inch (mm)	Applicable inserts	Clamp screw	Applicable inserts	Clamp screw	Applicable inserts	Clamp screw				
Metric	MSTB	○○○AN0607-○T	SE-40050TRN	6	-	LNEU1235..	SE-40050TRN	-	-	LNEU1235..	SE-40050TRN	TT-15	3		
		○○○SN0607-○T		6.5						LNEU1240..	SE-40055TR			LNEU1240..	SE-40055TR
				7						LNEU1240..	SE-40055TR				
	MSTB	○○○AN0809-○T	SE-40068TR	8	-	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR				
		○○○SN0809-○T		8.5						LNEU1250..	SE-40080TR			LNEU1250..	SE-40080TR
				9						LNEU1250..	SE-40080TR				
	MSTB	○○○AN1011-○T	SE-40068TR	10	-	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR				
		○○○SN1011-○T		10.5						LNEU1250..	SE-40080TR			LNEU1250..	SE-40080TR
				11						LNEU1250..	SE-40080TR			LNEU1250..	SE-40080TR
	MSTB	○○○AN1213-○T	SE-40090TR	12	-	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR				
				12.5						LNEU1260...	SE-40100TR			LNEU1260...	SE-40100TR
				13						LNEU1260...	SE-40100TR			LNEU1260...	SE-40100TR
Inch spec	MSTB	○○○○AN250-○T	SE-40055TR	-	²⁵⁰ (6.35mm)	LNEU1240..	SE-40055TR	-	-	LNEU1240..	SE-40055TR	TT-15	3		
		²⁷⁰ (6.86mm)			LNEU1245..					SE-40068TR	LNEU1245..			SE-40068TR	
		²⁸⁹ (7.34mm)			LNEU1245..					SE-40068TR					
	MSTB	○○○○AN312-○T	SE-40068TR	-	³¹² (7.92mm)	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR				
		³³² (8.43mm)			LNEU1250..					SE-40080TR	LNEU1250..			SE-40080TR	
		³⁵¹ (8.91mm)			LNEU1250..					SE-40080TR					
	MSTB	○○○○AN375-○T	SE-40068TR	-	³⁷⁵ (9.525mm)	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR				
		³⁹⁵ (10.33mm)			LNEU1250..					SE-40080TR	LNEU1250..			SE-40080TR	
		⁴¹⁴ (10.52mm)			LNEU1250..					SE-40080TR	LNEU1250..			SE-40080TR	
	MSTB	○○○○AN500-○T	SE-40090TR	-	⁵⁰⁰ (12.7mm)	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR				
		⁵²⁰ (13.21mm)			LNEU1260...					SE-40100TR	LNEU1260...			SE-40100TR	
		⁵³⁹ (13.69mm)			LNEU1260...					SE-40100TR	LNEU1260...			SE-40100TR	

For clamp screw, above listed "Standard attachment parts" are attached. In case of necessity of another size of clamp screw by changing slotting width, please purchase separately.

Slot width (Edge width) adjustment



The slot width (Edge width) of MSTB slot mills is adjustable by a maximum of 1 mm with the combination of inserts.

1. In the case of MSTB○○○○AN0607-○T the width (W) is 6mm by installing LNEU1235 on both A line and C line.
2. By replacing C line only with LNEU1240 the width (W) is 6.5 mm.
3. By replacing A line and C line with LNEU1240 the width (W) is 7 mm.
4. If the slotting width (Edge width) is 10 mm, the B line (Middle edge) is necessary.

* Caution

1. There is no description such as "A line", "B line", and "C line" on the actual slot mill. These are only for explanation of the combination of insert.
2. Use proper clamp screws for applicable inserts on the basis of the above chart.
3. Please do not use any slot mills, that have a difference of width of more than 1 mm.

Bottom cutting shape of MSTB slot mill

Slot bottom shape will be (Fig. 1) convex shape.

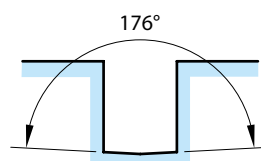


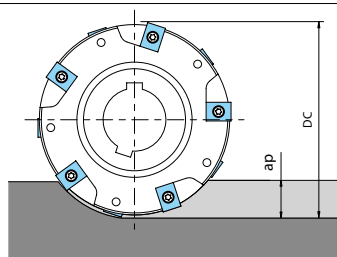
Fig. 1 Convex bottom shape

Recommended cutting conditions

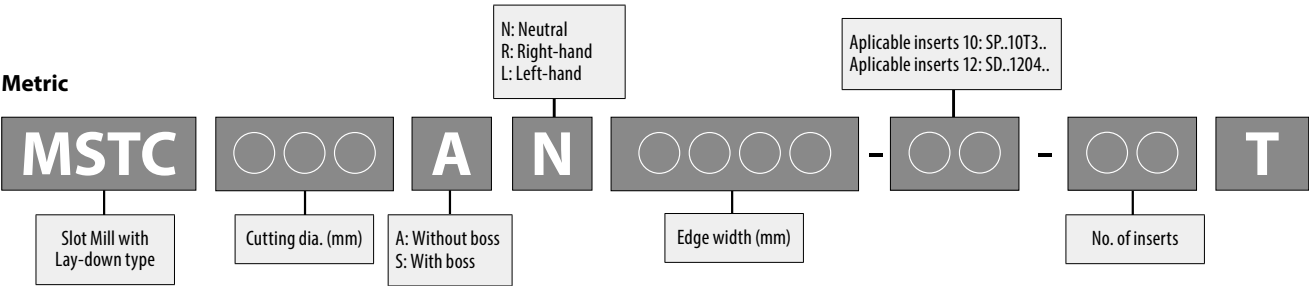
Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)	fz (mm/t)		Remarks
			PVD Coated carbide	Insert thickness (mm)		
			PR0725	3.5~4.0	4.5~6.0	
Low carbon steel	SS400 S10C ~ S25C	125	170~210	0.07~0.20	0.10~0.22	Dry
Carbon steel	S30C ~ S58C (Annealed)	190	100~140	0.07~0.20	0.10~0.22	
	S30C ~ S58C (Heat treated)	250	90~120	0.07~0.20	0.10~0.22	
Alloy steel	SCM, SGr (Annealed)	180	90~120	0.07~0.20	0.10~0.22	
	SCM, SGr (Heat treated)	275	80~110	0.05~0.18	0.08~0.20	
High carbon alloy	SKD11, SKD61, etc.	280	70~90	0.05~0.18	0.08~0.20	Coolant
Stainless steel	Austenitic related SUS304, SUS316, SUH310, etc.	220	110~140	0.05~0.18	0.08~0.20	
	Martensitic related SUS403, SUS410, SUH430F, etc.	300	100~120	0.05~0.18	0.08~0.20	
Heat-resistant alloys	Ni-base heat-resistant alloys	350	15~30	0.05~0.18	0.08~0.20	
Titanium alloys	Ti-6Al-4V, etc.	270	20~50	0.05~0.18	0.08~0.20	
Gray cast iron	FC250 ~ FC350	260	110~130	0.07~0.22	0.10~0.25	Dry
Nodular cast iron	FCD400 ~ FCD500	160	80~100	0.07~0.22	0.10~0.25	
	FCD600 ~ FCD800	250	70~90	0.07~0.22	0.10~0.25	

Note: 1. Use down-cut machining.

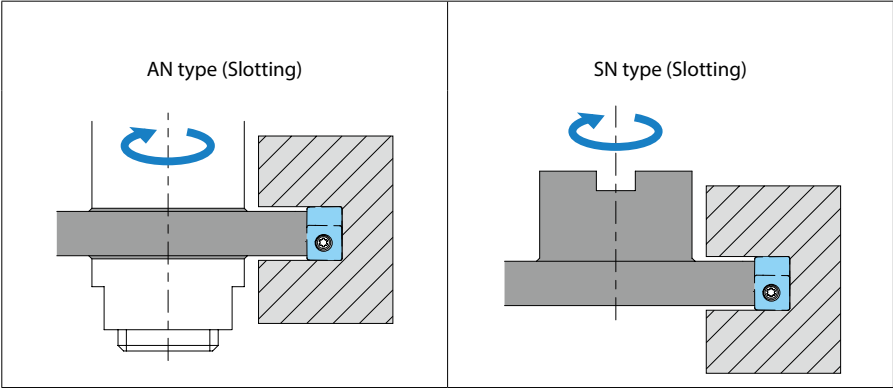
2. If a_p is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.



Identification system toolholder MSTC



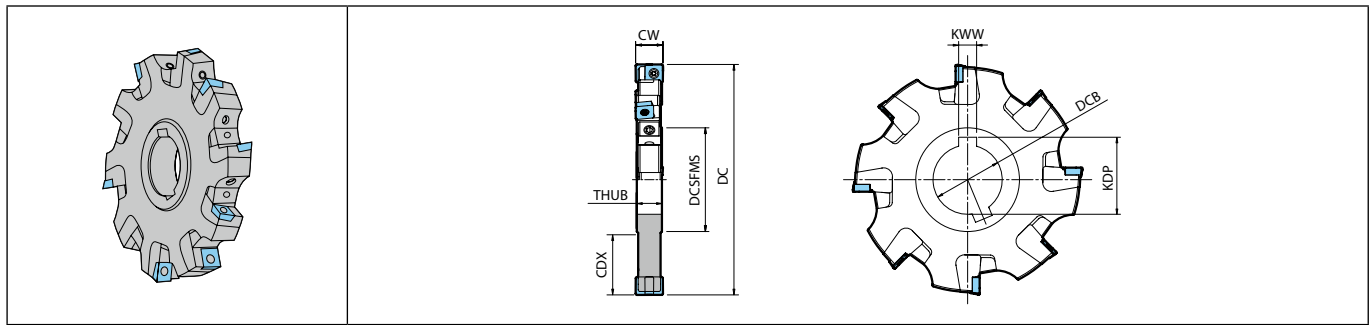
Cutting direction of MSTC slot mill



M

Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

MSTC (Without Boss)

In order to be used in combination with two or more mills, this slot mill has 2 key slots.

Toolholder dimensions (Without Boss, Metric)

Description		Availability	Inserts	Edge line	Dimension (mm)									Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Applicable inserts ➡ M252 M253	
		N			DC	DCSFMS	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.					
MSTC	100AN1416-10-3T	●	6	3	100	46.8	32	34.8	8	25.9						17250	0.5	SPCT10T3... SPET10T3...
	125AN1416-10-4T	●	8	4	125	54.8	40	43.5	10	34.4	13.9	14	16	No	15450	0.8		
	160AN1416-10-5T	●	10	5	160					51.9					13650	1.5		
MSTC	125AN1618-10-4T	●	8	4	125	54.8	40	43.5	10	34.4	15.9	16	18	No	15450	1	SPCT10T3... SPET10T3...	
	160AN1618-10-5T	●	10	5	160					51.9					13650	1.8		
MSTC	125AN1820-12-4T	●	8	4	125	54.8	40	43.5	10	34	18.2	18	20.6	No	10350	1	SDCT1204... SDET1204...	
	160AN1820-12-5T	●	10	5	160					51.5					9150	1.8		
MSTC	125AN2123-12-4T	●	8	4	125	54.8	40	43.5	10	34	20.8	20.6	23.3	No	10350	1.2	SDCT1204... SDET1204...	
	160AN2123-12-5T	●	10	5	160					51.5					9150	2.1		

Spare parts ➡ M251

Slot width (Edge width) adjustment ➡ M255 - M257

● : Standard item

M



Milling

MSTC (With Boss)

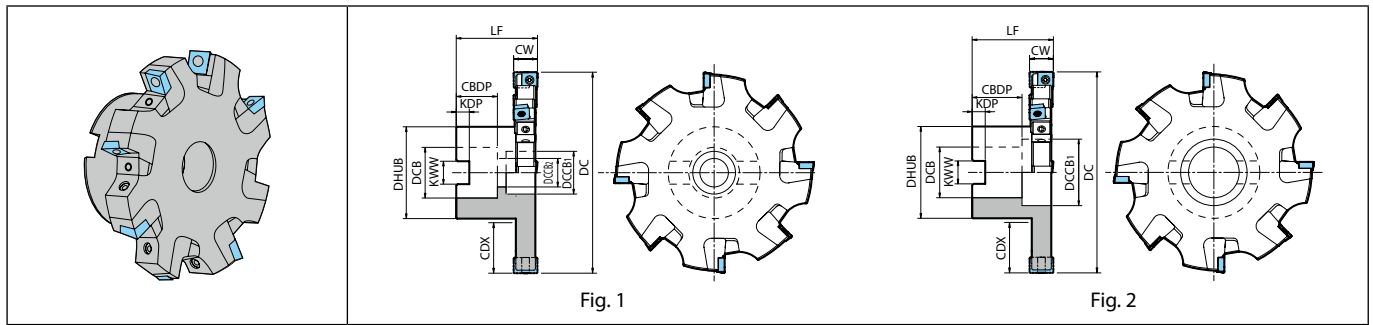


Fig. 1

Fig. 2

Toolholder dimensions (With Boss, Metric)

Description		Availability	Inserts	Edge line	Dimension (mm)												Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M252 M253	
		N			DC	DCB	DCB ₁	DCB ₂	LF (min.)	CBDP	KDP	KWW	CDX	DHUB	CW min.	CW max.						
MSTC	100SN1416-10-3T	●	6	3	100	27	20	14	50.8	24	7	12.4	24.4	48	14	16	No	17250	1	1		SPCT10T3... SPET10T3...
	125SN1416-10-4T	●	8	4	125	32	27	18		26	8	14.4	31.9	58			15450	1.6	1			
	160SN1416-10-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			13650	2	2			
MSTC	125SN1618-10-4T	●	8	4	125	32	27	18	50.8	26	8	14.4	31.9	58	16	18	No	15450	1.7	1	SPCT10T3... SPET10T3...	
	160SN1618-10-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			13650	2.3	2			
MSTC	125SN1820-12-4T	●	8	4	125	32	27	18	51	26	8	14.4	31.9	58	18	20.6	No	10350	1.6	1	SDCT1204... SDET1204...	
	160SN1820-12-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			9150	2.3	2			
MSTC	125SN2123-12-4T	●	8	4	125	32	27	18	51	26	8	14.4	31.9	58	20.6	23.3	No	10350	1.7	1	SDCT1204... SDET1204...	
	160SN2123-12-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			9150	2.6	2			

LF (min.) dimension shows in case of minimum of edge width (CW).

M

Spare parts M251

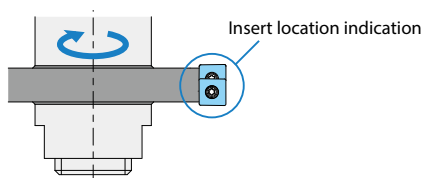
Slot width (Edge width) adjustment M255 - M257

Milling

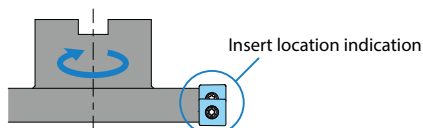
Applicable insert installation method

When installing handed inserts, it is necessary to equip same number of right-hand and left-hand inserts as shown in "No. of edge lines" respectively. Please Install as show in the figure below.

MSTC...AN... (Without boss)



MSTC...SN... (With boss)



Toolholder description	Insert location indication	Applicable inserts M252, M253	
		Handed	Neutral
MSTC...AN...10.. MSTC...SN...10..		SP..10T3...L...	SP..10T3...N...
		SP..10T3...R...	
MSTC...AN...12.. MSTC...SN...12..		SD..1204...L...	SD..1204...N...
		SD..1204...R...	

● : Standard item

M250

Spare parts (MSTC) (common to Metric / Inch spec)

Description				Spare parts																		
				Cartridge		Wedge	Wedge screw	Cam pin	Clamp screw	Wrench			Anti-seize compound	Mounting bolt								
				Right-hand	Left-hand					for wedge screw	for cam pin	for clamp screw										
																						
Without boss	Metric	MSTC	100AN1416-10-3T	C90SP1416-10R	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-								
			125AN1416-10-4T				W6X20															
			160AN1416-10-5T				W6X20															
		MSTC	125AN1618-10-4T	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15										
			160AN1618-10-5T				W6X20															
		MSTC	125AN1820-12-4T	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20															
			160AN1820-12-5T												AP-1820	SB-3590TRP		LW-3	DTP-15			
		MSTC	125AN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20																
			160AN2123-12-5T																			
With boss	Metric	MSTC	100SN1416-10-3T	C90SP1416-10R	C90SP1416-10L	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH12X35								
			125SN1416-10-4T											HH16X35								
			160SN1416-10-5T											-								
		MSTC	125SN1618-10-4T	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15	P-37	HH16X35								
			160SN1618-10-5T											-								
		MSTC	125SN1820-12-4T	C90SD1820-12R	C90SD1820-12L	WC-18								W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15	P-37	HH16X35	
			160SN1820-12-5T																		-	
		MSTC	125SN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20															W6X20	AP-1820
			160SN2123-12-5T											-								
															-							
																-						



Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Tightening torque

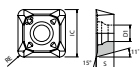
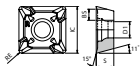
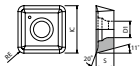
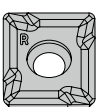
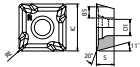
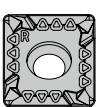
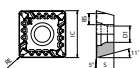
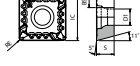
Wrench	TH-3L	DTP-9	DTP-15
			
Tightening torque (N·m)	5~6	1.5	4

M



Milling

SPCT/SPET

Classification of usage ● : 1st Choice ○ : 2nd Choice		Carbon steel / Alloy steel					●	●	P			
		Mold and die steel										
		Stainless steel					○	●	M			
		Gray cast iron					○	●	K			
		Nodular cast iron					○	●				
		Non-ferrous metals						●	N			
		Heat-resistant alloy						●	S			
Titanium alloy					○	●						
Hard materials								H				
Insert		Description	No. of edges	Dimension (mm)					Carbide			Applicable toolholder ➡ M249, M250
				IC	S	D1	RE	BS	CVD CA0835 PR0110 PR0725	PVD		
		SPCT 10T316EN-SD	4	10	3.97	3.4	1.6	-		●	MSTC...-10-..	
	 With wiper edge	SPCT 10T308ER-SD 10T308EL-SD 10T312ER-SD 10T312EL-SD	4	10	3.97	3.4	0.8 0.8 1.2 1.2	2.5 2.5 1.8 1.8		● ● ● ●	MSTC...-10-..	
	 Sharp edge	SPCT 10T316FN-SE	4	10	3.97	3.4	1.6	-		●	MSTC...-10-..	
	 Sharp edge / With wiper edge	SPCT 10T308FR-SE 10T308FL-SE 10T312FR-SE 10T312FL-SE	4	10	3.97	3.4	0.8 0.8 1.2 1.2	2.7 2.7 2.2 2.2		● ● ● ●	MSTC...-10-..	
	 With wiper edge	SPET 10T308ER-SB 10T308EL-SB	4	10	3.97	3.4	0.8	2.7	● ●	● ●	MSTC...-10-..	
	 Tough edge / With wiper edge	SPET 10T308SR-SB 10T308SL-SB	4	10	3.97	3.4	0.8	2.7	● ●	● ●	MSTC...-10-..	

Handed insert shows Right-hand

Recommended cutting conditions ➡ M254

Inserts identification system

Shape		Tolerance				Edge length		Corner-R (RE)		Hand of tool	
Symbol	Shape	Symbol	Corner height	Thickness	I.C Size			Symbol	Corner-R (RE)	Symbol	Hand of tool
S	Square	C	±0.013mm	±0.025mm	±0.025mm			16	1.6mm	N	Neutral
		E	±0.025mm					12	1.2mm	L	Left-hand
								08	0.8mm	R	Right-hand
S	P	C	T	10	T3	08	E	R	-	SD	
Relief angle Symbol Relief angle D 15° P 11°		Hole/Chipbreaker Symbol Shape T Single-sided chipbreaker, with hole				Thickness Symbol Thickness T3 3.97mm 04 4.76mm		Edge Preparation Symbol Cutting edge spec. E Honed F Sharp edge S Chamfered + R-honed		Chipbreaker symbol Symbol Rake angle SB 5° SD 15° SE 20°	

● : Standard item

M252

M

Milling

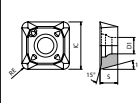
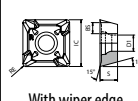
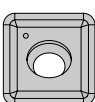
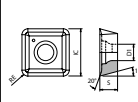
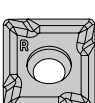
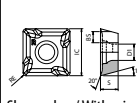
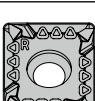
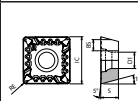
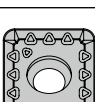
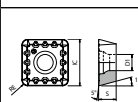
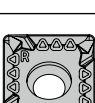
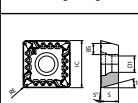
Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

SDCT/SDET

Classification of usage ● : 1st Choice ○ : 2nd Choice			Carbon steel / Alloy steel		●	●	P						
			Mold and die steel										
			Stainless steel		○	●	M						
			Gray cast iron		○	●	K						
			Nodular cast iron		○	●							
			Non-ferrous metals			●	N						
			Heat-resistant alloy			●							
			Titanium alloy			○	●	S					
			Hard materials					H					
Insert		Description	No. of edges	Dimension (mm)					Carbide			Applicable toolholder ➡ M249, M250	
				IC	S	D1	RE	BS	CVD CA0835	PVD PR0110 PR0725			
		SDCT 120416EN-SD	4	12.7	4.76	4.4	1.6	-			●	MSTC...-12-..	
	 With wiper edge	SDCT 120408ER-SD 120408EL-SD 120412ER-SD 120412EL-SD	4	12.7	4.76	4.4	0.8 0.8 1.2 1.2	2.5 2.5 1.8 1.8			● ● ● ●	MSTC...-12-..	
	 Sharp edge	SDCT 120416FN-SE	4	12.7	4.76	4.4	1.6	-			●	MSTC...-12-..	
	 Sharp edge / With wiper edge	SDCT 120408FR-SE 120408FL-SE 120412FR-SE 120412FL-SE	4	12.7	4.76	4.4	0.8 0.8 1.2 1.2	2.7 2.7 1.9 1.9			● ● ● ●	MSTC...-12-..	
	 With wiper edge	SDET 120408ER-SB 120408EL-SB 120412ER-SB 120412EL-SB	4	12.7	4.76	4.4	0.8 0.8 1.2 1.2	2.5 2.5 1.8 1.8			● ● ● ●	MSTC...-12-..	
	 Tough edge	SDET 120416SN-SB	4	12.7	4.76	4.4	1.6	-			●	●	MSTC...-12-..
	 Tough edge / With wiper edge	SDET 120408SR-SB 120408SL-SB	4	12.7	4.76	4.4	0.8	2.5			● ●	● ●	MSTC...-12-..

Handed insert shows Right-hand

Recommended cutting conditions ➡ M254

● : Standard item

M



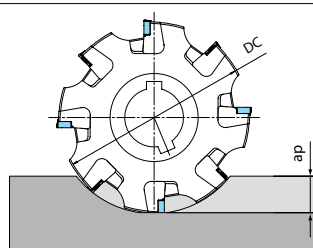
Milling

Recommended cutting conditions

Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)			fz (mm/t)				Remarks
			CVD Coated carbide	PVD Coated carbide		Chipbreaker				
				CA0835	PR0725	PR0110	EN-SD ER-SD EL-SD	ER-SB EL-SB	SN-SB SR-SB SL-SB	
Low carbon steel	SS400 S10C ~ S25C	125	250~310	170~210	-	0.07~0.20	0.10~0.22	0.15~0.3	-	Dry
Carbon steel	S30C ~ S58C (Annealed)	190	160~190	100~140	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
	S30C ~ S58C (Heat treated)	250	140~180	90~120	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
Alloy steel	SCM, SCr (Annealed)	180	140~180	90~120	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
	SCM, SCr (Heat treated)	275	120~160	80~110	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
High carbon alloy	SKD11, SKD61, etc.	280	110~130	70~ 90	-	0.05~0.18	0.08~0.20	0.12~0.25	-	Coolant
Stainless steel	Austenitic related SUS304, SUS316, SUH310, etc.	220	160~200	110~140	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
	Martensitic related SUS403, SUS410, SUH430F, etc.	300	150~180	100~120	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Heat-resistant alloys	Ni-base heat-resistant alloys	350	-	15~ 30	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Titanium alloys	Ti-6Al-4V, etc.	270	-	20~ 50	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Gray cast iron	FC250 ~ FC350	260	160~200	110~130	-	0.07~0.22	0.10~0.25	0.15~0.35	-	Dry
Nodular cast iron	FCD400 ~ FCD500	160	130~160	80~100	-	0.07~0.22	0.10~0.25	0.15~0.35	-	
	FCD600 ~ FCD800	250	110~140	70~ 90	-	0.07~0.22	0.10~0.25	0.15~0.35	-	
Non-ferrous metals	AC4A, A7050, etc.	-	-	-	750~950	-	-	-	0.07~0.20	Coolant

Note: 1. Use down-cut machining.

2. If a_p is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.



Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

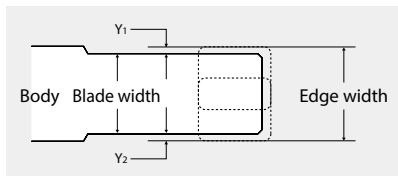
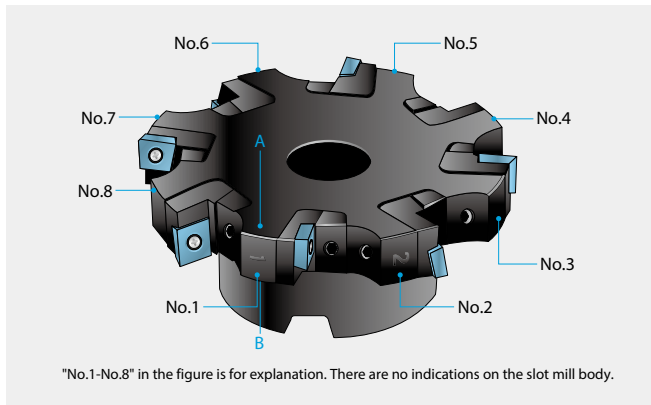
Slot Mill

Ball-nose
Radius

Others

Slot width (Edge width) adjustment of MSTC slot mill

Slot width (Edge width) measurement and adjustment



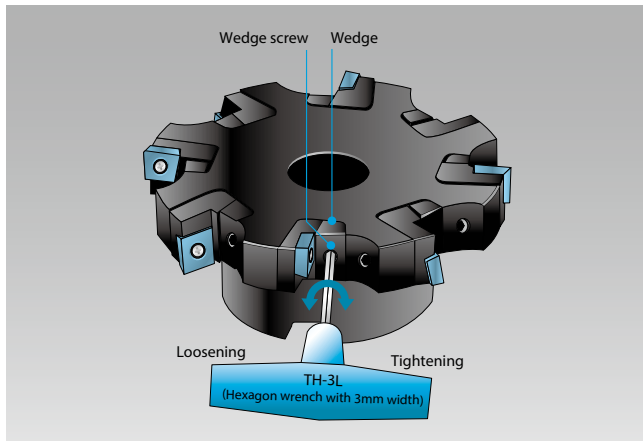
1. Set up the slot mill on length measuring equipment such as tool presetters.
2. Choose any one of the edges as a reference position. (No.1)
3. Measure the blade width of the slot mill body at position No.1. (between point A and B in the figure)
4. Move the length measuring equipment to the insert corner part and measure the step (Y_1) between the point A and the insert No.1.
5. Using the same procedure, measure (Y_2) dimension based on point B.

$$\text{Edge width} = \text{Blade width} + Y_1 + Y_2$$

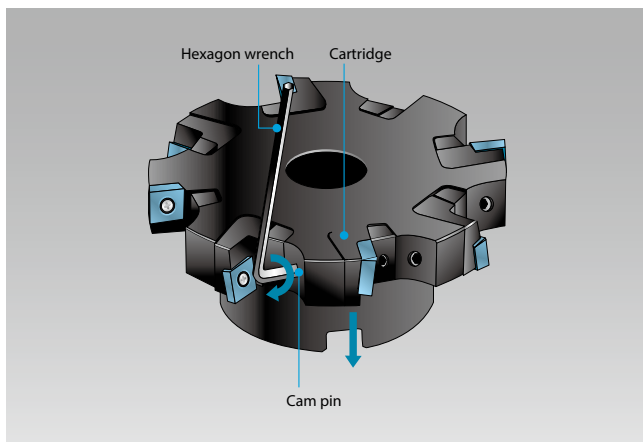
6. Place the point A of the slot mill body near the position No.1 to "0 (zero)" of the length measuring equipment.
7. Adjust the edge position of the inserts in odd numbered positions (No. 3, 5, 7) to "0 (zero)" with the length measuring equipment.
8. Adjust the edge position of the inserts in even numbered positions (No. 2, 4, 6, 8) to the required edge width.

For steps 7. and 8., see "In the case of changing the slot width (Edge width)" on next page.

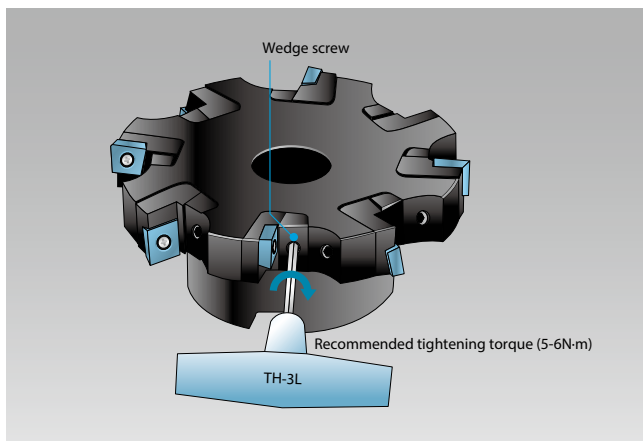
In the case of changing the slot width (Edge width)



1. Set up the slot mill on length measuring equipment such as tool presettters.
2. Insert a hexagon wrench with 3mm width (TH-3L) into the wedge screw.
3. Turn TH-3L counterclockwise to loosen the wedge.
4. Turn TH-3L clockwise by the torque of 1 N·m to tighten the wedge lightly and make the wedge contact the cartridge and the slot mill body. In doing so, some resistance occurs against the cartridge.

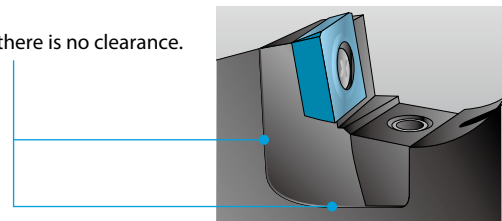


5. Insert a hexagon wrench (LW-2.5 OR LW-3) into the cam pin on the back of the cartridge.
6. Turn the wrench and adjust the position of the cartridge.
7. To secure the adjustment, back-turn the cam pin and make sure that it does not touch the groove surface of the back of the cartridge.
8. Remove the hexagon wrench from the cam pin.



9. Insert TH-3L into the wedge screw.
10. Tighten the wedge screw by the torque of 5-6N·m. (Use a torque wrench to get the correct torque.)
11. Make sure there is no clearance between the cartridge and the slot mill body.

Make sure there is no clearance.



M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

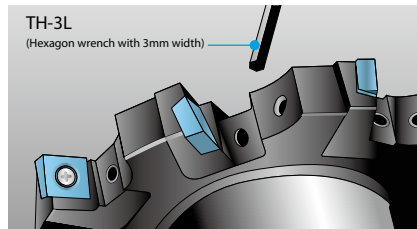
Slot Mill

Ball-nose
Radius

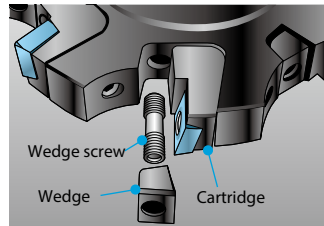
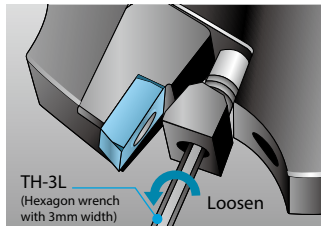
Others

Replacement of the cartridge

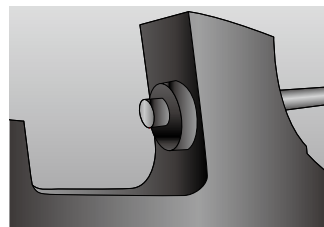
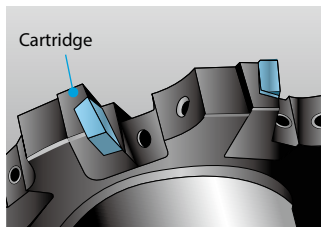
Follow the instruction below to replace the cartridge.



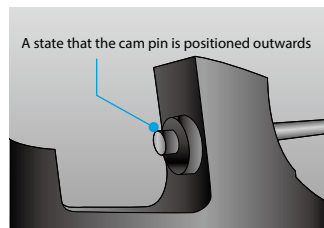
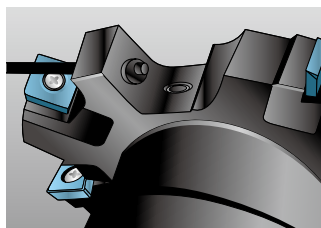
1. Insert hexagon wrench with 3mm width (TH-3L) into the wedge screw.



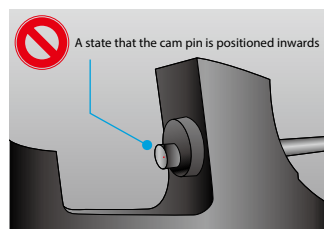
2. Loosen the wedge screw.
3. Remove the wedge screw and wedge.



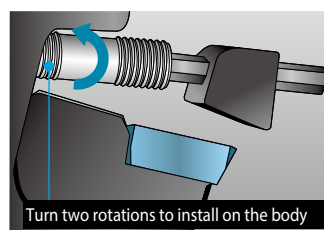
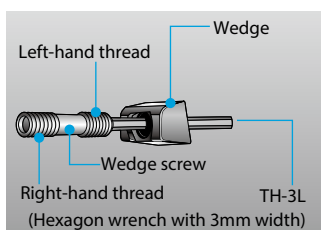
4. Remove the cartridge.



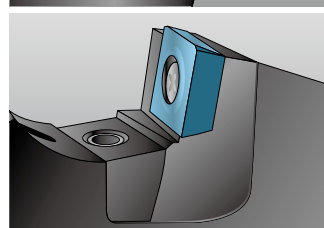
5. Before replacing the cartridge, make sure that the cam pin is positioned radially-outwards.



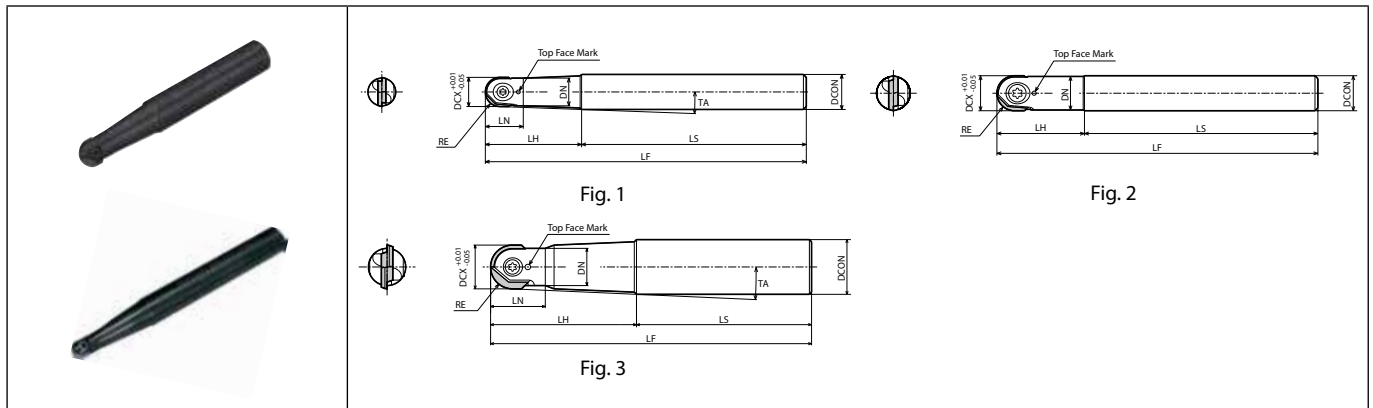
6. If the cam pin is in the position shown in the left diagram, assembling the cartridge is not possible.



7. Place the wedge so that its larger slant surface faces toward the cartridge.
8. Turn the wedge screw two rotations to install the wedge to the body.
9. When installing the wedge screw to the body, keep the wedge from rotating and screw it in.
10. Tighten the wedge screw by the torque of 5-6N·m. Keep the screw head and the wedge even (Prevent either of those from sticking out).



MRF



Top Face Shown

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)								TA	Coolant hole	Fig.	Spare parts				Applicable inserts ➡ M260
					RE	DCX	DCON	LF	LH	DN	LN	LS				Anti-seize compound 	Screw 	Wrench 	Wrench 	
Standard Neck	MRF	08-S12	●	1	4	8	100	22	7.5	10	78	6°20'	No	P-37	SC-30067	DT-8	-	RDFG08FR		
		10-S12	●		5	10		25	9.5	13	75	3°00'			1	SC-35085		DT-10	RDFG10FR	
		12-S12	●		6	12		110	30	11.5	-	-			2	SC-40100		DT-15	RDFG12FR	
		16-S20	●		8	16	20	130	50	14	20	2°50'			1	SC-50130		DT-20	RDFG16FR	
		20-S25	●		10	20	25	140	60	17	25	3°00'			3	SC-60160	-	TT-25	RDFG20FR	
		25-S32	●		12.5	25	32	150	70	22	31	3°30'			3	SC-60210		TT-30	RDFG25FR	
Long Neck	MRF	08-S12-130	●	1	4	8	12	130	50	7.5	10	80	2°30'	No	P-37	SC-30067	DT-8	-	RDFG08FR	
		10-S16-150	●		5	10	150	9.5		15	100	3°50'	1			SC-35085	DT-10		RDFG10FR	
		12-S16-160	●		6	12	16	60		11.5		16	2°10'			1	SC-40100		DT-15	RDFG12FR
		16-S20-160	●		8	16	20	160	65	14		20	95			2°00'	1		SC-50130	DT-20
		20-S25-180	●		10	20	25	180	80	17	25	100	2°10'			3	SC-60160	-	TT-25	RDFG20FR
		25-S32-200	●		12.5	25	32	200	90	22	31	110	2°40'			3	SC-60210	-	TT-30	RDFG25FR

TA (Toolholder's interference angle) is the angle formed by the tangential line from insert dia. to toolholder's shank dia.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

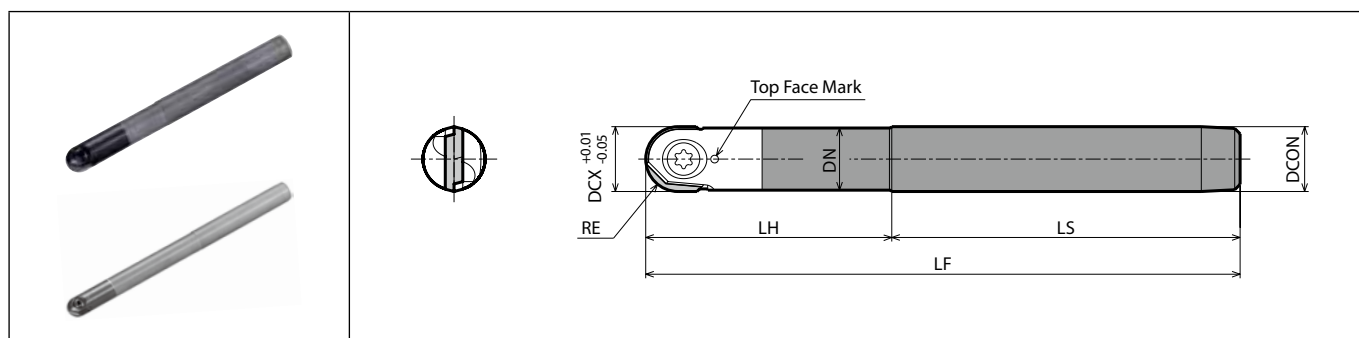
Slot Mill

Ball-nose
Radius

Others

● : Standard item

M258

MRFW (Carbide Shank)

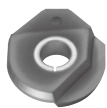
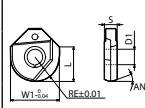
Top Face Shown

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)								Coolant hole	Spare parts			Applicable inserts ➡ M260
														Anti-seize compound	Screw	Wrench	
																	
Carbide Standard	MRFW	08-S08	●	1	4	8	8	100	30	7.4	70	No	P-37	SC-30067	DT-8	RDFG08FR	
		10-S10	●		5	10	10		35	9.5	65			SC-35085	DT-10	RDFG10FR	
		12-S12	●		6	12	12		110	45				11.5	SC-40100	DT-15	RDFG12FR
Carbide Long Neck	MRFW	08-S08-130	●	1	4	8	8	130	65	7.4	65	No	P-37	SC-30067	DT-8	RDFG08FR	
		10-S10-140	●		5	10	10	140	75	9.5				SC-35085	DT-10	RDFG10FR	
		12-S12-150	●		6	12	12	150	85	11.5				SC-40100	DT-15	RDFG12FR	

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

RDFG

Classification of usage ● : 1st Choice ○ : 2nd Choice		Carbon steel / Alloy steel							●	P
		Mold and die steel							●	
		Stainless steel							○	M
		Gray cast iron							○	K
		Nodular cast iron							○	
		Non-ferrous metals								N
		Heat-resistant alloy								S
		Titanium alloy								
		Hard materials								H
Insert	Description	Dimension (mm)					Angle (°)	Carbide	Applicable toolholder ➡ M258 M259	
		S	D1	RE	L	W1	AN	PVD PR915		
 	RDFG 08FR	2.1	3.1	4	6.6	8	15	●	MRF(W)08...	
	10FR	2.7	3.6	5	8	10	15	●	MRF(W)10...	
	12FR	3.2	4.1	6	9.4	12	15	●	MRF(W)12...	
	16FR	4.2	5.1	8	11.3	16	10	●	MRF16...	
	20FR	5.2	6.1	10	14.1	20	10	●	MRF20...	
	25FR	6.2	6.1	12.5	15.5	25	10	●	MRF25...	

Handed insert shows Right-hand

Recommended cutting conditions ➡ M261

M



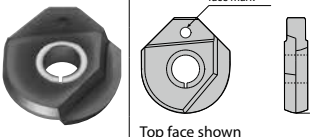
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item

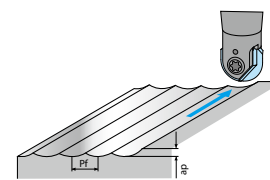
M260

Applicable inserts

Insert	Description
	RDFG 08FR 10FR 12FR 16FR 20FR 25FR

Check the top face mark of both insert and toolholder.

Recommended depth of cut

Description		Depth of cut (mm)		Applications
		ap	Pf	
Standard neck	MRF08-S12	0.2 (Max0.3)	0.8	
	MRF10-S12	0.2	1	
	MRF12-S12	0.5	1.2	
	MRF16-S20	0.5	1.6	
	MRF20-S25	1	2	
	MRF25-S32	1	2.5	
Long neck	MRF08-S12-130	0.2 (Max0.3)	0.8	
	MRF10-S12-150	0.2	1	
	MRF12-S12-160	0.5	1.2	
	MRF16-S20-160	0.5	1.6	
	MRF20-S25-180	1	2	
	MRF25-S32-200	1	2.5	
Carbide standard neck	MRFW08-S08	0.2 (Max0.3)	0.8	
	MRFW10-S10	0.2	1	
	MRFW12-S12	0.5	1.2	
Carbide long Neck	MRFW08-S08-130	0.2 (Max0.3)	0.8	
	MRFW10-S10-140	0.2	1	
	MRFW12-S12-150	0.5	1.2	

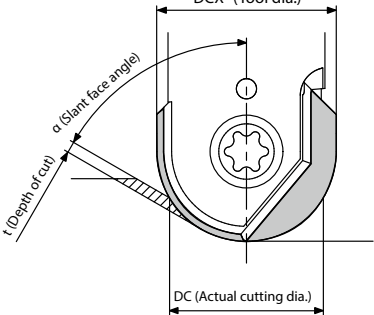
For ø8, holder may be broken because of over load if ap exceeds 0.3mm.

Recommended cutting conditions (At cutting dia. DCX)

Workpiece material	Insert grades	Vc (m/min)	fz (mm/t)	ø8		ø10		ø12	
				Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)
Carbon steel	PR915	100~200	0.1~0.3	150 (5,970)	0.2 (2,390)	150 (4,770)	0.2 (1,910)	150 (3,980)	0.2 (1,590)
Alloy steel	PR915	80~180	0.1~0.3	130 (5,170)	0.2 (2,070)	130 (4,140)	0.2 (1,660)	130 (3,450)	0.2 (1,380)
Mold steel	PR915	50~150	0.1~0.2	100 (3,980)	0.15 (1,190)	100 (3,180)	0.15 (950)	100 (2,650)	0.15 (800)
Stainless steel	PR915	50~150	0.1~0.2	100 (3,980)	0.15 (1,190)	100 (3,180)	0.15 (950)	100 (2,650)	0.15 (800)
Cast iron	PR915	100~200	0.2~0.4	150 (5,970)	0.3 (3,580)	150 (4,770)	0.3 (2,860)	150 (3,980)	0.3 (2,390)
Workpiece material	Insert grades	Vc (m/min)	fz (mm/t)	ø16		ø20		ø25	
				Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)
Carbon steel	PR915	100~200	0.1~0.3	150 (2,980)	0.2 (1,190)	150 (2,390)	0.2 (950)	150 (1,910)	0.2 (760)
Alloy steel	PR915	80~180	0.1~0.3	130 (2,590)	0.2 (1,030)	130 (2,070)	0.2 (830)	130 (1,660)	0.2 (660)
Mold steel	PR915	50~150	0.1~0.2	100 (1,990)	0.15 (600)	100 (1,590)	0.15 (480)	100 (1,270)	0.15 (380)
Stainless steel	PR915	50~150	0.1~0.2	100 (1,990)	0.15 (600)	100 (1,590)	0.15 (480)	100 (1,270)	0.15 (380)
Cast iron	PR915	100~200	0.2~0.4	150 (2,980)	0.3 (1,790)	150 (2,390)	0.3 (1,430)	150 (1,910)	0.3 (1,150)

Actual cutting speed (Vd) conversion coefficient table

- Vd varies depending on ap and slant face angle.
- Vd can be obtained by dividing the conversion coefficient into the recommended cutting speed.

Model	Tool dia. (DCX)		ø8		ø10		ø12	
	Depth of cut (t:mm)		0.1	0.2	0.1	0.2	0.2	0.5
	Slant face angle (α)	15°	1.00	1.00	1.00	1.00	1.00	1.00
		30°	1.05	1.02	1.05	1.03	1.04	1.01
		45°	1.18	1.12	1.20	1.14	1.16	1.07
		60°	1.47	1.34	1.51	1.38	1.42	1.24
		75°	2.15	1.82	2.24	1.92	2.02	1.60
		90°(Horizontal plane)	4.48	3.22	5.06	3.57	3.92	2.50
	Tool dia. (DCX)		ø16		ø20		ø25	
	Depth of cut (t:mm)		0.2	0.5	0.5	1	0.5	1
	Slant face angle (α)	15°	1.00	1.00	1.00	1.02	1.00	1.01
30°		1.05	1.01	1.02	1.00	1.03	1.00	
45°		1.18	1.10	1.12	1.06	1.14	1.08	
60°		1.47	1.30	1.34	1.21	1.38	1.25	
75°		2.14	1.73	1.83	1.53	1.93	1.62	
90°(Horizontal plane)		4.48	2.87	3.20	2.29	3.57	2.55	

e.g.) Suppose tool dia. 8mm, ap=0.1mm, slant face angle 90°: The actual Cutting speed Vd for carbon steel machining, when Vc is 150m/min at the biggest diameter, Vd can be obtained as Vd=150 / 4.48=33.5m/min



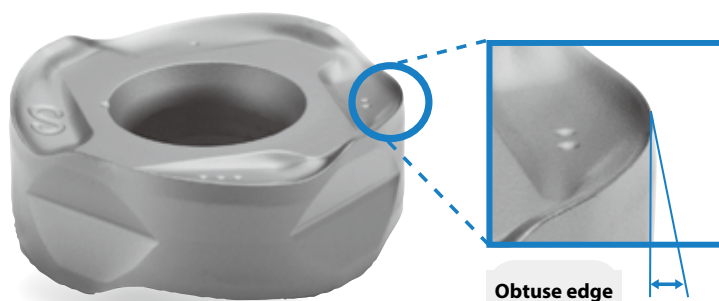
MRW

**Economical and high efficiency radius cutter
with double-sided insert for various types of workpieces**

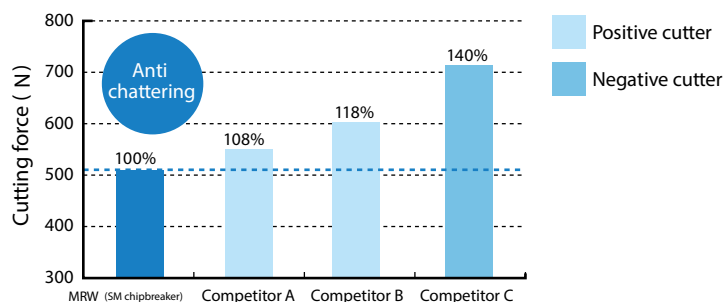
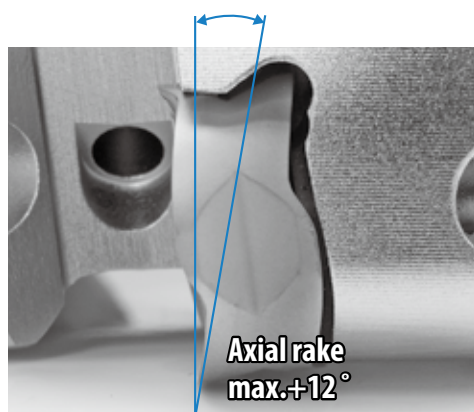
Economical double-sided 8-edge insert
Combine sharpness and cutting edge strength

Obtuse edge increases cutting edge toughness

Helical cutting edge design with maximum axial rake 12° reduces cutting force, equivalent to positive inserts.



Low cutting force chipbreaker

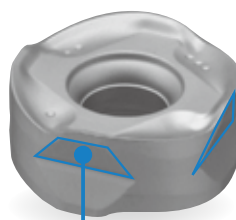


<Cutting conditions>
Vc=120m/min, ap × ae=1 × 40mm, fz=0.2mm/t
SUS304, cutter ø50

Positive cutter
Negative cutter

1 Flat lock structure to hold insert firmly

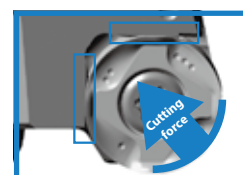
Prevent insert rotation during machining
and realizes stable machining



Wide and flat constraint surface

Flat lock structure

Wide flat constraint surface
• Receives even cutting forces
• Controls insert rotation

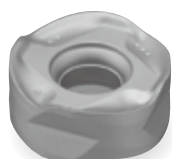


Long tool life by wide lineup with 4 grades and 3 chipbreakers, available for steel, stainless steel and heat-resistant alloys

Workpiece material		Applicable insert grades	Applicable chipbreaker
P Carbon steel/Alloy steel/Mold steel		PR1825	GM/SM/GH chipbreaker
K Cast iron		PR1810	GH/GM chipbreaker
S Ni-base heat-resistant alloys	M Stainless steel (Martensitic related)	CA6535	SM/GM chipbreaker
S Ni-base heat-resistant alloys S Titanium alloys	M Stainless steel (Austenitic related) M Stainless steel (Precipitation hardening)	PR1835	SM/GM chipbreaker

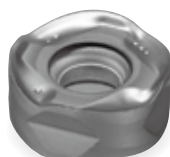
2 Insert grades for difficult-to-cut material

Controls sudden fracture and realizes stable machining
Suitable for high efficiency machining



CA6535

for martensitic stainless steel and Ni-base heat-resistant alloys
High heat resistance and wear resistance with CVD coating
Improved stability with thin layer coating technology

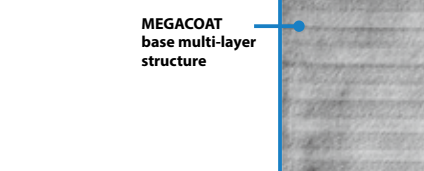
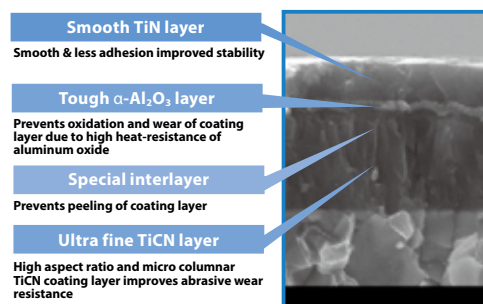


PR1835

For Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
Stable and longer tool life by special nano coating layer
MEGACOAT NANO EX



High toughness substrate



MEGACOAT base multi-layer structure

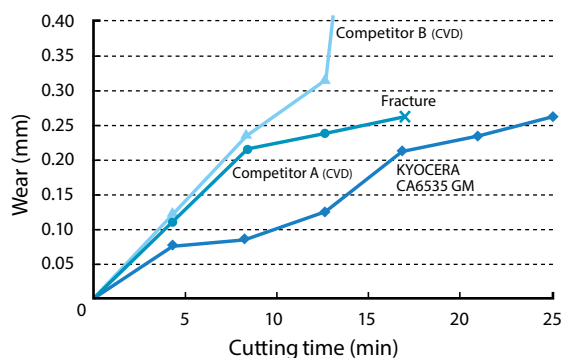
M



Milling

Tool life comparison (Internal evaluation)

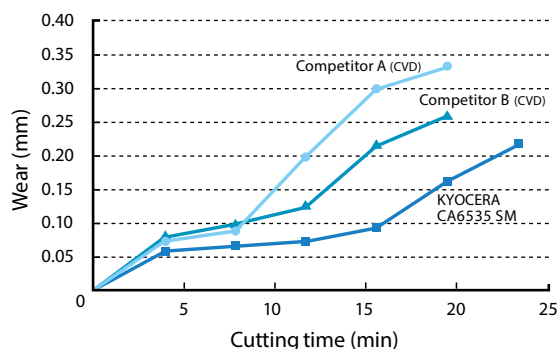
Ni-base heat-resistant alloys



<Cutting conditions> Vc=50m/min, ap=1.0mm, fz=0.15mm/t, wet

1st choice GM chipbreaker

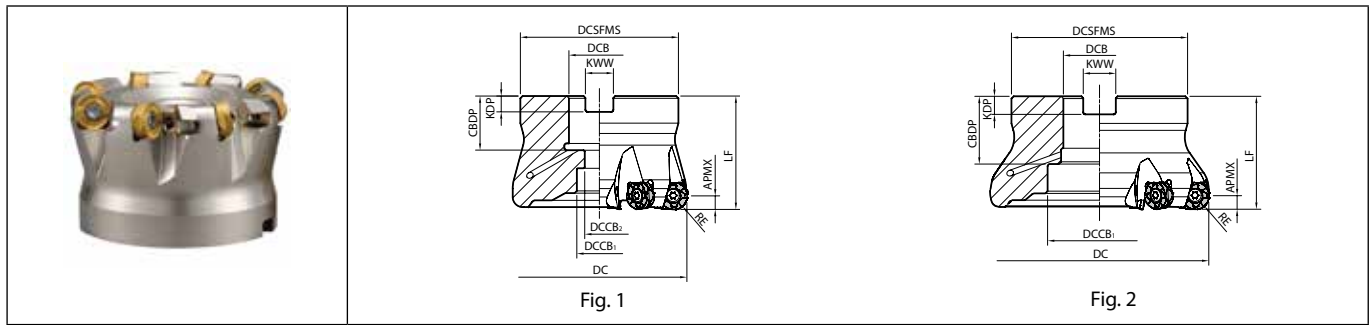
Stainless steel (Martensitic related)



<Cutting conditions> Vc=300m/min, ap=2.0mm, fz=0.2mm/t, wet

1st choice SM chipbreaker

MRW (Face mill)



Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)											A.R. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M267				
					R		RE	DC	DCSfMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP								KWW	APWX		
Metric	MRW	050R-12-5T-M	●	5	6	50	48	18	11	40	21	6.3	10.4	6	+12	-15.5	Yes	16000	0.3	1	ROMU1204M0ER-..					
		050R-12-6T-M	●	6																1						
		063R-12-6T-M	●	6			63	60			19	24	7						12.4	14000		0.6	1			
		063R-12-7T-M	●	7																			1			
		080R-12-6T-M	●	6		80	70	27	20	13	12000		1.1					1								
		080R-12-8T-M	●	8														1								
		100R-12-7T-M	●	7		100	78	32	46	-		30	8					14.4	10600	1.5		2				
		100R-12-9T-M	●	9																		1.4	2			
	MRW	063R-16-5T-M	●	5	8	63	60	22	19	11	40	21	6.3	10.4	8	+11	-16.5	Yes		12800	0.5	1	ROMU1605M0ER-..			
		063R-16-6T-M	●	6																		1				
		080R-16-6T-M	●	6			80	70			27	20	13	24					7		12.4	11000		1.1	1	
		080R-16-7T-M	●	7																					1	
		100R-16-6T-M	●	6		100	78	32	46	-	30	8	14.4	9600					1.4	2						
		100R-16-8T-M	●	8																1.3	2					
		125R-16-8T-M	●	8		125	89	40	55	63	33	9	16.4						8500	2.6	2					
		125R-16-10T-M	●	10																	2.5	2				
Bore dia. inch spec	MRW	080R-12-6T	●	6	6	80	70	25.4	20	13	50	27	6	9.5	6	+12	-15.5	Yes		12000	1.2	1	ROMU1204M0ER-..			
		080R-12-8T	●	8																	1.1	1				
		100R-12-7T	●	7			100	78				31.75	46	-					34		8	12.7		10600	1.5	2
		100R-12-9T	●	9																						1.4
	MRW	080R-16-6T	●	6	8	80	70	25.4	20	13	50	27	6	9.5	8	+11	-16.5	Yes	11000	1.1	1	ROMU1605M0ER-..				
		080R-16-7T	●	7																2	1					
		100R-16-6T	●	6			100	78				31.75	46	-						34	8		12.7	9600	1.4	2
		100R-16-8T	●	8																						2
		125R-16-8T	●	8		125	89	38.1	55	63	38	10	15.9	8560					2.6	2						
		125R-16-10T	●	10																2	2					

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

APMX is Maximum ap. For more details, see page M268 below.

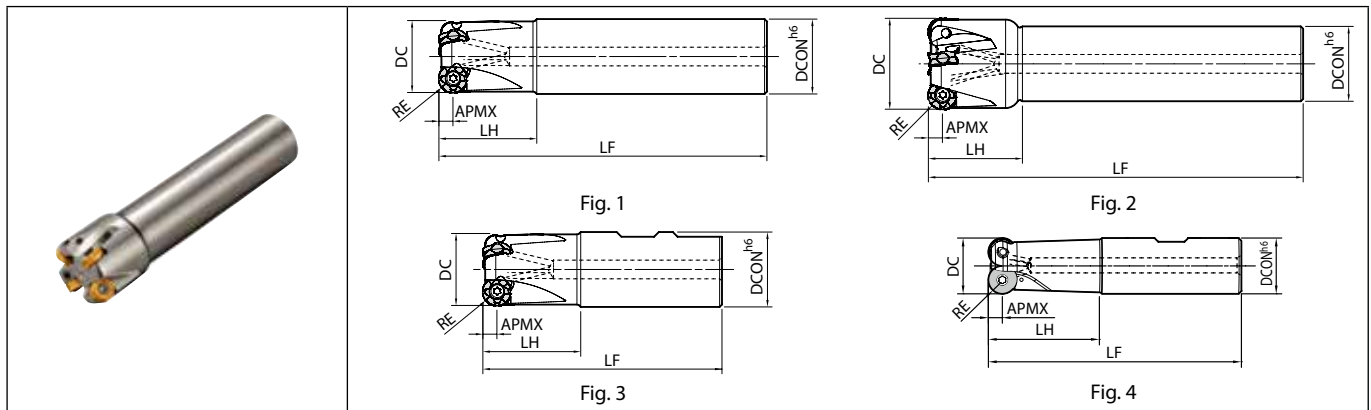
● : Standard item

M264

Spare parts and applicable inserts (MRW face mill)

Description		Spare parts					Applicable Inserts  M267		
		Clamp screw	Wrench		Anti-seize compound	Mounting bolt			
			DTPM-15 	TTP-20 			General purpose	Low cutting force	Tough Edge (For Heavy Milling)
MRW	050R-12...	SB-4085TRP	DTPM-15 Recommended tightening torque for insert clamp 3.5N·m		P-37	HH10X30	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
	063R-12...					HH12X35			
	080R-12...					-			
	100R-12...					-			
MRW	063R-16...	SB-50140TRP	TTP-20 Recommended tightening torque for insert clamp 4.5N·m		P-37	HH10X30	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
	080R-16...					HH12X35			
	100R-16...					-			
	125R-16...					-			

MRW (End mill)



Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Applicable inserts ➡ M267
					RE	DC	DCON	LF	LH	APMX						
Cylindrical	MRW	32-S32-12-3T	●	3	6	32	32	140	40	6	+12	-20	Yes	22000	1	ROMU1204M0ER-..
		40-S32-12-4T	●	4		40	160	-16.5				18800		2		
		50-S42-12-5T	●	5		50	42	170				-15.5		16000	2	
	MRW	40-S32-16-3T	●	3	8	40	32	160	40	8	+11	-18	Yes	17200	2	ROMU1605M0ER-..
		50-S42-16-4T	●	4		50	42	170				-16.5		14800	2	
		63-S42-16-5T	●	5		63	42	170				50		12800	2	
Long Shank	MRW	32-S32-12-2T-200	●	2	6	32	32	200	40	6	+12	-20	Yes	22000	1	ROMU1204M0ER-..
		40-S32-12-3T-200	●	3		40	160	-16.5				18800		2		
		50-S42-12-4T-300	●	4		50	42	300				-15.5		16000	2	
	MRW	40-S32-16-2T-200	●	2	8	40	32	200	40	8	+11	-18	Yes	17200	2	ROMU1605M0ER-..
		50-S42-16-3T-300	●	3		50	42	300				-16.5		14800	2	
		63-S42-16-4T-300	●	4		63	42	300				50		12800	2	
Weldon	MRW	32-W32-12-3T	●	3	6	32	32	102	40	6	+12	-20	Yes	22000	3	ROMU1204M0ER-..
		40-W32-12-4T	●	4		40	100	-16.5				18800		4		
		50-W40-12-5T	●	5		50	40	110				-15.5		16000	4	
	MRW	40-W32-16-3T	●	3	8	40	32	100	40	8	+11	-18	Yes	17200	4	ROMU1605M0ER-..
		50-W40-16-4T	●	4		50	110	-16.5				14800		4		
		63-W40-16-5T	●	5		63	40	120				50		12800	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

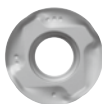
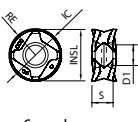
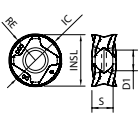
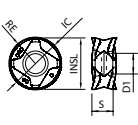
APMX is Maximum ap. For more details, see page M268 below.

Spare parts and applicable inserts (MRW end mill)

Description	Spare parts				Applicable Inserts ➡ M267		
	Clamp screw	Wrench		Anti-seize compound			
		DTPM-15 	TTP-20 				
MRW ...-12...	SB-4085TRP	DTPM-15 Recommended tightening torque for insert clamp 3.5N·m		P-37	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
MRW ...-16...	SB-50140TRP	TTP-20 Recommended tightening torque for insert clamp 4.5N·m		P-37	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH

● : Standard item

ROMU

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel			☆			★	☆	P					
		Mold and die steel			☆			★	☆						
		Austenitic stainless steel				☆		☆	★	M					
		Martensitic stainless steel	★						☆						
		Precipitation hardening stainless steel				☆			★						
		Gray cast iron		☆				★		K					
		Nodular cast iron		☆				★							
		Non-ferrous metals								N					
		Heat-resistant alloy	★						☆	S					
		Titanium alloy				☆			★						
Hard materials									H						
Insert		Description	Dimension (mm)					Carbide						Applicable toolholder 🔌 M264 M266	
			IC	S	D1	RE	INSL	CVD	PVD						
								CA6335	PR1510	PR1525	PR1535	PR1810	PR1825		PR1835
		ROMU 1204M0ER-GM	12	4.75	4.6	6	11.8	●	□	○	●	●	●	●	MRW...-12-..
	General purpose	ROMU 1605M0ER-GM	16	5.48	6.2	8	15.8	●	□	○	●	●	●	●	MRW...-16-..
		ROMU 1204M0ER-SM	12	4.75	4.6	6	11.8	●		○	●		●	●	MRW...-12-..
	Low cutting force	ROMU 1605M0ER-SM	16	5.48	6.2	8	15.8	●		○	●		●	●	MRW...-16-..
		ROMU 1204M0ER-GH	12	4.75	4.6	6	11.8	●	□	○	●	●	●	●	MRW...-12-..
	Tough edge	ROMU 1605M0ER-GH	16	5.48	6.2	8	15.8	●	□	○	●	●	●	●	MRW...-16-..

Handed insert shows Right-hand

Recommended cutting conditions ● M268

M



Milling

Recommended cutting conditions

Workpiece material	Recommended chipbreaker (fz: mm/t) *Recommended feed rate (Reference value) for ROMU12 type: ap=3 mm/for ROMU16 type: ap=4 mm			Recommended insert grades (Vc: m/min)			
				MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coated carbide
	GM	SM	GH	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535
Carbon steel	★ 0.1~ 0.2 ~0.3	☆ 0.06~ 0.15 ~0.2	☆ 0.15~ 0.3 ~0.35	-	★ 120~ 180 ~250	☆ 120~ 180 ~250	-
Alloy steel	★ 0.1~ 0.2 ~0.3	☆ 0.06~ 0.15 ~0.2	☆ 0.15~ 0.3 ~0.35	-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-
Mold steel	★ 0.1~ 0.15 ~0.25	☆ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.3	-	★ 80~ 140 ~180	☆ 80~ 140 ~180	-
Stainless steel (Austenitic related)	☆ 0.1~ 0.15 ~0.2	★ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.25	-	☆ 100~ 160 ~200	★ 100~ 160 ~200	-
Stainless steel (Martensitic related)	☆ 0.1~ 0.15 ~0.2	★ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.25	-	-	☆ 150~ 200 ~250	★ 180~ 240 ~300
Stainless steel (Precipitation Hardening)	★ 0.1~ 0.15 ~0.2	☆ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.25	-	-	★ 90~ 120 ~150	-
Gray cast iron	★ 0.1~ 0.2 ~0.3	-	☆ 0.15~ 0.3 ~0.35	★ 120~ 180 ~250	-	-	-
Nodular cast iron	★ 0.1~ 0.15 ~0.25	-	☆ 0.15~ 0.2 ~0.3	★ 100~ 150 ~200	-	-	-
Ni-base heat-resistant alloys	★ 0.1~ 0.12 ~0.15	☆ 0.06~ 0.1 ~0.15	☆ 0.12~ 0.15 ~0.2	-	-	☆ 20~ 30 ~50	★ 20~ 30 ~50
Titanium alloys	☆ 0.1~ 0.12 ~0.15	★ 0.06~ 0.1 ~0.15	-	☆ 30~ 50 ~70	-	★ 40~ 60 ~80	-

★: 1st Recommendation ☆: 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* Recommended feed rate is the reference value when ap is RE/2 (3mm for ROMU12, 4mm for ROMU16).

For lower ap than the above conditions, the conversion factor in the following table is recommended.

Insert	ap (Recommended)	Max. ap	Conversion factor for feed per tooth fz				
			ap=0.5mm	ap=1mm	ap=2mm	ap=3mm	ap=4mm
ROMU12 type	3mm or less	6mm	2.1	1.5	1.1	1.0 (Standard)	-
ROMU16 type	4mm or less	8mm	2.4	1.7	1.3	1.1	1.0 (Standard)

* Example (ROMU12 type, carbon steel, GM chipbreaker, ap=1mm)

$$\begin{array}{|c|} \hline fz=0.2\text{mm/t} \\ \hline \end{array} \begin{array}{|c|} \hline \text{(Reference value for carbon steel and GM chipbreaker)} \\ \hline \end{array} \times \begin{array}{|c|} \hline 1.5 \\ \hline \end{array} \begin{array}{|c|} \hline \text{(Conversion factor for ROMU12 type, ap=1mm)} \\ \hline \end{array} = \begin{array}{|c|} \hline fz = 0.3 \text{ mm/t} \\ \hline \end{array} \begin{array}{|c|} \hline \text{(Recommended feed rate)} \\ \hline \end{array}$$

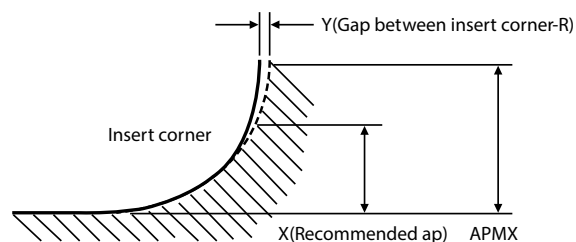
* Recommended ap: 3mm or less for ROMU12, 4mm or less for ROMU16

Except the case that ap temporally surpass the recommended ap, machining under the recommended ap is recommended.

Corner-R shape during processing

Corner-R shape during processing with MRW (Ref. to the right figure)

Insert	APMX	X	Y
ROMU12 type	6 mm	3 mm	0.1 mm
ROMU16 type	8 mm	4 mm	0.1 mm



* When machining with larger ap than recommended ap (X), there is a gap (Y) between the workpiece corner and Insert corner-R(RE).

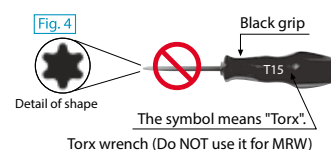
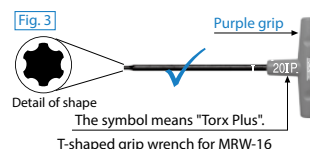
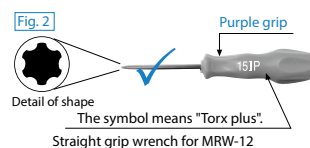
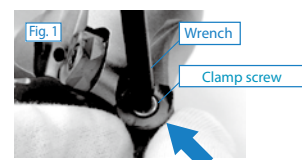
* The above figure is estimation. There would be ±0.2mm variation depending on the cutting conditions.

How to mount an insert

- Be sure to remove dust and chips from the insert mounting pocket.
- Clamp screw
 - Apply anti-seize compound on portion of taper and thread of clamp screw.
 - Attach the screw to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1)
- Wrenches and clamp screws are "Torx Plus".
 - Fig. 2 wrench is for MRW-12. (Straight grip)
 - Fig. 3 wrench is for MRW-16. (T-shaped grip)

Please use a "Torx Plus" Wrench for tightening clamp screw.

* If a "Torx" wrench (Fig. 4) is used to tighten, the screw head might become damaged and then the screw cannot be removed.
- When tightening the screw, make sure that the wrench is parallel to the screw.
- After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder or between the insert side surfaces and the constraint surface of the toolholder. If there is any clearance, remove the insert and mount it again according to the above steps.



Case studies

12Cr Steel	
Machining efficiency 1.2 times Economical double-sided insert	
- Turbine blade • Vc=270m/min • fz=0.278mm/t - ap=0.5~1.0mm ae=max.35mm • Dry - MRW050R-12-6T-M (6 flutes) • ROMU1204M0ER-SM (CA6535)	
CA6535	Stable machining
Competitor A (Positive cutter)	Unstable machining with large noise
- MRW improved machining efficiency by 1.2 times with same tool life compared with competitor A. - MRW has cost advantage due to double-sided inserts. (User evaluation)	

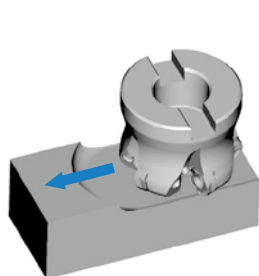
12Cr Steel	
Same or longer tool life Economical double-sided insert	
- Turbine Blade • Vc=250m/min • fz=0.16mm/t - ap=2.0mm ae=5~30mm • Wet - MRW050R-12-5T-M (5 flutes) • ROMU1204M0ER-SM (CA6535)	
CA6535	Stable, available for further machining
Competitor B (Positive cutter)	Unstable machining with large noise
- MRW showed less damage on the cutting edge and reduced machining noise. - MRW has equal or longer tool life and cost advantage due to double sided inserts. (User evaluation)	

M

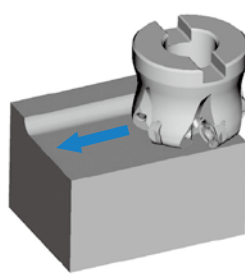


Milling

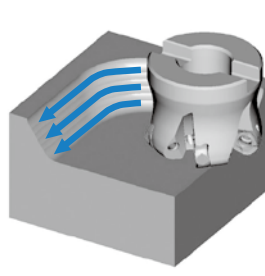
Applications



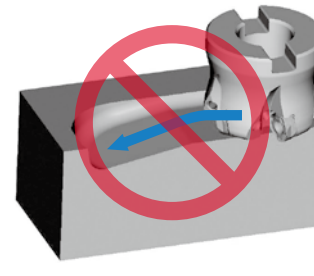
Facing



Shouldering



Contouring



Plunging/Profiling

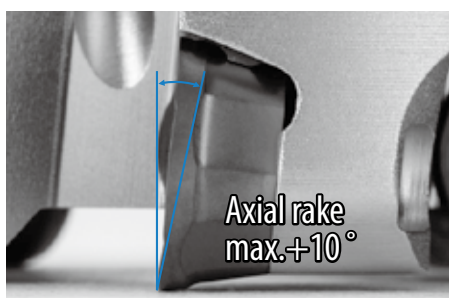
MRX

Excellent cutting performance with low cutting force design

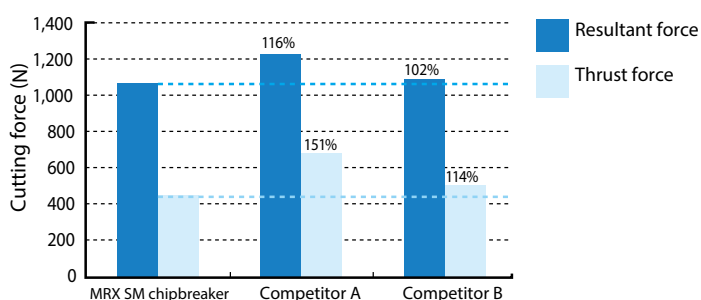
High efficiency radius cutter



1 Low cutting force design with helical cutting-edge design



Cutting force comparison (Internal evaluation)



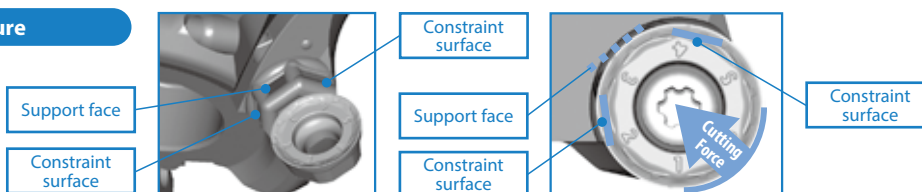
<Cutting conditions>
Vc=120m/min, ap,ae=2×25mm, fz=0.2mm/t, SUS304, Cutterø50

2 Flat lock structure to hold insert firmly

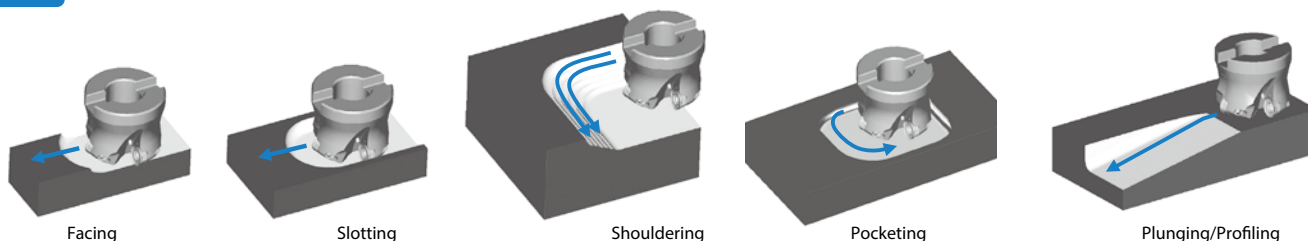
Prevent insert rotation during machining and realizes stable machining

Flat lock structure

- Wide flat constraint surface**
- Receives even cutting forces
 - Controls insert rotation



3 Various applications

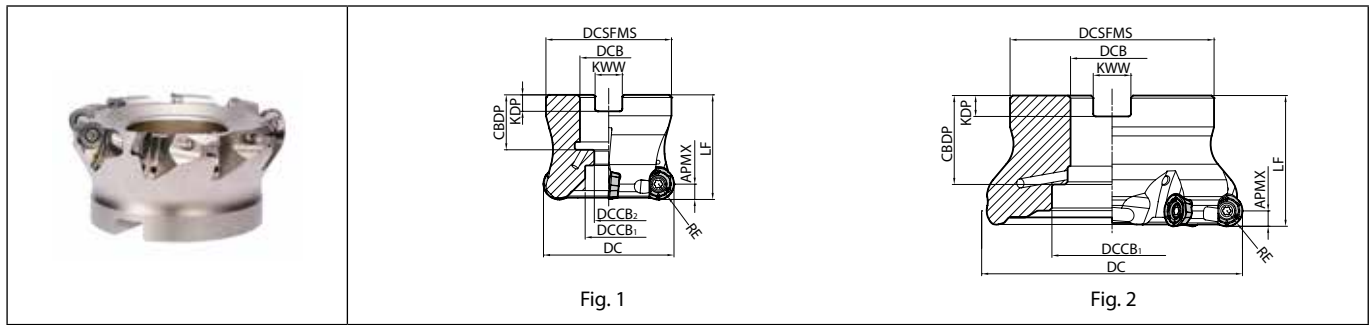


4 Machining of various materials possible

Insert grades **CA6535/PR1835(PR1535)** for difficult-to-cut material are available. Long tool life by wide lineup with 4 grades and 3 chipbreakers, available for steel, stainless steel and heat-resistant alloys.

Cost-effective M class inserts are available

MRX (Face mill)



Toolholder dimensions

Description			Availability		Dimension (mm)											A.R. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts ➡ M276	
			R	Inserts	RE	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX								
Metric	MRX	040R-10-5T-M	●	5	5	40	38	16	15	9	40	19	5.6	8.4	5	+10	-5.5	Yes	20000	0.2	1	RPGT10T3... RPMT10T3...	
		050R-10-6T-M	●	6		50	48	22	18	11		21	6.3	10.4					17500	0.3	1		
		063R-10-7T-M	●	7		63	60					15000	0.6	1									
	MRX	040R-12-4T-M	●	4	6	40	38	16	13.5	9	40	19	5.6	8.4	6	+10	-5.5	Yes	21000	0.2	1	RPGT1204... RPMT1204...	
		050R-12-4T-M	●			50	48	22	18	11		21	6.3	10.4					18000	0.3	1		
		050R-12-5T-M	●			63	60												15500	0.6	1		
		063R-12-5T-M	●	5	63			13500	1.2	1													
		063R-12-6T-M	●	6	80	70	27	20	13	50	24	7	12.4	12000					1.4	2			
		080R-12-6T-M	●	8	100	78	32	46	-		30	8	14.4	2					1				
		080R-12-8T-M	●	7	2	1																	
		100R-12-7T-M	●	9	2	1																	
		100R-12-9T-M	●	9	2	1																	
		MRX	063R-16-4T-M	●	4	8	8	63	60	22	18	11	40	21					6.3	10.4	8		+10
	063R-16-5T-M		●	5	80			70	27	20	13	50	24	7	12.4	11500	1.1	1					
	080R-16-5T-M		●	5	100			78	32	46	-		30	8	14.4	10000	1.4	2					
	080R-16-6T-M		●	6												2	1						
	100R-16-6T-M		●	7												2	1						
	100R-16-7T-M		●	7	2			1															
	125R-16-6T-M		●	6	125			89	40	55	-	63	33	9	16.4	9000	2.6	2					
	125R-16-8T-M		●	8	2			1															
Bore dia. inch spec	MRX	080R-12-6T	●	6	6	6	80	70	25.4	20	13	50	27	6	9.5	6	+10	-5.5	Yes	13500	1.2	1	RPGT1204... RPMT1204...
		080R-12-8T	●	8			100	78	31.75	46	-		34	8	12.7					12000	1.5	2	
		100R-12-7T	●	7																2	1		
		100R-12-9T	●	9																2	1		
	MRX	080R-16-5T	●	5	8	8	80	70	25.4	20	13	50	27	6	9.5	8	+10	-5.5	Yes	11500	1.1	1	RPGT1605... RPMT1605...
		080R-16-6T	●	6			100	78	31.75	46	-		34	8	12.7					10000	1.4	2	
		100R-16-6T	●	7																2	1		
		100R-16-7T	●	7																2	1		
		125R-16-6T	●	6			125	89	38.1	55	-	63	38	10	15.9					9000	2.7	2	
		125R-16-8T	●	8			2	1															

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Spare parts and applicable inserts (MRW face mill)

Description		Spare parts				Applicable inserts  M276			
		Clamp screw	Wrench		Anti-seize compound		Mounting bolt		
			DTPM 	TTP 					
MRX	040R-10...	SB-3070TRP	DTPM-10		P-37	HH8X25	RPMT10T3M0ER-GM RPGT10T3M0ER-GM RPGT10T3M0ER-SM RPMT10T3M0EN-GH	* 1	
	050R-10...					HH10X30			
	063R-10...								
		Recommended tightening torque for insert clamp 2.0N•m							
MRX	040R-12...	SB-4090TRPN	DTPM-15		P-37	HH8X25	RPMT1204M0ER-GM RPGT1204M0ER-GM RPGT1204M0ER-SM RPMT1204M0EN-GH	* 2	
	050R-12...					HH10X30			
	063R-12...								
	080R-12...								HH12X35
	100R-12...								
		Recommended tightening torque for insert clamp 3.5N•m							
MRX	063R-16...	SB-50120TRP	TTP-20		P-37	HH10X30	RPMT1605M0ER-GM RPGT1605M0ER-GM RPGT1605M0ER-SM RPMT1605M0EN-GH	* 3	
	080R-16...					HH12X35			
	100R-16...					-			
	125R-16...								
		Recommended tightening torque for insert clamp 4.5N•m							

Max. Revolution

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

*1... Not compatible with the conventional RPMT10T3M0.

*2... Not compatible with the conventional RPMT1204M0 and RPMT1204M0-H.

*3... Not compatible with the conventional RPMT1606M0-H.

M



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

Ball-nose
Radius

Others

MRX (End mill)

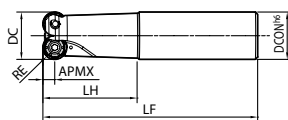


Fig. 1

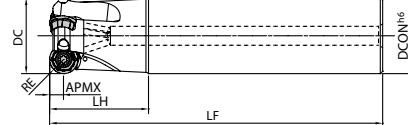


Fig. 2

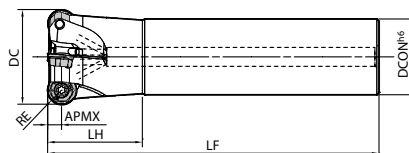


Fig. 3

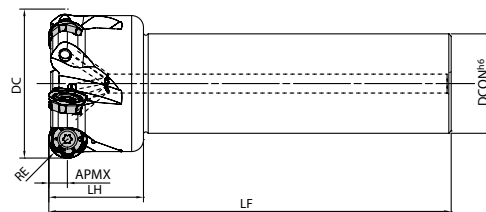


Fig. 4

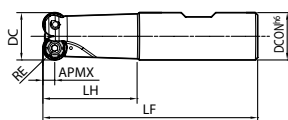


Fig. 5

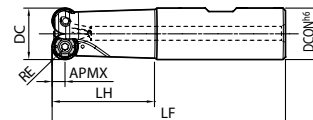


Fig. 6

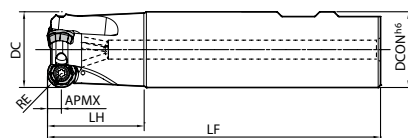


Fig. 7

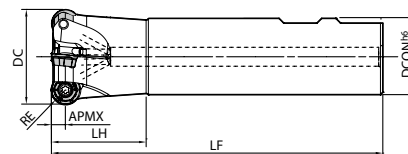


Fig. 8

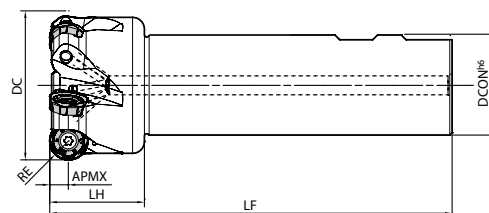


Fig. 9

M



Milling

Toolholder dimensions

Description			Availability	Inserts	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Applicable inserts ➡ M276
					RE	DC	DCON	LF	LH	APMX						
Cylindrical	MRX	16-S16-08-2T	●	2	4	16	16	110	40	4	+3	No	38000	1	RDGT0803... RDMT0803...	
		20-S20-08-2T	●			20	20	120			-5.5	32000	2			
		25-S25-08-4T	●			25	25	120			+10	28000	2			
	MRX	20-S20-10-2T	●	2	5	20	20	120	40	5	+5	-8	No	30000	1	RPGT10T3... RPMT10T3...
		25-S25-10-3T	●			25	25	120			-5.5	28000	2			
		32-S32-10-4T	●			32	32	140			+10	22500	2			
	MRX	32-S32-12-3T	●	3	6	32	32	140	40	6	+10	-5.5	Yes	24500	2	RPGT1204... RPMT1204...
		40-S32-12-4T	●			40	42	170						21000	3	
		50-S42-12-5T	●			50	42	170						18000	3	
	MRX	40-S32-16-2T	●	2	8	40	32	140	40	8	+10	-5.5	Yes	18000	3	RPGT1605... RPMT1605...
		50-S42-16-4T	●			50	42	170						15500	3	
		63-S42-16-5T	●			63	42	170						13500	4	
Weldon	MRX	16-W16-08-2T	●	2	4	16	16	89	40	4	+3	No	38000	5	RDGT0803... RDMT0803...	
		20-W20-08-2T	●			20	20	91			-5.5	32000	6			
		25-W25-08-4T	●			25	25	97			+10	28000	7			
	MRX	20-W20-10-2T	●	2	5	20	20	91	40	5	+5	-8	No	30000	5	RPGT10T3... RPMT10T3...
		25-W25-10-3T	●			25	25	97			-5.5	28000	7			
		32-W32-10-4T	●			32	32	101			+10	22500	7			
	MRX	32-W32-12-3T	●	3	6	32	32	101	40	6	+10	-5.5	Yes	24500	7	RPGT1204... RPMT1204...
		40-W32-12-4T	●			40	40	111						21000	8	
		50-W40-12-5T	●			50	40	111						18000	8	
	MRX	40-W32-16-2T	●	2	8	40	32	101	40	8	+10	-5.5	Yes	18000	8	RPGT1605... RPMT1605...
		50-W40-16-4T	●			50	40	111						15500	8	
		63-W40-16-5T	●			63	40	112						13500	9	
Long Shank	MRX	16-S16-08-2T-160	●	2	4	16	16	160	70	4	+3	No	38000	1	RDGT0803... RDMT0803...	
		20-S20-08-2T-180	●			20	20	180	80		-5.5	32000	2			
		25-S25-08-4T-180	●			25	25	180	+10		28000	2				
	MRX	20-S20-10-2T-180	●	2	5	20	20	180	80	5	+5	-8	No	30000	1	RPGT10T3... RPMT10T3...
		25-S25-10-2T-180	●			25	25	180			-5.5	28000	2			
		32-S32-10-4T-200	●			32	32	200			+10	22500	2			
	MRX	32-S32-12-2T-200	●	2	6	32	32	200	80	6	+10	-5.5	Yes	24500	2	RPGT1204... RPMT1204...
		40-S32-12-4T-200	●			40	42	300	21000					3		
		50-S42-12-4T-300	●			50	42	300	18000					3		
	MRX	40-S32-16-2T-200	●	2	8	40	32	200	40	8	+10	-5.5	Yes	18000	3	RPGT1605... RPMT1605...
		50-S42-16-4T-300	●			50	42	300						15500	3	
		63-S42-16-4T-300	●			63	42	300						13500	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item

M274

M

Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for Finishing

High Feed Cutter

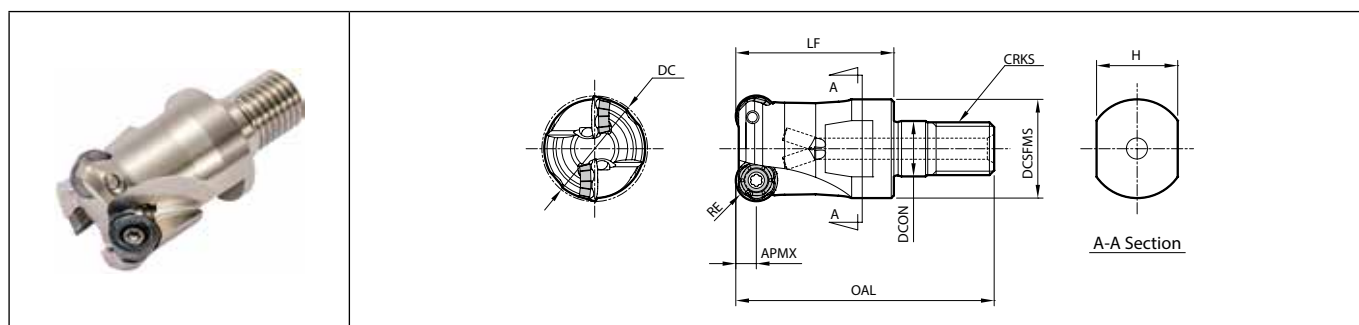
Multi-Function

Slot Mill

Ball-nose Radius

Others

MRX (Modular type)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)									A.R. max (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Applicable inserts ➡ M276
			RE	DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H					
MRX 16-M08-08-2T 20-M10-08-2T 25-M12-08-4T	●	2	16	8.5	14.7	42	25	4	M8x1.25	12	+3	-5.5	No	38000	RDGT0803... RDMT0803...	
	●	4	20	10.5	18.7	48	30		M10x1.5	15			Yes	32000		
	●		25	12.5	23	56	35		M12x1.75	19	+10			28000		
MRX 20-M10-10-2T 25-M12-10-3T 32-M16-10-4T	●	2	20	10.5	18.7	48	30	5	M10x1.5	15	+5	-8	No	30000	RPGT10T3... RPMT10T3...	
	●	3	25	12.5	23	56	35		M12x1.75	19	+10	-5.5	Yes	28000		
	●	4	32	17	30	62	40		M16x2.0	24			22500			
MRX 32-M16-12-3T 40-M16-12-4T	●	3	32	17	30	62	40	6	M16x2.0	24	+10	-5.5	Yes	24500	RPGT1204... RPMT1204...	
	●	4	40											21000		
MRX 40-M16-16-2T	●	2	8	40	17	30	62	40	8	M16x2.0	24	+10	-5.5	Yes	18000	RPGT1605... RPMT1605...

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Spare parts and applicable inserts

Description	Clamp screw	Wrench		Anti-seize compound	Applicable inserts  M276
		DTPM 	TTP 		
MRX ...-08...	SB-2555TRP	DTPM-8		P-37	RDMT0803M0ER-GM RDGT0803M0ER-GM RDGT0803M0ER-SM RDMT0803M0EN-GH * 1
	Recommended tightening torque for insert clamp 1.2N·m				
MRX ...-10...	SB-3070TRP	DTPM-10		P-37	RPMT10T3M0ER-GM RPGT10T3M0ER-GM RPGT10T3M0ER-SM RPMT10T3M0EN-GH * 2
	Recommended tightening torque for insert clamp 2.0N·m				
MRX ...-12...	SB-4090TRPN	DTPM-15		P-37	RPMT1204M0ER-GM RPGT1204M0ER-GM RPGT1204M0ER-SM RPMT1204M0EN-GH * 3
	Recommended tightening torque for insert clamp 3.5N·m				
MRX ...-16...	SB-50120TRP	TTP-20		P-37	RPMT1605M0ER-GM RPGT1605M0ER-GM RPGT1605M0ER-SM RPMT1605M0EN-GH * 4
	Recommended tightening torque for insert clamp 4.5N·m				

Max. Revolution

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

*1... Not compatible with the conventional RDMT08T2M0-H.

*2... Not compatible with the conventional RPMT10T3M0.

*3... Not compatible with the conventional RPMT1204M0 and RPMT1204M0-H.

*4... Not compatible with the conventional RPMT1606M0-H.

● : Standard item

M

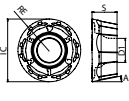
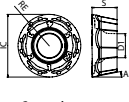
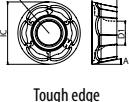


Milling

RDMT/RDGT/PPMT/RPGT

Classification of usage		Carbon steel / Alloy steel										★ ☆		P
		Mold and die steel										☆ ★ ☆		
		Austenitic stainless steel										☆ ☆ ★		M
		Martensitic stainless steel										★ ☆		
		Precipitation hardening stainless steel										☆ ★		
		Gray cast iron										☆ ★		K
Nodular cast iron										☆ ★				
Non-ferrous metals												N		
Heat-resistant alloy										★ ☆				
Titanium alloy										☆ ★		S		
Hard materials														
												★ ☆		H

Insert		Description	Dimension (mm)				Angle (°)	Carbide						Applicable toolholder ➡ M271 M274 M275	
			IC	S	D1	RE		AN	CVD						
									CA6535	PVD					
										PR1510	PR1525	PR1535	PR1810		PR1825

		RDGT 0803M0ER-GM	8	3.18	3	4	15	●	□	○	●	●	●	●	MRX...-08..
		RPGT 10T3M0ER-GM	10	3.97	3.5	5	11	●	□	○	●	●	●	●	MRX...-10..
		RPGT 1204M0ER-GM	12	4.76	4.6	6	11	●	□	○	●	●	●	●	MRX...-12..
		RPGT 1605M0ER-GM	16	5.56	5.8	8	11	●	□	○	●	●	●	●	MRX...-16..
		RDMT 0803M0ER-GM	8	3.18	3	4	15	●	□	○	●	●	●	●	MRX...-08..
		RPMT 10T3M0ER-GM	10	3.97	3.5	5	11	●	□	○	●	●	●	●	MRX...-10..
		RPMT 1204M0ER-GM	12	4.76	4.6	6	11	●	□	○	●	●	●	●	MRX...-12..
		RPMT 1605M0ER-GM	16	5.56	5.8	8	11	●	□	○	●	●	●	●	MRX...-16..
		RDGT 0803M0ER-SM	8	3.18	3	4	15	●	□	○	●	●	●	●	MRX...-08..
		RPGT 10T3M0ER-SM	10	3.97	3.5	5	11	●	□	○	●	●	●	●	MRX...-10..
		RPGT 1204M0ER-SM	12	4.76	4.6	6	11	●	□	○	●	●	●	●	MRX...-12..
		RPGT 1605M0ER-SM	16	5.56	5.8	8	11	●	□	○	●	●	●	●	MRX...-16..
		RDMT 0803M0EN-GH	8	3.18	3	4	15	●	□	○	●	●	●	●	MRX...-08..
		RPMT 10T3M0EN-GH	10	3.97	3.5	5	11	●	□	○	●	●	●	●	MRX...-10..
		RPMT 1204M0EN-GH	12	4.76	4.6	6	11	●	□	○	●	●	●	●	MRX...-12..
		RPMT 1605M0EN-GH	16	5.56	5.8	8	11	●	□	○	●	●	●	●	MRX...-16..

Handed insert shows Right-hand

Recommended cutting conditions M277

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

● : Standard item ○ : Will be replaced with a new product □ : Expected to be discontinued in September 2026

M276

Recommended cutting conditions

Workpiece material	Recommended chipbreaker (fz: mm/t)				Recommended insert grades (Vc: m/min)			
	* RD**08 type: ap=2mm, RP**10 type: ap=2.5mm RP**12 type: ap=3mm, RP**16 type: ap=4mm				MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coated carbide
	RDMT-GM RPMT-GM	RDGT-GM RPGT-GM	RDGT-SM RPGT-SM	RDMT-GH RPMT-GH	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535
Carbon steel	★ 0.1~0.2~0.3	☆ 0.1~0.2~0.3	☆ 0.06~0.15~0.2	☆ 0.15~0.3~0.35	-	★ 120~180~250	☆ 120~180~250	-
Alloy steel	★ 0.1~0.2~0.3	☆ 0.1~0.2~0.3	☆ 0.06~0.15~0.2	☆ 0.15~0.3~0.35	-	★ 100~160~220	☆ 100~160~220	-
Mold steel	★ 0.1~0.15~0.25	☆ 0.1~0.15~0.25	☆ 0.06~0.12~0.2	☆ 0.15~0.2~0.3	-	★ 80~140~180	☆ 80~140~180	-
Stainless steel (Austenitic related)	☆ 0.1~0.15~0.2	☆ 0.1~0.15~0.2	★ 0.06~0.12~0.2	☆ 0.15~0.2~0.25	-	☆ 100~160~200	★ 100~160~200	-
Stainless steel (Martensitic related)	☆ 0.1~0.15~0.2	☆ 0.1~0.15~0.2	★ 0.06~0.12~0.2	☆ 0.15~0.2~0.25	-	-	☆ 150~200~250	★ 180~240~300
Stainless steel (Precipitation Hardening)	☆ 0.1~0.15~0.2	★ 0.1~0.15~0.2	☆ 0.06~0.12~0.2	☆ 0.15~0.2~0.25	-	-	★ 90~120~150	-
Gray cast iron	★ 0.1~0.2~0.3	☆ 0.1~0.2~0.3	-	☆ 0.15~0.3~0.35	★ 120~180~250	-	-	-
Nodular cast iron	★ 0.1~0.15~0.25	☆ 0.1~0.15~0.25	-	☆ 0.15~0.2~0.3	★ 100~150~200	-	-	-
Ni-base heat-resistant alloys	☆ 0.1~0.12~0.15	★ 0.1~0.12~0.15	☆ 0.06~0.1~0.15	☆ 0.12~0.15~0.2	-	-	☆ 20~30~50	★ 20~30~50
Titanium alloys	☆ 0.1~0.12~0.15	☆ 0.1~0.12~0.15	★ 0.06~0.1~0.15	-	☆ 30~50~70	-	★ 40~60~80	-

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

* RDGT/RPGT are recommended for stainless steel, Ni-base heat-resistant alloys and titanium alloy.

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* Recommended feed rate in the table is the reference value when ap is RE/2. (2 mm for RD**08/2.5 mm for RP**10/3mm for RP**12/4 mm for RP**16)

For other ap, calculate the recommended feed rate based on the conversion factor below.

* For MRX16-S16-08-2T(-160), MRX16-W-08-2T, MRX20-S20-10-2T(-180) and MRX20-W20-10-2T, set the feed rate not higher than 50% of the recommended cutting conditions.

★: 1st Recommendation ☆: 2nd Recommendation

Conversion factor for feed per tooth by depth of cut (ap)

Insert	Max. ap	Conversion factor for feed per tooth fz									
		ap=0.5 mm	ap=1 mm	ap=1.5 mm	ap=2 mm	ap=2.5 mm	ap=3 mm	ap=4 mm	ap=5 mm	ap=6 mm	ap=8 mm
RD**08 type (GM/SM/GH chipbreaker)	4mm	1.7	1.3	1.1	¹ (Standard)	0.9	0.8	0.8	-	-	-
RP**10 type (GM/SM/GH chipbreaker)	5mm	1.9	1.4	1.2	1	¹ (Standard)	0.9	0.8	0.8	-	-
RP**12 type (GM/SM/GH chipbreaker)	6mm	2.1	1.5	1.3	1.1	1	¹ (Standard)	0.9	0.8	0.8	-
RP**16 type (GM/SM/GH chipbreaker)	8mm	2.4	1.7	1.4	1.3	1.1	1.1	¹ (Standard)	0.9	0.8	0.8

* Example (ROMU12 type, carbon steel, GM chipbreaker, ap=1mm)

fz=0.2 mm/t (Reference value for carbon steel and GM chipbreaker)	×	^{1.5} (Conversion factor for ROMU12 type, ap=1mm)	=	fz=0.3 mm/t (Recommended feed rate)
--	---	---	---	--

Recommended cutting conditions for drilling/ramping/helical milling

Tool spec.		Max. ap	Drilling		Ramping (Slant milling)			Helical milling		
Insert	Tool dia.		Max. cutting depth Pd	Min. Cutting length X for flat bottom surface	Max. ramping angle RMPX	tan RMPX	Cutting length L at max. ramping angle	Min. cutting dia. øDh1	Min. cutting dia. for flat bottom facing øDh2	Max. cutting dia. øDh3
RD**08 type	16	4	0.7	9	8°	0.141	28	20	24	30
	20		1.4	13	9°	0.158	25	26	32	38
	25			18	5°	0.087	45	36	42	48
RP**10 type	20	5	0.6	11	5°	0.087	57	26	30	38
	25		1.9	16	10°	0.176	28	33	40	48
	32			23	6°	0.105	47	47	54	62
	40			31	4°	0.070	71	63	70	78
	50			41	3°	0.052	95	83	90	98
	63			54	2°	0.035	143	109	116	124
RP**12 type	32	6	2.4	21	9°	0.158	37	43	52	62
	40			29	5°	0.087	68	59	68	78
	50			39	4°	0.070	85	79	88	98
	63			52	2°	0.035	171	105	114	124
	80			69				139	148	158
	100			89	1°	0.017	343	179	188	198
RP**16 type	40	8	3.4	25	11°	0.194	41	51	64	78
	50			35	7°	0.123	65	71	84	98
	63			48	4°	0.070	114	97	110	124
	80			65	3°	0.052	152	131	144	158
	100			85	2°	0.035	229	171	184	198
	125			110	1°	0.017	458	221	234	248

* Above is the value considering the clearance 1mm between the tool body and the workpiece.

Unit: mm

M



Milling

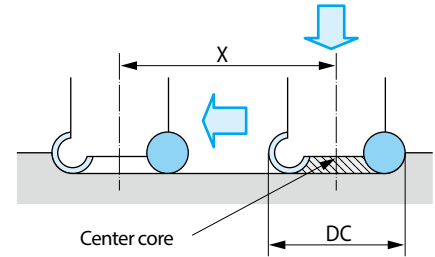
Guide for drilling

Depth of drilling

Refer to max. cutting depth (Pd) shown in the lower table of M277.
(Pd Shows the maximum plunge depth.)

When traversing after drilling

1. Reduce the table feed by 50% until the center core part (do not forget to grind) is completely cut off.
(The internal cutting edge's radial rake angle is large in the negative direction)
2. The min. cutting length "X" for flat bottom surface is as follows M277.

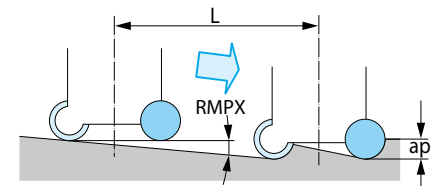


Guide for ramping (Slant milling)

- Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
- Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle

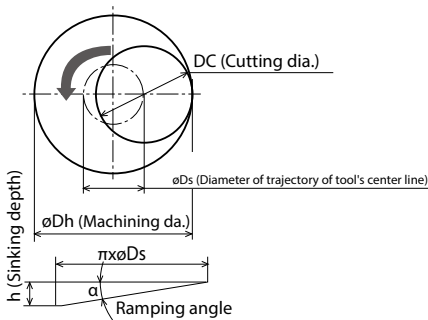
$$L = \frac{ap}{\tan RMPX}$$



Guide for helical milling

- Sinking depth (h) per revolution when helical milling should be max. ap or under in the above cutting conditions.
Ramping angle (with trajectory of the center line of tool) should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
- Feed rate should be 70% or under of the above cutting conditions.
- Down-cut machining is recommended.

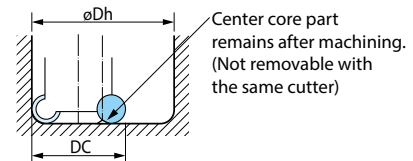
Helical milling factors



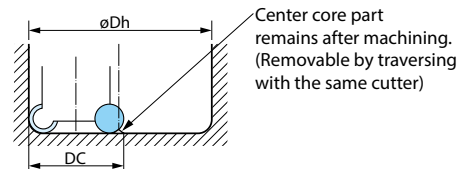
øDs (How to find diameter of trajectory of tool's center line)
øDs = øDh - DC

Formula for sinking depth (h)
h = π x øDs x tan α
(h should be ap or under)
(α should be RMPX or under)

[When cutting dia. øDh1 ≤ øDh < øDh2]



[When cutting dia. øDh2 ≤ øDh ≤ øDh3]



Please refer to M277 the list for øDh1 ~ Dh3.



Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Max. ap and usable edges

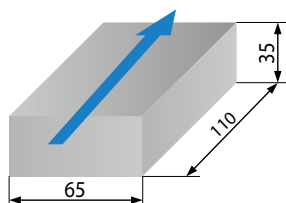
(mm)

Usable edges	Insert corner-R			
	R4	R5	R6	R8
3 edges	ap=2.0~4.0	ap=2.5~5.0	ap=3.0~6.0	ap=4.0~8.0
6 edges	ap=2.0 Less than	ap=2.5 Less than	ap=3.0 Less than	ap=4.0 Less than

Case studies

SUS304

- Nozzle parts
- $V_c = 113\text{m/min}$
- $a_p \times a_e = 1.0 \times 65\text{mm}$
- $f_z = 0.14\text{mm/t}$
- Dry
- MRX100R-12-9T-M (9 flutes)
- RPGT1204M0ER-SM (PR1535)



4.5 times longer tool life

PR1535

450 pcs/edge

Conventional

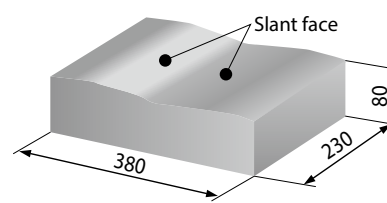
100 pcs/edge

- High cost efficiency with 4.5 times longer tool life and 1.5 times more insert edges.
- MRX prevented burr formation and improved surface finish.

(User evaluation)

SKD61 (47~49HRC)

- Mold part
- $V_c = 125\text{m/min}$
- $a_p \times a_e = 1.0 \sim 2.0 \times 10\text{mm}$
- $f_z = 0.25\text{mm/t}$
- Dry
- MRX20-S20-08-2T (2 flutes)
- RDGT0803M0ER-GM (PR1525)



More than double tool life

PR1525

2 pcs and more Stable tool life

Conventional

1 pc unstable tool life

- Conventional tool machined only 1 pc of workpiece due to unstable tool life, but MRX doubled the tool life with stable machining.

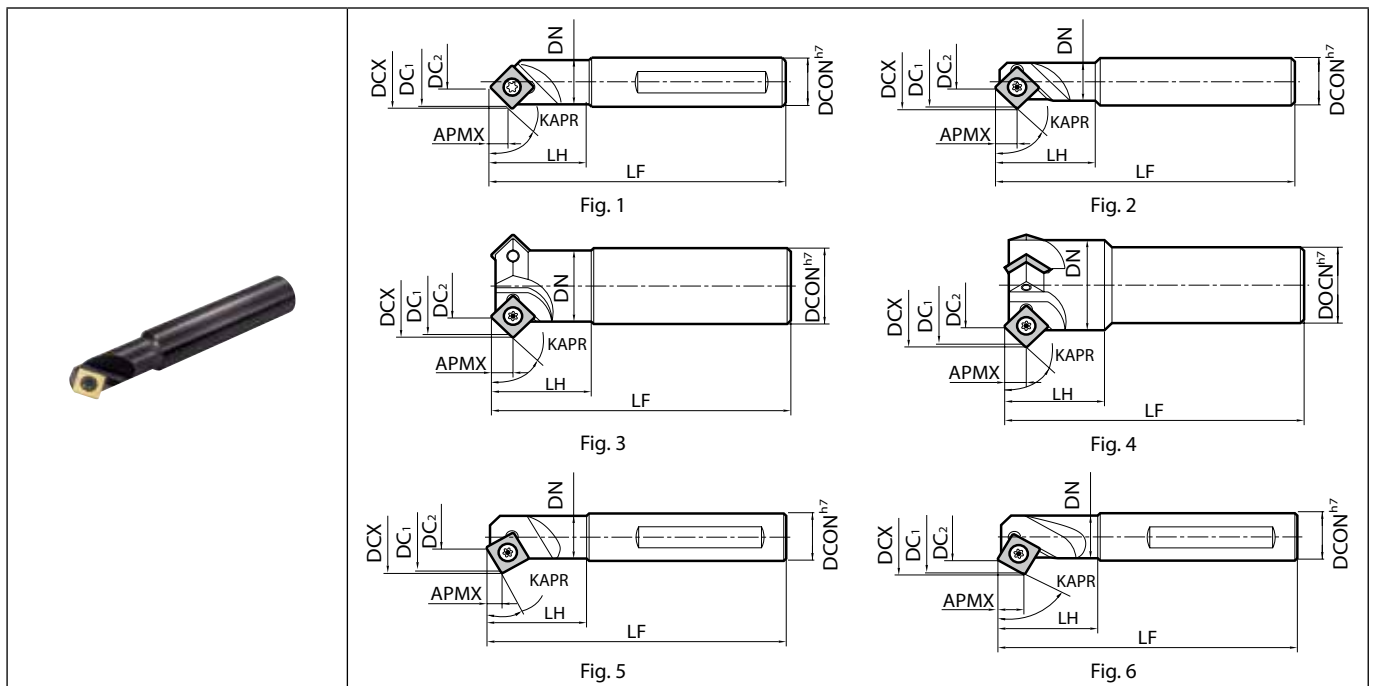
(User evaluation)

M



Milling

MCSE



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								Standard corner-R(RE)	KAPR (°)	A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts  M281
			DCX	DC1	DC2	DCON	LF	LH	APMX	DN							Screw	Wrench	Wrench	
MCSE 104 106 115 227 336		1	16	15	4	16	85	31	6.5	15	0.4	45	0	-4.5	No	1	SB-3060TR	DT-10	-	SDKW09T2... SDMT09T204C
			22	21	6	20			16	2								SEKW1203... SEMT120304C		
			31	30	15		121	41	8.6	18	2									
		2	43	42	27				30	3	SB-5090TR					-	LTW-20			
		3	52	51	36	32				38	4									
MCSE 104-30D 108-30D 110-30D		1	19	18	4	16	85	31	4.7	15	0.4	30	0	-4	No	5	SB-3060TR	DT-10	-	SDKW09T2... SDMT09T204C
			28	27	8	20	110	41		19	0.8					5			SEKW1203... SEMT120304C	
			30	28	10		120	40	6.3	18	5					SB-5090TR	-	LTW-20		
MCSE 108-60D 120-60D		1	19.5	19	8	20	110	41		19	0.8	60	0	-3.5	No	6	SB-5070TR			SEKW1203... SEMT120304C
			31	30	20		120	40	10	18	6					SB-5090TR	-	LTW-20		

● : Standard item

M280

M

Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

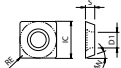
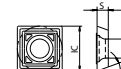
Multi-
Function

Slot Mill

Ball-nose
Radius

Others

SDKW/SDMT/SEKW/SEMT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel					★	■	P		
		Mold and die steel					★	■			
		Austenitic stainless steel					★		M		
		Martensitic stainless steel									
		Precipitation hardening stainless steel									
		Gray cast iron					☆		K		
		Nodular cast iron									
		Non-ferrous metals					★		N		
		Heat-resistant alloy							S		
		Titanium alloy					☆				
		Hard materials							H		
Insert		Description	Dimension (mm)				Angle (°)	Carbi- de	Cemet	Applicable toolholder ➡ M280	
			IC	S	D1	RE	AN	PVD PRI825	- KW10		- TN100M
		SDKW 09T204FN	9.525	2.78	3.4	0.4	15	●		MCSE104-30D MCSE104	
		SDKW 09T204TN	9.525	2.78	3.4	0.4	15	●		●	MCSE104-30D MCSE104
		SEKW 120304FN 120308FN	12.7	3.18	5.5	0.4 0.8	20		● ●		MCSE106, MCSE108-..D MCSE110-30D, MCSE115 MCSE120-60D, MCSE227 MCSE336
		SEKW 120304TN 120308TN	12.7	3.18	5.5	0.4 0.8	20	● ●		● ●	
	 Low cutting force	SDMT 09T204C	9.525	2.78	3.4	0.4	15	●	●	●	MCSE104-30D MCSE104
		SEMT 120304C	12.7	3.18	5.5	0.4	20	●	●		

Recommended cutting conditions ➡ M282

● : Standard item

M



Milling

Applicable inserts

Description		Applicable inserts  M281		
				
MCSE	104 104-30D	SDKW 09T204TN	SDKW 09T204FN	SDMT 09T204C
MCSE	106 115 227 336	SEKW 120304TN 120308TN	SEKW 120304FN 120308FN	SEMT 120304C
MCSE	108-30D 110-30D			
MCSE	108-60D 120-60D			

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)		
			MEGACOAT	Carbide	Cermet
	DC ₂ (ø4~ø20)	DC ₂ (ø27~ø36)	PR1825	KW10	TN100M
Carbon steel	0.05~0.25	0.2~0.4	★ 120~250	-	★ 100~180
Alloy steel	0.05~0.25	0.2~0.4	★ 100~220	-	★ 100~180
Mold steel	0.05~0.25	0.2~0.4	★ 80~180	-	★ 100~150
Stainless steel	0.05~0.2	0.1~0.3	★ 120~220	-	☆ 100~180
Cast iron	0.1~0.3	0.3~0.5	-	☆ 80~150	-
Non-ferrous metals	0.1~0.3	0.3~0.5	-	★ 100~300	-

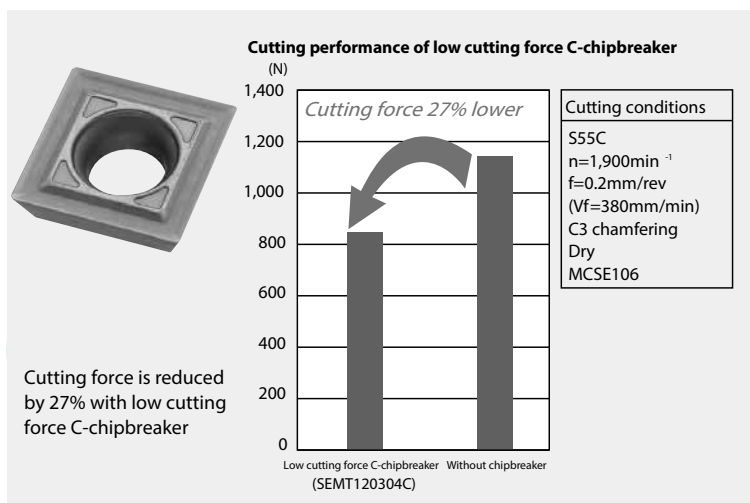
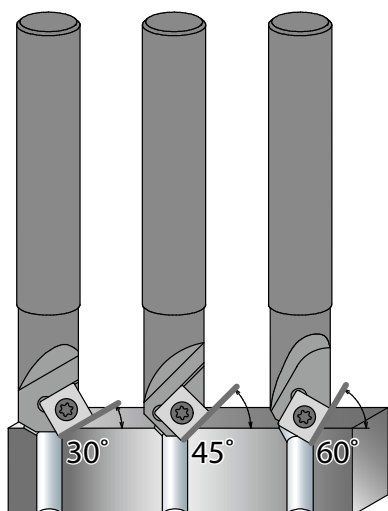
★: 1st Recommendation ☆: 2nd Recommendation

M



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others



High efficiency bolt countersink end mill

MEF Expanded Offering

For countersinking and boring of bolts with hexagon holes (M6 to M30)

Economical inserts with 4 cutting edges

1

New GM chipbreaker provides high-efficiency and stable machining

Excellent chip control for a wide range of machining. Provides stable machining with a low cutting force design

NEW

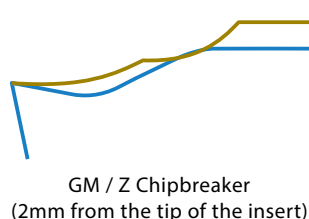
General purpose
1st recommendation

GM Chipbreaker



Tough edge

Z Chipbreaker

GM / Z Chipbreaker
(2mm from the tip of the insert)Conventional
challenges

- Poor chip evacuation can lead to entanglement.
- Feed rate cannot increase due to high cutting force.
- Chatter occurs when deep hole making.

GM Chipbreaker

Variable chipbreaker width
considering speed difference
of inner and outer periphery

⇒ Stable chip control at high D.O.C.

Bump at corners

⇒ Stable chip control
at low D.O.C.

Chip samples by GM chipbreaker

10mm

Case1	Vc = 120 m/min fz = 0.10 mm/t	ap = 4.5 mm ø26 S45C	Case2	Vc = 80m/min fz = 0.15 mm/t	ap = 3.5 mm ø30 S45C
Case3	Vc = 120 m/min fz = 0.10 mm/t	ap = 1.0 mm ø26 S50C	Case4	Vc = 120 m/min fz = 0.15 mm/t	ap = 1.0 mm ø26 S50C

Achieves excellent chip control under various machining conditions

(User/internal evaluation)

2

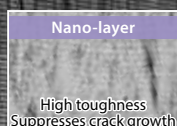
New Grade PR18 series

Provides extended tool life

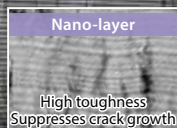
NEW

MEGACOAT
NANO EX MillingDouble lamination technology
maintains longer tool lifeMulti-layer structure with two unique
nano layers
Superior abrasion resistance and fracture
resistance

Special nano layer x Multilayer lamination



Nano-layer

AlCr-based coating
with excellent abrasion resistanceHigh toughness
Suppresses crack growth

Nano-layer

AlTi-based coating
with excellent heat resistanceHigh toughness
Suppresses crack growth

Multi-layering of high-performance nano layers

Increases toughness with the suppression of crack growth
and optimization of internal stress

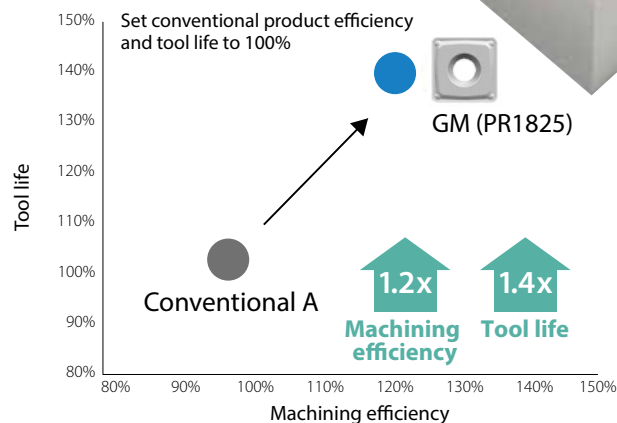
(CC image)

Case study

Alloy steel/Copper alloy Block

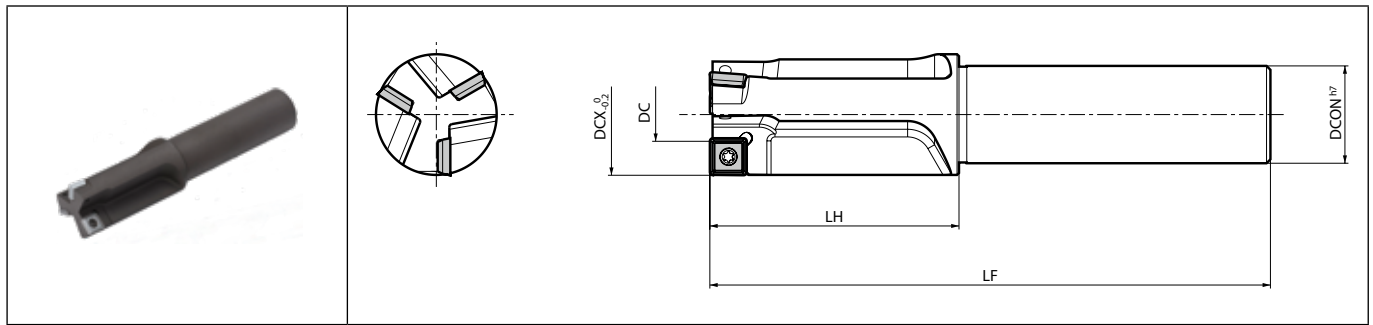
Vc = 100m/min
ap x H = 0.8x75mm
Vf = 225mm/min
Wet (Internal and external)
SPMT090308EN-GM PR1825
Custom-made toolholder

Milling

GM chipbreaker (PR1825) provided stable machining with increased cutting speed and feed rate.
Reduced chip clogging and extended tool life.

(User evaluation)

MEF

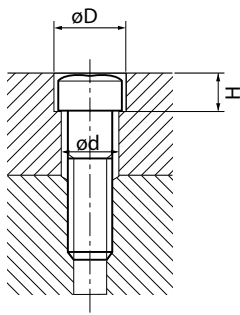


Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					Standard corner-R(RE)	A.R. (°)	R.R. (°)	Objective bolt size	Coolant hole	Spare parts		Applicable inserts ➔ M285		
			DC	DCX	DCON	LF	LH						Screw	Wrench			
																	
MEF	11-S10	●	1	3	11	10	103	23	0.4	+5	-13	M6	No	SB-2250TR	DT-7	SPMT060204EN-GM SPMT060208EN-GM SPMT060204E-Z SPMT060208E-Z	
	14-S12	●	4.5	14	12	108	28	M8									
	17-S16	●	7.3	17.5	16	115	35	M10									
	18-S16	●	7.7	18		117	38	-									
	20-S16	●	3	9.5	20	20	120	40			M12	-12					M14
	22-S20	●		11.4	22		124	44			-						
	23-S20	●		12.4	23		126	46			-						
	24-S20	●		13.4	24		128	48			-						
	25-S20	●		14.4	25		130	50			-						
MEF	26-S25	●	3	9.8	26	25	132	52	0.8	+5	-13	M16	No	SB-3080TR	DT-10	SPMT090304EN-GM SPMT090308EN-GM SPMT090304E-Z SPMT090308E-Z	
	27-S25	●		10.6	27		134	54				-					
	28-S25	●		11.5	28		136	56				-					
	29-S25	●		12.6	29		138	58				M18					
	30-S25	●		13.5	30		140	60				-					
	32-S25	●		15.5	32		144	64				M20					
	35-S32	●		18.4	35		150	70			M22						
	39-S32	●		4	22.5		39	32			158	78					M24
	43-S32	●	26.2		43	166	86				M27						
	48-S32	●	31.3		48	176	96				M30						

Although Corner-R(RE) pertains to MEF11-S10, DC = 3.0 mm.

Bolt countersink (Hexagon socket head cap screw)

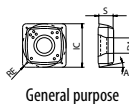
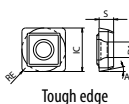


Nominal screw size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
øD (mm)	11	14	17.5	20	23	26	29	32	35	39	43	48
H (mm)	6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32
ød (mm)	6.6	9	11	14	16	18	20	22	24	26	30	33
Applicable end mill	MEF11	MEF14	MEF17	MEF20	MEF23	MEF26	MEF29	MEF32	MEF35	MEF39	MEF43	MEF48

● : Standard item

M284

SPMT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel				★	☆	P					
		Mold and die steel				★	☆						
		Austenitic stainless steel				☆	★	M					
		Martensitic stainless steel					☆						
		Precipitation hardening stainless steel					★						
		Gray cast iron				★		☆	K				
		Nodular cast iron				★							
		Non-ferrous metals						★	N				
		Heat-resistant alloy						☆	S				
		Titanium alloy					★	☆					
		Hard materials							H				
Insert		Description		Dimension (mm)				Angle (°)	Carbide			Applicable toolholder ➡ M284	
				IC	S	D1	RE	AN	PVD				-
									PR1810	PR1825	PR1835		
	 General purpose	SPMT	060204EN-GM 060208EN-GM	6.35	2.38	2.5	0.4 0.8	11	●	●	●	MEF(11~25)-S..	
		SPMT	090304EN-GM 090308EN-GM	9.525	3.18	3.4	0.4 0.8	11	●	●	●	MEF(26~48)-S..	
	 Tough edge	SPMT	060204E-Z 060208E-Z	6.35	2.38	2.5	0.4 0.8	11	●	●	●	MEF(11~25)-S..	
		SPMT	090304E-Z 090308E-Z	9.525	3.18	3.4	0.4 0.8	11	●	●	●	MEF(26~48)-S..	

Recommended cutting conditions ➡ M285

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)			
		MEGACOAT NANO EX			Carbide
		PR1810	PR1825	PR1835	KW10
Carbon steel	0.1~ 0.12 ~0.15	-	★ 120~ 180 ~220	☆ 120~ 180 ~220	-
Alloy steel	0.1~ 0.12 ~0.15	-	★ 120~ 180 ~220	☆ 120~ 180 ~220	-
Mold steel	0.05~ 0.08 ~0.1	-	★ 100~ 150 ~180	☆ 100~ 150 ~180	-
Stainless steel	0.05~ 0.08 ~0.1	-	-	★ 80~ 120 ~180	-
Cast iron	0.1~ 0.15 ~0.2	★ 100~ 180 ~220	-	-	☆ 80~ 100 ~120
Non-ferrous metals	0.1~ 0.15 ~0.2	-	-	-	★ 100~ 200 ~300

★: 1st Recommendation ☆: 2nd Recommendation

● : Standard item

M



Milling

Points at bolt countersinking

1. Carbon steel

Increase the feed rate to **$fz=0.1 \sim 0.15$ (mm/t)** for preventing long chips at low feed rates.

Chip control is good when setting (**$Vc=80\text{m/min}$**) for **MEF11~MEF25**, and (**$Vc=120\text{m/min}$**) for **MEF26~MEF48**.

Toolholder description	$Vc(\text{m/min})$	$fz(\text{mm/t})$
MEF11~MEF25	80	0.1~0.15
MEF26~MEF48	120	0.1~0.15

2. Sticky materials

Step feed is recommended for good chip control

Increase the feed rate to **$fz=0.1 \sim 0.15$ (mm/t)** for preventing long chips at low feed rate (**$fz=0.05\text{mm/t}$**).

Use cover to prevent accidents or injury by thick chips at higher feed rates.

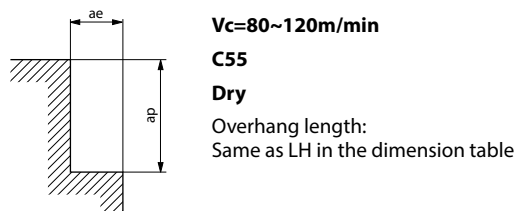
Toolholder description	$Vc(\text{m/min})$	$fz(\text{mm/t})$	Step feed (mm)
MEF11~MEF48	80~150	0.1~0.15	0.5~1.5

3. Stainless steel

Use a lower cutting speed. high cutting speeds cause chattering.

Cutting performance when shouldering

MEF bolt countersink end mill is also recommended of shouldering.



- When shouldering, both side edge and bottom edges function.
- Both edges wear at the same time depending on ap . The insert uses 2 edges instead of 4. (Fig. 1)
- MEF type's side edge is designed to have a slight clearance for the countersinking. Therefore, worked side wall is approx. 1° inclined against the vertical face. (Fig. 2)

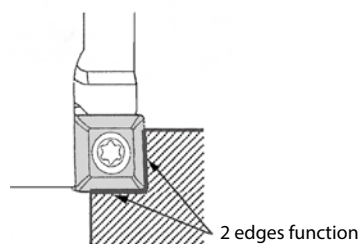


Fig. 1

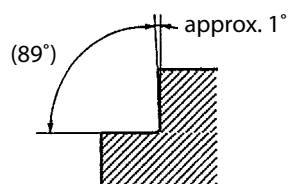


Fig. 2

Description	Cutting range
MEF11-S12 MEF14-S12 MEF17-S16 MEF18-S16	
MEF20-S16 MEF22-S20 MEF25-S20	
MEF26-S25 MEF32-S25 MEF35-S32	
MEF39-S32 MEF43-S32 MEF48-S32	

M



Milling

Cutting edge angle
 $45^\circ \sim 70^\circ$

Cutting edge angle
 75°

Cutting edge angle
 $88^\circ/90^\circ$

Cutter for
Finishing

High Feed
Cutter

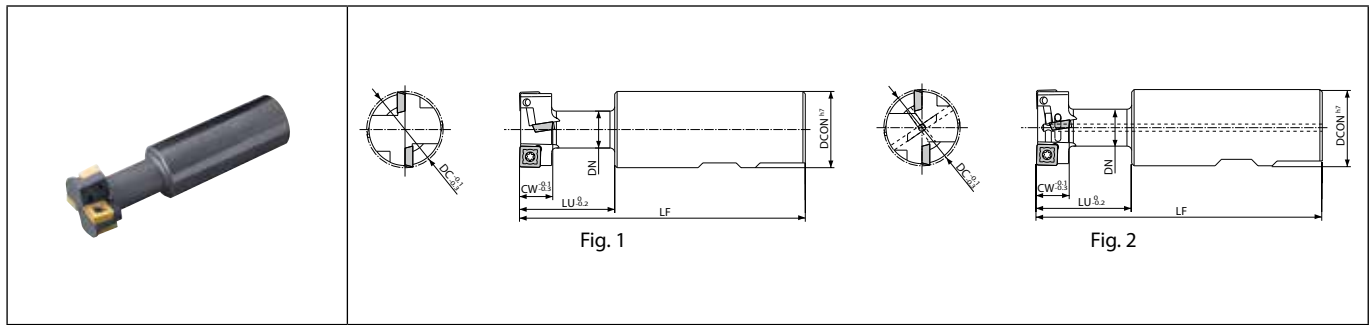
Multi-
Function

Slot Mill

Ball-nose
Radius

Others

METS



Toolholder dimensions

Description	Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts		Applicable inserts ➡ M288	
														Screw	Wrench		
				DC	DCON	LF	LU	CW	DN								
METS	21-S25	●	2	1	21	25	109	29	9	10.5	+9	-10	No	1	SB-2560TR	DT-8	SDMT060304E-K
	25-S25	●			25			112	32	11				12.5	1		
	32-S32	●	4	2	32	32	120	38	14	15.5	1	SB-3060TR	DT-10	SDMT080308E-K			
	40-S32	●			40		130	50	18	20.5	1	SB-4085TR	DT-15	SDMT120408E-K			
	50-S32	●			50		140	60	22	26.5	1						
METS	21-S25-H	●	2	1	21	25	109	29	9	10.5	+9	-10	Yes	2	SB-2560TR	DT-8	SDMT060304E-K
	25-S25-H	●			25			112	32	11				12.5	2		
	32-S32-H	●	4	2	32	32	120	38	14	15.5	2	SB-3060TR	DT-10	SDMT080308E-K			
	40-S32-H	●			40		130	50	18	20.5	2	SB-4085TR	DT-15	SDMT120408E-K			
	50-S32-H	●			50		140	60	22	26.5	2						

METS...-H has air holes

JIS standard of T-slot (Extracted from B0952)

(Unit: mm)

A (Nominal size)	B	C	H	
			Max.	Min.
12	19 ⁺² / ₀	8 ⁺¹ / ₀	25	20
14	23 ⁺² / ₀	9 ⁺² / ₀	28	23
18	30 ⁺² / ₀	12 ⁺² / ₀	36	30
22	37 ⁺³ / ₀	16 ⁺² / ₀	45	38
28	46 ⁺⁴ / ₀	20 ⁺² / ₀	56	48

Previous milling groove does not affect.

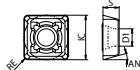
● : Standard item

M



Milling

SDMT

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel				★		P			
		Mold and die steel				★					
		Austenitic stainless steel						M			
		Martensitic stainless steel									
		Precipitation hardening stainless steel									
		Gray cast iron				★	☆	K			
		Nodular cast iron				★					
		Non-ferrous metals					★	N			
		Heat-resistant alloy						S			
		Titanium alloy									
		Hard materials						H			
Insert	Description	Dimension (mm)				Angle (°)	Carbide		Applicable toolholder ➡ M287		
		IC	S	D1	RE	AN	PVD			-	
							PR1810	PR1835			KW10
		SDMT 060304E-K	6.35	3.18	2.8	0.4	15	●	●	●	METS21-S25(-H) METS25-S25(-H)
		SDMT 080308E-K	8	3.18	3.4	0.8	15	●	●	●	METS32-S32(-H)
		SDMT 120408E-K	12.7	4.76	4.4	0.8	15	●	●	●	METS40-S32(-H) METS50-S32(-H)

Recommended cutting conditions ➡ M289

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

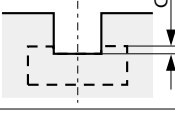
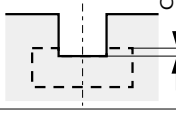
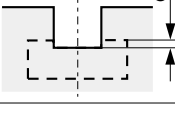
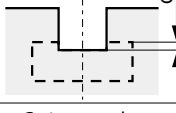
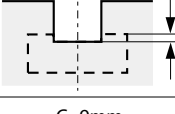
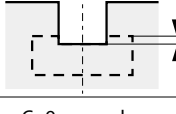
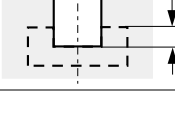
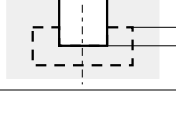
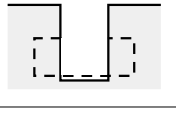
● : Standard item

M288

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)		
		MEGACOAT NANO EX		Carbide
		PR1810	PR1830	KW10
Carbon steel	0.1~0.15	-	★ 100~200	-
Alloy steel	0.08~0.12	-	★ 100~200	-
Mold steel	0.05~0.1	-	★ 80~150	-
Cast iron	0.1~0.15	★ 100~200	-	☆ 80~120
Non-ferrous metals	0.1~0.15	-	-	★ 100~300

★: 1st Recommendation ☆: 2nd Recommendation

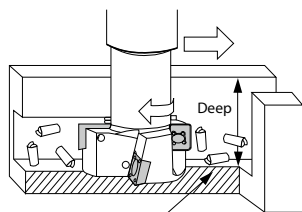
Description (T-Slot nominal size)	Steel			Cast iron		
	Groove shape at pre-process	T-Slotting conditions	Conditions to prevent chattering	Groove shape at pre-process	T-Slotting conditions	Conditions to prevent chattering
METS21-S25(-H) (Nominal size 12)	C=1~3mm 	Vc= 120 fz= 0.1 (n= 1,820) (Vf= 182)	Vc= 60 fz= 0.15 (n= 920) (Vf= 137)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,820) (Vf= 218)	Vc= 80 fz= 0.15 (n= 1,210) (Vf= 182)
METS25-S25(-H) (Nominal size 14)	C=1~3mm 	Vc= 120 fz= 0.1 (n= 1,530) (Vf= 306)	Vc= 60 fz= 0.15 (n= 760) (Vf= 228)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,530) (Vf= 367)	Vc= 80 fz= 0.15 (n= 1,020) (Vf= 306)
METS32-S32(-H) (Nominal size 18)	C=1~3mm 	Vc= 100 fz= 0.1 (n= 1,000) (Vf= 200)	Vc= 60 fz= 0.15 (n= 600) (Vf= 180)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,190) (Vf= 286)	Vc= 80 fz= 0.15 (n= 800) (Vf= 240)
METS40-S32(-H) (Nominal size 22)	C=9mm 	Vc= 80 fz= 0.15 Chattering is likely when set to shallower than C=9mm.	Vc= 60 fz= 0.15 (n= 480) (Vf= 144)	C=9mm and over 	Vc= 120 fz= 0.15 (n= 960) (Vf= 228)	Vc= 80 fz= 0.15 (n= 640) (Vf= 192)
METS50-S32(-H) (Nominal size 28)	Not recommended for steel because of chattering				Vc= 120 fz= 0.15 (n= 760) (Vf= 228)	Vc= 80 fz= 0.15 (n= 510) (Vf= 153)

Cutting speed: Vc(m/min), Revolution: n(min⁻¹), Feed rate fz(mm/t), Table feed Vf(mm/min)

Chattering is likely when fz is less than fz=0.1mm/t. Keep feed rate between fz=0.1 ~ 0.15mm/t.

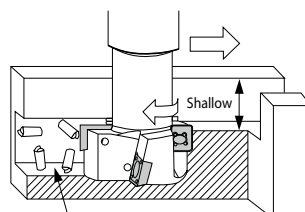
How to prevent damaging chips when steel machining

Before Improvement (Deep Groove at Pre-Process)



Chips stay in the pre-process groove.

After Improvement (Shallow Groove at Pre-Process)

Chips are evacuated backward and
chances of damaging chips are less.Improvement of
chip biting

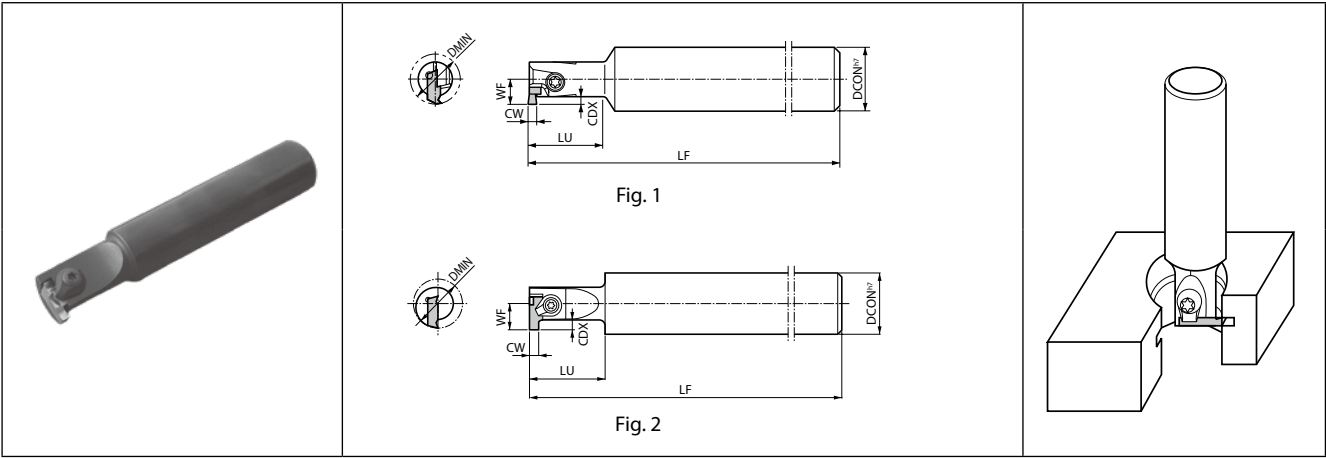
Make pre-process groove shallower to prevent the tool damage from chips.
Use compressed air to aid in chip evacuation.

M



Milling

MGI



Toolholder dimensions

Description		Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts					Applicable inserts ➡ M291
													Clamp set	Clamp set	Screw	Wrench	Wrench	
			DMIN	DCON	LF	LU	CDX	WF	CW min.	CW max.								
MGI	1420-1SS	●	14	20	100	20	2.2	6.8	1	3	No	1	-	-	SB-4065TR	-	FT-15	GVR...-020SS
MGI	1620-1S	●	16	20	110	25	2.2	7.8	1	3.4	No	1	-	-	SB-4085TR	-	FT-15	GVR...-020S
MGI	2020-1A	●	20	20	110	30	2.2	9.8	1	3.4	No	2	CPS-5F	-	-	-	FT-15	GVR...-020A, GVR...-...AR
MGI	2220-1B	●	22	20	110	30	2.8	11	1.45	4	No	2	CPS-5F	-	-	-	FT-15	GVR...-020B, GVR...-...BR
MGI	3225-1C	●	32	25	120	35	5.5 (4.5)	16	2.8	4	No	2	-	CPS-6F	-	LW-3	-	GVR...-020C

CDX shows available grooving depth.
GVR280-020C, GVR300-020C is available to the groove depth up to 4.5mm.
GVR430 ~ 500-020C can be installed to MGI3225-1C, but not recommended for steel machining because of toolholder's rigidity.

M



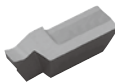
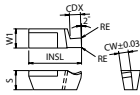
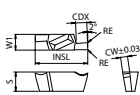
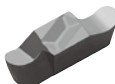
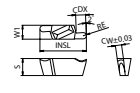
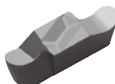
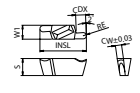
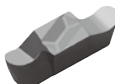
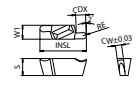
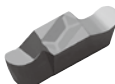
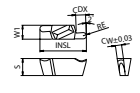
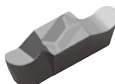
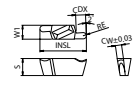
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item

M290

GVR

Classification of usage		Carbon steel / Alloy steel										P				
		Stainless steel										M				
● : Continuous ~Light interruption / 1st Choice		Gray cast iron										K				
☺ : Continuous ~Light interruption / 2nd Choice		Non-ferrous metals										N				
● : Continuous / 1st Choice		Titanium alloy										S				
○ : Continuous / 2nd Choice		Hard materials (~ 40HRC)										H				
		Hard materials (40HRC ~)														
Insert	Description	No. of edges	Dimension (mm)						Tolerance (mm)		Carbide		Cer- met	Applicable toolholder ➡ M290		
			CW	CDX	S	RE	INSL	W1	CW min.	CW max.	PVD	-	-			
											PR125	PR930	KW10		TC40N	TC60M
	 1-edge	1	100-020SS	1												MGI1420-1SS
			125-020SS	1.25												
			145-020SS	1.45	2.3	3	0.2	9	3.6	-0.03	+0.03					
			200-020SS	2												
			250-020SS	2.5												
			300-020SS	3												
	 2-edge	1	100-020S	1												MGI1620-1S
			125-020S	1.25												
			145-020S	1.45	2.3	4	0.2	11	4	-0.03	+0.03					
			185-020S	1.85												
			200-020S	2												
			250-020S	2.5												
	 2-edge / Full R / Copying	2	100-020A	1												MGI2020-1A
			125-020A	1.25												
			145-020A	1.45	2.3	5	0.2	12	4	-0.03	+0.03					
			185-020A	1.85												
			200-020A	2												
			250-020A	2.5												
	 2-edge / Full R / Copying	2	300-020A	3												MGI2220-1B
			340-020A	3.4												
			145-020B	1.45	2.8											
			185-020B	1.85	2.8											
			200-020B	2	3.2											
			230-020B	2.3	3.2	5.5	0.2	15	4.5	-0.03	+0.03					
	 2-edge / Full R / Copying	2	250-020B	2.5	3.2											MGI3225-1C
			280-020B	2.8	3.2											
			300-020B	3	4.2											
			340-020B	3.4	4.2											
			400-020B	4	4.2											
			280-020C	2.8	4.5											
	 2-edge / Full R / Copying	2	300-020C	3	4.5											MGI2020-1A
			340-020C	3.4	5.5											
			400-020C	4	5.5	6.5	0.2	21	5.8	-0.03	+0.03					
			(430-020C)	4.3	6.3											
			(460-020C)	4.6	6.3											
			(500-020C)	5	6.3											
	 2-edge / Full R / Copying	2	200-100AR	2			1									MGI2220-1B
			250-125AR	2.5	2.3	5	1.25	12	4	-0.03	+0.03					
			300-150AR	3			1.5									
			200-100BR	2	2											
			300-150BR	3	3.2	5.5	1	15	4.5	-0.03	+0.03					
						4.2		1.5								

CDX shows available grooving depth.
Right-hand shown

Recommended cutting conditions M293

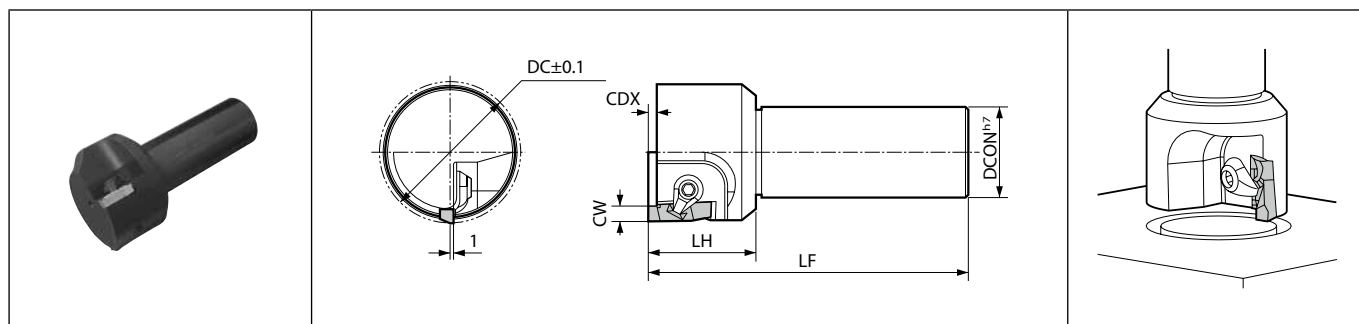
● : Standard item

M



Milling

MVG



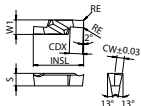
Toolholder dimensions

Description	Availability	Dimension (mm)							Coolant hole	Spare parts		Applicable inserts ➡ M292	
		DC	DCON	LF	LH	CDX	CW min.	CW max.		Clamp set	Wrench		
													
MVG	3032	●	30										GVFR400-020B GVFR430-020B GVFR460-020B GVFR490-020B
	3532	●	35										
	4032	●	40										
	4532	●	45	32	120	40	5.2	4	4.9	No	CPS-6V	LW-3	
	5032	●	50										
	5532	●	55										
	6032	●	60										

CDX shows available grooving depth.

M

GVFR

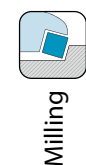
Classification of usage		Carbon steel / Alloy steel										●		☺				P	
		Stainless steel										●		☺				M	
● : Continuous ~Light interruption / 1st Choice ☺ : Continuous ~Light interruption / 2nd Choice ● : Continuous / 1st Choice ○ : Continuous / 2nd Choice		Gray cast iron												●				K	
		Non-ferrous metals												●				N	
		Titanium alloy												●				S	
		Hard materials (~ 40HRC)										●		○				H	
Hard materials (40HRC ~)																			
Insert	Description	No. of edges	Dimension (mm)						Tolerance (mm)		Carbide		Cermet		Applicable toolholder ➡ M292				
			CW	CDX	S	RE	INSL	W1	CW min.	CW max.	PVD	-	-						
											PR1225	PR930	KW10	Tc40N		Tc60M			
		GVFR	400-020B 430-020B 460-020B 490-020B	2	4 4.3 4.6 4.9	5.3	5	0.2	20	5.8	- 0.03	+ 0.03	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	MVG....		

CDX shows available grooving depth.
Right-hand shown

Recommended cutting conditions ➡ M293

● : Standard item

M292



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

MGI

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				
		MEGACOAT	PVD Coated carbide	Carbide	Cermet	
		PR1225	PR930	KW10	TC40N	TC60M
Carbon steel	0.05~0.15	★ 80~150	☆ 80~150	-	☆ 120~200	☆ 100~180
Alloy steel	0.05~0.15	★ 80~150	☆ 80~150	-	☆ 120~200	☆ 100~180
Mold steel	0.03~0.12	★ 60~130	☆ 60~130	-	☆ 100~180	☆ 80~150
Stainless steel	0.03~0.12	★ 60~130	☆ 60~130	-	☆ 100~180	★ 80~150
Cast iron	0.05~0.2	-	-	★ 80~150	☆ 100~150	-
Non-ferrous metals	0.05~0.2	-	-	★ 100~300	-	-

Use down-cut machining.

★: 1st Recommendation ☆: 2nd Recommendation

MVG

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				
		MEGACOAT	PVD coated carbide	Carbide	Cermet	
		PR1225	PR930	KW10	TC40N	TC60M
Carbon steel	0.05~0.15	★ 80~170	☆ 80~150	-	★ 120~200	☆ 100~180
Alloy steel	0.05~0.15	★ 80~170	☆ 80~150	-	★ 120~200	☆ 100~180
Mold steel	0.03~0.12	★ 60~150	☆ 60~130	-	★ 100~180	☆ 80~150
Stainless steel	0.03~0.12	★ 60~150	☆ 60~130	-	☆ 100~180	☆ 80~150
Cast iron	0.05~0.2	-	-	★ 80~150	-	-
Non-ferrous metals	0.05~0.2	-	-	★ 100~300	-	-

★: 1st Recommendation ☆: 2nd Recommendation

M

Milling

S-type inserts

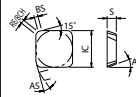
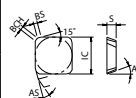
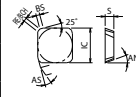
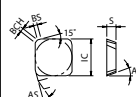
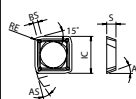
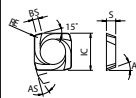
Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)			Carbon steel / Alloy steel										☆	★	■	P		
			Mold and die steel										☆	★	■			
			Austenitic stainless steel										☆	★				
			Martensitic stainless steel													M		
			Precipitation hardening stainless steel															
			Gray cast iron										★	☆	☆		K	
			Nodular cast iron										★	☆				
			Non-ferrous metals												★	N		
			Heat-resistant alloy													S		
			Titanium alloy															
			Hard materials													H		
			Insert		Description	No. of edges	Dimension (mm)						Angle (°)		Carbide			
IC	S	BCH					INSL	RE	BS	AN	AS	CVD	PVD	-	-			
																CA420M	PR1210	PR1225
		SDKN 1203AUFN	4	12.7	3.18	0.5	-	-	1.2	15	23					●		-
		SDKN 1203AUTN	4	12.7	3.18	0.5	-	-	1.2	15	23		●	●			●	
		SDKN 1504AUTN	4	15.875	4.76	0.5	-	-	1.2	15	23			●			●	
		SDKR 1203AUEN-S	4	12.7	3.18	0.5	-	-	1.7	15	23			●			●	-
		SDMR 1203AUER-H	4	12.7	3.18	-	-	1	0.8	15	23				●			-
		SEEN 1203AFTN	4	12.7	3.18	0.5	-	-	1.4	20	25						●	-
		SEKN 1203AFFN	4	12.7	3.18	0.5	-	-	1.4	20	25						●	
		SEKN 1203AFTN	4	12.7	3.18	0.5	-	-	1.4	20	25		●	●			●	
		SEKN 1204AFTN	4	12.7	4.76	0.5	-	-	1.4	20	25			●				
		SEKN 1504AFTN	4	15.875	4.76	0.5	-	-	1.4	20	25			●				
		SEEN 1203AFFR-W	1	12.7	3.18	-	14.56	-	3.5	20	25					●		-
		SEEN 1203AFTR-W	1	12.7	3.18	-	14.56	-	3.5	20	25						●	
		SEKN 1203EFTR	4	12.7	3.18	1.2	-	-	1.4	20	25						●	-
		SEKR 1203AFEN-S	4	12.7	3.18	0.5	-	-	1.7	20	25			●			●	-
		SEMR 1203AFER-H	4	12.7	3.18	-	-	1	1	20	25				●			-

Handed insert shows Right-hand

● : Standard item

SEEN-W inserts are sold in 5 piece boxes

S-type inserts

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel										☆	★	■	P		
		Mold and die steel										☆	★	■			
		Austenitic stainless steel										☆	★				
		Martensitic stainless steel													M		
		Precipitation hardening stainless steel															
		Gray cast iron										★	☆	☆		☆	
		Nodular cast iron										★	☆	☆			
		Non-ferrous metals													★		N
		Heat-resistant alloy															
		Titanium alloy															S
Hard materials																	
Insert		Description	Dimension (mm)					Angle (°)		Carbide				Cermet	Applicable toolholder		
			IC	S	BCH	RE	BS	AN	AS	CVD	PVD			-		-	
CA420M	PR1210	PR1225									PR1810	PR1825	KN10	TN100M	TN60		
		SPCN 1203EDTR	12.7	3.18	-	1	2	11	15						●	-	
		SPKN 1203EDER	12.7	3.18	1	-	1.6	11	15	●							
		SPKN 1203EDFR	12.7	3.18	1	-	1.6	11	15						●		
		SPKN 1203EDTR	12.7	3.18	-	1	2	11	15		●				●		
		1203EDTL			-	1					●				●		
		SPKN 1504EDFR	15.875	4.76	1	-	2.2	11	15						●		
		SPEN 1203EEER	12.7	3.18	1	-	1.4	11	20	●						-	
		SPEN 1203EESR	12.7	3.18	1	-	1.4	11	20			●					
		SPCN 1203XPTR	12.7	3.18	-	1	2	11	11						●	-	
		SPKN 1203XPFR	12.7	3.18	1	-	2	11	11						●		
		SPKN 1203XPTR	12.7	3.18	-	1	2	11	11						●		
		SPKN 1504XETR	15.875	4.76	1	-	2	11	20						●		
		SPCN 1904EETR1	19.05	4.76	0.7	-	1.2	11	20						●	-	
		SPKR 1203EDER-S	12.7	3.18	-	2	1	11	15			●				-	
		SPMR 1203EDER-H	12.7	3.18	-	1	2	11	15				●			-	
		SPGN 090304	9.525	3.18	-	0.4	-	11	-						●	-	
		090308				0.8								●			
		SPGN 120304	12.7	3.18	-	0.4	-	11	-						●	-	
		120308				0.8								●			
		SPMN 120308	12.7	3.18	-	0.8	-	11	-						●	-	
		120312				1.2								●			
		SPMN 120408	12.7	4.76	-	0.8	-	11	-	●						-	
		120412				1.2				●							

Handed insert shows Right-hand

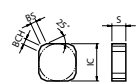
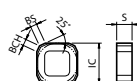
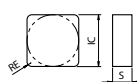
● : Standard item

M



Milling

S-type inserts

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)			Carbon steel / Alloy steel							■	P			
			Mold and die steel							■				
			Austenitic stainless steel								M			
			Martensitic stainless steel											
			Precipitation hardening stainless steel											
			Gray cast iron							★	K			
			Nodular cast iron							★				
			Non-ferrous metals								N			
			Heat-resistant alloy								S			
			Titanium alloy											
Hard materials								H						
Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide	Cermat	Applicable toolholder	
				IC	S	RE	BCH	BS	AN	AS	CVD	-		
											C4420M	TN100M		
		SNCN 1204XNTN	8	12.7	4.76	-	2	2	-	-		●		-
		SNKN 1204XNTN	8	12.7	4.76	-	2	2	-	-		●		-
		SNMF 1204XNTN	8	12.7	4.76	-	2	2	-	-		●		-
	 Without chipbreaker	SNMN 120412 120424	8	12.7	4.76	1.2 2.4	-	-	-	-	● ●	● ●		-

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

● : Standard item

M296

T type inserts

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel										☆	★	■	P
		Mold and die steel										☆	★	■	
		Austenitic stainless steel										☆	★		M
		Martensitic stainless steel													
		Precipitation hardening stainless steel													
		Gray cast iron										★		☆	K
		Nodular cast iron										★			
		Non-ferrous metals												★	N
		Heat-resistant alloy													S
		Titanium alloy													
		Hard materials													H
Insert	Description	No. of edges	Dimension (mm)					Angle (°)		Carbide			Cermet		Applicable toolholder
			IC	S	BCH	RE	BS	AN	AS	PVD	-	-			
													PH210	PH125	
	TEKN 1603PTFR	3	9.525	3.18	0.7	-	1.4	20	22						-
	TEKN 1603PTTR	3	9.525	3.18	0.7	-	1.4	20	22	●					
	TEEN 2204PTTR	3	12.7	4.76	-	1	1.4	20	22						
	TEKN 2204PTFR	3	12.7	4.76	0.7	-	1.4	20	22						
	TEKN 2204PTTR	3	12.7	4.76	0.7	-	1	1.4	20	22	●				
	TEKR 2204PTFR-S	3	12.7	4.76	-	1	1.4	20	22		●				-
	TEMR 1603PTFR-H	3	9.525	3.18	-	0.8	1.2	20	22			●			-
	TEMR 2204PTFR-H	3	12.7	4.76	-	1	1.4	20	22			●			
	TPKN 1603PDTR	3	9.525	3.18	0.7	-	1.2	11	15					●	-
	TPKN 1603PDTR	3	9.525	3.18	0.7	-	1.2	11	15	●	●			●	
	TPKN 2204PDTR	3	12.7	4.76	0.7	-	1.6	11	15				●		
	TPKN 2204PDTR	3	12.7	4.76	0.7	-	1.6	11	15	●	●			●	
	TPKR 2204PDTR-S	3	12.7	4.76	-	1	1.4	11	15		●				-
	TPMR 1603PDTR-H	3	9.525	3.18	-	0.8	1.2	11	15			●			-
	TPMR 2204PDTR-H	3	12.7	4.76	-	1	1.4	11	15			●			
	TPGN 090202	3	5.56	2.38	-	0.2	-	11	-				●	●	-
	TPGN 090204					0.4							●	●	
	TPGN 110302	3	6.35	3.18	-	0.2	-	11	-				●	●	
	TPGN 110304					0.4							●	●	
	TPGN 110308					0.8							●	●	
	TPGN 160304	3	9.525	3.18	-	0.4	-	11	-				●	●	
	TPGN 160308					0.8							●	●	
	TPMN 110304	3	6.35	3.18	-	0.4	-	11	-				●	●	
	TPMN 110308					0.8							●	●	
	TPMN 160304	3	9.525	3.18	-	0.4	-	11	-				●	●	
	TPMN 160308					0.8							●	●	
	TPMN 160312					1.2							●	●	
TPMN 220408	3	12.7	4.76	-	0.8	-	11	-					●		

Handed insert shows Right-hand

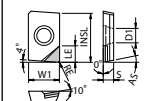
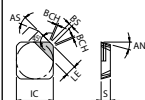
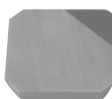
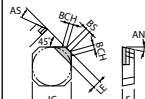
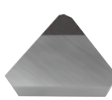
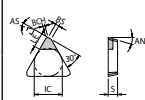
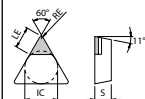
● : Standard item

M



Milling

PCD inserts

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel														P			
		Mold and die steel																	
		Austenitic stainless steel														M			
		Martensitic stainless steel																	
		Precipitation hardening stainless steel																	
		Gray cast iron														K			
		Nodular cast iron																	
		Non-ferrous metals											□		■	N			
		Heat-resistant alloy														S			
		Titanium alloy											□		■				
Hard materials														H					
Insert		Description	No. of edges	Dimension (mm)										Angle (°)		PCD			Applicable toolholder
				IC	W1	S	D1	RE	INSL	LE	BCH	BS	AN	AS	-				
															KPD001	KPD010	KPD230		
		NDCW 150302FRX 150302FRX-NE	1	-	9.525	3.18	4.4	0.2	15	5.7 5.1	-	-	-	15	●	●	●	DMC...SX(...) DMC...H	
		SDKN 1203AUFN 1203AUFN-NE	1	12.7	-	3.18	-	-	-	3.6 3.1	0.5	1.2	15	23	●	●	●	-	
		SEEN 1203AFFN 1203AFFN-NE	1	12.7	-	3.18	-	-	-	3.5 3	0.5	1.4	20	25	●	●	●	-	
		TEEN 1603PTFR 1603PTFR-NE	1	9.525	-	3.18	-	-	-	4.7 4.1	0.6	1.4	20	22	●	●	●	-	
		TEKN 2204PTFR 2204PTFR-NE	1	12.7	-	4.76	-	-	-	4.8 4.2	0.7	1.8	20	22	●	●	●	-	
		TPGN 110302 110304	1	6.35	-	3.18	-	0.2 0.4	-	3.9 3.7	-	-	11	-	●	●	●	-	

Handed insert shows Right-hand

M

Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

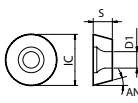
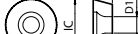
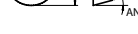
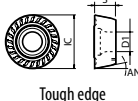
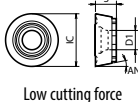
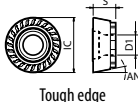
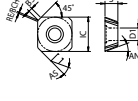
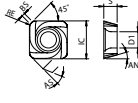
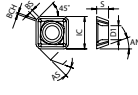
Others

● : Standard item

M298

CBN & PCD Inserts are
sold in 1 piece boxes

Available geometries

Classification of usage ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)			Carbon steel / Alloy steel										☆	★	☆	■	P		
			Mold and die steel										☆	★	☆	■			
			Austenitic stainless steel										☆	☆	★			M	
			Martensitic stainless steel												☆				
			Precipitation hardening stainless steel												★				
			Gray cast iron										☆	★		☆			K
			Nodular cast iron										☆	★					
			Non-ferrous metals													★		N	
			Heat-resistant alloy													☆		S	
			Titanium alloy												★				
			Hard materials															H	
			Insert		Description	Dimension (mm)								Angle (°)		Carbide			
IC	S	D1				RE	BCH	BS	L	AN	AS	PVD				-	-		
												PR1210	PR1225	PR1810	PR1825			PR1835	KW10
		RDHX 0702M0T	7	2.39	2.8	-	-	-	-	15	-					●			-
		RDHX 1003M0T	10	3.18	3.8	-	-	-	-	15	-					●			
		RDHX 12T3M0T	12	3.97	3.8	-	-	-	-	15	-					●			
		RDMT 08T2M0-H	8	2.78	3.4	-	-	-	-	15	-			●	●	●			-
		RPMT 10T3M0	10	3.97	3.4	-	-	-	-	11	-			●	●	●			-
		RPMT 1204M0-H	12	4.76	4.4	-	-	-	-	11	-			●	●	●	●		-
		RPMT 1606M0-H	16	6.35	5.5	-	-	-	-	11	-			●	●	●	●		
		RPMT 2006M0-H	20	6.35	6.5	-	-	-	-	11	-			●	●	●	●		
Tough edge																			
		SDKW 1204AESN	12.7	4.76	5.5	1	-	1.5	-	15	20		●						-
		SDKW 1204AETN	12.7	4.76	5.5	1	-	1.5	-	15	20	●							
		SEKW 1204AFTN	12.7	4.76	5.5	-	0.5	1.7	-	20	25	●	●						
		SDMT 1204AESR-H	12.7	4.76	5.5	1	-	0.8	-	15	20			●					-
		SEKT 1204AFEN-S	12.7	4.76	5.5	-	0.5	1.7	-	20	25		●						-

Handed insert shows Right-hand

● : Standard item

M



Milling

