

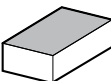
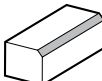
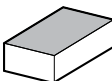
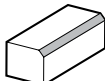






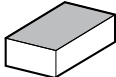
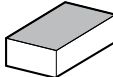






MILLING

M1 - M269

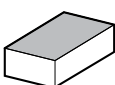

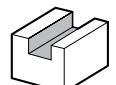
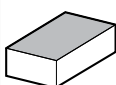
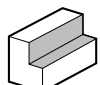
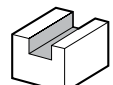









MILLING SERIES		M2 - M10
PRODUCT LINEUP		M2
MILLING INSERTS		M12 - M30
45° / 66° / 70° LEAD ANGLE		M31 - M56
MFPN45		M31
MFPN66		M36
MFLN45 / MFLN70		M40
MFK / MFK-SF	for Cast Iron Machining	M46
MFSE45		M52
75° LEAD ANGLE		M57 - M61
MSRS15		M57
90° / 88° LEAD ANGLE		M62 - M165
MEW	M-FOUR	M62
MEC / MECX		M72
MEV	M-THREE	M88
MEWH / MECH / MECHT	Helical End Mills	M96
MFWN / MFWN-MINI	M-SIX	M110
MFSN88		M122
MFLN90		M126
MSRS90		M128
MSR / MSR-BT50		M134
MTP90		M141
DMC / DMC-SX / DMC-H		M142
MFAH	for Aluminum Machining	M146
MEAS	for Aluminum Machining	M154
EM / EM-LE / FM-90		M160
FM-AL / EM-AL	for Aluminum Machining	M163
MAP / CEM		M164
HIGH FEED MILLING		M166 - M199
MFH	MFH-MAX	M166
MFH	MFH-RAPTOR	M174
MFH	MFH-RAPTOR Mini	M187
MFH	MFH-RAPTOR Micro	M194
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MFF		M200
MULTI-FUNCTION END MILLS (MEY / MEZ-G)		M206 - M209
SLOT MILLS (MSTA / MSTB / MSTC)		M210 - M235
BALL-NOSE / RADIUS CUTTERS		M236 - M255
MRF / MRFW		M236
MRW	RAD-8	M238
MRX	RAD-6	M246
OTHER APPLICATIONS		M256 - M268
API	Ring Groover	M256
CM / CM-AL	Chamfering End Mill	M259
MCSE	Chamfering End Mill	M260
MEF	Bolt Countersink End Mill	M262
METS	T-Slot Mill	M264
MGI	Grooving End Mills for M/C	M266
MVG	Ring Grooving End Mills for M/C	M268
DC	Dovetail End Mills	M269

45° / 66° / 70° / 75° Lead Angles

Lead Angle	Applications		Facing	Chamfering	Lead Angle	Applications		Facing	Chamfering
	Shape					Shape			
45°	MFPN45  ➔ M31		<ul style="list-style-type: none">• 10-edge pentagonal inserts• Double-sided pentagonal insert Economical with 10-edge insert• Low cutting force due to helical cutting-edge design• Fractures suppressed with double-edge position		45°	MFLN45  ➔ M42		<ul style="list-style-type: none">• Heavy milling• Tangentially mounted inserts for high stability• Large D.O.C. and high feed rates• Maximum D.O.C. = 12mm	
	MFPN45  ➔ M33		<ul style="list-style-type: none">• 10-edge pentagonal inserts• Double-sided pentagonal insert Economical with 10-edge insert• Low cutting force due to helical cutting-edge design• Fractures suppressed with double-edge position• With weldon or cylindrical shank			MFSE45  ➔ M52		<ul style="list-style-type: none">• High precision high rake milling• Rough and finish in a single pass• Excellent surface finish	


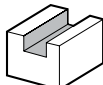
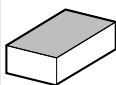
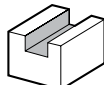







Lead Angle	Applications		Lead Angle	Applications	
	Shape	Facing		Shape	Facing
66°					
	MFPN66  ➔ M37	<ul style="list-style-type: none">• Double-sided 10-edge insert• Cutting edge angle of 66°• Reduces chattering with a low cutting force design	70°	MFLN70  ➔ M43	<ul style="list-style-type: none">• Heavy milling• Tangentially mounted inserts for high stability• Large D.O.C. and high feed rates• Maximum D.O.C. = 17mm
	MFPN66  ➔ M38	<ul style="list-style-type: none">• Double-sided 10-edge insert• Cutting edge angle of 66°• Reduces chattering with a low cutting force design• With Ø32mm and Ø40mm cylindrical shanks		MFK  ➔ M48	<ul style="list-style-type: none">• High efficiency multi-edge cutter for cast iron• Economical double-sided 10-edge inserts• Low cutting forces due to helical cutting-edge design• Improved surface finish, minimizing chattering and prevents burr formation• Dual cutting edge design (high toughness)
75°	MSRS15  ➔ M58	<ul style="list-style-type: none">• For heavy cutting• Max D.O.C. 0.472"• Metal removal rate is increased drastically		MFK-SF  ➔ M50	<ul style="list-style-type: none">• Cutter for cast iron with adjustable cutting edge height• High speed and high precision machining of cast iron by combining ceramic and CBN wiper inserts

90° / 88° Lead Angles (Double-sided Insert)

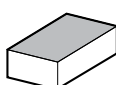
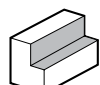
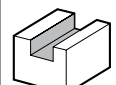
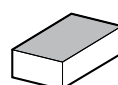
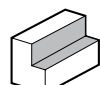
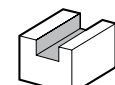

















Lead Angle	Applications	Facing	Shouldering	Slotting	Lead Angle	Applications	Facing	Shouldering	Slotting
	Shape								
90°	MEW End Mill  ➔ M64	<ul style="list-style-type: none"> Economical 4-edge insert Obtuse edge increases cutting edge toughness Smooth surface wall due to low cutting forces Good anti-chatter performance 			90°	MFWN Face Mill  ➔ M112	<ul style="list-style-type: none"> Economical 6-edge Insert Superior fracture resistance due to thick edge design Dynamic slant design reduces shock when cutting edge enters the workpiece Low cutting forces End mills have weldon or cylindrical shanks 		
	MEW Face Mill  ➔ M66					MFWN End Mill  ➔ M115			
	MEW Modular  ➔ M68					MFWN-Mini Face Mill  ➔ M118			
88°					88°	MFWN-Mini End Mill  ➔ M119	<ul style="list-style-type: none"> Small diameter for 5mm D.O.C. or less Economical 6-edge insert Superior fracture resistance due to thick edge design Dynamic slant design reduces shock when cutting edge enters the workpiece Low cutting forces and chatter resistance 		
						MFSN88 Face Mill  ➔ M123			
						MFSN88 End Mill  ➔ M124			

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

90° Lead Angles (Heavy Milling)




Lead Angle	Applications	Facing	Shouldering	Slotting	Lead Angle	Applications	Facing	Shouldering	Slotting
									
Shape					Shape				
0° (Long Cutting Edge)	MEWH	<ul style="list-style-type: none">• Low cutting force and sharp cutting performance• Excellent surface finish quality• Economical double-sided 4-edge inserts• High quality and stable machining during heavy milling applications			0° (Long Cutting Edge)	MECH	<ul style="list-style-type: none">• Notched insert promotes higher productivity• Large depth of cut provides high efficiency cutting• MECH is the best solution for problems with heavy milling		
									
	➡ M97					➡ M100			
	MEWH Shell Mill	<ul style="list-style-type: none">• MEWH shell mill				MECH Shell Mill	<ul style="list-style-type: none">• MECH shell mill		
									
	➡ M98					➡ M101			
MSR	<ul style="list-style-type: none">• Low cutting force and resistance to chattering with notched insert• Chipbreaker design with specialized notches improves chip evacuation• Chipbreaker achieves stabilized cutting for heavy roughing applications			0° (Long Cutting Edge)	MECH-BT50 MECH-BT50SA	<ul style="list-style-type: none">• Highly rigid, integral BT50 arbor• Head exchangeable type is available (MECH-BT50SA)			
									
➡ M135					➡ M101-M103				
MSR-BT50	<ul style="list-style-type: none">• Highly rigid, BT50 Arbor				MECHT	<ul style="list-style-type: none">• Designed for stable machining in titanium alloy with exceptional chatter resistance and chip control• Helical end mill type available with Ø32mm shank			
									
➡ M137					➡ M109				
MFLN90	<ul style="list-style-type: none">• Heavy milling• Tangentially mounted inserts for high stability• Large D.O.C. and high feed rates• Maximum D.O.C. = 20mm				MAP	<ul style="list-style-type: none">• Cutting dia. 1.000"• Low cutting force, good chip evacuation• High-efficiency machining			
									
➡ M126					➡ M164				
MSRS90	<ul style="list-style-type: none">• Notched insert reduces cutting forces• Stable cutting without chatter• Neutral insert allows the possibility of various custom-ordered cutters			CEM	<ul style="list-style-type: none">• Cutting dia. 0.375" to 1.500"• For small milling machines				
									
➡ M130				➡ M165					

90° Lead Angles

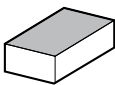
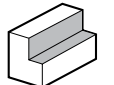
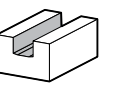
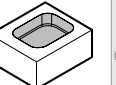
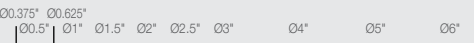























































Lead Angle	Applications	Facing	Shouldering	Slotting	Lead Angle	Applications	Facing	Shouldering	Slotting
									
Shape					Shape				
90°	MEC End Mill  ➔ M72	<ul style="list-style-type: none">• Great 90 degree shoulders• Low cutting force• The silver coating prevents chip wear on the tool body• With air hole (Over Ø16)			MEV End Mill  ➔ M90	<ul style="list-style-type: none">• High-performance multi-functional milling• Economical 3-edge insert• Triangular insert design provides lower cutter forces and increased rigidity• Improved tool life• Great for slotting, helical milling, shouldering, ramping, facing, and pocketing			
	MEC Face Mill  ➔ M75	<ul style="list-style-type: none">• The twisted cutting edge improves cutting performance• Smooth surface of shoulder Wall• True 90° Corners• The silver coating prevents chip wear on the tool body• Available with coolant holes			MEV Face Mill  ➔ M91				
	MEC Modular  ➔ M77	<ul style="list-style-type: none">• Great 90 degree shoulders• Low cutting force• The silver coating prevents chip wear on the tool body• With air hole (Over Ø16)			MEV Modular  ➔ M91				
	MECX End Mill  ➔ M84	<ul style="list-style-type: none">• Great 90 degree shoulders• Small size Insert with multi-edge specification• Low cutting force• The silver coating prevents chip wear on the tool body• With air hole			DMC  ➔ M142	<ul style="list-style-type: none">• For small milling machine, M/C			
	MECX Face Mill  ➔ M85	<ul style="list-style-type: none">• Efficient machining due to small diameter cutter that holds multiple inserts• Recommended for small machines: low cutting force and high strength design• The silver coating prevents chip wear on the tool body• Available with coolant holes			DMC-H  ➔ M144	<ul style="list-style-type: none">• High rake type• For small milling machine, M/C			
	MTP90  ➔ M141	<ul style="list-style-type: none">• Medium to roughing of steel / cast iron• For small machines and M/C			DMC-SX  ➔ M143	<ul style="list-style-type: none">• For small milling machine, M/C			
	EM  ➔ M160	<ul style="list-style-type: none">• Extended length end mills							
	EM-LE  ➔ M161	<ul style="list-style-type: none">• Long edge end mill							
	FM-90  ➔ M162	<ul style="list-style-type: none">• Fixed pocket face mills							
	FM-AL  ➔ M163	<ul style="list-style-type: none">• Aluminum cutting face mills• Fixed pocket							
	EM-AL  ➔ M163								

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
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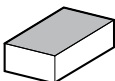


Aluminum Milling Cutters

Lead Angle	Shape	Applications			
		Facing	Shouldering	Slotting	Pocketing
90°	MFAH  M148	<ul style="list-style-type: none"> • High efficiency milling cutter for finishing aluminum • Light-weight hybrid body with internal coolant available • Adjustable blade runout • 3 different cutting edges 			
	MEAS End Mill  M156	<ul style="list-style-type: none"> • High efficiency, high-speed end mills for aluminum machining • Reliable scatter prevention • Great for multiple machining applications 			
	MEAS Face Mill  M156	<ul style="list-style-type: none"> • High efficiency, high-speed face mills for aluminum machining • Reliable scatter prevention • Great for multiple machining applications 			

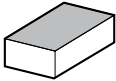







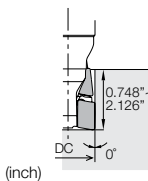
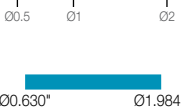


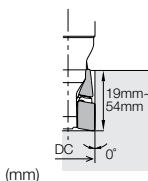
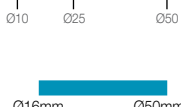
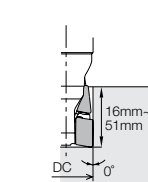
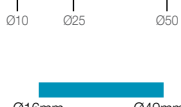
High Feed Cutters

Lead Angle	Applications	Facing	Shouldering	Slotting	Pocketing	Cutting Dia. DCX	
							
	Shape						
90°	MFH Face Mill  M176	<ul style="list-style-type: none"> Various applications with 4 insert types 				 	A
	MFH End Mill  M179	GM (General Milling) GH (Tough Edge) FL (Wiper Edge) Available for both Roughing and Finishing LD (Large D.O.C.) MAX D.O.C. = 0.197" Available for Scale Removal				   	B
	MFH Modular  M182	<ul style="list-style-type: none"> Convex cutting edge reduces chatter and chip biting Multi-functional cutter for ramping, helical milling, plunging etc. (GM/GH type) 				 	C
	MFH-MAX End Mill  M168	<ul style="list-style-type: none"> Economical double-sided 4-edge insert 				   	D
	MFH-MAX Face Mill  M169	<ul style="list-style-type: none"> High feed milling with a larger depth of cut Excellent performance in a variety of applications, including auto parts, difficult-to-cut materials, and mold machining 				   	E
	MFH-MAX Modular  M170					   	F
	MFH-Mini End Mill  M188	<ul style="list-style-type: none"> Economical double-sided 4-edge insert 				   	G
	MFH-Mini Face Mill  M190	GM (General Milling) GH (Tough Edge)				   	H
	MFH-Mini Modular  M191	<ul style="list-style-type: none"> High efficiency and high feed small diameter machining 				   	J
	MFH Micro  M196	<ul style="list-style-type: none"> Smallest diameters in the MFH high feed milling series 				   	K
	MFH Micro Modular  M197	GM (General Milling)				   	L


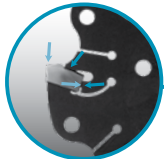



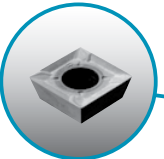
Finishing Milling Cutters

Lead Angle	Applications	Facing
	Shape	
90°	MFF   M204	<ul style="list-style-type: none"> • Unique cutter design for finishing solutions • Features wiper edge for high-feed finishing and excellent surface finish • Easily adjustable cutting edge height

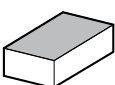
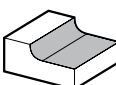
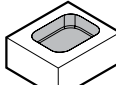

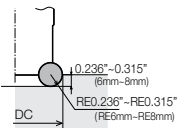
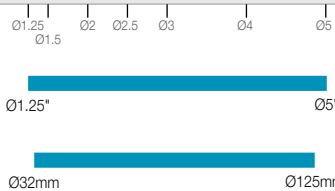

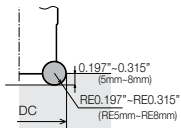
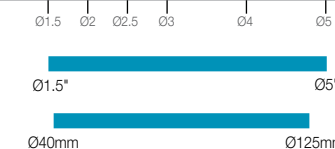

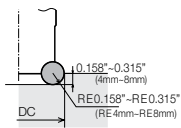
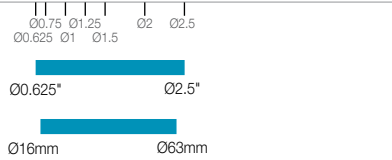

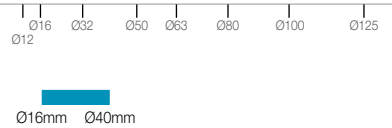
Multi-Function End Mills

Applications	Facing	Shouldering	Slotting	Deep Slotting	Pocketing	Drilling	Lead Angle and MAX D.O.C.	Cutting Dia. DC
Shape								
MEY   M206	<ul style="list-style-type: none"> • Ultra drill mill • Multi-function cutting (drilling / ramping / shouldering / grooving) • High-efficiency mold cutting • Low cutting force, good chip evacuation 		<ul style="list-style-type: none"> • Full 2-Flute structure and high stability • Good chip control when ramping 		<ul style="list-style-type: none"> • Cutting diameters that are larger than the shank diameters enables wall shouldering • The silver coating prevents chip wear on the tool body 		 (inch)	 (inch)
MEZ-G   M208	<ul style="list-style-type: none"> • Silver drill mill • Multi-function cutting • High-efficiency mold cutting • Low cutting force, Good chip evacuation 		<ul style="list-style-type: none"> • The silver coating prevents chip wear on the tool body • The clearance groove prevents chip welding 				 (mm)	 (mm)
							 (mm)	 (mm)

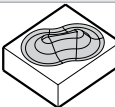
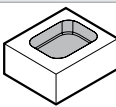

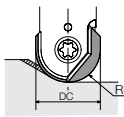



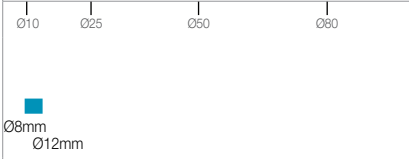
MST Slot Mills

MSTA  M212 	MSTB  M216 	MSTC  M222 
<ul style="list-style-type: none"> • Self-clamping system • Remove insert with appropriate wrench 	<ul style="list-style-type: none"> • Easy screw on tangential clamped insert 	<ul style="list-style-type: none"> • Adjustable slotting width due to unique cam adjustment structure






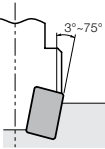

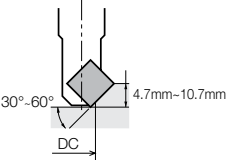
Radius Cutters

Applications	Facing	Shouldering	Pocketing	Lead Angle and MAX D.O.C.	Cutting Dia. DC
Shape					
MRW (RAD-8)  M240	<ul style="list-style-type: none"> High efficiency radius cutter with multiple-edge inserts Combines sharpness and cutting edge strength (A.R. Max. +12°) Prevents insert rotation during machining with flat lock structure Wide application range from steel to heat-resistant alloys 			 0.236°~0.315° (6mm~8mm) RE0.236°~RE0.315° (RE6mm~RE8mm)	 01.25 02 02.5 03 04 05 01.25" 05" Ø32mm Ø125mm
MRX (RAD-6) Face Mill  M247	<ul style="list-style-type: none"> Low cutting force and high performance radius cutter Low cutting force due to helical cutting-edge design (A.R. Max. +10°) Prevents insert rotation during machining with flat lock structure Wide application range including facing, grooving, pocketing and plunging Wide application range from steel to heat-resistant alloys 			 0.197°~0.315° (5mm~8mm) RE0.197°~RE0.315° (RE5mm~RE8mm)	 01.5 02 02.5 03 04 05 01.5" 05" Ø40mm Ø125mm
MRX (RAD-6) End Mill  M249				 0.158°~0.315° (4mm~8mm) RE0.158°~RE0.315° (RE4mm~RE8mm)	 00.75 01.25 02 02.5 00.625 01 01.5 00.625" 02.5" Ø16mm Ø63mm
MRX (RAD-6) Modular  M251					 016 032 050 063 080 0100 0125 012 Ø16mm Ø40mm

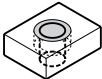
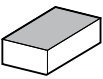
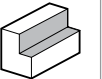

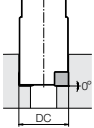
Ball-Nose End Mills

Applications	Contouring / Profiling	Pocketing	Lead Angle and MAX D.O.C.	Cutting Dia. DC
Shape				
MRF  M236	<ul style="list-style-type: none"> For high quality mold finishing High R-accuracy (insert's R-accuracy: under ±0.01mm) The bushing ensures insert installation accuracy 			 010 025 050 080 Ø8mm Ø25mm
MRFW  M236	<ul style="list-style-type: none"> Carbide For high quality mold finishing High R-accuracy (Insert's R-accuracy: Under ±0.01mm) The bushing ensures insert installation accuracy Anti-vibration, and stable cutting is possible with long overhang length without chattering 			 010 025 050 080 Ø8mm Ø12mm




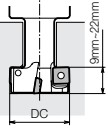
Chamfering

Applications	Chamfering	Countersinking	Back Chamfering	V Shape Slotting	Lead Angle and MAX D.O.C.
Shape					
CM / CM-AL  M259	<ul style="list-style-type: none"> Chamfering angles 3°-75° CM-AL for aluminum cutting 				
MCSE  M260	<ul style="list-style-type: none"> Chamfering angles for 30°, 45°, 60° Economical 4-sided insert Available for back chamfering 				


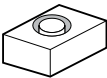
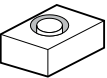

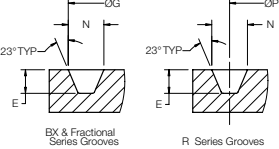

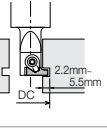

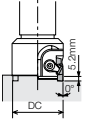
Counterboring

Applications	Bolt Counterboring	Facing	Shouldering	Lead Angle and MAX D.O.C.
Shape				
MEF  M262	<ul style="list-style-type: none"> Counterboring for hexagon socket bolt (M6-M30) Economical S-type insert (4-Edge) 			

T-Slotting

Applications	T-Slotting	Back Side Milling	Lead Angle and MAX D.O.C.
Shape			
METS  M264	<ul style="list-style-type: none"> T-Slotting Recommended for high feed cutting with 2 flute design Economical square insert (4 cutting edges) 		

Grooving

Applications	Internal Grooving	Ring Grooving	API Ring Grooving	Lead Angle and MAX D.O.C.
Shape				
API  M256			<ul style="list-style-type: none"> The most economical and reliable tool to produce API ring grooves for the oil, gas, and petrochemical industries 	
MGI  M266	<ul style="list-style-type: none"> Edge Width 1.0-4.0mm Grooving for machining centers 			
MVG  M268		<ul style="list-style-type: none"> Cutting dia. Ø30-Ø75mm Edge width: 4.0-4.9mm O-Ring grooving (G Series) 		

MILLING INSERT IDENTIFICATION SYSTEM

Symbol	Shape
H	Hexagon
O	Octagon
P	Pentagon
S	Square
T	Triangle
C	80° Diamond
D	55° Diamond
E	75° Diamond
F	50° Diamond
M	86° Diamond
V	35° Diamond
W	80° Trigon
L	Rectangle
A	85° Parallelogram
B	82° Parallelogram
K	55° Parallelogram
R	Round

Shown angle stands for acute angle for rhombic and parallelogram inserts.

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other Angles

Symbol (Class)	Tolerance					
	Corner Height		Thickness		I.C. Size	
	ANSI (±inch)	ISO (±mm)	ANSI (±inch)	ISO (±mm)	ANSI (±inch)	ISO (±mm)
A	0.0002	0.005			0.0010	0.025
F					0.0005	0.013
C	0.0005	0.013			0.0010	0.025
H					0.0005	0.013
E	0.0010	0.025			0.0010	0.025
G					0.0010	0.025
J	0.0002	0.005				
K*	0.0005	0.013				
L*	0.0010	0.025				
M*	0.003-0.007	0.080-0.180				
N*						
U*	0.005-0.015	0.130-0.380				
R	Blank with grind stock on all surfaces					
S	Blank with grind stock on top and bottom surface only					

Insert's periphery is as fired.
* Tolerance difference depends on size and shape of insert.

I.C. Size (inch)	Symbol
5/32	1.2
3/16	1.5
7/32	1.8
1/4	2
5/16	2.5
3/8	3
7/16	3.5
1/2	4
9/16	4.5
5/8	5
11/16	5.5
3/4	6
7/8	7
1	8
1-1/4	10

Inserts with Radius			
0	Sharp Corner	4	1/16" Radius
1	1/64" Radius	6	3/32" Radius
2	1/32" Radius	8	1/8" Radius
3	3/64" Radius		

Insert with Wiper Flats	
A	Square Insert 45° Chamfer
D	Square Insert 30° Chamfer
E	Square Insert 15° Chamfer
F	Square Insert 3° Chamfer
K	Square Insert 30° Double Chamfer
L	Square Insert 15° Double Chamfer
M	Square Insert 3° Double Chamfer
N	Truncated Triangle Insert
P	Flatted Corner Triangle
X	Triangle Insert 15° Double Chamfer

Symbol	Insert
F	Sharp Edge
E	R-honed
T	Chamfered
S	Chamfered + R-honed

ANSI
(inch)

S	E	K	N	4	2	A	F	T	N	
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

ISO
(metric)

S	E	K	N	12	03	A	F	T	N	
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

④ Hole / Chipbreaker	
Symbol	Insert
W	No Chipbreaker with Hole
T	Single-sided Chipbreaker with Hole
F	Double-sided Chipbreaker without Hole
N	No Chipbreaker without Hole
R	Single-sided Chipbreaker without Hole
M	Single-sided Chipbreaker with Hole
A	No Chipbreaker with Hole

⑤ Edge Length Symbol (ISO)	
S	
T	
R	
A, N	
O	
P	
W	

⑥ Thickness			
ISO		ANSI	
Thickness (mm)	Symbol	Thickness (inch)	Symbol
1.59	01	1/16	1
1.98	T1	5/64	1.2
2.38	02	3/32	1.5
2.78	T2	-	-
3.18	03	1/8	2
3.97	T3	5/32	2.5
4.76	04	3/16	3
5.56	05	7/32	3.5
6.35	06	1/4	4
7.94	07	5/16	5
9.525	09	3/8	6

Thickness displayed as the distance between bottom surface and highest point on cutting edge.

⑦ Cutting Edge Angle	
Symbol	Cutting Edge Angle
A	45°
D	60°
E	75°
F	85°
H	87°
P	90°
X	65°

⑧ Relief Angle	
Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
R	10°
S	14°
T	22°
U	23°

⑩ Tool Hand	
R	Right-hand
L	Left-hand
N	Neutral

⑪ Manufacturer's Option	
	Chipbreaker, etc.

⑦⑧ Corner-R(RE)			
ISO		ANSI	
Symbol	Corner-R (RE) (mm)	Symbol	Corner-R (RE) (inch)
04	0.40	1	1/64
08	0.80	2	1/32
12	1.20	3	3/64
16	1.60	4	1/16
20	2.00	5	5/64

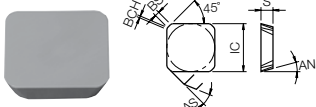
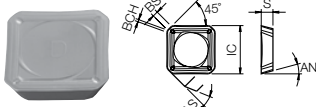
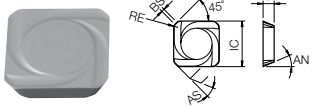
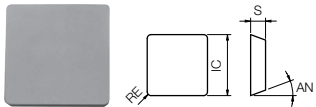

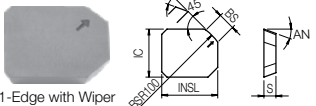
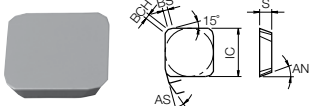
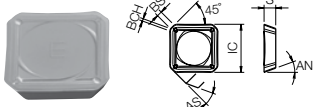

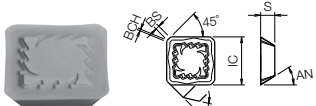

Milling Inserts

without Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice (Hardness Under 45HRC)

P	Free-Cutting Steel	■	■					★		
	Carbon/Alloy Steel	■	■					★		
M	Stainless Steel							★		
K	Gray Cast Iron								★	☆
	Nodular Cast Iron								★	
N	Non-ferrous Metals									★
S	Heat-Resistant Alloys							★		
	Titanium Alloy								★	☆
H	Hard Materials								■	

Insert (Right-hand Shown)	Part Number (ANSI)	Part Number (ISO)	Dimensions (in)							Angle (°)		Cermet		CVD Coated Carbide	MEGACOAT (PVD Coated Carbide)	Carbide	Toolholder Page			
			IC	S	BCH	BS	RE	INSL	AN	AS	TN610	TN60	TN100M	CA6535	CA420M	PR1535		PR1225	PR1210	KW10
	SDKN 42AUTN	SDKN 1203AUTN	0.500	0.125	0.020	0.047	-	-	15°	23°			●			●	●			-
	42AUFN	1203AUFN																		
	(Use ISO Part Number)	SDKN 1504AUTN		0.625	0.187												●			
	SDKR 42AUFN-S	SDKR 1203AUFN-S	0.500	0.125	0.020	0.067	-	-	15°	23°			●				●			-
	SDMR 42AUFN-H	SDMR 1203AUFN-H	0.500	0.125	-	0.031	0.039	-	15°	23°							●			-
	SEC 422	SEC 120308	0.500	0.125	-	-	0.031	-	20°	-	●									-
	424	120316					0.063				●									
	SEEN 42AFTN	SEEN 1203AFTN	0.500	0.125	0.020	0.055	-	-	20°	25°			●				●	●		-
	SEKN 42AFTN	SEKN 1203AFTN											●							
	42AFFN	1203AFFN																●		
	SEKN 43AFTN	SEKN 1204AFTN															●			
	SEKN 53AFTN	SEKN 1504AFTN	0.625	0.187									●				●			-
 1-Edge with Wiper	SEEN 42AFTR-W	SEEN 1203AFTR-W	0.500	0.125	-	0.138	-	0.573	20°	25°			●							-
	42AFFR-W	1203AFFR-W																		
	SEKN 42EFTR	SEKN 1203EFTR	0.500	0.125	0.047	0.055	-	-	20°	25°			●							-
	SEKR 42AFEN-S	SEKR 1203AFEN-S	0.500	0.125	0.020	0.067	-	-	20°	25°			●				●			-
	(Use ISO Part Number)	SOKN 13T3AXTN	0.531	0.156	0.020	0.043	-	-	27°	32°			△				△	△		-
		13T3AXFN																		
	(Use ISO Part Number)	SOKR 13T3AXEN-J	0.531	0.156	0.020	0.043	-	-	27°	32°			△				△		△	-

SEEN-W inserts sold in 5 piece boxes.

Other inserts sold in 10 piece boxes.

Milling Inserts

without Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice
- (Hardness Under 45HRC)

Insert (Right-hand Shown)	Part Number (ANSI)	Part Number (ISO)	Dimensions (in)					Angle (°)		Cermet	CVD Coated Carbide	MEGACOAT (PVD Coated Carbide)	Carbide	Toolholder Page									
			IC	S	BCH	BS	RE	AN	AS														
	SPCN 42EDTR	SPCN 1203EDTR	0.500	0.125	-	0.079	0.039	11°	15°	TN60	TN100M	CA6535	CA420M	PR1535	PR1225	PR1210	KW10	-					
	SPKN 42EDTR	SPKN 1203EDTR			0.039		-			●	●	●	●	●	●	●	●	●	●	●	●	●	-
	42EDTL	1203EDTL			-		0.039			●	●	●	●	●	●	●	●	●	●	●	●	●	-
	42EDER	1203EDER			0.039		-			●	●	●	●	●	●	●	●	●	-				
	42EDFR	1203EDFR								●	●	●	●	●	●	●	●	●	●	●	-		
	SPKN 53EDTR	SPKN 1504EDTR	0.625	0.187	0.039	0.087	-	●	●	●	●	●	●	●	●	●	●	●	-				
	SPEN 42EEER	SPEN 1203EEER	0.500	0.125	0.039	0.055	-	11°	20°	●	●	●	●	●	●	●	●	-					
	42EESR	1203EESR								●	●	●	●	●	●	●	●	●	●	●	●	●	●
	SPCN 42XPTR	SPCN 1203XPTR	0.500	0.125	-	0.079	0.039	11°	11°	●	●	●	●	●	●	●	●	-					
	SPKN 42XPTR	SPKN 1203XPTR					0.039			-	●	●	●	●	●	●	●	●	●	●	●	●	-
	42XPFR	1203XPFR	0.625	0.187	0.039	-	11°	20°	●	●	●	●	●	●	●	●	●	-					
	SPKN 53XETR	SPKN 1504XETR							●	●	●	●	●	●	●	●	●	●	●	●	●	-	
	SPCN 63EETR1	SPCN 1904EETR1	0.750	0.187	0.028	0.047	-	11°	20°	●	●	●	●	●	●	●	●	-					
	SPKR 42EDER-S	SPKR 1203EDER-S	0.500	0.125	-	0.079	0.039	11°	15°	△	●	●	●	●	●	●	●	-					
	SPMR 42EDER-H	SPMR 1203EDER-H	0.500	0.125	-	0.079	0.039	11°	15°	●	●	●	●	●	●	●	●	-					
	SPM 422	SPMN 120308	0.500	0.125	-	-	0.031	11°	-	●	●	●	●	●	●	●	●	●	-				
	423	120312					0.047			●	●	●	●	●	●	●	●	●	●	●	●	●	-
	SPM 432	SPMN 120408	0.031	●			●			●	●	●	●	●	●	●	●	●	●	●	-		
	433	120412	0.047	●			●			●	●	●	●	●	●	●	●	●	●	●	-		
	SPG 321	SPGN 090304	0.375	0.125	0.016	●	●			●	●	●	●	●	●	●	●	●	●	-			
	322	090308			0.031	●	●			●	●	●	●	●	●	●	●	●	●	-			
	SPG 421	SPGN 120304	0.500	0.125	-	-	0.016	11°	-	●	●	●	●	●	●	●	●	-					
	422	120308					0.031			●	●	●	●	●	●	●	●	●	●	●	●	-	
	SNCN 43XNTN	SNCN 1204XNTN	0.500	0.187	0.079	0.079	-	-	-	●	●	●	●	●	●	●	●	-					
	SNKN 43XNTN	SNKN 1204XNTN					●			●	●	●	●	●	●	●	●	●	●	●	●	-	
	SNMF 43XNTN	SNMF 1204XNTN	0.500	0.187	0.079	0.079	-	-	-	●	●	●	●	●	●	●	●	-					
	SNM 433	SNMN 120412	0.500	0.187	-	-	0.047	-	-	●	●	●	●	●	●	●	●	-					
	436	120424					0.094			●	●	●	●	●	●	●	●	●	●	●	-		

Inserts sold in 10 piece boxes.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)

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(Technical Support) 800.823.7284 - Option 2
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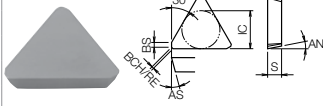
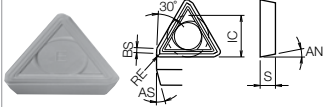
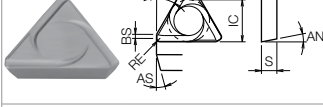
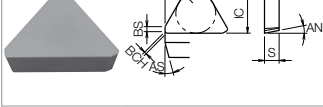
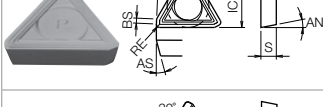
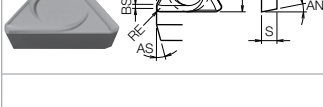


Milling Inserts



without Hole

Usage Classification

- ★ Roughing / 1st Choice
 - ☆ Roughing / 2nd Choice
 - Finishing / 1st Choice
 - Finishing / 2nd Choice
- (Hardness Under 45HRC)

P	Free-Cutting Steel	■	■			★		
	Carbon/Alloy Steel	■	■			★		
M	Stainless Steel					★		
K	Gray Cast Iron						★	☆
	Nodular Cast Iron						★	
N	Non-ferrous Metals							★
S	Heat-Resistant Alloys					★		
	Titanium Alloy						★	☆
H	Hard Materials					■		

Insert (Right-hand Shown)	Part Number (ANSI)	Part Number (ISO)	Dimensions (in)					Angle (°)		Cermet		CVD Coated Carbide	MEGACOAT (PVD Coated Carbide)	Carbide	Toolholder Page					
			IC	S	BCH	BS	RE	AN	AS	TN610	TN60	TN100M	CA6535	CA420M		PR1535	PR1225	PR1210	KW10	
	TEKN 32PTTR	TEKN 1603PTTR	0.375	0.125	-	0.039	0.031	20°	22°			●				●				-
	32PTFR	1603PTFR	0.375	0.125	0.028	0.055	-	20°	22°									●		
	TEEN 43PTTR	TEEN 2204PTTR	0.500	0.187	-	0.055	0.039	20°	22°			●								
	TEKN 43PTTR	TEKN 2204PTTR	0.500	0.187	-	0.055	0.039	20°	22°			●						●		
	43PTFR	2204PTFR	0.500	0.187	0.028	0.055	-	20°	22°									●		
	TEKR 43PTTR-S	TEKR 2204PTTR-S	0.500	0.187	-	0.055	0.039	20°	22°			△					●			-
	TEMR 32PTTR-H	TEMR 1603PTTR-H	0.375	0.125	-	0.047		0.039	20°	22°								●		-
	TEMR 43PTTR-H	TEMR 2204PTTR-H	0.500	0.187	-	0.055												●		
	TPC 32P4R	TPC 1603P4R	0.375	0.125	0.026	0.063					●									-
	TPK 32PDTR	TPKN 1603PDTR	0.375	0.125	0.028	0.047		11°	15°			●								
	32PDFR	1603PDFR																		
	TPK 43PDTR	TPKN 2204PDTR	0.500	0.187	0.028	0.063						●								
	43PDFR	2204PDFR																		-
	TPKR 43PDER-S	TPKR 2204PDER-S	0.500	0.187	-	0.055	0.039	11°	15°			△					●			M141
	TPMR 32PDER-H	TPMR 1603PDER-H	0.375	0.125	-	0.047	0.031		11°	15°								●		-
	TPMR 43PDER-H	TPMR 2204PDER-H	0.500	0.187	-	0.055	0.039											●		
	TPM 221	TPMN 110304	0.250				0.016												●	-
	222	110308					0.031												●	
	321	160304	0.125				0.016					●							●	
	322	160308	0.375				0.031					●							●	
	323	160312					0.047					●								
	432	220408	0.500	0.187			0.031					●								
	TPG 181505	TPGN 090202					0.008												●	
	18151	090204	0.219	0.094			0.016				●	●							●	
	18152	090208					0.031					△								
	2205	110302					0.008					●							●	
	221	110304	0.250				0.016					●	●						●	
	222	110308	0.125				0.031					●							●	
	321	160304					0.016					●	●						●	
	322	160308	0.375				0.031					●	●						●	

Cutting Range	Chipbreaker		Features
Finishing-Roughing	S		S chipbreaker for general-purpose machining. Low cutting resistance due to 13° chipbreaker rake angle. Recommended for various depths of cut with 3-step chipbreaker design. Ground wiper edge enables good surface finishes.
Medium-Finishing	H		H chipbreaker for general-purpose machining. Smooth chip evacuation due to the chipbreaker's smooth rake face. 20% less cutting force than flat-top inserts due to a 25° rake angle chipbreaker.

Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice (Hardness Under 45HRC)

P	Free-Cutting Steel									■			☆	★																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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*DLC: DLC Coated Carbide

*MN: MEGACOAT NANO

Inserts sold in 10 piece boxes.

● : Standard Item □ : Made to Order △ : Phaseout Item (will be removed from next catalog)
Contact your local Kyocera sales engineer to upgrade old products to new technology

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(Technical Support) 800.823.7284 - Option 2
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Milling Inserts

Usage Classification

- ★ Roughing / 1st Choice
 ☆ Roughing / 2nd Choice
 ■ Finishing / 1st Choice
 □ Finishing / 2nd Choice
 (Hardness Under 45HRC)

P	Free-Cutting Steel										☆	★							Toolholder Page		
	Carbon/Alloy Steel										☆	★									
M	Austenitic Stainless Steel										★	☆									
	Martensitic Stainless Steel								★		☆										
	Precipitation Hardened Stainless Steel										★										
K	Gray Cast Iron												★								
	Nodular Cast Iron												★								
N	Non-ferrous Metals																★	☆			
S	Heat-Resistant Alloys								★		☆										
	Titanium Alloy										★										
H	Hard Materials											■					★				
Dimensions (in)								Carnet	CVD Carbide			MEGACOAT (PVD Coated Carbide)								DLC*	Carbide
W1	S	D1	INSL	L	BS	RE	TN100M	CA6535	CA420M	PR1535	PR1525	PR1510	PR1225	PR1210	PR015S	PDL025	GW25				
0.260	0.157	0.134	-	0.429	0.083	0.016		●		●	●	●									
					0.067	0.031		●		●	●	●									
					0.051	0.047		●		●	●	●									
					0.039	0.063		●		●	●	●									
					0.039	0.079		●		●	●	●									
0.362	0.220	0.189	-	0.618	0.087	0.016		●		●	●	●									
					0.071	0.031		●		●	●	●									
					0.063	0.039					●										
					0.055	0.047		●		●	●	●									
					0.039	0.063		●		●	●	●									
					0.024	0.079		●		●	●	●									
0.260	0.157	0.134	-	0.429	0.067	0.031		●		●	●	●						M64 M65 M66 M67 M68 M97 M98			
0.362	0.220	0.189	-	0.618	0.071	0.031		●		●	●	●									
0.260	0.157	0.134	-	0.429	0.067	0.031		●		●	●	●			●						
0.362	0.220	0.189	-	0.618	0.071	0.031		●		●	●	●			●						
0.268	0.157	0.142	-	0.437	0.110	0.031										●	●	M64 M65 M66 M67 M68			
0.350	0.220	0.193	-	0.626	0.110	0.031										●	●				
0.358	0.173	0.161	0.571	-	-	0.039		●		●	●	●						M168 M169 M170			
0.165	0.086	0.083	0.247	-	-	0.039		●		●	●							M196 M197			

***DLC:** DLC Coated Carbide

Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice
- (Hardness Under 45HRC)

P	Free-Cutting Steel																
	Carbon/Alloy Steel																
M	Austenitic Stainless Steel																
	Martensitic Stainless Steel																
	Precipitation Hardened Stainless Steel																
K	Gray Cast Iron						★		■	☆				★	☆		
	Nodular Cast Iron						★		■	☆				☆	★		
N	Non-ferrous Metals																
S	Heat-Resistant Alloys																
	Titanium Alloy																
H	Hard Materials																
Dimensions (in)					Cermet	CVD Coated Carbide		MEGACOAT (PVD Coated Carbide)					SNC*	CVD SNC*	CEN	Toolholder Page	
INSL	S	BCH	BS	TN100M	CA6535	CA420M	PR1535	PR1525	PR1510	PR1225	PR1210	KS6050	CS7050	KBN475			
0.667	0.256	0.059	0.059									●	●				
0.672	0.250	-	-									●	●				
0.711	0.256	0.067	0.189											●			
0.676	0.250	0.102	0.102			●		●	●								
0.678	0.250	0.079	0.079			●		●	●								
						●		●	●								
0.709	0.250	0.079	0.394			●		●	●								

*SNC: Silicon Nitride Ceramic
*CVD SNC: CVD Coated Silicon Nitride Ceramic

PNEG1106XNER-W inserts sold in 5 piece boxes.

PNEG1106XNTR-T01015W inserts sold in 1 piece boxes.

Other inserts sold in 10 piece boxes.


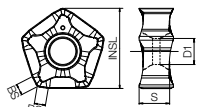

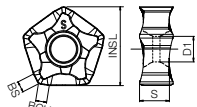

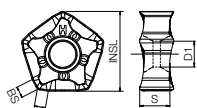

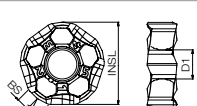

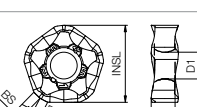

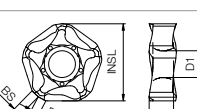

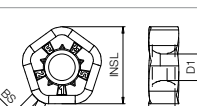

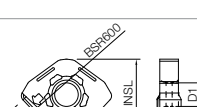

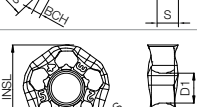
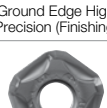
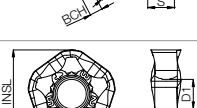
Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
 ☆ Roughing / 2nd Choice
 ■ Finishing / 1st Choice
 □ Finishing / 2nd Choice
 (Hardness Under 45HRC)

P	Free-Cutting Steel	■				☆	★		☆				
	Carbon/Alloy Steel	■				☆	★		☆				
M	Austenitic Stainless Steel					★			☆				
	Martensitic Stainless Steel					★			☆				
	Precipitation Hardened Stainless Steel					★			☆				
K	Gray Cast Iron								★			☆	
	Nodular Cast Iron								★			☆	
N	Non-ferrous Metals												
S	Heat-Resistant Alloys					★			☆			☆	
	Titanium Alloy					★			☆			☆	
H	Hard Materials								■				★

Insert (Right-hand Shown)		Part Number	Dimensions (in)					Cermet		CVD Coated Carbide		MEGACOAT (PVD Coated Carbide)						Toolholder Page			
			INSL	S	D1	BCH	BS	TN620M	TN100M	CA6535	CA420M	PR1535	PR1525	PR1510	PR1225	PR1210	PR015S				
 General Purpose		PNMU 0905XNER-GM	0.575	0.219	0.185	0.079	0.079	●				●	●	●				M37 M38			
 Low Cutting Force		PNMU 0905XNER-SM													●	●	●				
 Tough Edge (Heavy Milling)		PNMU 0905XNER-GH														●	●		●		
 Ground Edge High Precision (Finishing)		PNEU 1205ANER-GL	0.689	0.219	0.244	0.106	0.106	●		●		●	●	●	●	●		M31 M32 M33			
 General Purpose		PNMU 1205ANER-GM	0.704	0.219	0.244	0.079	0.079	●		●		●	●	●	●	●					
 Low Cutting Force		PNMU 1205ANER-SM													●		●		●	●	●
 Tough Edge (Heavy Milling)		PNMU 1205ANER-GH	0.708	0.243	0.244	0.079	0.079			●		●	●	●	●	●	●				
 Wiper Insert (2-edge)		PNEU 1205ANER-W	0.703	0.219	0.244	0.091	0.319	●	●	●		●	●	●							
 Ground Edge High Precision (Finishing)		PNEU 1205ANER-GL	0.689	0.219	0.244	0.106	0.106	●		●		●	●	●				M32			
 General Purpose		PNMU 1205ANER-GM	0.704	0.219	0.244	0.079	0.079	●		●		●	●	●							

PNEU-W inserts sold in 5 piece boxes.

Other inserts sold in 10 piece boxes.

Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
☆ Roughing / 2nd Choice
■ Finishing / 1st Choice
□ Finishing / 2nd Choice
(Hardness Under 45HRC)

P	Free-Cutting Steel						■				☆	★							Toolholder Page
	Carbon/Alloy Steel						■				☆	★							
M	Austenitic Stainless Steel										☆	☆							
	Martensitic Stainless Steel								★		☆								
	Precipitation Hardened Stainless Steel										★								
K	Gray Cast Iron												★						
	Nodular Cast Iron												★						
N	Non-ferrous Metals																		
S	Heat-Resistant Alloys								★		☆								
	Titanium Alloy										★								
H	Hard Materials												■				★		
Dimensions (in)							Angle (°)	Cermet		CVD Coated Carbide		MEGACOAT (PVD Coated Carbide)							
IC	S	D1	INSL	BS	RE	AN	TN620M	TN100M	CA6535	CA420M	PR1535	PR1525	PR1510	PR1225	PR1210	PR015S			
0.315	0.125	0.118	-	-	0.157	15°			●		●	●	●				M249 ~ M251		
0.394	0.156	0.138			0.197			●		●		●	●	●				M247 ~ M251	
0.472	0.187	0.181			0.236	11°		●		●		●	●	●				M249 ~ M251	
0.630	0.219	0.228			0.315			●		●		●	●	●				M249 ~ M251	
0.315	0.125	0.118	-	-	0.157	15°			●		●	●	●				M249 ~ M251		
0.394	0.156	0.138			0.197			●		●		●	●	●				M247 ~ M251	
0.472	0.187	0.181			0.236	11°		●		●		●	●	●				M249 ~ M251	
0.630	0.219	0.228			0.315			●		●		●	●	●				M247 ~ M251	
0.315	0.125	0.118	-	-	0.157	15°			●		●	●					M249 ~ M251		
0.394	0.156	0.138			0.197			●		●		●	●	●				M247 ~ M251	
0.472	0.187	0.181			0.236	11°		●		●		●	●	●				M249 ~ M251	
0.630	0.219	0.228			0.315			●		●		●	●	●				M247 ~ M251	
0.472	0.187	0.181	-	-	0.236	11°					●	●					M247 ~ M251		
0.630	0.219	0.228			0.315						●	●							M251
0.472	0.187	0.181	-	-	0.236	-			●		●	●	●				M240 M241 M242 M243		
0.630	0.216	0.244			0.622		0.315			●		●	●	●					
0.472	0.187	0.181			0.465		0.236			●		●	●						
0.630	0.216	0.244			0.622		0.315			●		●	●						
0.472	0.187	0.181			0.465		0.236			●		●	●	●					
0.630	0.216	0.244			0.622		0.315			●		●	●	●					
								●			●	●	●				M123 M124		
0.512	0.217	0.185	-	0.039	1/32	-					●	●	●						
											●	●	●			●			

INSERT GRADES	A
TURNING INSERTS	B
CBN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

Inserts sold in 10 piece boxes.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)
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(Technical Support) 800.823.7284 - Option 2
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Milling Inserts

Usage Classification

★ Roughing / 1st Choice
 ☆ Roughing / 2nd Choice
 ■ Finishing / 1st Choice
 □ Finishing / 2nd Choice
 (Hardness Under 45HRC)

P	Free-Cutting Steel					■				☆	★								
	Carbon/Alloy Steel					■				☆	★								
M	Austenitic Stainless Steel									☆	☆								
	Martensitic Stainless Steel							★		☆									
	Precipitation Hardened Stainless Steel									★									
K	Gray Cast Iron											★							
	Nodular Cast Iron											★							
N	Non-ferrous Metals																		
S	Heat-Resistant Alloys							★		☆									
	Titanium Alloy									★									
H	Hard Materials										■					★			
Dimensions (in)						Angle (°)	Cermets		CVD Coated Carbide	MEGACOAT (PVD Coated Carbide)							DLC*	Carbide	Toolholder Page
IC	S	D1	BS	RE	AN	TN620M	TN100M	CA6535	CA420M	PR1535	PR1525	PR1510	PR1225	PR1210	PR015S	PDL025	GW25		
0.406	0.180	0.181	-	0.079	16°			●		●	●	●							
0.557	0.219	0.228								●		●	●	●					
0.411	0.180	0.181	0.035	0.079	16°			●		●	●	●							
0.581	0.219	0.228	0.063						●		●	●	●						
0.411	0.180	0.181	0.055	0.079	16°			●		●	●	●							
0.574	0.219	0.228	0.122	0.055				●		●	●	●							
0.411	0.180	0.179	-	0.079	16°					●	●	●				●			
0.558	0.219	0.228										●	●	●				●	
0.283	0.224	0.134	0.075	1/64	-			●		●	●	●							
			0.059	1/32	-			●		●	●	●							
0.283	0.224	0.134	0.059	1/32	-			●		●	●								
0.283	0.224	0.134	0.059	1/32	-			●		●	●								

M176
M177
M179
M180
M181
M182

M90
M91

***DLC:** DLC Coated Carbide

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Inserts sold in 10 piece boxes.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)

Contact your local Kyocera sales engineer to upgrade old products to new technology.

Milling Inserts


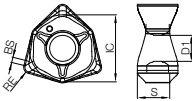


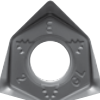
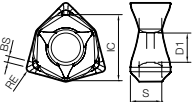



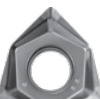

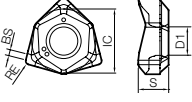
with Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice

(Hardness Under 45HRC)

P	Free-Cutting Steel	■				☆	★													
	Carbon/Alloy Steel	■				☆	★													
M	Austenitic Stainless Steel									★	☆									
	Martensitic Stainless Steel										☆									
	Precipitation Hardened Stainless Steel										★									
K	Gray Cast Iron														★					
	Nodular Cast Iron														★					
N	Non-ferrous Metals																	★	☆	
S	Heat-Resistant Alloys									★	☆									
	Titanium Alloy										★									
H	Hard Materials														■			★		

Insert (Right-hand Shown)		Part Number	Dimensions (in)					Angle (°)	Cermet		CVD Coated Carbide		MEGACOAT (PVD Coated Carbide)					DLC*	Carbide	Toolholder Page		
			IC	S	D1	BS	RE		AN	TN620M	TN100M	CA6535	CA420M	PR1535	PR1525	PR1510	PR1225	PR1210	PR015S		PDL025	GW25
<div>EW</div> <div></div> <div>General Purpose</div>	<div></div>	WNMU 050408EN-GM	0.346	0.165	0.134	0.028	0.031						●	●	●							M118 M119
<div>EW</div> <div></div> <div>Low Cutting Force</div>		WNMU 050408EN-SM	0.346	0.165	0.134	0.028	0.031	-					●	●	●							
<div>EW</div> <div></div> <div>Tough Edge (Heavy Milling)</div>		WNMU 050408EN-GH	0.346	0.165	0.134	0.028	0.031						●	●	●			●				
<div></div> <div>Surface Finish Oriented (Ground Tolerance)</div>	<div></div>	WNEU 080608EN-GL	0.552	0.262	0.244	0.059	0.031		●		●		●	●	●							M112 M113 M115
<div></div> <div>General Purpose</div>		WNMU 080604EN-GM	0.552	0.262	0.244	0.067	0.016		●		●		●	●	●							
<div></div> <div>General Purpose</div>		080608EN-GM	0.552	0.262	0.244	0.051	0.031		●		●		●	●	●							
<div></div> <div>Low Cutting Force</div>		WNMU 080608EN-SM	0.552	0.262	0.244	0.051	0.031	-			●		●	●	●							
<div></div> <div>Tough Edge (Heavy Milling)</div>		WNMU 080608EN-GH	0.552	0.262	0.244	0.051	0.031				●		●	●	●			●				
<div></div> <div>Aluminum / Non-Ferrous Metals (3-Edge)</div>	<div></div>	WNGT 080608FN-AM	0.552	0.262	0.244	0.059	0.031												●	●		

*DLC: DLC Coated Carbide

Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
☆ Roughing / 2nd Choice
■ Finishing / 1st Choice
□ Finishing / 2nd Choice
(Hardness Under 45HRC)

P	Free-Cutting Steel						■		☆	★	★	☆						
	Carbon/Alloy Steel													■	☆	★	★	☆
M	Austenitic Stainless Steel							★	☆	☆	☆							
	Martensitic Stainless Steel																	
	Precipitation Hardened Stainless Steel																	
K	Gray Cast Iron										★							
	Nodular Cast Iron																	
N	Non-ferrous Metals											★	☆					
S	Heat-Resistant Alloys																	
	Titanium Alloy							★			★		☆					
H	Hard Materials															■		
Dimensions (in)					Angle (°)		Cermet	CVD*	MN*	MEGACOAT			PVD*					
W1	S	D1	L	RE	AS	AN	TN100M	CA6535	PR1535	PR1225	PR1230	PR1210	PR830	PDL025	GW25			
0.265	0.125	0.110	0.413	0.016	11°	15°	●			●		●	△					
				0.031				●	●									
0.375	0.187	0.177	0.669	0.031			●		●		●	△						
				0.063			●											
0.625	0.250	0.256	0.984	0.031	15°	11°				●	●					M135		
				0.063				●	●					M136				
				0.157				●						M137				
				0.063				●						-				
0.625	0.250	0.256	0.984	0.031	15°	11°				●	●					M135		
				0.063				●	●	△				M136				
				0.157				●						M137				
				0.063				●						-				
0.625	0.250	0.256	0.984	0.063	15°	11°				●	●					M135		
																	M136	
0.625	0.250	0.256	0.984	0.063	15°	11°					●	●					M137	
0.181	0.102	0.091	0.264	0.008	16°	15°		●	●	●				△				
				0.016			●	●	●									
				0.031			●	●	●									
0.181	0.102	0.091	0.264	0.008	16°	15°		●	●	●		●					M85	
				0.016			●	●	●		●							
				0.031			●	●	●		●							
0.264	0.150	0.110	0.433	0.008	18°	13°								●	●			
				0.016									●	●				
				0.031									●	●				
				0.016									●	●				
0.378	0.193	0.173	0.669	0.031	18°	13°								●	●			
				0.079									●	●				
				0.122									●	●				
				0.008														
0.248	0.118	0.110	0.433	0.016	18°	15°		●	●	●								
				0.031			●	●	●									
				0.008			●	●	●									
0.264	0.150	0.110	0.433	0.016	18°	13°		●	●	●							M72	
				0.031			●	●	●									M77
0.378	0.193	0.173	0.669	0.016	18°	13°		●	●	●							M109	
				0.031			●	●	●									

*CVD: CVD Coated Carbide
*MN: MEGACOAT NANO

*PVD: PVD Coated Carbide
*DLC: DLC Coated Carbide

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Inserts sold in 10 piece boxes.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)


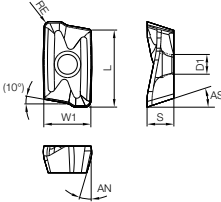





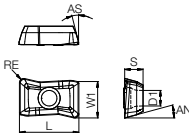

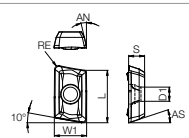
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Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice
- (Hardness Under 45HRC)

Insert (Right-hand Shown)	Part Number	Dimensions (in)					Angle (°)		Cement	CVD*	MN*	MEGACOAT					PVD*	Carbide	Toolholder Page
		W1	S	D1	L	RE	AS	AN											
		W1	S	D1	L	RE	AS	AN											
 	BDMT 110302ER-JT					0.008													M72 ~ M77
	110304ER-JT	0.248	0.118	0.110	0.433	0.016	18°	15°		●	●	●	●	●	●				
	110308ER-JT					0.031				●	●	●	●	●	●				
	BDMT 11T302ER-JT					0.008					●	●	●	●	●	△			
	11T304ER-JT					0.016				●	●	●	●	●	●				
	11T308ER-JT					0.031				●	●	●	●	●	●				
	11T312ER-JT	0.264	0.150	0.110	0.433	0.047	18°	13°		●	●	●	●	●	●				
	11T316ER-JT					0.063				●	●	●	●	●	●				
	11T320ER-JT					0.079				●	●	●	●	●	●				
	11T324ER-JT					0.094				●	●	●	●	●	●				
	11T331ER-JT					0.122				●	●	●	●	●	●				
	BDMT 170404ER-JT					0.016				●	●	●	●	●	●				
	170408ER-JT					0.031				●	●	●	●	●	●				
	170412ER-JT					0.047				●	●	●	●	●	●				
	170416ER-JT	0.378	0.193	0.173	0.669	0.063	18°	13°		●	●	●	●	●	●				
	170420ER-JT					0.079				●	●	●	●	●	●				
	170424ER-JT					0.094				●	●	●	●	●	●				
	170431ER-JT					0.122				●	●	●	●	●	●				
	170440ER-JT					0.157					●	●	●	●	●	△			
 2-Notch	BDMT 11T308ER-N2	0.264	0.150	0.110	0.433	0.031	18°	13°			●	●	●	●	●	△			M100 ~ M103
 3-Notch	BDMT 11T308ER-N3	0.264	0.150	0.110	0.433	0.031	18°	13°			●	●	●	●	●	△			
 3-Notch	BDMT 170408ER-N3	0.378	0.193	0.173	0.669	0.031	18°	13°			●	●	●	●	●				
 4-Notch	BDMT 170408ER-N4	0.378	0.193	0.173	0.669	0.031	18°	13°			●	●	●	●	●				
 	GOMT 08T208ER-D	0.205	0.109	0.091	0.343							●		●					M206
	100308ER-D	0.258	0.130	0.110	0.421							●		●					
	13T308ER-D	0.329	0.152	0.134	0.520	0.031	13°	17°				●		●					
	160408ER-D	0.395	0.187	0.173	0.657							●		●		△			
 	JOMT 08T208ER-D	0.202	0.109	0.091	0.335							●		●					
	100308ER-D	0.252	0.125	0.110	0.402							●		●					
	13T308ER-D	0.318	0.146	0.134	0.520	0.031	17°	13°				●		●					
	160408ER-D	0.383	0.177	0.173	0.657							●		●		△			

*CVD: CVD Coated Carbide *PVD: PVD Coated Carbide
 *MN: MEGACOAT NANO

Inserts sold in 10 piece boxes.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)
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Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice
(Hardness Under 45HRC)

P	Free-Cutting Steel Carbon/Alloy Steel	■				★		☆	
M	Stainless Steel					★		☆	
K	Gray Cast Iron Nodular Cast Iron							★	
N	Non-ferrous Metals								★
S	Heat-Resistant Alloys Titanium Alloy					★		☆	
H	Hard Materials						■		□

Insert (Right-hand Shown)	Part Number (ANSI)	Part Number (ISO)	Dimensions (in)					Angle (°)	Cermet TN100M	CVD* TC80	MN* CA6535	MEGACOAT PR1535	MEGACOAT PR1225	MEGACOAT PR1230	MEGACOAT PR1210	PVD* PR830	Carbide KW10	Toolholder Page
			IC	S	D1	L	RE											
	NDCT 831R-B	NDCT 090204R-B	0.250	0.094	0.110	0.374	0.016	15°	●									M165
	831TR	090204TR							△									M142
	831FR	090204FR														△		M165
	832R-B	090208R-B					0.031		●	●								M165
	NDCT 032TR	NDCT 120208TR	0.313	0.094	0.134	0.500	0.031	15°	△									M142
	032FR	120208FR														△		M165
	NDCT 322FR-B	NDCT 150308FR-B	0.375	0.125	0.177	0.591	0.031	15°									●	M165
	322FR	150308FR															●	M143 M165
	NDCT 322TRX	NDCT 150308TRX	0.375	0.125	0.173	0.591	0.031	15°	●									M143 M140
	NDCW 032TR	NDCW 120208TR	0.313	0.094	0.134	0.500	0.031	15°	●									M165
	NDCW 3205TR	NDCW 150302TR	0.375	0.125	0.177	0.591	0.008	15°	●									M143
	321TR	150304TR					0.016		●									
	322TR	150308TR					0.031		●									
	325TR	150320TR					0.079		●									
	3275TR	150330TR					0.118		●									
	3210TR	150340TR					0.157		●									
	NDCW 322TRX	NDCW 150308TRX	0.375	0.125	0.173	0.591	0.031	15°	●									M143
	322FRX	150308FRX															●	M144 M165
	NDMM 322ER-SP	NDMM 150308ER-SP	0.375	0.125	0.173	0.591	0.031	15°			●							M143 M144 M165
	(Use ISO Part Number)	NDMT 080208ER-D	0.200	0.094	0.087	0.335	0.031	15°	△				△	△	△			M208
		10T208ER-D	0.247	0.109	0.110	0.402			△				△	△	△			
		NEMT 120308ER-D	0.302	0.125	0.134	0.500	0.031	20°	△				△	△	△			
	(Use ISO Part Number)	16T308ER-D	0.364	0.156	0.173	0.638			△				△	△	△			
		NDMT 080208ER-DH	0.200	0.094	0.087	0.335	0.031	15°	△				△	△	△			
		10T208ER-DH	0.247	0.109	0.110	0.402			△				△	△	△			
		NEMT 120308ER-DH	0.302	0.125	0.134	0.500	0.031	20°	△				△	△	△			
		16T308ER-DH	0.364	0.156	0.173	0.638			△				△	△	△			

*CVD: CVD Coated Carbide
*MN: MEGACOAT NANO

*PVD: PVD Coated Carbide

Inserts sold in 10 piece boxes.

Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice (Hardness Under 45HRC)

		Free-Cutting Steel Carbon/Alloy Steel						■				★	★						
M		Stainless Steel										★	★						
K		Gray Cast Iron												★				☆	
		Nodular Cast Iron												★					
N		Non-ferrous Metals																★	
S		Heat-Resistant Alloys										★	★						
		Titanium Alloy												★			☆		
H		Hard Materials										■	■						
Dimensions (in)								Angle (°)		Carnet	CVD*	MN*	MEGACOAT			PVD Coated Carbide		Carbide	Toolholder Page
IC	W1	S	D1	BS	RE	AN	AS	TN100M	CA6535	PR1535	PR1225	PR1230	PR1210	PR830	PR915	KW10			
0.708	-	0.194	-	0.047	-	26°	26°					△						-	
0.703	-	0.202	-	0.043	-								△		△				
0.526	-	0.190	0.181	0.020	0.055	26°	26°				●		●					-	
0.703		0.202	0.232	0.031	0.047			●		●									
0.530	-	0.187	0.173		0.067	26°	22°				●		●					-	
0.708		0.192	0.228		-			●		●									
0.260	0.315	0.083	0.122	-	0.157	15°	-									●	M236		
0.315	0.394	0.106	0.142		0.197										●				
0.370	0.472	0.126	0.161		0.236										●				
0.445	0.630	0.165	0.201		0.315										●				
0.555	0.787	0.205	0.240		0.394			10°	-							●			
0.610	0.984	0.244	0.240		0.492											●			
0.276	-	0.094	0.110	-	-	15°	-					●					-		
0.394		0.125	0.150								●								
0.472		0.156									●								
0.315	-	0.109	0.134	-	-	15°	-					●	●			●	-		
0.394	-	0.156	0.134	-	-	11°	-						●			●	-		
0.472		0.187	0.173						●	●		●							
0.472		0.187	0.173					●	●		●								
0.630		0.250	0.217					-	-	11°	-	●			●	●			●
0.787		0.250	0.256												●	●			●

*CVD: CVD Coated Carbide

*MN: MEGACOAT NANO

Inserts sold in 10 piece boxes.

RDFG inserts sold in 2 piece boxes.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)

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Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
☆ Roughing / 2nd Choice
■ Finishing / 1st Choice
□ Finishing / 2nd Choice
(Hardness Under 45HRC)

P	Free-Cutting Steel	■		★	★				
	Carbon/Alloy Steel	■		★	★				
M	Stainless Steel			★	★				
K	Gray Cast Iron					★	★		☆
	Nodular Cast Iron							★	
N	Non-ferrous Metals								★
S	Heat-Resistant Alloys			★	★				
	Titanium Alloy					★	★		☆
H	Hard Materials			■	■				

Insert (Right-hand Shown)		Part Number (ANSI)	Part Number (ISO)	Dimensions (in)						Angle (°)		Cemmet TN100M	CVD* CA6535	MN* PR1535	MEGACOAT					Carbide KW10	Toolholder Page
				IC	S	D1	BCH	BS	RE	AN	AS				PR1225	PR1230	PR1210				
		(Use ISO Part Number)	SDKW 09T204TN	0.375	0.109	0.134	-	-	0.016	15°	-	●				●				●	M260
		SEKW 421TN	SEKW 120304TN						0.016			●							●		
		421FN	120304FN	0.500	0.125	0.217	-	-		20°	-	●								●	
		422TN	120308TN						0.031			●								●	
		(Use ISO Part Number)	SDKW 1204AESN	0.500	0.187	0.217	-	0.059	0.039	15°	20°					●					-
		1204AETN																		●	
		SEKW 43AFTN	SEKW 1204AFTN				0.020	0.067	-	20°	25°	●				●		●			-
		(Use ISO Part Number)	SDMT 1204AESR-H	0.500	0.187	0.217	-	0.031	0.039	15°	20°					●					-
		SDMT 31.81C	SDMT 09T204C	0.375	0.109	0.134			0.016	15°		●				●			●	M260	
		SEMT 421C	SEMT 120304C	0.500	0.125	0.217			0.016	20°							●				●
		SDMT 221E-K	SDMT 060304E-K	0.250	0.125	0.110			0.016	15°	-						●	●	●	M264	
		(Use ISO Part Number)	SDMT 080308E-K	0.315		0.134	-	-				0.031			●	●	●				
		SDMT 432E-K	SDMT 120408E-K	0.500		0.187	0.173									●	●	●			
		SEKT 43AFEN-S	SEKT 1204AFEN-S	0.500	0.187	0.217	0.020	0.067	-	20°	25°	●				●					-
		(Use ISO Part Number)	SOMT 0903AXEN-J	0.375	0.125	0.134	0.020	0.043	-	27°	32°	△								△	-
		(Use ISO Part Number)	SOMW 0903AXTN	0.375	0.125	0.134	0.020	0.043	-	27°	32°	△									-
		0903AXFN																△			

*CVD: CVD Coated Carbide

*MN: MEGACOAT NANO

Milling Inserts with Hole

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice (Hardness Under 45HRC)

P	Free-Cutting Steel									★	★			Toolholder Page
	Carbon/Alloy Steel									★	★			
M	Stainless Steel									★	★			
K	Gray Cast Iron												★	
	Nodular Cast Iron												★	
N	Non-ferrous Metals													
S	Heat-Resistant Alloys									★	★			
	Titanium Alloy												★	
H	Hard Materials									■	■			
Dimensions (in)						Angle (°)		Cermet	CVD*	MN*	MEGACOAT			Carbide
IC	S	D1	BS	RE	AN	AS	TN100M	CA6535	PR1535	PR1225	PR1230	PR1210	KW10	
0.709	0.250	0.268	0.122	0.047	11°	15°				●	●	●		M58 M59
0.709	0.250	0.268	0.122	0.047	11°	15°				●	●	●		
0.709	0.250	0.268	0.122	0.047	11°	15°					●	●		M58 M59
										△				
0.709	0.250	0.268	0.122	0.047	11°	15°					●	●		M58 M59
										△				
0.709	0.250	0.268	0.122	0.047	11°	15°				●	●	●		M58 M59
0.709	0.250	0.268	0.122	0.047	11°	15°				●	●	●		
0.709	0.250	0.268	0.122	0.047	11°	15°				●	●	●		

*CVD: CVD Coated Carbide

*MN: MEGACOAT NANO

Inserts sold in 10 piece boxes.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)

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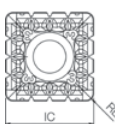


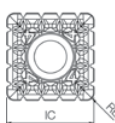


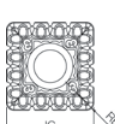


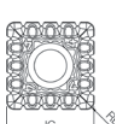


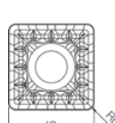




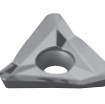
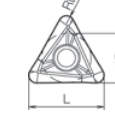

Milling Inserts

with Hole

Usage Classification

- ★ Roughing / 1st Choice
 ☆ Roughing / 2nd Choice
 ■ Finishing / 1st Choice
 □ Finishing / 2nd Choice
 (Hardness Under 45HRC)

P	Free-Cutting Steel			☆	★		★	★				
	Carbon/Alloy Steel			☆	★		★	★				
M	Austenitic Stainless Steel			☆	★		★	★				
	Martensitic Stainless Steel	★		☆			★	★				
	Precipitation Hardened Stainless Steel			★			★	★				
K	Gray Cast Iron					☆	★				★	☆
	Nodular Cast Iron					☆	★				★	
N	Non-ferrous Metals											★
S	Heat-Resistant Alloys		★	☆				★	★			
	Titanium Alloy			★						★	☆	
H	Hard Materials							■		■	■	

Insert (Right-hand Shown)			Part Number	Dimensions (in)						Angle (°)	Cemet TN100M	CVD CA6535	MEGACOAT NANO					MEGACOAT			Carbide KW10	Toolholder Page
				IC	S	D1	BS	L	RE	AN			PR1525	PR1510	PR1225	PR1230	PR1210					
 3-Notch			SPMT 180616EN-NB3	0.709	0.250	0.268	-	-	0.063	11°								●	●			
 4-Notch			SPMT 180616EN-NB4	0.709	0.250	0.268	-	-	0.063	11°								●	●			
 3-Notch / Low Cutting Force			SPMT 180616EN-NB3P	0.709	0.250	0.268	-	-	0.063	11°								●	●			M130 M131
 4-Notch / Low Cutting Force			SPMT 180616EN-NB4P	0.709	0.250	0.268	-	-	0.063	11°								●	●			
 Without Notch			SPMT 180616EN-V	0.709	0.250	0.268	-	-	0.063	11°								●	●			
			SPMT 060204E-Z	0.250	0.094	0.098	-	-	0.016	11°								●	●	●	M262	
			060208E-Z						0.031									●	●	●		
			SPMT 090304E-Z	0.375	0.125	0.134	-	-	0.016	11°								●	●	●		
			090308E-Z						0.031									●	●	●		
			TEMT 250624-AQ	0.625	0.250	0.217	-	0.906	0.094	20°										△	-	

*CVD: CVD Coated Carbide

with Hole

★ Roughing / 1st Choice
☆ Roughing / 2nd Choice
■ Finishing / 1st Choice
□ Finishing / 2nd Choice
(Hardness Under 45HRC)

***CVD:** CVD Coated Carbide

with Hole

A	INSERT GRADES
B	TURNING INSERTS
C	CBN/PCD INSERTS
D	TURNING HOLDERS
E	SMALL TOOLS
F	BORING
G	GROOVING
G	CUT-OFF
J	THREADING
K	DRILLING
M	MILLING
N	QUICK CHANGE TOOLING
P	SPARE PARTS
R	TECHNICAL
T	INDEX

M29


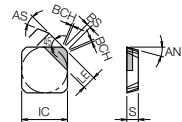
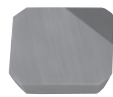
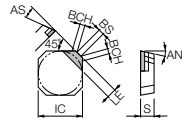

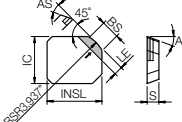
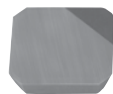
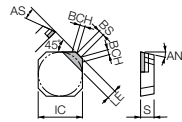
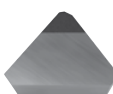
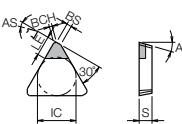

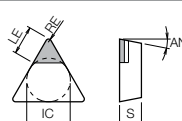

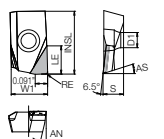

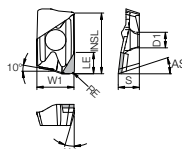

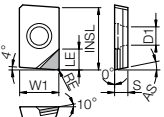
Milling Inserts

P C D

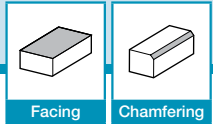
Usage Classification

- ★ Roughing / 1st Choice
 ☆ Roughing / 2nd Choice
 ■ Finishing / 1st Choice
 □ Finishing / 2nd Choice
 (Hardness Under 45HRC)

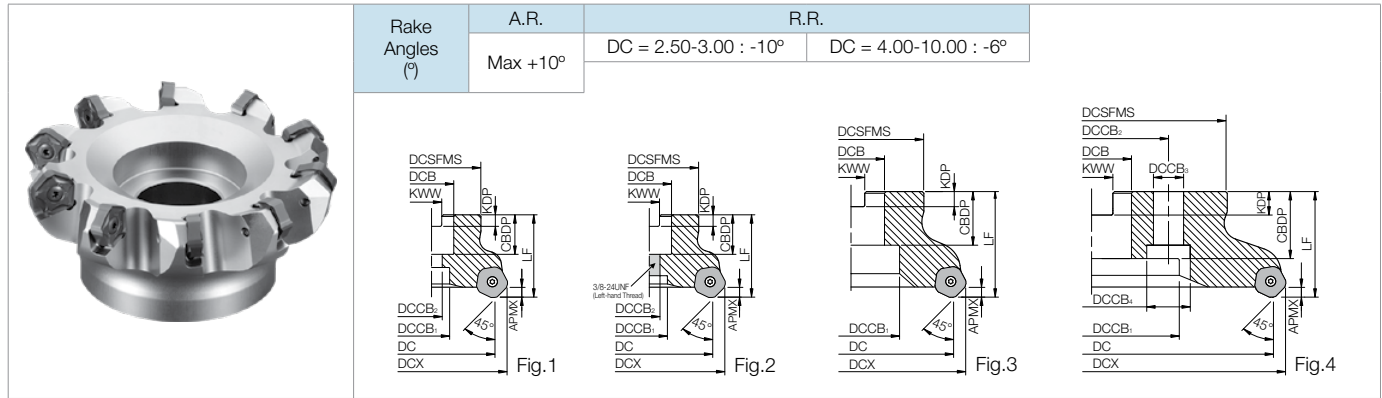
P	Free-Cutting Steel Carbon/Alloy Steel			
M	Stainless Steel			
K	Gray Cast Iron Nodular Cast Iron			
N	Non-ferrous Metals	□		■
S	Heat-Resistant Alloys			
S	Titanium Alloy	□		■
H	Hard Materials			

Insert (Right-hand Shown)		Part Number (ANSI)	Part Number (ISO)	Dimensions (in)						Angle (°)		PCD			Toolholder Page
				IC	S	BCH	BS	LE	INSL	AN	AS	KPD001	KPD010	KPD230	
		SDKN 42AUFN	SDKN 1203AUFN	0.500	0.125	0.020	0.047	0.142	-	15°	23°	●	△		-
		SEEN 42AFFN	SEEN 1203AFFN	0.500	0.125	0.020	0.055	0.138	-	20°	25°	●	●		-
 With Wiper Edge		SEEN 42AFFR-W	SEEN 1203AFFR-W	0.492	0.125	-	0.138	0.067	0.573	20°	25°	△			-
		(Use ISO Part Number)	SOKN 13T3AXFN-NE	0.531	0.156	0.016	0.043	0.118	-	27°	32°			△	-
		TEEN 32PTFR-NE	TEEN 1603PTFR-NE	0.375	0.125	0.024	0.055	0.161	-	20°	22°			●	-
		32PTFR	1603PTFR					0.185				●	●		
		TEKN 43PTFR-NE	TEKN 2204PTFR-NE	0.500	0.187	0.028	0.071	0.165	-	20°	22°			●	
		43PTFR	2204PTFR					0.189				●	●		
Insert (Right-hand Shown)		Part Number (ANSI)	Part Number (ISO)	Dimensions (in)						Angle (°)		PCD			Toolholder Page
				IC	S	RE	LE	-	-	AN	-	KPD001	KPD010	KPD230	
		TPG 2205	TPGN 110302	0.250	0.125	0.008	0.154			11°	-	●	●		-
		221	110304			0.016	0.146	-	-			●	●		
		222	110308			0.031	0.134						△		
Insert (Right-hand Shown)		Part Number (ANSI)	Part Number (ISO)	Dimensions (in)						Angle (°)		PCD			Toolholder Page
				W1	S	D1	INSL	RE	LE	AS	AN	KPD001	KPD010	KPD230	
		(Use ISO Part Number)	BDGT 11T302FR	0.264	0.150	0.110	0.453	0.008	0.150	18°	13°	●	●	●	M72 M77
		(Use ISO Part Number)	BDGT 11T304FR					1/64				●	●	●	
		(Use ISO Part Number)	BDGT 11T308FR					1/32				●	●	●	
		(Use ISO Part Number)	BDGT 11T302FR-LE					0.008	●			●	●		
		(Use ISO Part Number)	BDGT 11T304FR-LE					1/64	●			●	●		
		(Use ISO Part Number)	BDMT 11T302FR	0.264	0.150	0.110	0.433	0.008	0.142	18°	13°	●	●	●	M72 M77
		(Use ISO Part Number)	BDMT 11T304FR					1/64				●	●	●	
		(Use ISO Part Number)	BDMT 170402FR	0.378	0.193	0.173	0.669	0.008	0.173	18°	13°	●	●	●	
		(Use ISO Part Number)	BDMT 170404FR					1/64				●	●	●	
		NDCW 3205FRX-NE	NDCW 150302FRX-NE	0.375	0.125	0.173	0.591	0.008	0.201	15°	-			●	M144
		3205FRX	150302FRX					0.224	●			●			

PCD inserts sold in 1 piece boxes.



MFPN45 Face Mill (Inch Size)



Toolholder Dimensions

Part Number				Stock	No. of Inserts	Dimensions (in)												Drawing	Weight (kg)	Shim
						DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	DCCB ₃	DCCB ₄			
Inch Bore Dia.	Coarse Pitch	MFPN	452500R-4T	●	4	2.500	2.815	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.313	-	-	Fig.1	0.5	Yes
			453000R-5T	●	5	3.000	3.315	2.283	1.000	0.866	0.551	1.969	1.063	0.236	0.375	-	-	Fig.1	1.1	
			454000R-6T	●	6	4.000	4.315	2.756	1.500	2.047	-	1.969	1.142	0.394	0.625	-	-	Fig.3	1.4	
			455000R-7T	●	7	5.000	5.315	3.425	1.500	2.283	-	2.480	1.417	0.394	0.625	-	-	Fig.3	2.6	
			456000R-8T	●	8	6.000	6.315	4.016	2.000	2.835	-	2.480	1.496	0.433	0.750	-	-	Fig.3	3.8	
			458000R-10T	●	10	8.000	8.315	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.000	0.709	1.024	Fig.4	6.6	
			451000R-12T	●	12	10.000	10.315	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.000	0.709	1.024	Fig.4	9.3	
	Fine Pitch	MFPN	452000R-4T	●	4	2.000	2.315	1.750	0.750	-	3/8-24UNF	1.969	0.830	0.187	0.313	-	-	Fig.2	0.3	No
			452500R-5T	●	5	2.500	2.815	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.313	-	-	Fig.1	0.5	
			453000R-6T	●	6	3.000	3.315	2.283	1.000	0.866	0.551	1.969	1.063	0.236	0.375	-	-	Fig.1	1.1	
			454000R-8T	●	8	4.000	4.315	2.756	1.500	2.047	-	1.969	1.142	0.394	0.625	-	-	Fig.3	1.3	
			455000R-10T	●	10	5.000	5.315	3.425	1.500	2.283	-	2.480	1.417	0.394	0.625	-	-	Fig.3	2.6	
			456000R-12T	●	12	6.000	6.315	4.016	2.000	2.835	-	2.480	1.496	0.433	0.750	-	-	Fig.3	3.9	
			458000R-14T	●	14	8.000	8.315	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.000	0.709	1.024	Fig.4	6.6	
	451000R-16T	●	16	10.000	10.315	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.000	0.709	1.024	Fig.4	9.3			
Extra Fine Pitch	MFPN	452500R-6T	●	6	2.500	2.815	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.313	-	-	Fig.1	0.5	No	
		453000R-8T	●	8	3.000	3.315	2.283	1.000	0.866	0.551	1.969	1.063	0.236	0.375	-	-	Fig.1	1.1		
		454000R-10T	●	10	4.000	4.315	2.756	1.500	2.047	-	1.969	1.142	0.394	0.625	-	-	Fig.3	1.3		
		455000R-13T	●	13	5.000	5.315	3.425	1.500	2.283	-	2.480	1.417	0.394	0.625	-	-	Fig.3	2.6		
			456000R-16T	●	16	6.000	6.315	4.016	2.000	2.835	-	2.480	1.496	0.433	0.750	-	-	Fig.3	3.9	

*Dimension APMX is 0.236" for GM/SM/GH chipbreaker and 0.197" for GL chipbreaker

Spare Parts (Inch / Inch Bore)

Part Number		Spare Parts								
		Clamp Screw	Wrench		Shim	Shim Screw	Wrench	Anti-seize Compound	Arbor Bolt	Mounting Screw
Coarse Pitch	MFPN 452500R-4T	SB-50140TR	TTW-15	-	MFPN-45	SPW-7050	LW-5	P-37	HH3/8-1.25	-
	453000R-5T									
	454000R-6T									
	451000R-12T									
Fine Pitch	MFPN 452000R-4T	SB-50140TR	TTW-15	-	-	-	-	P-37	HH3/8-1.25	XNS610 ^{*2}
	452500R-5T									
	453000R-6T									
	454000R-8T									
	451000R-16T									
Extra Fine Pitch	MFPN 452500R-6T	SB-40140TRN	-	DTM-15	-	-	-	P-37	HH3/8-1.25	-
	453000R-8T									
	454000R-10T									
	451000R-20T									

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Recommended Cutting Conditions **M34**

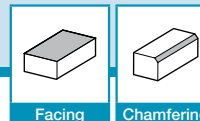
*2 Differential screw (3/8-24UNF)

Applicable Inserts **M33**

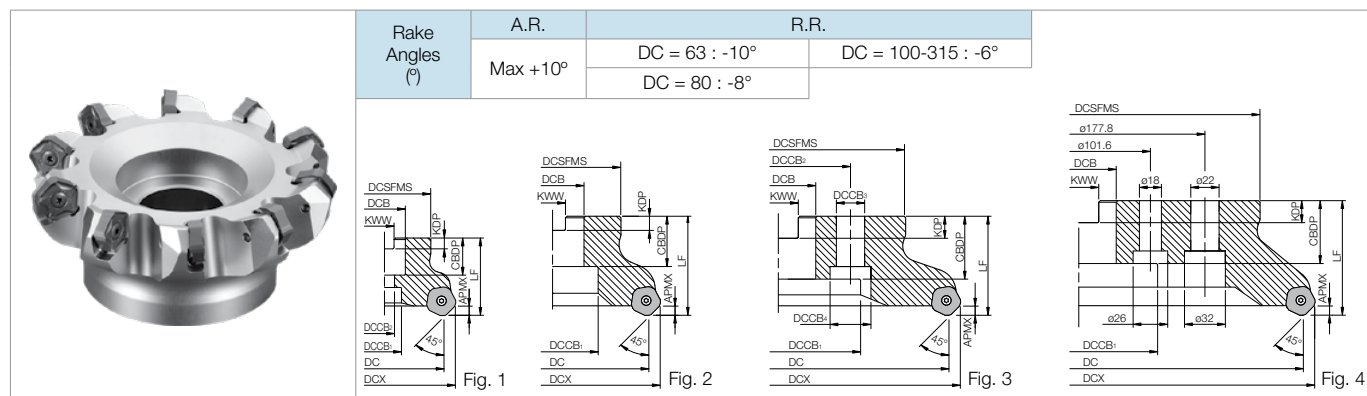
● : Standard Item △ : Phaseout Item (will be removed from next catalog)

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MFPN45 Face Mill (Metric Size)



Toolholder Dimensions

Part Number		Stock		No. of Inserts	Dimensions (mm)												Drawing	Weight (kg)	Shim
		R	L		DC	DCX	DCSFS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KDP	KWW	DCCB ₃	DCCB ₄			
Inch Bore Dia.	Coarse Pitch	●	●	MFPN 45080%-5T	80	93	60	1.000"	22	13.0	50	1.063"	0.236"	0.375"	-	-	Fig.1	1.1	Yes
				45100%-6T	100	113	70	1.250"	48	-	50	1.260"	0.315"	0.500"	-	-	Fig.2	1.4	
				45125%-7T	125	138	87	1.500"	58	-	63	1.417"	0.394"	0.625"	-	-		2.6	
				45160%-8T	160	173	102	2.000"	72	-	63	1.496"	0.433"	0.750"	-	-	Fig.3	4.0	
				45200R-10T	200	213	142	1.875"	110	4.000"	63	1.575"	0.551"	1.000"	18	26		6.7	
				45250R-12T	250	263	142	1.875"	110	4.000"	63	1.575"	0.551"	1.000"	18	26	Fig.3	9.4	
	Fine Pitch	●	●	MFPN 45080R-6T	80	93	60	1.000"	22	13.0	50	1.063"	0.236"	0.375"	-	-	Fig.1	1.1	No
				45100R-8T	100	113	70	1.250"	48	-	50	1.260"	0.315"	0.500"	-	-	Fig.2	1.4	
				45125R-10T	125	138	87	1.500"	58	-	63	1.417"	0.394"	0.625"	-	-		2.7	
				45160R-12T	160	173	102	2.000"	72	-	63	1.496"	0.433"	0.750"	-	-	Fig.3	4.0	
				45200R-14T	200	213	142	1.875"	110	4.000"	63	1.575"	0.551"	1.000"	18	26		6.9	
				45250R-16T	250	263	142	1.875"	110	4.000"	63	1.575"	0.551"	1.000"	18	26	Fig.3	9.6	
	Extra Fine Pitch	●	●	MFPN 45080R-8T	80	93	60	1.000"	22	13.0	50	1.063"	0.236"	0.375"	-	-	Fig.1	1.1	No
				45100R-10T	100	113	70	1.250"	48	-	50	1.260"	0.315"	0.500"	-	-	Fig.2	1.3	
				45125R-13T	125	138	87	1.500"	58	-	63	1.417"	0.394"	0.625"	-	-		2.7	
				45160R-16T	160	173	102	2.000"	72	-	63	1.496"	0.433"	0.750"	-	-	Fig.3	4.0	
				45200R-18T	200	213	142	1.875"	110	4.000"	63	1.575"	0.551"	1.000"	18	26		6.9	
				45250R-20T	250	263	142	1.875"	110	4.000"	63	1.575"	0.551"	1.000"	18	26	Fig.3	9.6	
Metric Bore Dia.	Coarse Pitch	●	●	MFPN 45063R-4T-M	63	76	47	22	19	11.0	40	21	6.3	10.4	-	-	Fig.1	0.5	Yes
				45080R-5T-M	80	93	60	27	22	13.0	50	24	7.0	12.4	-	-	Fig.2	1.1	
				45100R-6T-M	100	113	70	32	48	-	50	30	8.0	14.4	-	-		1.4	
				45125R-7T-M	125	138	87	40	58	-	63	32	9.0	16.4	-	-	Fig.3	2.6	
				45160R-8T-M	160	173	102	68	66.7	-	63	32	9.0	16.4	14	20		3.8	
				45200R-10T-M	200	213	142	60	110	101.6	63	40	14.0	25.7	18	26	Fig.3	6.4	
	Fine Pitch	●	●	45250R-12T-M	250	263	142	60	110	101.6	63	40	14.0	25.7	18	26	Fig.3	9.1	No
				MFPN 45063R-5T-M	63	76	47	22	19	11.0	40	21	6.3	10.4	-	-	Fig.1	0.5	
				45080R-6T-M	80	93	60	27	22	13.0	50	24	7.0	12.4	-	-		1.0	
				45100R-8T-M	100	113	70	32	48	-	50	30	8.0	14.4	-	-	Fig.2	1.4	
				45125R-10T-M	125	138	87	40	58	-	63	32	9.0	16.4	-	-		2.5	
				45160R-12T-M	160	173	102	68	66.7	-	63	32	9.0	16.4	14	20	Fig.3	3.8	
	Extra Fine Pitch	●	●	45200R-14T-M	200	213	142	60	110	101.6	63	40	14.0	25.7	18	26		6.5	
				45250R-16T-M	250	263	142	60	110	101.6	63	40	14.0	25.7	18	26	Fig.3	9.1	
				MFPN 45063R-6T-M	63	76	47	22	19	11.0	40	21	6.3	10.4	-	-	Fig.1	0.5	No
				45080R-8T-M	80	93	60	27	22	13.0	50	24	7.0	12.4	-	-		1.1	
				45100R-10T-M	100	113	70	32	48	-	50	30	8.0	14.4	-	-	Fig.2	1.3	
				45125R-13T-M	125	138	87	40	58	-	63	32	9.0	16.4	-	-		2.6	

*Dimension APMX is 6mm for GM, SM, GH Chipbreakers, 5mm for GL Chipbreaker and, 3mm for W Chipbreaker: PR15 series Recommended Cutting Conditions **M34**

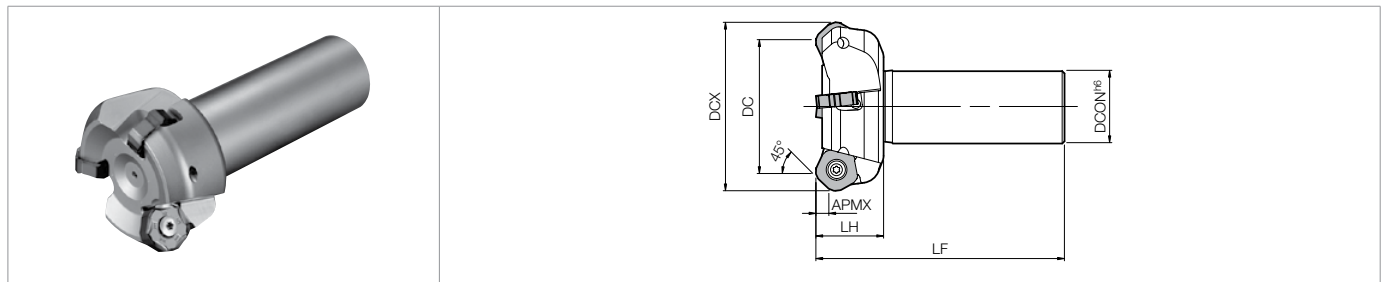
Spare Parts & Applicable Inserts **M33**

Spare Parts (Metric Size / Inch Bore & Metric Size / Metric Bore)




Part Number		Spare Parts							
		Clamp Screw	Wrench		Shim	Shim Screw	Wrench	Anti-seize Compound	Arbor Bolt
			TTW	DTM					
Coarse Pitch	MFPN 45063R-4T-M	SB-50140TR	TTW-15	-	MFPN-45	SPW-7050	LW-5	P-37	HH10x30
	45080R-5T(-M)								HH12x35
	45100R-6T(-M)								-
	45315R-14T(-M)								-
Fine Pitch	MFPN 45063R-5T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10x30
	45080R-6T(-M)								HH12x35
	45100R-8T(-M)								-
	45315R-18T(-M)								-
Extra Fine Pitch	MFPN 45063R-6T-M	SB-40140TRN	-	DTM-15	-	-	-	P-37	HH10x30
	45080R-8T(-M)								HH12x35
	45100R-10T(-M)								-
	45250R-20T(-M)								-

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed.

MFPN45 End Mill



Toolholder Dimensions

Part Number		Stock	No. of Inserts	Unit	Dimensions						Rake Angles		Shank Type	Spare Parts		
					DC	DCX	DCON	LF	LH	APMX	A.R. (Max)	R.R.		Clamp Screw	Wrench	Anti-seize Compound
																
Weldon Shank	MFPN 452000R-W125-3T	●	3	Inch	2.00	2.31	1.25	3.60	1.18	0.23 *(0.19)	+10°	-12°	Weldon	SB-50140TR	TTW-15	P-37
	452500R-W125-4T	●	4		2.50	2.81	1.25	3.60	1.18		+10°	-10°		Recommended Tightening Torque 4.2N · m		
	453000R-W125-5T	●	5		3.00	3.31	1.25	3.60	1.18		+10°	-8°				
Cylindrical Shank	MFPN 45050R-S32-3T	●	3	mm	50	63	32	110	30	6 (5)	+10°	- 12°	Cylindrical	SB-50140TR	TTW-15	P-37
	45063R-S32-4T	●	4		63	76	32	110	30		+10°	- 10°		Recommended Tightening Torque 4.2N · m		
	45080R-S32-5T	●	5		80	93	32	110	30		+10°	- 8°				

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed.

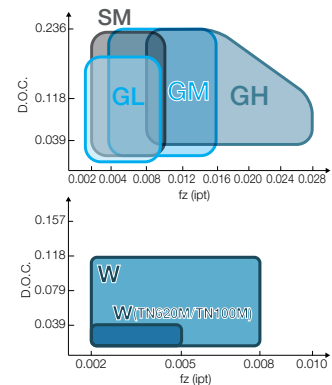
*Dimension APMX is 0.236" for GM, SM, GH Chipbreakers, 0.197" for GL Chipbreaker and, 0.118" for W Chipbreaker: PR15 series

Applicable Inserts (Face Mill and End Mill)

Part Number	Applicable Inserts M18						
	PNMU 1205ANER-GM	PNMU 1205ANER-SM	PNMU 1205ANER-GH	PNEU 1205ANER-GL	PNEU 1205ANER-W	-	-
MFPN 45...R-...	PNMU 1205ANER-GM	PNMU 1205ANER-SM	PNMU 1205ANER-GH	PNEU 1205ANER-GL	PNEU 1205ANER-W	-	-
MFPN 45...L-...	-	-	-	-	-	PNMU 1205ANER-GM	PNEU 1205ANER-GL

Recommended Cutting Conditions M34

Applicable Chipbreaker Range



● Cutter Type and Chipbreaker Selection

Milling Purpose	Cutter Type			Chipbreaker				
	Coarse Pitch	Fine Pitch	Extra Fine Pitch	GM	SM	GH	GL	W
General milling for steel and alloy steel		●		●				
Steel and alloy steel (to prevent chattering due to low rigidity machine or poor clamping power)	●				●			
Productivity oriented (high metal removal rate) (D.O.C. $\geq 0.1575"$, $f_z \geq 0.0138$ ipt)	●					●		
Focusing on finishing quality	●	●					●	
General milling of stainless steel		●			●			
Stainless steel (to prevent chattering due to low rigidity machine or poor clamping power)	●				●			
Cast iron (for high feed rates and high efficiency)			●	●				
Cast iron (D.O.C. $\geq 0.1575"$, $f_z \geq 0.0138$ ipt)	●					●		
Improved surface finish in high-efficiency milling		●	●					●

● How to Use Wiper Insert

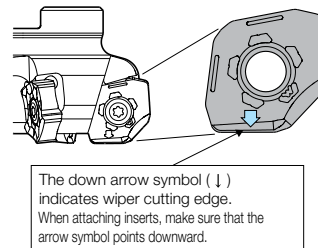
- 1) Please use one wiper insert per cutter.
(If you use more than 2 inserts on one cutter, the workpiece surface may have galling.)
- 2) Combination of Wiper Insert with other Chipbreakers

GM	SM	W
Yes	-	Yes
-	Yes	Yes

GH+W and GL+W insert chipbreaker combinations are not recommended.

- 3) For checking the protrusion amount of the wiper insert, use tool presetter. (Appropriate protrusion: 0.0039")

● How to Attach Wiper Inserts on MFPN Cutter



◆ Recommended Cutting Conditions

Chipbreaker	Workpiece Material	fz (ipt) <i>Feeds in () are for Grade TN620M</i>	Recommended Insert Grades (Cutting Speed Vc : sfm)					
			Cermet	MEGACOAT NANO (MEGACOAT)			MEGACOAT HARD	CVD Coated Carbide
			TN620M	PR1535	PR1525 (PR1225)	PR1510 (PR1210)	PR015S	CA6535
GM	Carbon Steel	0.004~0.008~0.016 (0.002~0.005~0.008)	★ 660~820~980	☆ 390~590~820	★ 390~590~820	-	-	-
	Alloy Steel	0.004~0.008~0.016 (0.002~0.005~0.008)	★ 590~720~820	☆ 330~520~720	★ 330~520~720	-	-	-
	Mold Steel	0.004~0.008~0.014 (0.002~0.003~0.006)	★ 490~590~720	☆ 260~460~590	★ 260~460~590	-	-	-
	Austenitic Stainless Steel	0.004~0.008~0.016	-	☆ 330~520~660	☆ 330~520~660	-	-	-
	Martensitic Stainless Steel	0.004~0.008~0.016	-	☆ 490~660~820	-	-	-	☆ 590~790~980
	Precipitation Hardened Stainless Steel	0.004~0.008~0.012	-	★ 300~390~490	-	-	-	-
	Gray Cast Iron	0.004~0.008~0.016	-	-	-	★ 390~590~820	-	-
	Nodular Cast Iron	0.004~0.008~0.014	-	-	-	★ 330~490~660	-	-
	Ni-base Heat Resistant Alloys	0.004~0.005~0.008	-	☆ 70~100~160	-	-	-	★ 70~100~160
	Titanium Alloys	0.002~0.003~0.006	-	★ 130~200~260	-	-	-	-
SM *1(GL)	Carbon Steel	0.002~0.005~0.010 (0.002~0.004~0.006)	★ 660~820~980	☆ 390~590~820	☆ 390~590~820	-	-	-
	Alloy Steel	0.002~0.005~0.010 (0.002~0.004~0.006)	★ 590~720~820	☆ 330~520~720	☆ 330~520~720	-	-	-
	Mold Steel	0.002~0.004~0.008 (0.002~0.003~0.005)	★ 490~590~720	☆ 260~460~590	☆ 260~460~590	-	-	-
	Austenitic Stainless Steel	0.002~0.005~0.010	-	★ 330~520~660	☆ 330~520~660	-	-	-
	Martensitic Stainless Steel	0.002~0.005~0.010	-	☆ 490~660~820	-	-	-	★ 590~790~980
	Precipitation Hardened Stainless Steel	0.002~0.005~0.010	-	☆ 300~390~490	-	-	-	-
	Gray Cast Iron	0.002~0.005~0.010	-	-	-	☆ 390~590~820	-	-
	Nodular Cast Iron	0.002~0.004~0.008	-	-	-	☆ 330~490~660	-	-
	Ni-base Heat Resistant Alloys	0.002~0.004~0.006	-	☆ 70~100~160	-	-	-	☆ 70~100~160
	Titanium Alloys	0.002~0.003~0.006	-	★ 130~200~260	-	-	-	-
*2GH	Carbon Steel	0.008~0.016~0.028	-	☆ 390~590~820	☆ 390~590~820	-	-	-
	Alloy Steel	0.008~0.016~0.024	-	☆ 330~520~720	☆ 330~520~720	-	-	-
	Mold Steel	0.008~0.014~0.020	-	☆ 260~460~590	☆ 260~460~590	-	-	-
	Austenitic Stainless Steel	0.008~0.012~0.016	-	☆ 330~520~660	☆ 330~520~660	-	-	-
	Martensitic Stainless Steel	0.008~0.012~0.016	-	☆ 490~660~820	-	-	-	☆ 590~790~980
	Precipitation Hardened Stainless Steel	0.008~0.012~0.016	-	☆ 300~390~490	-	-	-	-
	Gray Cast Iron	0.008~0.016~0.028	-	-	-	☆ 390~590~820	-	-
	Nodular Cast Iron	0.008~0.014~0.020	-	-	-	☆ 330~490~660	-	-
	Ni-base Heat Resistant Alloys	0.008~0.012~0.016	-	☆ 70~100~160	-	-	-	☆ 70~100~160
	Hard Materials	0.004~0.010~0.014	-	-	-	-	★ 260~330~390	-

● Values in bold indicate starting value of recommended condition.

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

● Machining with coolant is recommended for Ni-base heat-resistant alloys and Titanium alloys.

*1. GL Chipbreaker is recommended for surface finish oriented milling.

2. GH Chipbreaker : Fine Pitch ➡ $f_z \leq 0.0157$ ipt

Extra Fine Pitch ➡ Not Recommended

★: 1st Recommendation ☆: 2nd Recommendation

● Applicable Chipbreaker

Cutter Type	Chipbreaker		
	GM	SM (GL)	GH
Coarse Pitch (with shim)	✓	✓	✓
Fine Pitch (without shim)	✓	✓	✓ (Feed rate is recommended under $f_z = 0.0157$ ipt)
Extra Fine Pitch (without shim)	✓	✓	Not recommended

■ Usage Precautions (How to mount an insert)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. After applying anti-seize compound on portion of taper and thread, while pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten the screw with appropriate torque. Ref. to Fig. 1 and Fig.2.
Recommended tightening torque ➡ The torque for coarse pitch (using M5 screw) is 4.2 N·m
The torque for extra fine pitch (using M4 screw) is 3.5 N·m.
3. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder and between the insert side surfaces and the pocket wall of the toolholder.
4. **To change the cutting edge of the insert, turn the insert counterclockwise** (ref. to Fig. 3).
Insert corner identification number is stamped on the top surface of insert (Fig. 4). To protect the wiper edge, use the corners of insert in the sequence of corner numbers.

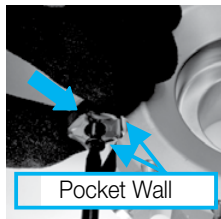


Fig.1

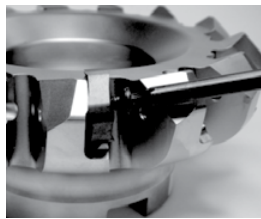


Fig.2



Fig.3

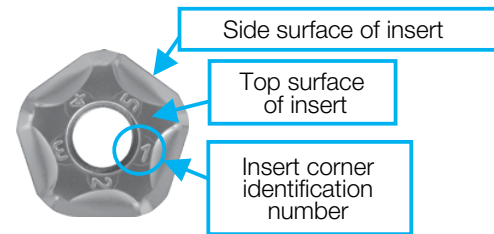


Fig.4

■ How to Replace the Shim (Coarse Pitch)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding pocket wall (ref. to Fig. 5) and lightly pressing the shim toward the constraint surface, insert the screw into the hole of the shim and tighten it (ref. to Fig. 6).
When tightening the screw, make sure that the screw is vertical to the bearing surface. Recommended tightening torque is 6.0N·m.
3. After tightening the screw, make sure that there is no clearance between the shim seat surface and the bearing surface. If there is any clearance, remove the insert and mount it again according to the above steps.

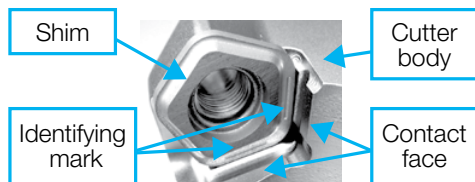


Fig.5



Fig.6

MFPN66

High Efficiency Milling with a 24° Lead Angle

Economical Double-sided 10-edge Insert

Reduces Chattering with a Low Cutting Force Design

Reduces Cutting Costs when Machining Auto Parts and Other General Purpose Machining Applications

1

Economical Double-sided 10-edge Insert

Large Lineup of Sizes from Ø32mm for Various Machining Applications

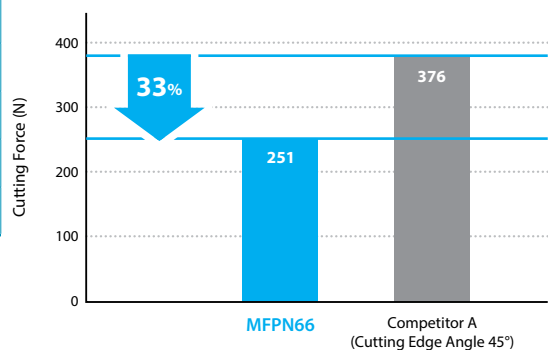
Cost reduction in various applications from general parts to automotive parts machining

2

Reduces Chattering with a Low Cutting Force Design
Available for Small to Medium D.O.C.

Suppresses vibration for excellent surface finish with a 24° lead angle

Low Cutting Force Comparison (Internal Evaluation)



Cutting Conditions : Vc = 660 sfm, f = 0.006 ipt, D.O.C. = 0.118"
Cutter Diameter Ø63mm, Workpiece : 1049 Steel

Surface Finish (Machining with Workpiece Overhang Length of 80mm)



Excellent Surface Finish with Low Workpiece Clamping Rigidity

Cutting Conditions : Vc = 660 sfm, f = 0.008 ipt, D.O.C. = 0.020"
Cutter Diameter Ø63mm, Workpiece : 1049 Steel

3

Extended Tool Life with MEGACOAT NANO Coating Technology
Insert Lineup Also Includes a Cermet Grade for Better Surface Finish



GM Chipbreaker

1st Recommendation (General Purpose)



GH Chipbreaker

Tough Edge



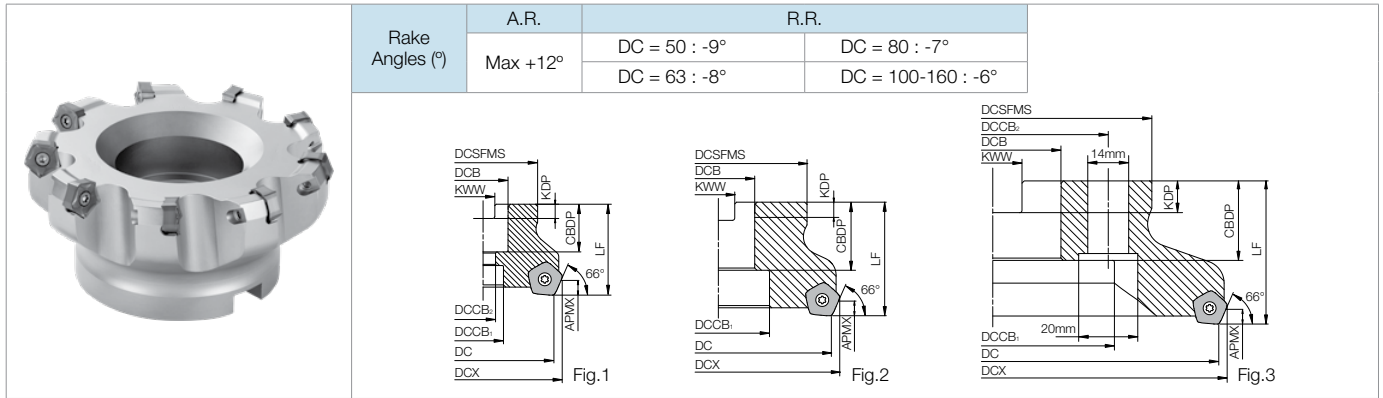
SM Chipbreaker

for Stainless Steel



Facing

MFPN66 Face Mill (Metric Size)



Toolholder Dimensions

Part Number			Stock	No. of Inserts	Dimensions (mm)										Drawing	Weight (kg)	Shim
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW			
Inch Bore Dia.	Fine Pitch	MFPN 66080R-6T-G	●	6	80	88	70	1.000"	20	13	50	1.063"	0.236"	0.375"	Fig.1	1.2	No
		66100R-7T-G	●	7	100	107	78	1.250"	45	63		1.339"	0.315"	0.500"	Fig.2	1.7	
		66125R-9T-G	●	9	125	132	89	1.500"	55		-	1.496"	0.394"	0.626"		2.9	
		66160R-11T-G	●	11	160	167	110	2.000"	72	1.496"		0.433"	0.750"	4.5			
	Extra Fine Pitch	MFPN 66080R-9T-G	●	9	80	88	70	1.000"	20	13	50	1.063"	0.236"	0.375"	Fig.1	1.2	No
		66100R-11T-G	●	11	100	107	78	1.250"	45	63		1.339"	0.315"	0.500	Fig.2	1.7	
		66125R-13T-G	●	13	125	132	89	1.500"	55		-	1.496"	0.394"	0.625"		3	
		66160R-15T-G	●	15	160	167	110	2.000"	72	1.496"		0.433"	0.750"	4.8			
Metric Bore Dia.	Fine Pitch	MFPN 66050R-4T-M-G	●	4	50	58	48	22	18	11	40	21	6.3	10.4	Fig.1	0.3	No
		66063R-5T-M-G	●	5	63	71								0.5			
		66080R-6T-M-G	●	6	80	88	70	27	20	13	50	24	7	12.4		1.2	
		66100R-7T-M-G	●	7	100	107	78	32	45	-		30	8	14.4	Fig.2	1.6	
		66125R-9T-M-G	●	9	125	132	89	40	55		63	33	9	16.4		2.8	
		66160R-11T-M-G	●	11	160	167									Fig.3	3.8	
	Extra Fine Pitch	MFPN 66050R-5T-M-G	●	5	50	58	48	22	18	11	40	21	6.3	10.4	Fig.1	0.4	No
		66063R-7T-M-G	●	7	63	71										0.5	
		66080R-9T-M-G	●	9	80	88	70	27	20	13	50	24	7	12.4		1.2	
		66100R-11T-M-G	●	11	100	107	78	32	45	-		30	8	14.4	Fig.2	1.6	
		66125R-13T-M-G	●	13	125	132	89	40	55		63	33	9	16.4		3	
		66160R-15T-M-G	●	15	160	167									Fig.3	4	

Recommended Cutting Conditions ➡ M39

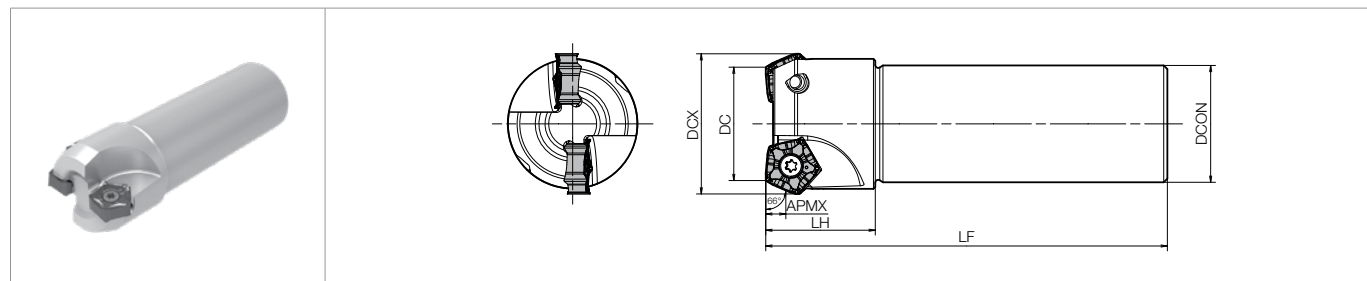
Applicable Inserts ➡ M38

Spare Parts (Both Metric & Inch Size Bore Dia.)


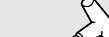

Part Number		Spare Parts			
		Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt
Fine Pitch	MFPN 66050R-4T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
	66063R-5T-M-G				HH10X30
	66080R-6T(-M)-G				HH12X35
	66100R-7T(-M)-G				-
	66125R-9T(-M)-G				-
	66160R-11T(-M)-G				-
Extra Fine Pitch	MFPN 66050R-5T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
	66063R-7T-M-G				HH10X30
	66080R-9T(-M)-G				HH12X35
	66100R-11T(-M)-G				-
	66125R-13T(-M)-G				-
	66160R-15T(-M)-G				-

🔧 Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed.

MFPN66 End Mill (Metric Size)



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)							Rake Angles		Spare Parts		
												Insert Screw	Wrench	Anti-seize Compound
			DC	DCX	DCON	LF	LH	APMX	A.R. (Max)	R.R.				
MFPN 66032R-S32-2T-G	●	2	32	39.5	32	110	30	5	12°	-14°	SB-4090TRP	DTPM-15	P-37	
66040R-S32-3T-G	●	3	40	47.5						-12°				Recommended Tightening Torque 3.5 Nm

Recommended Cutting Conditions  M39

Applicable Inserts

Usage Classification




★ Roughing / 1st Choice

☆ Roughing / 2nd Choice

■ Finishing / 1st Choice

□ Finishing / 2nd Choice
(Hardness Under 45HRC)

P	Free-Cutting Steel	■	☆	★		
	Carbon/Alloy Steel	■	☆	★		
M	Austenitic Stainless Steel		★	☆		
	Martensitic Stainless Steel		★			
	Precipitation Hardened Stainless Steel		★			
K	Gray Cast Iron				★	
	Nodular Cast Iron				★	
N	Non-ferrous Metals					
S	Heat-Resistant Alloys		★			
	Titanium Alloy		★			
H	Hard Materials					★

Insert (Right-hand Shown)	Part Number	Dimensions (in)					Cermet					MEGA COAT HARD
		INSL	S	D1	BCH	BS	TN620M	PR1535	PR1525	PR1510	PR015S	
 General Purpose	PNMU 0905XNER-GM	0.575	0.219	0.185	0.079	0.079	●	●	●	●		
 Low Cutting Force	PNMU 0905XNER-SM							●	●	●		
 Tough Edge (Heavy Milling)	PNMU 0905XNER-GH							●	●	●	●	

MFPN66 RECOMMENDED CUTTING CONDITIONS

◆ Recommended Cutting Conditions (Coated Carbide)

● Coated Carbide

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc : sfm)			
			MEGACOAT NANO			MEGACOAT HARD
			PR1535	PR1525	PR1510	PR015S
GM	Carbon Steel	0.004~0.008~0.012	☆ 390~590~820	★ 390~590~820	-	-
	Alloy Steel	0.004~0.008~0.012	☆ 330~520~720	★ 330~520~720	-	-
	Mold Steel	0.004~0.007~0.010	★ 260~460~590	★ 260~460~590	-	-
	Austenitic Stainless Steel	0.004~0.007~0.010	☆ 330~490~660	☆ 330~490~660	-	-
	Martensitic Stainless Steel	0.004~0.007~0.010	☆ 330~490~660	-	-	-
	Precipitation Hardened Stainless Steel	0.004~0.007~0.010	★ 300~390~490	-	-	-
	Gray Cast Iron	0.004~0.008~0.012	-	-	★ 390~590~820	-
	Nodular Cast Iron	0.004~0.007~0.010	-	-	★ 330~490~660	-
	Ni-base Heat Resistant Alloys	0.004~0.005~0.008	☆ 70~100~160	-	-	-
SM	Carbon Steel	0.002~0.005~0.008	-	☆ 390~590~820	-	-
	Alloy Steel	0.002~0.005~0.008	-	☆ 330~520~720	-	-
	Mold Steel	0.002~0.004~0.006	-	☆ 260~460~590	-	-
	Austenitic Stainless Steel	0.002~0.005~0.008	★ 330~490~660	☆ 330~490~660	-	-
	Martensitic Stainless Steel	0.002~0.005~0.008	★ 330~490~660	-	-	-
	Precipitation Hardened Stainless Steel	0.002~0.005~0.008	☆ 300~390~490	-	-	-
	Gray Cast Iron	0.002~0.005~0.008	-	-	☆ 390~590~820	-
	Nodular Cast Iron	0.002~0.004~0.006	-	-	☆ 330~490~660	-
	Ni-base Heat Resistant Alloys	0.002~0.003~0.006	★ 70~100~160	-	-	-
GH	Titanium Alloys	0.002~0.003~0.006	★ 130~200~260	-	-	-
	Carbon Steel	0.006~0.010~0.014	-	☆ 390~590~820	-	-
	Alloy Steel	0.006~0.010~0.014	-	☆ 330~520~720	-	-
	Mold Steel	0.004~0.008~0.012	-	☆ 260~460~590	-	-
	Gray Cast Iron	0.006~0.010~0.014	-	-	☆ 390~590~820	-
	Nodular Cast Iron	0.004~0.008~0.012	-	-	☆ 330~490~660	-
	Hard Materials	0.004~0.008~0.012	-	-	-	★ 260~330~390

● Center value in the table indicate the most recommended value. Adjust cutting speed and feed rate according to the actual machining conditions

● Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys

★: 1st Recommendation ☆: 2nd Recommendation

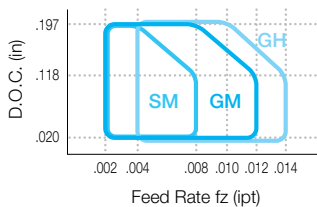
● Cermet

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade (Cutting Speed Vc : sfm)
			Cermet
			TN620M
GM	Carbon Steel	0.002~0.005~0.006	★ 660~820~980
	Alloy Steel	0.002~0.005~0.006	★ 590~720~820
	Mold Steel	0.002~0.004~0.005	★ 490~590~720

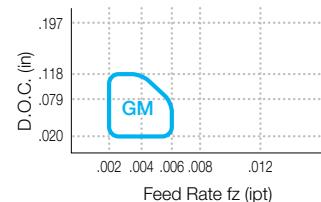
★: 1st Recommendation

● Applicable Chipbreaker Range

Coated Carbide



Cermet



● Applicable Chipbreakers

Cutter Type	Chipbreaker		
	GM	SM	GH
Fine Pitch	✓	✓	✓
Extra Fine Pitch	✓	✓	✓ (Feed rate is recommended under fz = 0.008 ipt)

MFLN

4-Edge Face Mills with Tangential Inserts for Heavy Milling

Tough 4-edge tangential inserts for reliable heavy milling at large D.O.C. and high feed rates

Three lead angle options for optimized machining in various applications

1 Tough and Reliable Inserts for Stable Heavy Milling

Inserts up to 20mm long offer increased rigidity

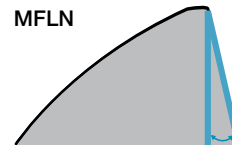
Tangentially mounted inserts provide 2 cutting edges on each side

Obtuse Edge Design

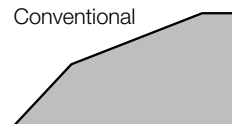
Increases the cutting edge angle only at the tip to maintain both strength and sharpness

Cross-section view of cutting edge

MFLN



Conventional



Corner Chamfer

(only available on MFLN90)

Both general corner-R type and chamfered corner type available

Prevents chattering and insert fracturing



Convex cutting edge ridge

Reduced impact forces when entering the workpiece



Wide Flat Mounting Surface

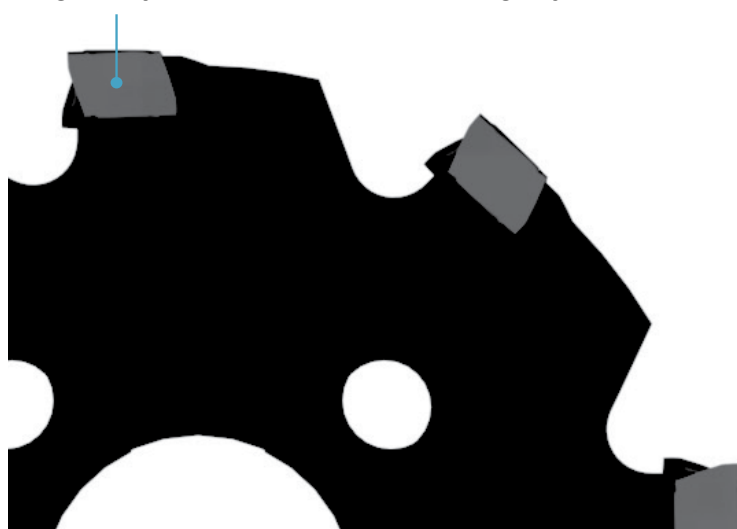
Holds insert firmly in heavy milling applications

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

M

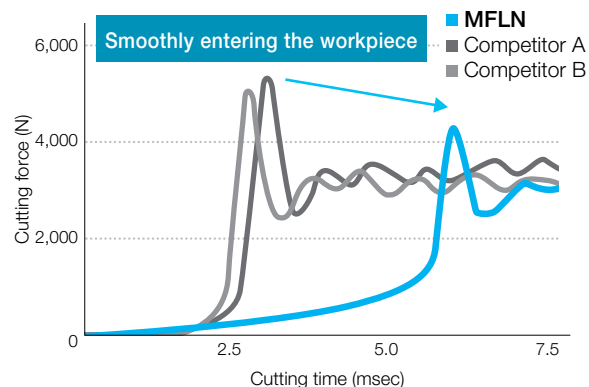
MILLING

Tangentially mounted inserts increase rigidity

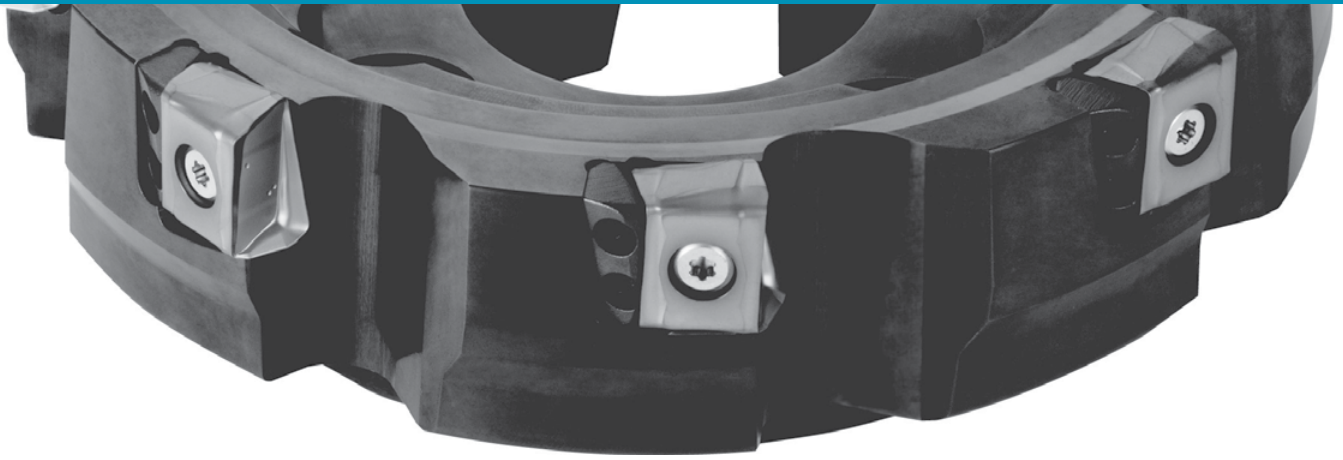


Cutting Forces when Entering the Workpiece (Internal evaluation)

MFLN90 (Insert : Chamfered corner type)



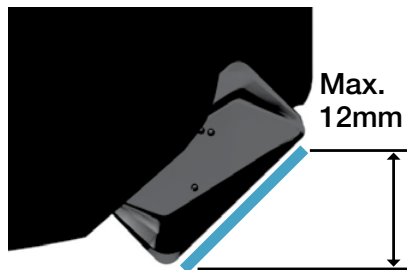
Cutting conditions : $V_c = 490$ sfm, D.O.C. \times ae = $0.197'' \times 2.95''$, $f_z = 0.012$ ipt $\phi 125$ (1 insert), Dry Workpiece : 1049



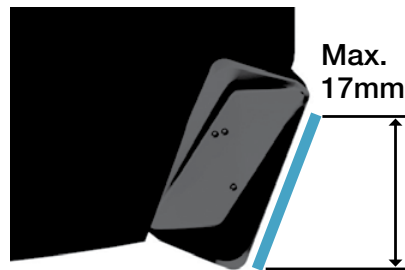
2 Large D.O.C. and High Feed Rates with 90°, 70°, and 45° Cutting Edge Angles

3 Cutter styles cover a wide variety of machining applications

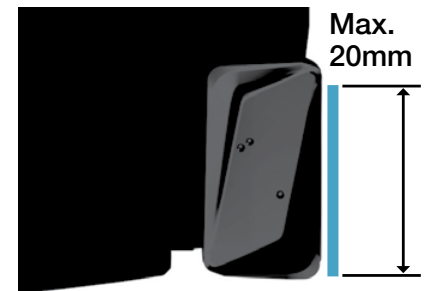
MFLN45
(Cutting edge angle 45°)



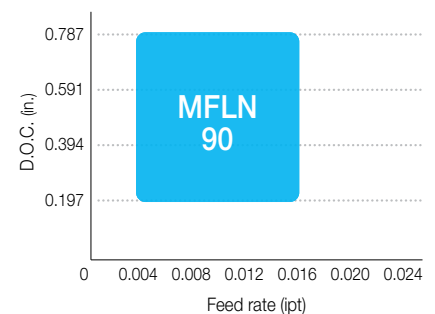
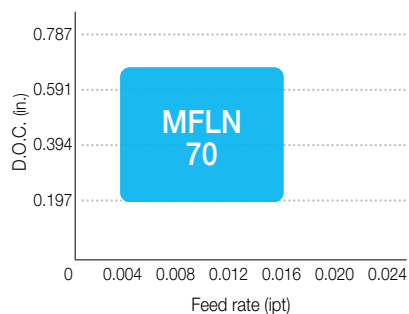
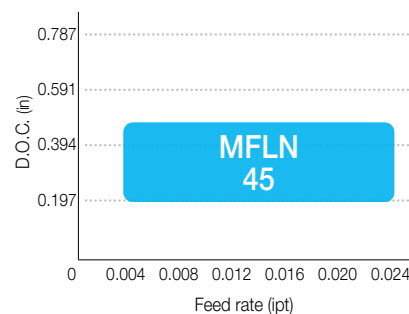
MFLN70
(Cutting edge angle 70°)



MFLN90
(Cutting edge angle 90°)



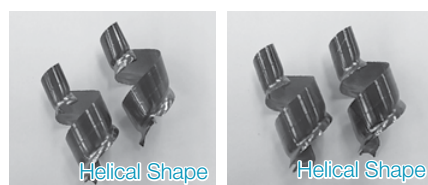
Application Range



Chip Comparison (Internal evaluation)

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

MFLN90 **Stable**



fz = 0.012 ipt

fz = 0.016 ipt

Competitor A **Unstable**



fz = 0.012 ipt

fz = 0.016" ipt

Competitor B **Unstable**



fz = 0.012 ipt

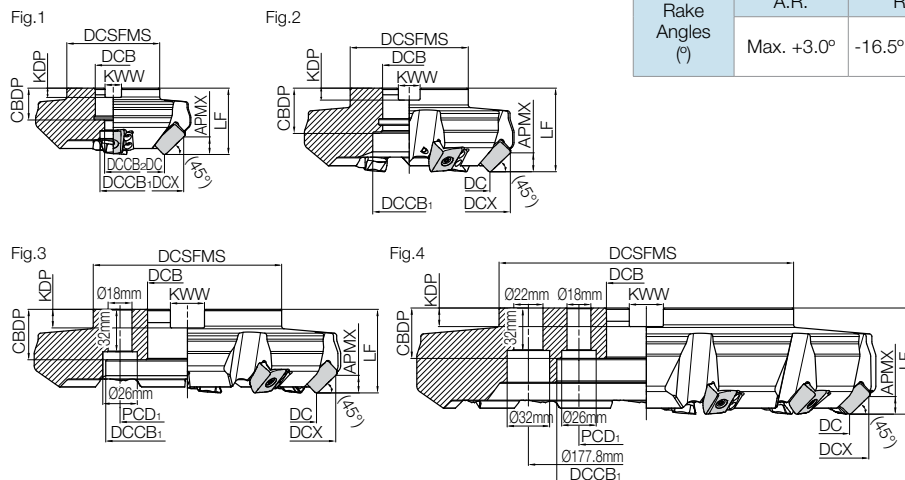
fz = 0.016 ipt

Cutting conditions : Vc = 490 sfm, ap × ae = 0.394" × 3.937", fz = 0.012, 0.016 ipt, ø125mm (1 insert), Dry Workpiece : 1049

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MFLN45 Face Mill

For MFLN90, see page M126



Rake Angles (°)	A.R.	R.R.
	Max. +3.0°	-16.5° ~ 13.5°

Toolholder Dimensions (Metric)

Part Number	Stock	No. of Inserts	Dimensions (mm)												Coolant Hole	Drawing	Weight (kg)
			DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	PCD ₁			
Inch Bore Dia.	MFLN	45080R-4T	80	104	70	1.000"	20	13	50	1.063"	0.236"	0.375"	-	-	Yes	Fig.1	2.0
		45100R-4T	100	124	78	1.250"	45	-	50	1.339"	0.315"	0.500"	-	-		Fig.1	2.7
		45125R-6T	125	149	89	1.500"	55	-	63	1.496"	0.394"	0.625"	12	-	No	Fig.2	4.6
		45160R-7T	160	184	110	2.000"	90	-	63	1.496"	0.433"	0.750"	12	-		Fig.2	6.8
		45200R-8T	200	224	142	-	124	-	80	-	0.551"	1.000"	101.6	-	No	Fig.3	10.0
		45250R-10T	250	274	222	1.875"	160	-	80	-	0.551"	1.000"	101.6	-		Fig.3	17.1
Metric Bore Dia.	MFLN	45315R-12T	315	339	-	-	215	-	80	-	-	-	-	-	Yes	Fig.4	25.3
		45080R-4T-M	80	104	70	27	20	13	50	24	7	12.4	-	-	Yes	Fig.1	2.0
		45100R-4T-M	100	124	78	32	45	-	50	30	8	14.4	-	-		Fig.2	2.7
		45125R-6T-M	125	149	89	40	55	-	63	33	9	16.4	12	66.7	No	Fig.2	4.6
		45160R-7T-M	160	184	110	-	90	-	63	-	-	-	12	66.7		Fig.3	6.7
		45200R-8T-M	200	224	142	60	124	-	80	38	14	25.7	101.6	-	No	Fig.3	9.7
Slot Mill	MFLN	45250R-10T-M	250	274	222	60	160	-	80	38	14	25.7	101.6	-		Fig.3	16.9
		45315R-12T-M	315	339	-	-	215	-	80	-	-	-	-	-	No	Fig.4	25.1
Ball-Nose Radius	MFLN	45315R-12T-M	315	339	-	-	215	-	80	-	-	-	-	-		Fig.4	25.1

Spare Parts

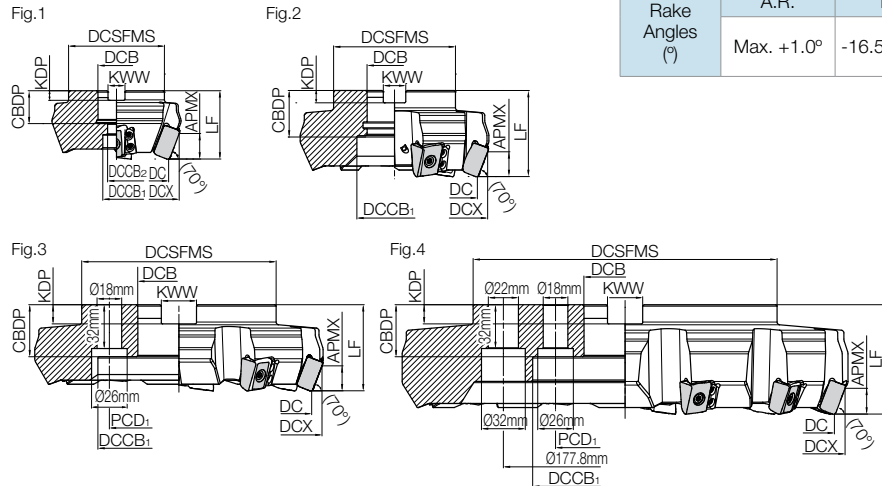
Part Number	Spare Parts						
	Insert Screw	Wrench	Shim	Shim Screw	Wrench	Anti-seize Compound	Arbor Bolt
MFLN ...080R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15	P-37	HH12X35
MFLN ...100R-4T(-M)	Recommended Torque for Insert Screw 6.0Nm		Recommended Torque for Shim Screw 3.5Nm		P-37		-
MFLN ...315R-12T(-M)							

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Recommended Cutting Conditions M45

Applicable Inserts M44

MFLN70 Face Mill

For MFLN90, see page [M126](#)

Rake Angles (°)	A.R.	R.R.
	Max. +1.0°	-16.5° ~ 13.5°

Toolholder Dimensions (Metric)

Part Number			Stock	No. of Inserts	Dimensions (mm)											Coolant Hole	Drawing	Weight (kg)	
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX				PCD ₁
Inch Bore Dia.	MFLN	70080R-4T	●	4	80	93	70	1.000"	20	13	50	1.063"	0.239"	0.375"	17	-	Yes	Fig.1	1.4
		70100R-4T	●		100	113	78	1.250"	45	1.339"		0.315"	0.500"	2.0					
		70125R-6T	●	6	125	138	89	1.500"	55	63	1.496"	0.394"	0.625"	Fig.2		3.5			
		70160R-7T	●	7	160	173	110	2.000"	70			0.433"	0.750"			5.8			
		70200R-8T	●	8	200	213	142	120	80			0.551"	1.000"	Fig.3		8.5			
		70250R-10T	●	10	250	263	222	160		101.6	No	Fig.4	22.2						
		70315R-12T	●	12	315	328		215											
Metric Bore Dia.	MFLN	70080R-4T-M	●	4	80	93	70	27	20	13	50	24	7	12.4	17	-	Yes	Fig.1	1.4
		70100R-4T-M	●		100	113	78	32	45	30		8	14.4	1.9					
		70125R-6T-M	●	6	125	138	89	40	55	63	33	9	16.4	66.7		No	Fig.3	3.4	
		70160R-7T-M	●	7	160	173	110		90		38	14	25.7					101.6	Fig.4
		70200R-8T-M	●	8	200	213	142	120											
		70250R-10T-M	●	10	250	263	222	160											
		70315R-12T-M	●	12	315	328		215											

Spare Parts

Part Number	Spare Parts						
	Insert Screw	Wrench	Shim	Shim Screw	Wrench	Anti-seize Compound	Arbor Bolt
MFPN ...080R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15		HH12X35
...100R-4T(-M)	Recommended Torque for Insert Screw 6.0Nm		Recommended Torque for Shim Screw 3.5Nm		P-37		
...315R-12T(-M)							

🔧 Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Recommended Cutting Conditions [M45](#)

Applicable Inserts [M44](#)



PR1525 : 1st recommendation for wear resistance. Great for scale removal and cast iron machining

PR1535 : Defect resistant, tough substrate for stable machining



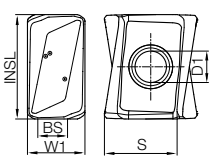
● Applicable Inserts

Usage Classification

★ Roughing / 1st Choice

☆ Roughing / 2nd Choice

P	Free-Cutting Steel	☆	★
	Carbon/Alloy Steel	☆	★
K	Gray Cast Iron	☆	★
	Nodular Cast Iron	☆	★

Insert (Right-hand Shown)			Part Number	Dimensions (in)					MEGACOAT NANO	
				W1	S	D1	INSL	BS	PR1535	PR1525
 Corner-R	 R0.063"	 INSL, BS, W1, S	LOGU 221616ER-GM	0.492	0.654	0.268	0.898	0.248	●	●

◆ How to Mount Inserts

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 (20IP) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 Nm)
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

● Applicable Insert Selection

	LOGU221616ER-GM (Corner-R)	LOGU2216PAER-GM (Corner Chamfer)
MFLN45	✓	Not Applicable
MFLN70	✓	Not Applicable
MFLN90	✓	✓

RECOMMENDED CUTTING CONDITIONS

◆ Recommended Cutting Conditions (MFLN45 / MFLN70)

● MFLN45

★: 1st Recommendation ☆: 2nd Recommendation

Workpiece Material	D.O.C. (in)		Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc : sfm)	
	Width of Cut (≤0.5xDC)	Width of Cut (>0.5xDC)		MEGACOAT NANO	
				PR1535	PR1525
Carbon Steel	~0.394	~0.315	0.004 ~ 0.012 ~ 0.024	☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Alloy Steel				☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Mold Steel				☆ 230 ~ 330 ~ 390	★ 260 ~ 390 ~ 490
Gray Cast Iron	~0.474	~0.394	0.004 ~ 0.012 ~ 0.024	☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Nodular Cast Iron				☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590

- 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.

● MFLN70

★: 1st Recommendation ☆: 2nd Recommendation

Workpiece Material	D.O.C. (in)		Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc : sfm)	
	Width of Cut (≤0.5xDC)	Width of Cut (>0.5xDC)		MEGACOAT NANO	
				PR1535	PR1525
Carbon Steel	~0.591	~0.472	0.004 ~ 0.008 ~ 0.016	☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Alloy Steel				☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Mold Steel				☆ 230 ~ 330 ~ 390	★ 260 ~ 390 ~ 490
Gray Cast Iron	~0.669	~0.591	0.004 ~ 0.008 ~ 0.016	☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Nodular Cast Iron				☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590

- 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.

◆ How to Replace the Insert Shim Seat

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.

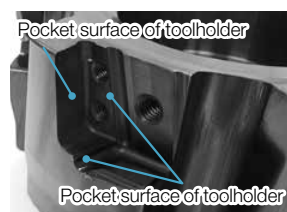


Fig.1

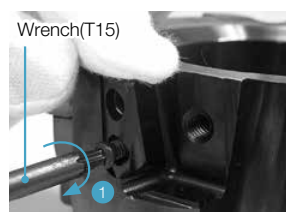


Fig.2



Fig.3

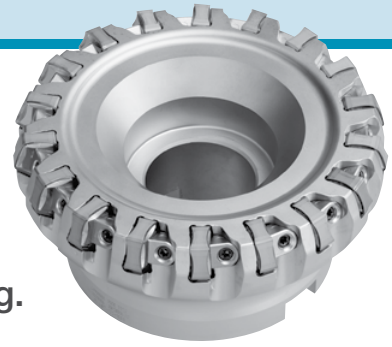


Fig.4

MFK

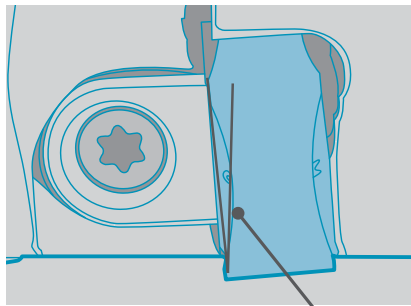
Milling Cutter for Cast Iron

Tough edge with low cutting forces enable stable machining.
Uses 10-edge inserts for economical machining.



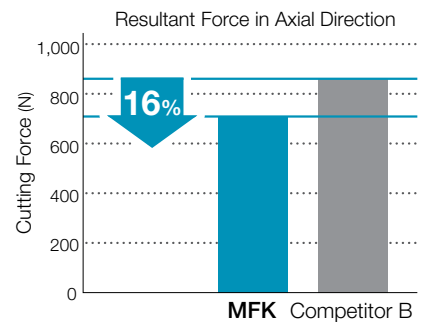
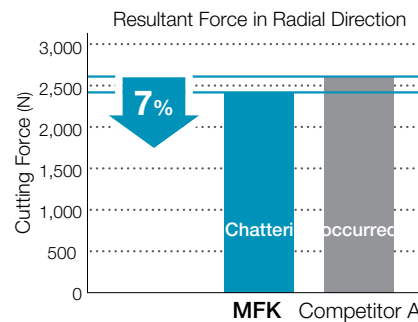
1 Low Cutting Forces Prevent Chattering

Low Cutting Forces with Helical Cutting Edge Design



A.R. Max.
+15°

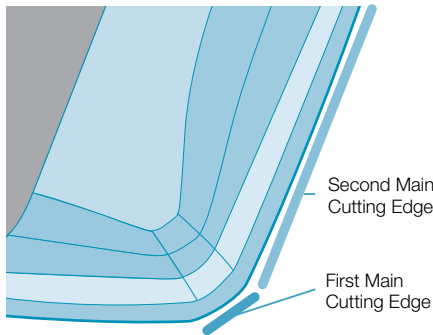
Cutting Force Comparison (Internal Evaluation)



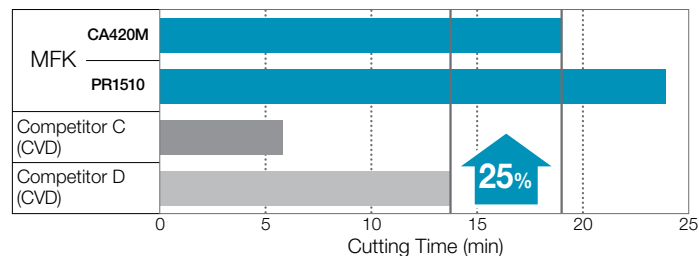
Cutting Conditions: $V_c = 590$ sfm, $f_z = 0.012$ ipt, D.O.C. \times ae = $0.118'' \times 2.441''$, Dry Workpiece: Nodular Cast Iron (80-60-03), Ø5.000"

2 Tough and Reliable Insert Construction Prevents Fracturing

Tough and Reliable Dual Angle Edge Design

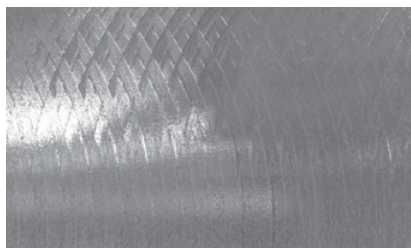


Fracture Resistance Comparison (Internal Evaluation)

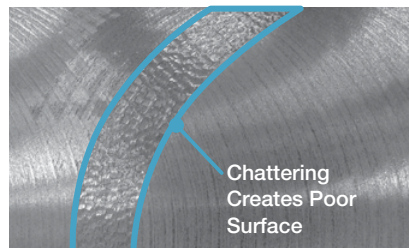


Cutting Conditions: $V_c = 980$ sfm, $f_z = 0.020$ ipt, D.O.C. = $0.079''$, Wet Workpiece: Nodular Cast Iron (65-45-12) with 4 Bores

Surface Finish Comparison (Internal Evaluation)



MFK



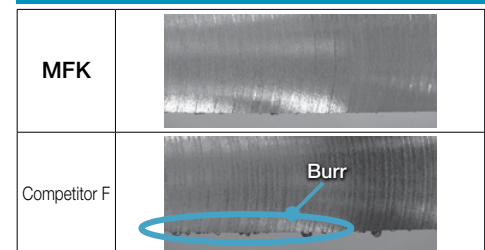
Competitor E

Chattering
Creates Poor
Surface

Cutting Conditions: $V_c = 590$ sfm, $f_z = 0.012$ ipt, D.O.C. \times ae = $0.118'' \times 3.071''$, Dry Workpiece: Nodular Cast Iron (80-60-03)

Burr Comparison

Sharp Cutting Prevents Burr Formation



← Cutting Direction

3 Large Toolholder and Insert Lineup for Various Applications

Fine and Extra Fine Pitch Types Available.



Fine Pitch

(Example: 5000R-11-12T = 12 Inserts)

- Recommended for Unstable Setups
- General Purpose for Wide Application Ranges

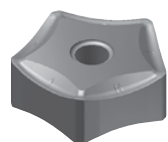


Extra Fine Pitch

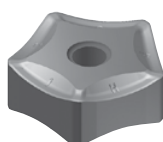
(Example: 5000R-11-18T = 18 Inserts)

- Recommended for Rigid Setups
- Finer Pitch for Higher Efficiency

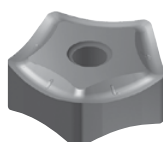
Wide Range of Chipbreakers for Various Machining Applications



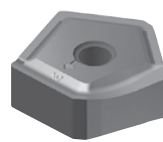
General Purpose:
GM Chipbreaker



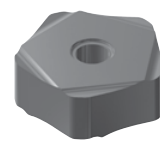
Heavy Duty:
GH Chipbreaker



Finishing:
GL Ground Chipbreaker

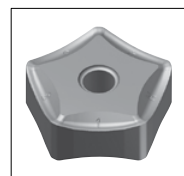


Wiper Edge:
W Ground Wiper Edge



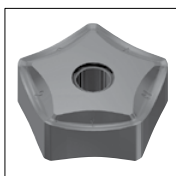
High Speed Machining:
Ceramic with Chipbreaker

Insert Grade Lineup



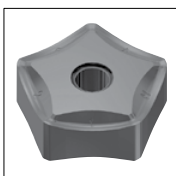
CA420M

Long Tool Life
(CVD)
(1st Recommendation)



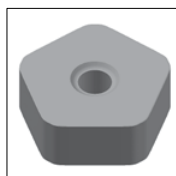
PR1510

Stable Machining
(PVD)



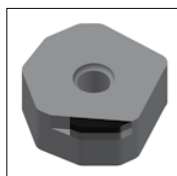
PR1525

Fracture Resistance
(PVD)



KS6050 / CS7050

High Speed Machining
(Ceramic)

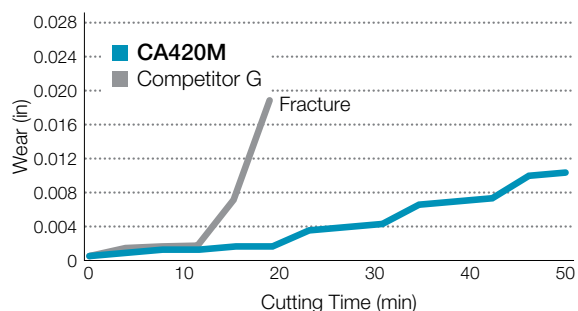


KBN475

High Speed &
Precision Machining
(CBN Wiper Insert)

Use CBN wiper
inserts together
with ceramic
KS6050/CS7050
inserts

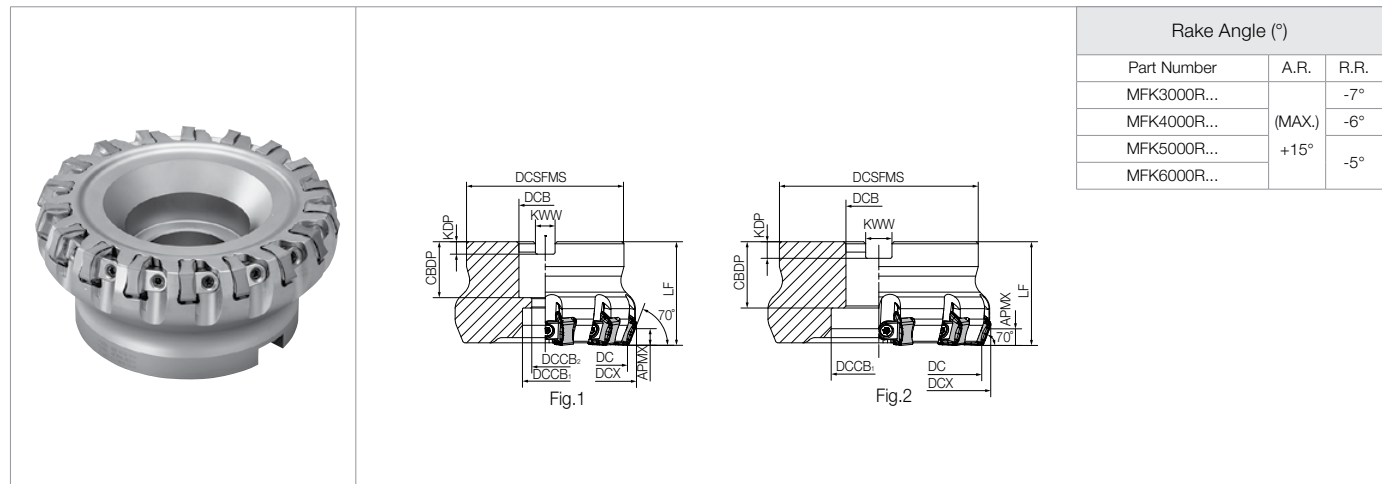
Wear Resistance Comparison (Internal Evaluation)



Cutting Conditions: $V_c = 670$ sfm, $f_z = 0.012$ ipt, D.O.C. \times ae = $0.079'' \times 3.150''$, Dry
Workpiece: Nodular Cast Iron (65-45-12)

INSERT GRADES	A
TURNING INSERTS	B
CBN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T






MFK Face Mill (Inch Size)



Toolholder Dimensions

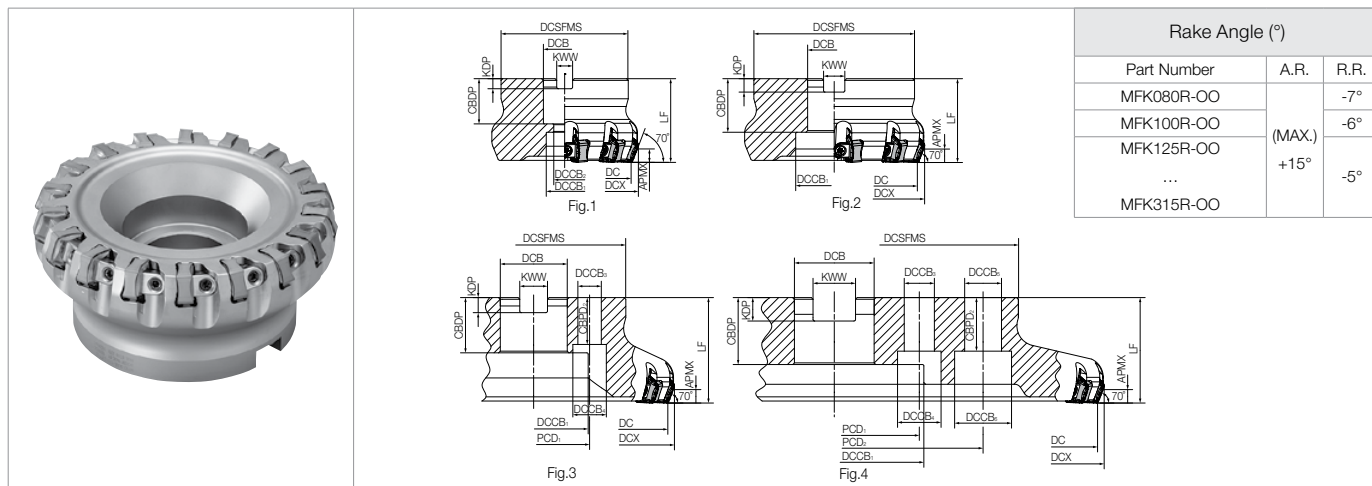
Part Number			Stock	No. of Inserts	Dimensions (in)										Drawing	Weight (kg)	
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW			APMX
Inch Bore Dia.	Fine Pitch	MFK 3000R-11-8T	●	8	3.000	3.340	2.750	1.000	0.866	0.551	2.480	1.063	0.240	0.375	0.236	Fig.1	1.610
		4000R-11-10T	●	10	4.000	4.340	3.750	1.500	1.299	0.866		1.181	0.390	0.625			2.860
	Extra Fine Pitch	MFK 3000R-11-10T	●	10	3.000	3.340	2.750	1.000	0.866	0.551	2.480	1.063	0.240	0.375	0.236	Fig.1	1.550
		4000R-11-14T	●	14	4.000	4.340	3.750	1.500	1.299	0.866		1.181	0.390	0.625			2.740
		5000R-11-18T	●	18	5.000	5.340			2.047	-		1.496				Fig.2	3.480

Spare Parts and Applicable Inserts

Part Number	Spare Parts				Applicable Inserts  M17
	Wedge	Wedge Screw	Wrench	Arbor Bolt	
					
MFK 3000R-11-8T	C09N	W6X18N	TT-15	HH1/2-1.25	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
4000R-11-10T	C09N	W6X18N	TT-15	HH3/4-2.3	
5000R-11-12T	C09N	W6X18N	TT-15	-	
6000R-11-16T					
MFK 3000R-11-10T	C09N	W6X18N	TT-15	HH1/2-1.25	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
4000R-11-14T	C09N	W6X18N	TT-15	HH3/4-2.3	
5000R-11-18T	C09N	W6X18N	TT-15	-	
6000R-11-22T					

Recommended Cutting Conditions ➡ M50-M51

MFK Face Mill (Metric Size)



Toolholder Dimensions

Part Number			Stock	No. of Inserts	Dimensions (mm)																		Drawing	Weight (kg)	
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	PCD ₁	PCD ₂	CBDP ₂			
Inch Bore Dia.	Fine Pitch	MFK	080R-11-8T	●	8	80	89	76	1.250"	26	17	63	1.260"	0.315"	0.500"	6.0	-	-	-	-	-	-	Fig.1	1.76	
			100R-11-10T	●	10	100	109	96	1.250"	26	17	63	1.260"	0.315"	0.500"	6.0	-	-	-	-	-	-	Fig.1	2.98	
			125R-11-12T	●	12	125	134	100	1.500"	55	-	63	1.496"	0.394"	0.625"	6.0	-	-	-	-	-	-	Fig.2	3.65	
			160R-11-16T	●	16	160	169	100	2.000"	70	-	63	1.496"	0.433"	0.750"	6.0	-	-	-	-	-	-	Fig.2	4.62	
			200R-11-20T	●	20	200	209	142	1.875"	110	-	63	1.575"	0.551"	1.000"	6.0	18	26	-	-	101.6	-	32	Fig.3	7.65
			250R-11-24T	●	24	250	259	142	1.875"	110	-	63	1.575"	0.551"	1.000"	6.0	18	26	-	-	101.6	-	32	Fig.3	10.73
		315R-11-28T	●	28	315	324	220	1.875"	110	-	63	1.575"	0.551"	1.000"	6.0	18	26	22	32	101.6	177.8	32	Fig.4	19.71	
	Extra fine Pitch	MFK	080R-11-10T	●	10	80	89	76	1.250"	26	17	63	1.260"	0.315"	0.500"	6.0	-	-	-	-	-	-	Fig.1	1.70	
			100R-11-14T	●	14	100	109	96	1.250"	26	17	63	1.260"	0.315"	0.500"	6.0	-	-	-	-	-	-	Fig.1	2.85	
			125R-11-18T	●	18	125	134	100	1.500"	55	-	63	1.496"	0.394"	0.625"	6.0	-	-	-	-	-	-	Fig.2	3.44	
			160R-11-22T	●	22	160	169	100	2.000"	70	-	63	1.496"	0.433"	0.750"	6.0	-	-	-	-	-	-	Fig.2	4.44	
			200R-11-28T	●	28	200	209	142	1.875"	110	-	63	1.575"	0.551"	1.000"	6.0	18	26	-	-	101.6	-	32	Fig.3	7.40
		250R-11-36T	●	36	250	259	142	1.875"	110	-	63	1.575"	0.551"	1.000"	6.0	18	26	-	-	101.6	-	32	Fig.3	10.36	
Metric Bore Dia.	Fine Pitch	MFK	080R-11-8T-M	●	8	80	89	76	27	20	13	63	24	7	12.4	6.0	-	-	-	-	-	-	Fig.1	1.87	
			100R-11-10T-M	●	10	100	109	96	32	26	17	63	28	8	14.4	6.0	-	-	-	-	-	-	Fig.1	2.99	
			125R-11-12T-M	●	12	125	134	100	40	55	-	63	33	9	16.4	6.0	-	-	-	-	-	-	Fig.2	3.56	
			160R-11-16T-M	●	16	160	169	100	40	70	-	63	33	9	16.4	6.0	14	20	-	-	66.7	-	28	Fig.3	4.51
			200R-11-20T-M	●	20	200	209	142	60	110	-	63	40	14	25.7	6.0	18	26	-	-	101.6	-	32	Fig.3	7.35
			250R-11-24T-M	●	24	250	259	142	60	110	-	63	40	14	25.7	6.0	18	26	-	-	101.6	-	32	Fig.3	10.43
		315R-11-28T-M	●	28	315	324	220	60	110	-	63	40	14	25.7	6.0	18	26	22	32	101.6	177.8	32	Fig.4	19.41	
	Extra fine Pitch	MFK	080R-11-10T-M	●	10	80	89	76	27	20	13	63	24	7	12.4	6.0	-	-	-	-	-	-	Fig.1	1.81	
			100R-11-14T-M	●	14	100	109	96	32	26	17	63	28	8	14.4	6.0	-	-	-	-	-	-	Fig.1	2.86	
			125R-11-18T-M	●	18	125	134	100	40	55	-	63	33	9	16.4	6.0	-	-	-	-	-	-	Fig.2	3.38	
			160R-11-22T-M	●	22	160	169	100	40	70	-	63	33	9	16.4	6.0	14	20	-	-	66.7	-	28	Fig.3	4.32
			200R-11-28T-M	●	28	200	209	142	60	110	-	63	40	14	25.7	6.0	18	26	-	-	101.6	-	32	Fig.3	7.10
		250R-11-36T-M	●	36	250	259	142	60	110	-	63	40	14	25.7	6.0	18	26	-	-	101.6	-	32	Fig.3	10.07	
	315R-11-44T-M	●	44	315	324	220	60	110	-	63	40	14	25.7	6.0	18	26	22	32	101.6	177.8	32	Fig.4	18.92		

Spare Parts and Applicable Inserts

Part Number	Spare Parts				Applicable Inserts M17
	Wedge	Wedge Screw	Wrench	Arbor Bolt	
MFK 080R-11-8T-M	C09N	W6X18N	TT-15	HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
080R-11-8T	C09N	W6X18N	TT-15	HH16X40	
100R-11-10T(-M)					
125R-11-12T(-M)					
160R-11-16T(-M)					
200R-11-20T(-M)					
250R-11-24T(-M)	C09N	W6X18N	TT-15	-	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
315R-11-28T(-M)					
MFK 080R-11-10T-M	C09N	W6X18N	TT-15	HH12X35	
080R-11-10	C09N	W6X18N	TT-15	HH16X40	
100R-11-14T(-M)					
125R-11-18T(-M)					
160R-11-22T(-M)					PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
200R-11-28T(-M)	C09N	W6X18N	TT-15	-	
250R-11-36T(-M)					
315R-11-44T(-M)					

Recommended Cutting Conditions M50-M51

● : Standard Item △ : Phaseout Item (will be removed from next catalog)

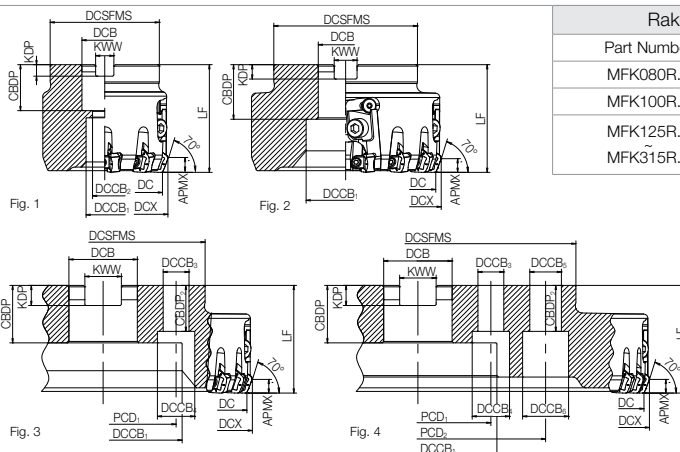
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■ **MFK-SF** Face Mill (Metric Size)












Rake Angle (°)		
Part Number	A.R.	R.R.
MFK080R...	(MAX.) +15°	-7°
MFK100R...		-6°
MFK125R...		-5°
MFK315R...		

- **Toolholder Dimensions**

Part Number		Stock	No. of Inserts	Dimensions (mm)																	Drawing	Weight (kg)	Max RPM	
				DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	PCD ₁	PCD ₂				CBDP ₂
Inch Bore Dia.	MFK 080R-11-9T-SF	●	9 (3)	80	89	76	1.250"	26	17		1.260"	0.315"	0.500"									Fig.1	2.08	8,000
	100R-11-12T-SF	●	12 (4)	100	109	96					1.260"	0.315"	0.500"										3.49	7,000
	125R-11-15T-SF	●	15 (5)	125	134	100	1.500"	55	75	1.496"	0.394"	0.625"		-	-						Fig.2	4.54	6,100	
	160R-11-18T-SF	●	18 (6)	160	169		2.000"	70															6.82	5,300
	200R-11-24T-SF	●	24 (8)	200	209	142	1.875"	110	-	1.575"	0.551"	1.000"	6.0	18	26	-	22	32	4.000"	7.000"	32	Fig.3	10.39	4,700
	250R-11-30T-SF	●	30 (10)	250	259																		16.85	4,200
	315R-11-39T-SF	●	39 (13)	315	324	220															Fig.4	28.65	3,700	
Metric Bore Dia.	MFK 080R-11-9T-M-SF	●	9 (3)	80	89	76	27	20	13		24	7	12.4									Fig.1	2.21	8,000
	100R-11-12T-M-SF	●	12 (4)	100	109	96	32	26	17		28	8	14.4		-	-							3.49	7,000
	125R-11-15T-M-SF	●	15 (5)	125	134	100	40	55	75	33	9	16.4	6.0	14	20	-	-	66.7	-	28	Fig.2	4.47	6,100	
	160R-11-18T-M-SF	●	18 (6)	160	169																			
	200R-11-24T-M-SF	●	24 (8)	200	209	142	60	110	-	35	14	25.7	18	26	-	-	101.6	-	177.8	32	Fig.3	9.89	4,700	
	250R-11-30T-M-SF	●	30 (10)	250	259																	16.35	4,200	
	315R-11-39T-M-SF	●	39 (13)	315	324	220															Fig.4	28.14	3,700	









* Numbers in parenthese () are number of adjustable cutting edge pockets. Install wiper inserts into the adjustable cutting edge pockets

- Spare Parts and Applicable Inserts

Part Number		Spare Parts							Applicable Inserts  M17	
		Wedge	Wedge Screw	Wrench	Cartridge	Cartridge Screw	Wrench	Adjustment Screw		Arbor Bolt
										
MFK	080R-11-9T-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
	100R-11-12T-SF								HH16X40	
	125R-11-15T-SF								-	
	315R-11-39T-SF								-	
MFK	080R-11-9T-M-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH16X40	
	100R-11-12T-M-SF									
	125R-11-15T-M-SF									
	315R-11-39T-M-SF									

- **Applicable Inserts**

Recommended Cutting Conditions ➡ M50~M51

Part Number	Applicable Inserts  M17						
	 General Purpose	 Tough Edge	 Surface-Finish Oriented	 Wiper Insert (2-edge)	 High Speed Machining	 High Speed Machining (with Chipbreaker)	 Wiper Insert (2-edge)
MFK....-11-...	PNMG1106XNEN-GM	PNMG1106XNEN-GH	PNEG1106XNEN-GL	PNEG1106XNER-W	PNEA1106XNTN-T01020	PNEG1106XNTR-T00515	PNEG1106XNTR-T01015W

◆ Recommended Cutting Conditions (Coated Carbide)

★: 1st Recommendation ☆: 2nd Recommendation

Workpiece Material	Insert Grades	Cutting Speed Vc (sfm)	Chipbreaker	Feed Rate fz (ipt)				
				0.0024	0.0039	0.0079	0.0118	0.0157
Cast Iron	CA420M	560~750~980	★ GM			● 0.0098		
	PR1510	390~590~820	☆ GH				● 0.0118	
	PR1525		GL		● 0.0047			
Nodular Cast Iron	CA420M	490~660~820	★ GM			● 0.0079		
	PR1510	330~490~660	☆ GH				● 0.0098	
	PR1525		GL		● 0.0039			

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● : Standard Item △ : Phaseout Item (will be removed from next catalog)
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◆ Recommended Cutting Conditions (Ceramic)

• Without Chipbreaker

Workpiece Material	Insert Grades	Cutting Speed Vc (sfm)	Edge Prep.	Feed Rate fz (ipt)				
				0.0020	0.0039	0.0079	0.0118	0.0157
Cast Iron	★ KS6050	1970~2950~3940	0.004 × 20°					
	☆ CS7050							
Nodular Cast Iron	☆ KS6050	1310~1970~2950			● 0.0039			
	★ CS7050							

• With Chipbreaker

Workpiece Material	Insert Grades	Cutting Speed Vc (sfm)	Edge Prep.	Feed Rate fz (ipt)				
				0.0020	0.0039	0.0079	0.0118	0.0157
Cast Iron	★ KS6050	1970~2950~3940	0.002 × 15°					
	☆ CS7050							
Nodular Cast Iron	☆ KS6050	1310~1970~2950			● 0.0039			
	★ CS7050							

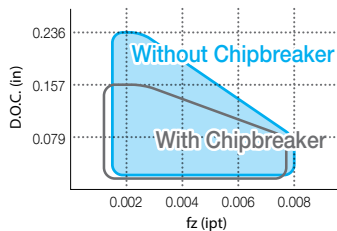
• CBN Wiper Insert

Workpiece Material	Insert Grades	Cutting Speed Vc (sfm)	Edge Prep.	Feed Rate fz (ipt)				
				0.0020	0.0039	0.0079	0.0118	0.0157
Cast Iron	KBN475	1970~2950~3940	0.004 × 15°		● 0.0039			
Nodular Cast Iron		1310~1970~2950						

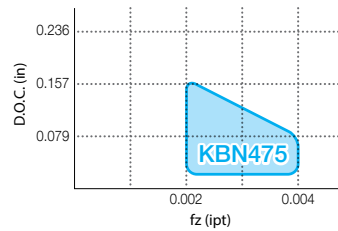
★: 1st Recommendation ☆: 2nd Recommendation

◆ Recommended Application Ranges

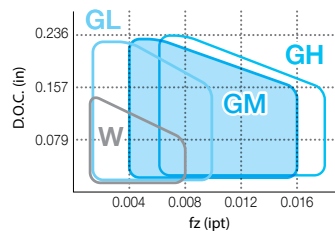
Gray/Nodular Cast Iron (Insert: Ceramic)



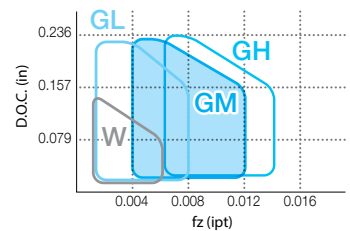
Gray/Nodular Cast Iron (Inserts: CBN)



Gray Cast Iron (Inserts: Coated Carbide)



Nodular Cast Iron (Inserts: Coated Carbide)



- When using W inserts, combine with GM or GH inserts
- If machining over fz = 0.0079", insert corner will be damaged. The main cutting edge of W type insert is receding from that of GM and GH. Therefore, the feed rate for the insert next to W type is double that of the other inserts.

■ How to Adjust Cutting Edge Height

1. Assemble all related parts into the cutter.
2. Make sure the back end of cartridge makes contact with adjustment screw (Fig 1), and pull them lightly inwards (Fig 2). Tighten the cartridge clamp screw temporary.
3. Install the insert (Fig 3), and tighten the wedge screw temporarily. Temporarily tighten the screw with a 40 to 45 degree rotation after the wedge contacts the insert.
4. Loosen the cartridge clamp screw (Fig 4).
5. Adjust the extruding amount with adjustment screw (Fig 5).
6. Tighten the wedge screw and firmly fix the insert.
(Recommended tightening torque : 6Nm)
7. Tighten the cartridge clamp screw firmly.
(Recommended tightening torque : 10Nm)

Notes :

1. Follow steps 1-7 above for adjustment.
2. To adjust the edge height adjust the wedge screw and loosen the cartridge clamp screw.
Tightening the adjustment screw with the clamp screw fixed firmly may damage the adjustment screw.
3. The adjusted edge height difference must be within 5µm.

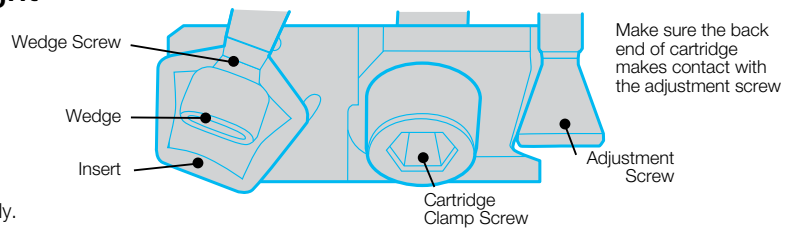


Fig.1

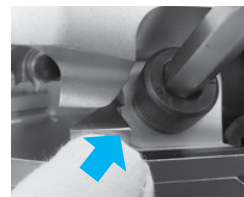


Fig.2

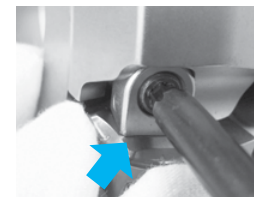


Fig.3

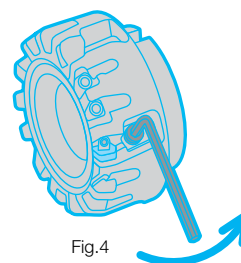


Fig.4

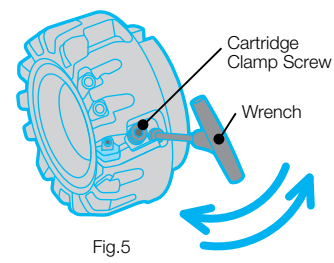


Fig.5

MFSE45 NEW

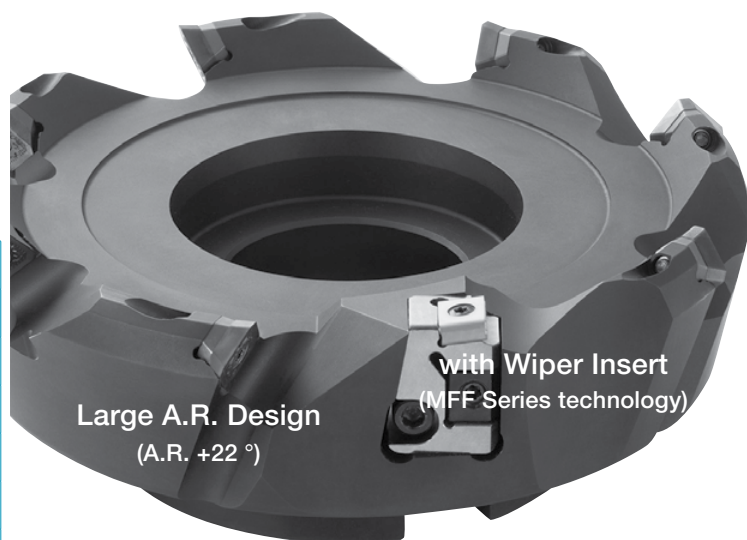
High Rake High Precision Milling

Rough and Finish in a Single Pass with Excellent Surface Finish

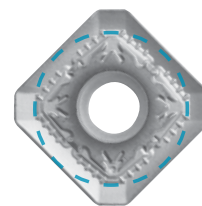
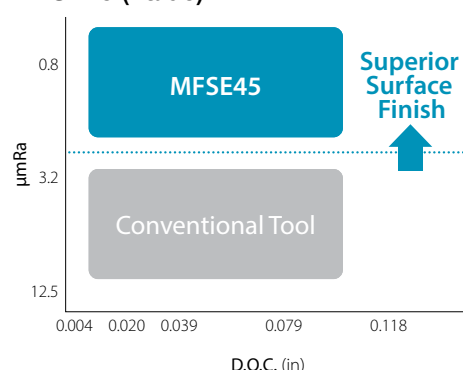
Roughing Condition ($f_z = 0.010$ ipt) Provides Excellent Surface Finish ($0.8 \mu\text{mRa}$ or Less)

1 The MFSE45 Milling Solution

Delivers high-quality surfaces by roughing and finishing simultaneously



MFSE45 (Value)



Inscribed Circle Tolerance
 ± 0.0008 " or Less

(Class E Standard ± 0.0012 " or less)

2 Excellent Surface Finish and Long Tool Life

Tight I.C. tolerance of insert

Improved surface finish quality and longer tool life
with reducing front edge runout

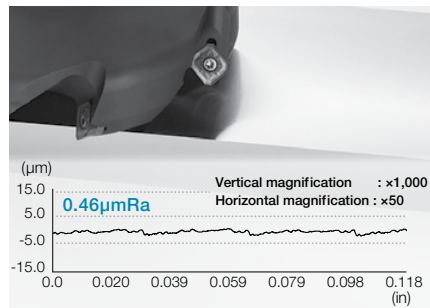
Advantage 1 Excellent surface finish

Effect on surface finish
(Image)



Front Edge Runout: Small \Rightarrow
Surface Finish: Good

Surface finish in stainless steel machining
(Internal evaluation)



Cutting Conditions : $V_c = 820$ sfm, D.O.C. $\times a_e = 0.039$ " $\times 3.937$ ",
 $f_z = 0.006$ ipt, Wet SS 304 $\varnothing 125$ mm (Standard 6 flutes) SL Chipbreaker

Advantage 2 Insert wear progresses evenly and tool life can be improved

Effect on wear (User Evaluation)

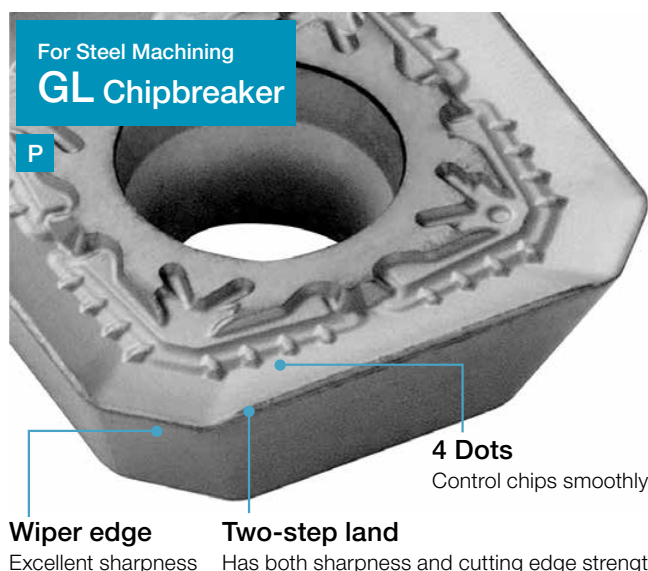
MFSE45	Competitor A
Average corner examples	Heavily damaged corner examples
Wear: 0.0059"	Wear: 0.0067"
Wear: 0.0043"	Wear: 0.0358"
Variation : Small	Variation : Large

Cutting Conditions : $V_c = 890$ sfm, D.O.C. $= -0.059$ ",
 $f_z = 0.008$ ipt, Wet SS 404 $\varnothing 250$ mm (15 flutes) SL Chipbreaker (PR1535)

Due to the high wear rate of the insert, all inserts need to be replaced, which may result in shorter tool life.

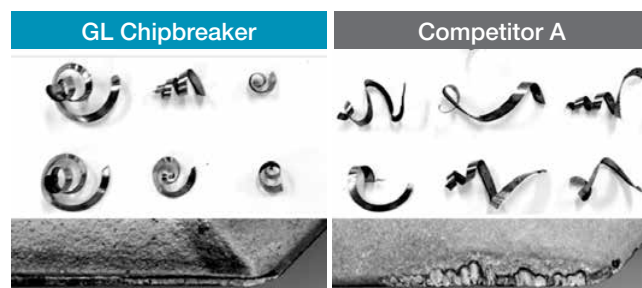
3 Kyocera's Newly Developed Unique Molded Chipbreaker

Excellent chip control. Eliminates chip entanglement in jigs, etc. and improves work efficiency



Delivers excellent chip evacuation, sharpness, strength and machining accuracy

Chip control and cutting edge condition comparison (Internal evaluation)



Stainless Steel and Aluminum Machining

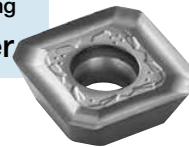
For Stainless Steel Machining
SL Chipbreaker

M
Micro-honing



For Aluminum Machining
AL Chipbreaker

N
Sharp Edge



4 Various Holders Available for Multiple Applications

In addition to styles with a wiper insert, the standard type with only the standard inserts are also available

Toolholder Specifications

Type	With Wiper Insert	Standard
Surface roughness	Approx. 0.8 μ mRa	Approx. 1.6 μ mRa
Recommended feed	fz = 0.010 ipt	fz = 0.005 ipt (Finish machining time)
Application	High efficiency finishing	General purpose (Uses 1 insert style)



Using wiper insert for MFF
(Cutting edge adjustment mechanism)

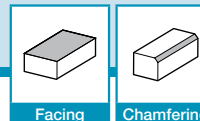
(Note) See page M55 for details on how to adjust the cutting edge.



CG image



*Standard type only (Bore Dia. inch spec, Ø160mm ~)

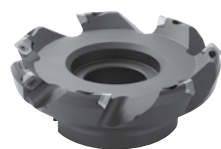


Facing

Chamfering

MFSE45 Face Mill **NEW**

Standard



With Wiper Insert

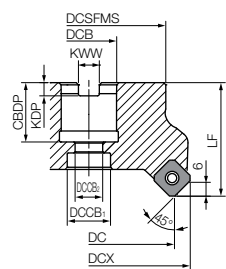
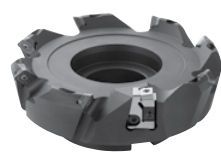


Fig.1

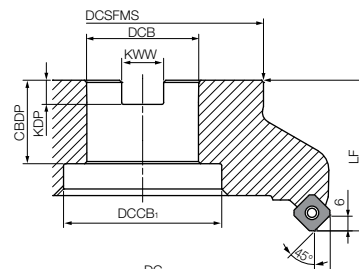


Fig.2

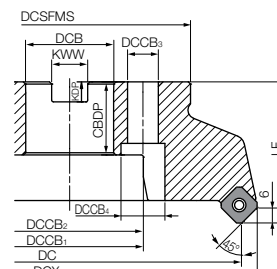
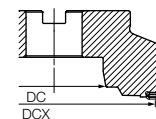


Fig.3



Wiper Insert Pocket

Rake Angle (°)
A.R.
+22°

● Toolholder Dimensions

Part Number			Stock	No. of Inserts	Dimensions (mm)										Cartridge	Drawing	Weight (kg)	Max RPM	
					DC	DCX	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	LF	CBDP	KDP					KWW
Standard	Inch Bore Dia.	MFSE 45080R-5T	<input type="checkbox"/>	5	80	88.7	1.000"	20	13	-	-	50	1.063"	0.236"	0.375"	No	Fig.1	1.4	12,800
		45100R-5T	<input type="checkbox"/>	5	100	108.7	1.250"	48	-	-	-	50	1.260"	0.315"	0.500"		Fig.2	1.9	11,500
		45125R-6T	<input type="checkbox"/>	6	125	133.7	1.500"	55	-	-	-	63	1.496"	0.394"	0.625"			3.3	10,200
		45160 ⅜ -7T	<input type="checkbox"/>	7	160	168.7	2.000"	72	-	-	-		1.496"	0.433"	0.750"			5.3	9,000
		45200 ⅝ -8T	<input type="checkbox"/>	8	200	208.7	1.875"	100	-	18	26		1.575"	0.551"	1.000"			7.3	8,100
		45250 ⅞ -10T	<input type="checkbox"/>	10	250	258.7		110	-	18	26	1.575"	0.551"	1.000"	15.8		7,200		
	Metric Bore Dia.	MFSE 45063R-5T-M	<input type="checkbox"/>	5	63	71.7	22	-	5	-	-	50	21	6.3	10.4	No	Fig.1	0.6	14,400
		45080R-5T-M	<input type="checkbox"/>	5	80	88.7	27	-	5	-	-		24	7	12.4		1.4	12,800	
		45100R-5T-M	<input type="checkbox"/>	5	100	108.7	32	-	5	-	-		30	8	14.4		1.8	11,500	
		45125R-6T-M	<input type="checkbox"/>	6	125	133.7	40	-	6	-	-		33	9	16.4		3.2	10,200	
		45160R-7T-M	<input type="checkbox"/>	7	160	168.7	40	-	7	14	20	63	32	9	16.4	Fig.3	5.4	9,000	
		45200R-8T-M	<input type="checkbox"/>	8	200	208.7	60	-	8	18	26		40	14	25.7		7.0	8,100	
		45250R-10T-M	<input type="checkbox"/>	10	250	258.7		-	10	18	26		40	14	25.7		15.5	7,200	
		Wiper Insert	Inch Bore Dia.	MFSE 45160R-8T-W	<input type="checkbox"/>	8	160	168.7	2.000"	72	-		-	-	63		1.496"	0.433"	0.750"
45200R-9T-W	<input type="checkbox"/>			9	200	208.7	1.875"	133	-	18	26	1.575"	0.551"	1.000"		Fig.3	7.6	800	
45250R-11T-W	<input type="checkbox"/>			11	250	258.7		133	-	18	26	1.496"	0.551"	1.000"		12.3	800		
Metric Bore Dia.	MFSE 45160R-8T-W-M		<input type="checkbox"/>	8	160	168.7	40	1	8	-	-	63	33	9	16.4	Yes (Wiper Insert Only)	Fig.3	5.5	1,000
	45200R-9T-W-M		<input type="checkbox"/>	9	200	212.8	60	1	9	18	26		40	14	25.7			7.3	800
	45250R-11T-W-M		<input type="checkbox"/>	11	250	262.7		1	11	18	26		38	14	25.7			12.0	800

Caution with Max. Revolution

Set the number of revolutions per minute within the recommended cutting speed on P8

When running an end mill or a cutter at the maximum revolution, the insert or the cutter may be damaged by centrifugal force.

Recommended Cutting Conditions **M56**Applicable Inserts **M55**

Common for Standard/Wiper Insert

Clamp Screw	Wrench	Shim	Shim Screw	Shim Wrench	Anti-seize Compound
SB-35120TRP	DTPM-15	MFSE-105	SPW-5035	LW-3.5	P-37
Fastening Torque for Insert Clamp 4 Nm		Fastening Torque for Shim Clamp 5 Nm			

For Wiper Insert

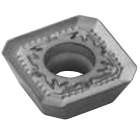
Clamp Screw	Wrench	Wedge	Cartridge	Cartridge Clamp Screw	Wrench	Adjustment Screw
SB-3592TR	DTM-10	AD-MFF	CR-MFF	HH5X15L	TTW-15	W6X18N
Fastening Torque for Wiper Insert Clamp 1.2 Nm						

● Applicable Inserts



Usage Classification

★ 1st Choice

☆ 2nd Choice

Insert	Part Number	Dimensions (mm)					Angle		MEGACOAT NANO		CVD Coating	DLC Coating
		IC	S	D1	RE	BS	AN	AS	PR1535	PR1525	CA6535	PDL025
	SEET 13T3AGSN-GL	13.4	3.97	4.2	1.5	2.1	20°	29°	●	●	●	
	SEET 13T3AGSN-SL	13.4	3.97	4.2	1.5	2.1	20°	29°	●	●	●	
	SEET 13T3AGFN-AL	13.4	3.97	4.2	1.5	2.1	20°	29°				●

Wiper Insert

Insert	Part Number	Dimensions (mm)					MEGACOAT NANO Cermet	MEGACOAT NANO
		IC	S	D1	RE	BS	PV60M	PR1525
 For Steel and Stainless Steel (Low Cutting Force)	LNGX 120916R-TT	9.525	4.76	4.2	12.7	1.6	●	●
 For Cast Iron	LNGX 120916	9.525	4.76	4.2	12.7	1.6	●	●

Recommended Cutting Conditions ➡ M56

● Cutting Edge Adjustment

1. Use the supplied TTW-15 wrench to rotate the screw and easily adjust the cutting edge position.
2. Thread in one direction clockwise (Fig.1) when adjusting.

If the adjustment is completed with the screw rotated counterclockwise, the screw will become loose and chatter due to backlash.

*Since the insert cutting edge of this product has an arc shape, it cannot be adjusted correctly if the measurement position is different.

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

Tighten the screws clockwise (raising the cutting edge) until the insert with the highest edge (Fig. 2) catches 60 μm. (Fig. 3)

*Use a dial gauge to measure protrusion amount.

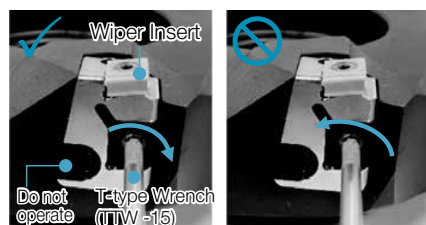


Fig. 1 Adjustment Direction



Fig. 2



Fig. 3

◆ Recommended Cutting Conditions

Chipbreaker	Workpiece	fz (ipt)	Recommended Insert Grade (Cutting Speed Vc: sfm)			
			PR1535	PR1525	CA6535	PDL025
GL	Carbon Steel	0.004 - 0.006 - 0.012	490 ★ 660 - 980	490 ☆ 660 - 980	490 ☆ 660 - 980	-
	Alloy Steel	0.004 - 0.006 - 0.012	490 ★ 660 - 980	490 ☆ 660 - 980	490 ☆ 660 - 980	-
	Mold Steel	0.004 - 0.006 - 0.010	330 ☆ 490 - 820	330 ★ 490 - 820	330 ☆ 490 - 820	-
	Austenitic Stainless Steel*	0.004 - 0.006 - 0.010	330 ★ 660 - 820	330 ☆ 660 - 820	330 ☆ 660 - 820	-
	Martensitic Stainless Steel*	0.004 - 0.006 - 0.010	330 ★ 660 - 820	330 ☆ 660 - 820	330 ☆ 660 - 820	-
	Gray Cast Iron	0.004 - 0.006 - 0.010	330 ☆ 660 - 820	330 ☆ 660 - 820	330 ☆ 660 - 820	-
	Nodular Cast Iron	0.004 - 0.006 - 0.010	330 ☆ 660 - 820	330 ☆ 660 - 820	330 ★ 660 - 820	-
SL	Carbon Steel	0.004 - 0.005 - 0.006	490 ☆ 660 - 980	490 ☆ 660 - 980	490 ☆ 660 - 980	-
	Alloy Steel	0.004 - 0.005 - 0.006	490 ☆ 660 - 980	490 ☆ 660 - 980	490 ☆ 660 - 980	-
	Mold Steel	-	-	-	-	-
	Austenitic Stainless Steel*	0.004 - 0.006 - 0.008	330 ★ 660 - 820	330 ☆ 660 - 820	330 ☆ 660 - 820	-
	Martensitic Stainless Steel*	0.004 - 0.006 - 0.008	330 ★ 660 - 820	330 ☆ 660 - 820	330 ☆ 660 - 820	-
AL	Aluminum Alloy (Si 13% or less)	0.004 - 0.006 - 0.012	-	-	-	★ 660 - 1,310 - 1,640

*Machining with coolant is recommended for stainless steel machining.

Bold text in the table indicates recommended values. Adjust the cutting speed and feed within the above conditions according to the actual machining situation.

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi- Function
Slot Mill
Ball-Nose Radius
Other Applications

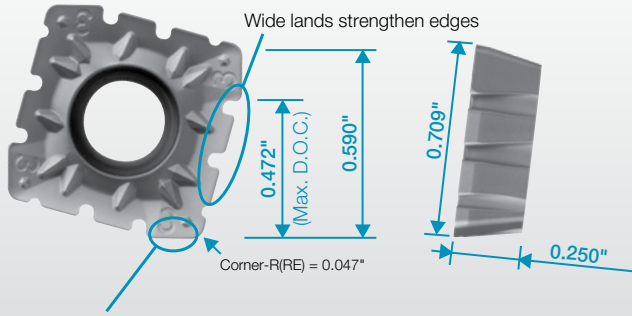


Facing

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

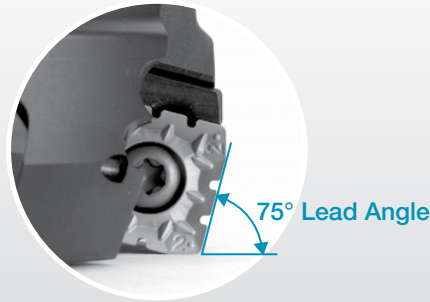
Large depths of cut and high feed rates improve metal removal efficiency

- Recommended D.O.C. : 5mm~10mm (0.200"~0.400")



Large wiper edges enable increased feed rates.

Strong inserts due to 6.35mm (0.250") thickness.



A.R. +9°
R.R. -9° (Ø80mm)
-5° (> Ø100mm)

Chipbreaker Selection

	Low Cutting Force Oriented	General Purpose	Edge Strength Oriented
Insert Type	NB2P (4-Notched) + NB3P (5-Notched)	NB2 (2-Notched) + NB3 (3-Notched)	NB2T (2-Notched) + NB3T (3-Notched)
Applications	Ideal when using extended arbors or for cutting thin plate workpieces	General purpose with good balance of strength and low cutting resistance	Ideal for interrupted cutting Ideal when feed rate is increased or workpiece material is Cast Iron
Edge Preparation	As many as four (or five) Notches help to alleviate the shock when biting into the workpiece 	Strength, cutting resistance, and chip control are all well balanced 	Strength is increased by the edge shape and moderate rake angle of the chamfer edge

A supplemental chipbreaker may be used when it is necessary to increase strength and bite while focusing on low cutting resistance, as when machining welded areas.



Insert Number - NB2P (4-Notched) and NB3P (5-Notched)

In order to match each insert with the corresponding insert pocket of the milling cutter, "2" is marked for NB2P insert (4-Notched) and "3" is marked on NB3P insert (5-Notched).

Features of Toolholder

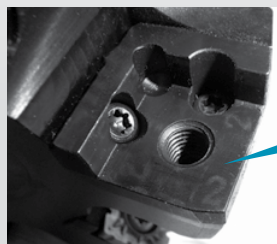
Coarse Pitch

Designed with Large Chip Pockets
Good Chip Evacuation

Designed with Cartridges
Prevents Damage to Base Body

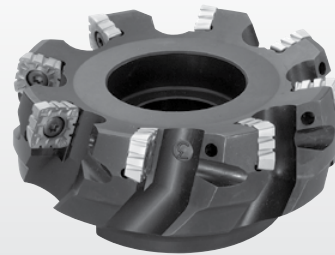
Applicable Insert Number
(Notch Number)

Insert Replacement Identification



Fine Pitch

Higher Productivity Due to Close Pitch Design



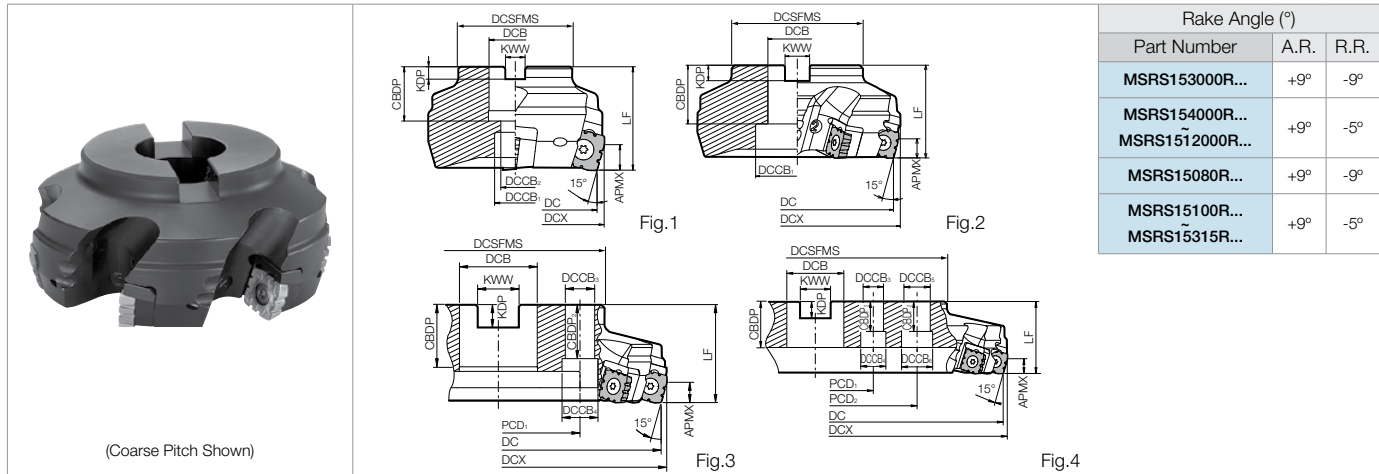
Insert number is transcribed as a result of the cutting tool load.

* Depending on the cutting conditions, marks may not be transcribed.



Facing

MSRS15 Face Mill (Inch Bore Dia.)



Rake Angle (°)		
Part Number	A.R.	R.R.
MSRS153000R...	+9°	-9°
MSRS154000R...	+9°	-5°
MSRS1512000R...	+9°	-5°
MSRS15080R...	+9°	-9°
MSRS15100R...	+9°	-5°
MSRS15315R...	+9°	-5°

Toolholder Dimensions (Bore Dia DC: Inch)

	Part Number	Stock	Unit	No. of Inserts	Dimensions																	Drawing	Weight (kg)	
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KDP	KWW	APMX	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	PCD ₁	PCD ₂	CDBP ₂		
Inserts	MSRS 155000R-6T	●	inch	6	5.00	5.27	3.75	1.500	2.13	-	2.48	1.00	0.40	0.625	-	-	-	-	-	-	-	Fig.2	3.6	
				10	8.00	8.27	5.12	2.500	-	-	-	1.25	0.53	1.000	0.47	0.675	1.045	-	-	4	-	1.25	Fig.3	7.7
45°~70° Lead Angle	158000R-10T	●	inch	6	3.00	3.27	2.25	1.000	0.87	0.551	1.97	0.75	0.31	0.375	0.47	-	-	-	-	-	-	-	Fig.1	1.3
				6	4.00	4.27	3.75	1.250	1.38	-	-	1	0.40	0.500	-	-	-	-	-	-	-	-	Fig.2	1.9
75° Lead Angle	MSRS 153000R-6T	●	inch	6	3.00	3.27	2.25	1.000	0.87	0.551	1.97	0.75	0.31	0.375	0.47	-	-	-	-	-	-	-	Fig.1	1.3
90°/88° Lead Angle	154000R-6T	●	inch	6	4.00	4.27	3.75	1.250	1.38	-	-	1	0.40	0.500	-	-	-	-	-	-	-	-	Fig.2	1.9
High Feed Milling	MSRS 15080R-4T	●	mm	4	80	87	70	1.000"	20	13	50	1.024"	0.236"	0.375"	-	-	-	-	-	-	-	-	Fig.1	1.3
				4	100	107	85	1.250"	42	-	-	1.260"	0.315"	0.500"	-	-	-	-	-	-	-	-	-	2.0
Finish Milling	15125R-6T	●	mm	6	125	132	85	1.500"	54	-	-	-	0.394"	0.625"	-	-	-	-	-	-	-	-	Fig.2	3.6
				8	160	167	110	2.000"	68	-	-	-	0.433"	0.750"	12	-	-	-	-	-	-	-	-	5.0
Multi-Function	15160R-8T	●	mm	10	200	207	140	-	-	-	60	1.496"	-	-	-	18	26	-	-	101.6	-	32	Fig.3	7.7
				12	250	257	140	1.875"	-	-	-	-	0.551"	1.000"	-	-	-	-	-	-	-	-	-	12.0
Slot Mill	15200R-10T	●	mm	14	315	322	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Fig.4	17.0
				14	315	322	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.0
Ball-Nose Radius	15250R-12T	●	mm	6	80	87	70	1.000"	20	13	50	1.024"	0.236"	0.375"	-	-	-	-	-	-	-	-	Fig.1	1.3
				6	100	107	85	1.250"	42	-	-	1.260"	0.315"	0.500"	-	-	-	-	-	-	-	-	-	1.9
Other Applications	15315R-14T	●	mm	8	125	132	85	1.500"	54	-	-	-	0.394"	0.625"	-	-	-	-	-	-	-	-	Fig.2	3.5
				10	160	167	110	2.000"	68	-	-	-	0.433"	0.750"	12	-	-	-	-	-	-	-	-	4.9
MILLING	MSRS 15080R-6T	●	mm	12	200	207	140	-	-	-	60	1.496"	-	-	-	18	26	-	-	101.6	-	32	Fig.3	7.6
				14	250	257	140	1.875"	-	-	-	-	0.551"	1.000"	-	-	-	-	-	-	-	-	-	11.9

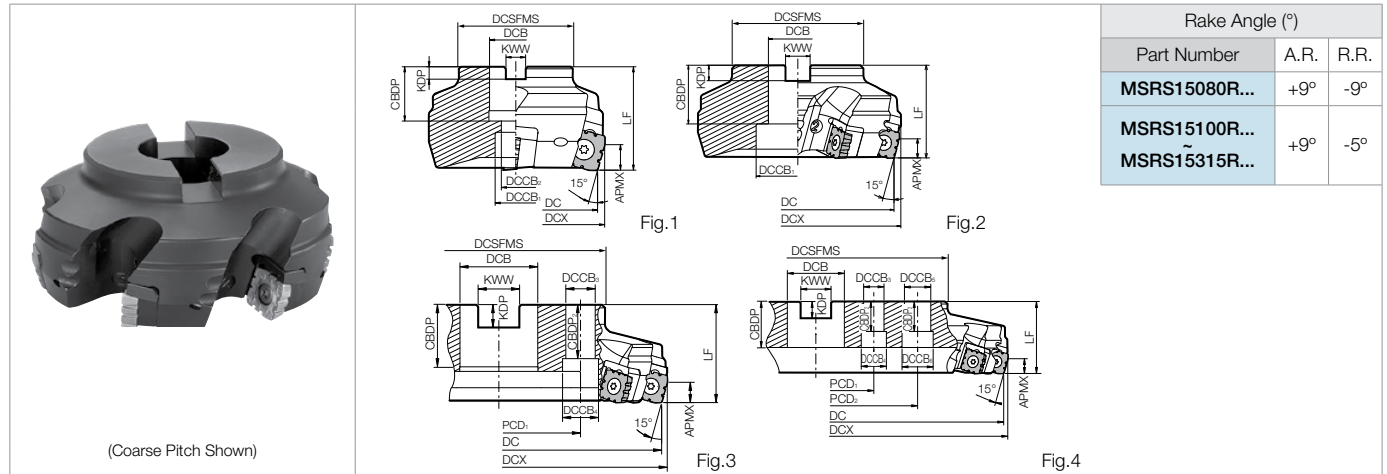
- Mounting bolts (HH12X35) are included in MSRS15080R-OT. (HH1/2-1.25) are included with MSRS153000R-OT.
- Cartridge is included in the coarse pitch cutters, but no Cartridge in the fine pitch.

Applicable Inserts ● **M60**



Facing

MSRS15 Face Mill (Metric Bore Dia.)



Toolholder Dimensions (Bore Dia DC: Metric)

Part Number		Stock	Unit	No. of Inserts	Dimensions																	Drawing	Weight (kg)				
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	PCD ₁	PCD ₂			CBDP ₂			
Coarse Pitch	MSRS 15080R-4T-M	●	mm	4	80	87	70	27	20	13	50	24	7	12.4	12	-	-	-	-	-	-	Fig.1	1.3				
	15100R-4T-M	●		4	100	107	85	32	45	29		8	14.4	2.0													
	15125R-6T-M	●		6	125	132	85	40	55	60	33	9	16.4	66.7		28	32		Fig.2		3.6						
	15160R-8T-M	●		8	160	167	110		68		38	15	25.7	18							26		101.6	5.0			
	15200R-10T-M	●		10	200	207	140	60	-	60	38	15	25.7	18		26	22		32		177.8		Fig.3	7.7			
	15250R-12T-M	●		12	250	257	140																	60	-	32	12.0
	15315R-14T-M	●		14	315	322	230																	32	17.0		
Fine Pitch	MSRS 15080R-6T-M	●	mm	6	80	87	70	27	20	13	50	24	7	12.4	12	-	-	-	-	-	-	Fig.1	1.3				
	15100R-6T-M	●		6	100	107	85	32	45	29		8	14.4	1.9													
	15125R-8T-M	●		8	125	132	85	40	55	60	33	9	16.4	66.7		28	32		Fig.2		3.5						
	15160R-10T-M	●		10	160	167	110		68		38	15	25.7	18							26		101.6	4.9			
	15200R-12T-M	●		12	200	207	140	60	-	60	38	15	25.7	18		26	22		32		177.8		Fig.3	7.6			
	15250R-14T-M	●		14	250	257	140																	60	-	32	11.9
	15315R-16T-M	●		16	315	322	230																	32	17.0		

- Mounting bolts (HH12X35) are included in MSRS15080R-OT-M.
- Cartridge is included in the coarse pitch cutters, but no Cartridge in the fine pitch.

Spare Parts

Part Number		Spare Parts						
		Clamp Screw	Wrench	Cartridge	Clamp Screw	Wrench	Anti-seize Compound	Mounting Bolt
Coarse Pitch	MSRS 15300R-4T	SB-60120TR	TT-25L	MAP-1806	SB-40140TR	DT-15	P-37	HH1/2-1.25
	15400R-4T							HH3/4-2.3
	15500R-6T							-
	151200R-14T							-
Fine Pitch	MSRS 15300R-6T	SB-60120TR	TT-25L	-	-	-	P-37	HH1/2-1.25
	15400R-6T							HH3/4-2.3
	15500R-8T							-
	151200R-16T							-
Coarse Pitch	MSRS 15080R-4T(-M)	SB-60120TR	TT-25L	MAP-1806	SB-40140TR	DT-15	P-37	HH12X35
	15100R-4T(-M)							-
	15315R-14T(-M)							-
	15100R-4T(-M)							-
Fine Pitch	MSRS 15080R-6T(-M)	SB-60120TR	TT-25L	-	-	-	P-37	HH12X35
	15100R-6T(-M)							-
	15315R-16T(-M)							-
	15100R-6T(-M)							-





Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed




Applicable Inserts M60



Facing

● Applicable Inserts

Part Number	Applicable Inserts M27 (Right-hand Shown)			
	 2-Notch	 3-Notch	 2-Notch / Tough Edge	 3-Notch / Tough Edge
MSRS... MSRS...M	SPMT 1806EDER-NB2	SPMT 1806EDER-NB3	SPMT 1806EDSR-NB2T	SPMT 1806EDSR-NB3T
For Custom Ordered Left-hand Cutter	-	-	SPMT 1806EDSL-NB2T	SPMT 1806EDSL-NB3T

Part Number	Applicable Inserts M27		
	 4-Notch / Low Cutting Force	 5-Notch / Low Cutting Force	 Without Notch
MSRS... MSRS...M	SPMT 1806EDER-NB2P	SPMT 1806EDER-NB3P	SPMT 1806EDER-V

Chipbreaker Selection **M57**

◆ Recommended Cutting Conditions

Workpiece	Feed Rate fz (ipt)			Recommended Insert Grades (Cutting Speed Vc: sfm)			
	NB2P + NB3P	NB2 + NB3	NB2T + NB3T	MEGACOAT			PVD Coated Carbide
				PR1225	PR1230	PR1210	PR830
Carbon Steel	0.006	0.008	0.012	☆ 400 ~ 600 ~ 820	★ 400 ~ 600 ~ 725	-	☆ 400 ~ 575 ~ 725
Alloy Steel	0.006	0.008	0.012	☆ 400 ~ 600 ~ 820	★ 400 ~ 600 ~ 725	-	☆ 400 ~ 575 ~ 725
Mold Steel	0.004	0.006	0.008	☆ 325 ~ 525 ~ 725	★ 325 ~ 525 ~ 675	-	☆ 325 ~ 500 ~ 675
Gray Cast Iron	0.008	0.010	0.014	-	-	★ 400 ~ 600 ~ 820	-
Nodular Cast Iron	0.006	0.008	0.012	-	-	★ 325 ~ 525 ~ 725	-
Stainless Steel	Not Recommended						
Aluminum / Copper	Not Recommended						

★ : 1st Recommendation ☆ : 2nd Recommendation

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi- Function
Slot Mill
Ball-Nose Radius
Other Applications

M
MILLING



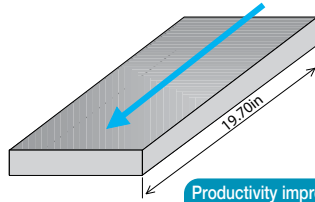
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Case Studies

Structural Steel

Plate

- $V_c=492$ sfm ($n = 382$ RPM)
- D.O.C. \times ae = $0.39" \times 4.92"$
- $fz=0.008$ ipt ($V_f = 18.03$ ipm)
- Dry · 6 flutes
- MSRS15125R-6T
- SPMT1806EDER-NB2
- SPMT1806EDER-NB3 (PR830)



Productivity improved
by 4.4 times!

MSRS15

Metal Removal Rate 34.91in³/min.

Competitor's Cutter A

7.87in³/min.

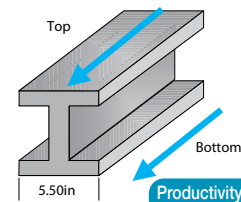
[Competitor's Cutter A]
Ø125mm, 6 flutes
 $V_c = 492$ sfm ($n=382$ RPM)
D.O.C. \times ae = $0.12" \times 4.92"$
 $fz=0.006$ ipt ($V_f=13.54$ ipm)

[User's Comments]
Because conditions can be raised drastically, this cutter was very effective at reducing cycle time. Productivity improved by 4.4 times. (Customer Evaluation)

1050 Steel

Rail

- $V_c=492$ ($n = 300$ RPM)
- D.O.C. \times ae = $0.24" \times 5.51"$
- $fz=0.008$ ipt ($V_f = 18.90$ ipm)
- Dry · 8 flutes
- MSRS15160R-8T
- SPMT1806EDER-NB2
- SPMT1806EDER-NB3 (PR830)



Productivity improved
by 4.7 times!

MSRS15

Metal Removal Rate 24.59in³/min.

Competitor's Cutter B

5.21in³/min.

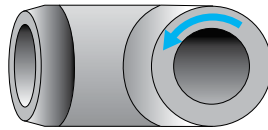
[Competitor's Cutter B]
Machining at $0.08" \times 3$ passes
 $V_c = 492$ sfm ($n = 300$ RPM)
D.O.C. \times ae = $0.08" \times 5.51"$
 $fz=0.005$ ipt ($V_f=11.81$ ipm)

[User's Comments]
MSRS can complete cutting with 1 pass what needed to be cut with 3 passes previously. Cutting sound of MSRS was still quiet. Productivity improved by 4.7 times. (Customer Evaluation)

Cast Steel

Industrial Machine Components

- $V_c = 325$ sfm ($n = 200$ RPM)
- D.O.C. \times ae = $0.394" \times 4.490"$
- $fz = 0.016$ ipt ($V_f = 25$ ipm)
- Dry · 8 flutes
- MSRS15160R-8T
- SPMT1806EDER-NB2
- SPMT1806EDER-NB3 (PR830)



Productivity improved
by 2.5 times!

MSRS15

Metal Removal Rate 44.18in³/min.

Competitor's Cutter C

17.70in³/min.

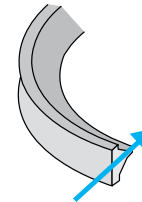
[Competitor's Cutter C]
Ø6", 8 flutes
 $V_c = 820$ sfm ($n = 522$ min⁻¹)
D.O.C. \times ae = $0.394" \times 4.490"$
 $fz=0.010$ ipt ($V_f=40.00$ ipm)

[User's Comments]
Before MSRS, D.O.C. could not be increased due to high cutting resistance, but MSRS can increase D.O.C. without increasing load on the main spindle. Productivity improved by 2.5 times (Customer Evaluation)

1045 Steel

Gear

- $V_c = 675$ sfm ($n = 255$ RPM)
- D.O.C. \times ae = $0.394" \times 7.874"$
- $fz = 0.007$ ipt ($V_f = 23.62$ ipm)
- Dry · 14 flutes
- MSRS15250R-14T
- SPMT1806EDER-NB2
- SPMT1806EDER-NB3 (PR830)



Productivity improved
by 2.6 times!

MSRS15

Metal Removal Rate 73.23in³/min.

Competitor's Cutter D

28.00in³/min.

[Competitor's Cutter D]
Ø250mm, 12 flutes
 $V_c=400$ sfm ($n=153$ RPM)
D.O.C. \times ae = $0.20" \times 7.87"$
 $fz = 0.010$ ipt ($V_f = 18.07$ ipm)

[User's Comments]
Cutting sound is quiet even when cutting width is less than 80% of cutter dia. Productivity improved by 2.6 times. (Customer Evaluation)

Q&A

Q-1 What amount of cutting width (ae) is recommended in a radial direction?

A-1 The estimated amount is 70-80% of the diameter of the cutting tool.

Q-2 Why does the MSRS15 have a 75° lead?

A-2 45° cutting angles can reduce the impact in cutting a workpiece but also increase thrust force. On the other hand, a 90° cutting angle can reduce thrust forces but increases the impact when the insert cuts the workpiece. The 75° cutting angle of the MSRS15 can suppress both thrust force and impact, offering a good balance and enabling smooth machining even in heavy machining applications.

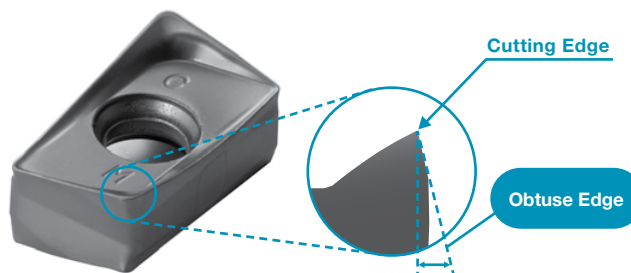
M-FOUR

MEW Milling Cutter

The M-Four double-sided, 4-edge insert with Kyocera's unique mold technology reduces cutting forces for reduced vibrations



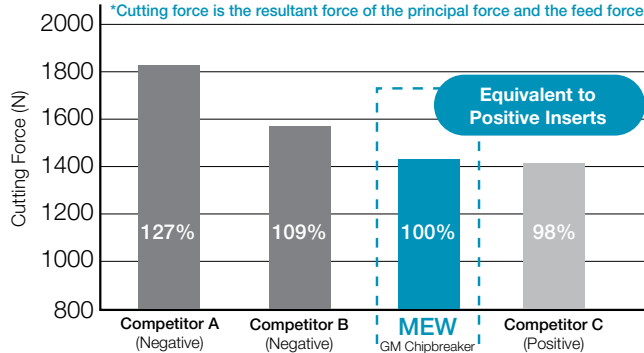
Obtuse Edge for Increased Cutting Edge Toughness



Low Cutting Forces Equivalent to Positive Inserts

• Cutting Force Comparison

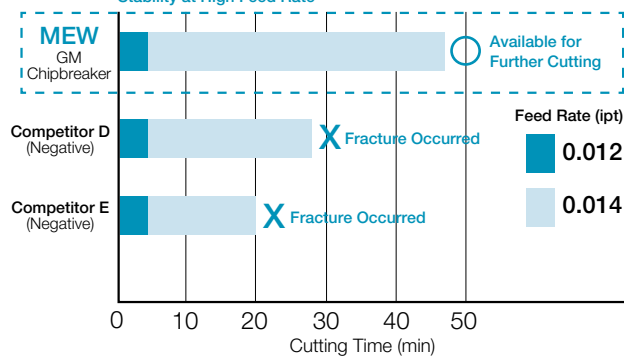
*Cutting force is the resultant force of the principal force and the feed force



1049 Ø20mm Cutter
Vc = 500 sfm D.O.C. x ae = 0.118" x 0.591" fz = 0.006 ipt (Internal Evaluation)

• Fracture Resistance Comparison

Stability at High Feed Rate



4140 (37~39Hs) Ø20mm Cutter
Vc = 400 sfm D.O.C. x ae = 0.118" x 0.394" fz = 0.012~0.014 ipt (Internal Evaluation)

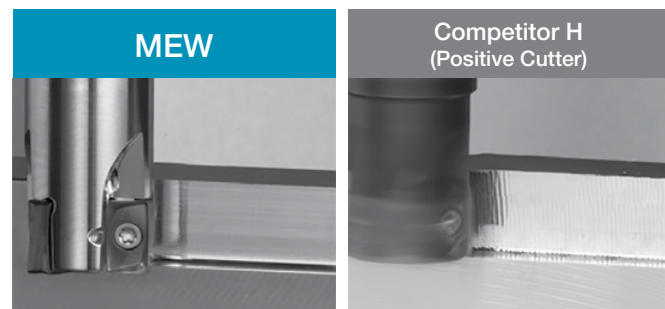
Improved Surface Finish & Minimized Vibration

Sharp cutting and superior resistance to vibration and burrs due to helical cutting edge and optimum axial rake design

Large Rake Angle Reduces Cutting Forces

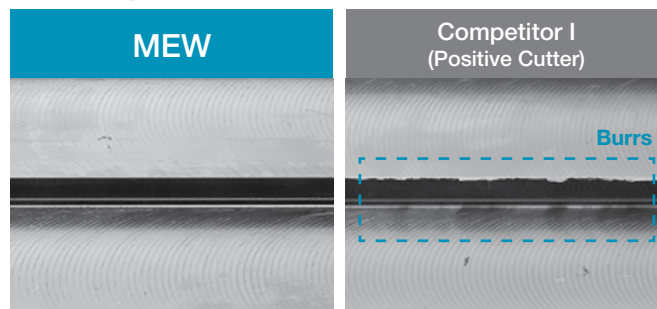
MEW GM Chipbreaker	Competitor F (Negative)	Competitor G (Positive)
+20°	+17°	+17°

Surface of Shoulder Wall

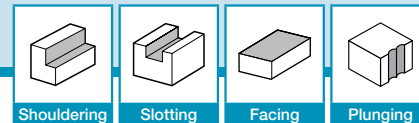


Smooth surface of MEW without chattering

Burr Comparison with Positive Cutters



Fewer burrs than positive cutters due to sharp cutting



Extended Tool Life with Innovative

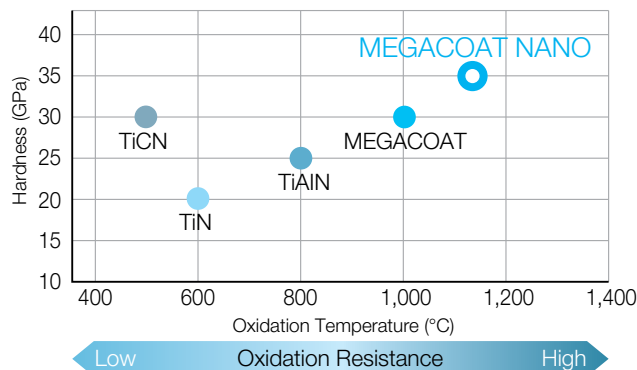
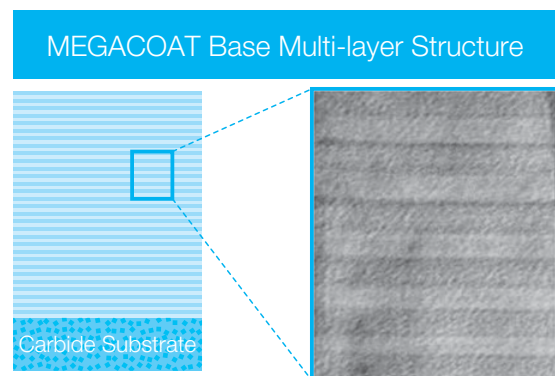
MEGACOAT NANO Coating Technology

Special multi-layered coating, "MEGACOAT NANO" enables stable milling and extended tool life

PR1525 for steel and austenitic stainless steel, **PR1510** for cast iron,

PR1535 titanium alloy and precipitation hardened steel

CA6535 (CVD coated carbide) for heat-resistant alloys and martensitic stainless steel

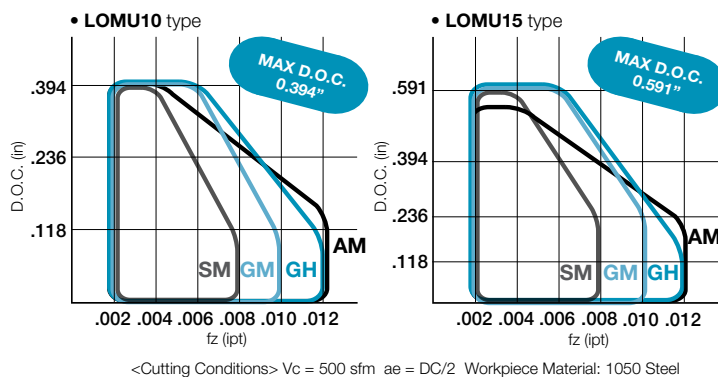


Prevents wear and fracture with high hardness (35GPa) and superior oxidation resistance (oxidation temperature: 1,150°C)

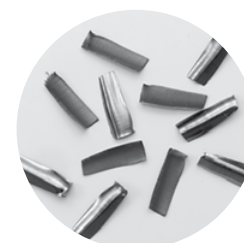
Chipbreaker Lineup

Three innovative chipbreaker designs to cover a wide range of applications

Chipbreaker	Application	Shape
GM	General Purpose	
SM	Low Cutting Force	
GH	Heavy Milling	
AM	Aluminum / Non-ferrous Metals	



Chips (Slotting)



Chips (Shouldering)

Insert Corner-R(RE) Lineup Expansion

Corner-R(RE) 0.4 , 1.0 , 1.2 , 1.6 and 2.0 added to GM chipbreaker lineup



LOMU100404ER-GM
LOMU150504ER-GM



LOMU100408ER-GM
LOMU150508ER-GM



LOMU150510ER-GM



LOMU100412ER-GM
LOMU150512ER-GM



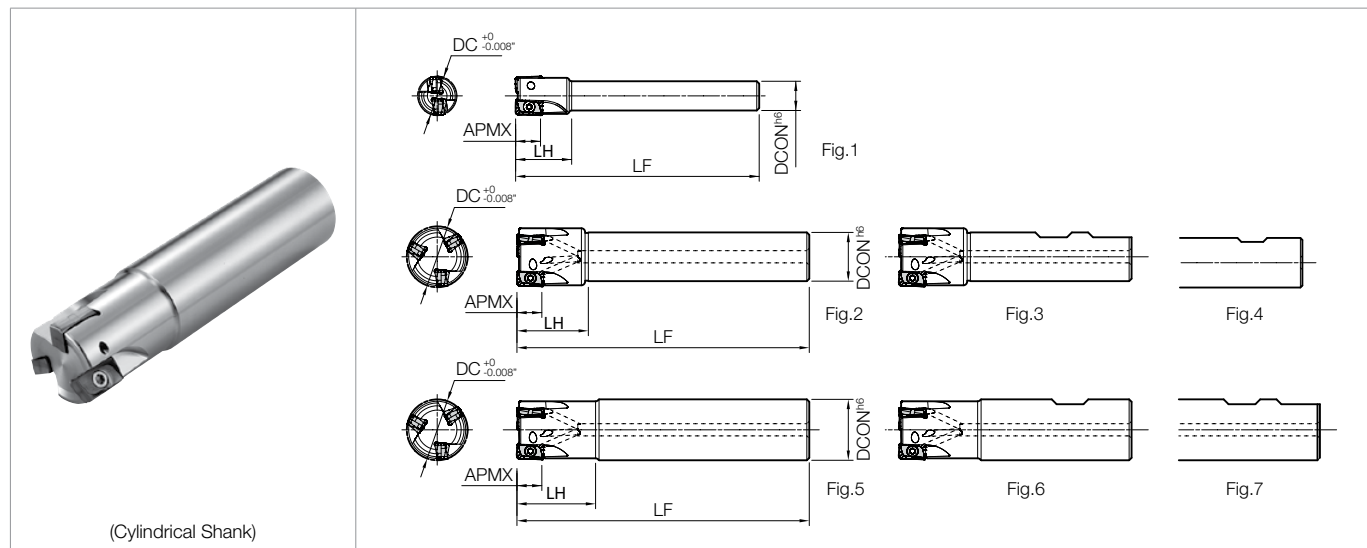
LOMU100416ER-GM
LOMU150516ER-GM



LOMU100420ER-GM
LOMU150520ER-GM

M-FOUR (MEW)

MEW End Mill (Inch)



(Cylindrical Shank)

Toolholder Dimensions (Inch)

Inserts	Shank	Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Coolant Hole	Drawing	Max RPM*
					DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			
45°~70° Lead Angle	Weldon	MEW 0625-W500-10-2T	●	2	0.625	0.500	2.75	0.969	0.393	+7°	-22°	No	Fig.4	43,900
75° Lead Angle			●	2	0.625	0.625	3.00	1.046			-22°		Fig.6	43,900
90°/88° Lead Angle			●	2	0.750	0.625	3.25	1.145			-20°		Fig.3	42,000
High Feed Milling			●	2	0.750	0.750	3.25	1.170			-20°		Fig.6	42,000
Finish Milling			●	3	0.750	0.750	3.25	1.170			-20°		Fig.6	42,000
Multi-Function			●	3	0.750	0.750	4.00	1.921			-20°		Fig.6	42,000
Slot Mill			●	3	1.000	0.750	3.25	1.219			-20°	Yes	Fig.3	37,200
Ball-Nose Radius			●	2	1.000	1.000	3.75	1.413			-20°		Fig.7	37,200
Other Applications			●	3	1.000	1.000	3.75	1.413			-20°		Fig.7	37,200
			●	3	1.000	1.000	4.75	1.413			-20°		Fig.7	37,200
			●	4	1.250	1.000	3.75	1.469			-20°		Fig.3	34,000
			●	3	1.250	1.250	4.00	1.663			-20°		Fig.7	34,000
			●	4	1.250	1.250	4.00	1.663			-20°		Fig.7	34,000
			●	5	1.500	1.250	4.125	2.070			-19°		Fig.3	30,700
	Cylindrical	MEW 1000-W100-45-10-3T	●	3	1.000	1.000	4.50	2.163	0.393	+7°	-20°	Yes	Fig.7	37,200
			●	2	0.625	0.625	6.00	1.500	0.393	+7°	-22°	Yes	Fig.5	43,900
	Weldon	MEW 0625-S625-6-10-2T	●	2	0.625	0.625	7.00	1.586			-22°		Fig.5	42,000
			●	3	1.000	1.000	7.00	1.980			-20°		Fig.5	37,200
			●	2	1.000	1.000	8.00	1.980			-20°		Fig.5	37,200
			●	3	1.000	1.000	8.00	1.980			-20°		Fig.5	37,200
			●	3	1.250	1.250	8.00	1.980	0.590	+10°	-22°		Fig.5	30,100
			●	4	1.500	1.250	8.00	2.069			-21°		Fig.2	25,600
		MEW 1000-W750-15-2T	●	2	1.000	0.750	3.25	1.219			-22°	Yes	Fig.3	34,700
			●	2	1.000	1.000	3.75	1.413			-22°		Fig.7	34,700
			●	2	1.000	1.000	4.75	1.413			-22°		Fig.7	34,700
			●	2	1.250	1.000	3.75	1.469			-22°		Fig.3	30,100
			●	2	1.250	1.250	4.00	1.663			-22°		Fig.7	30,100
			●	3	1.250	1.250	4.00	1.663			-22°		Fig.7	30,100
			●	3	1.500	1.250	4.125	2.069			-21°		Fig.3	25,600
			●	4	1.500	1.250	4.125	2.069			-21°		Fig.3	25,600

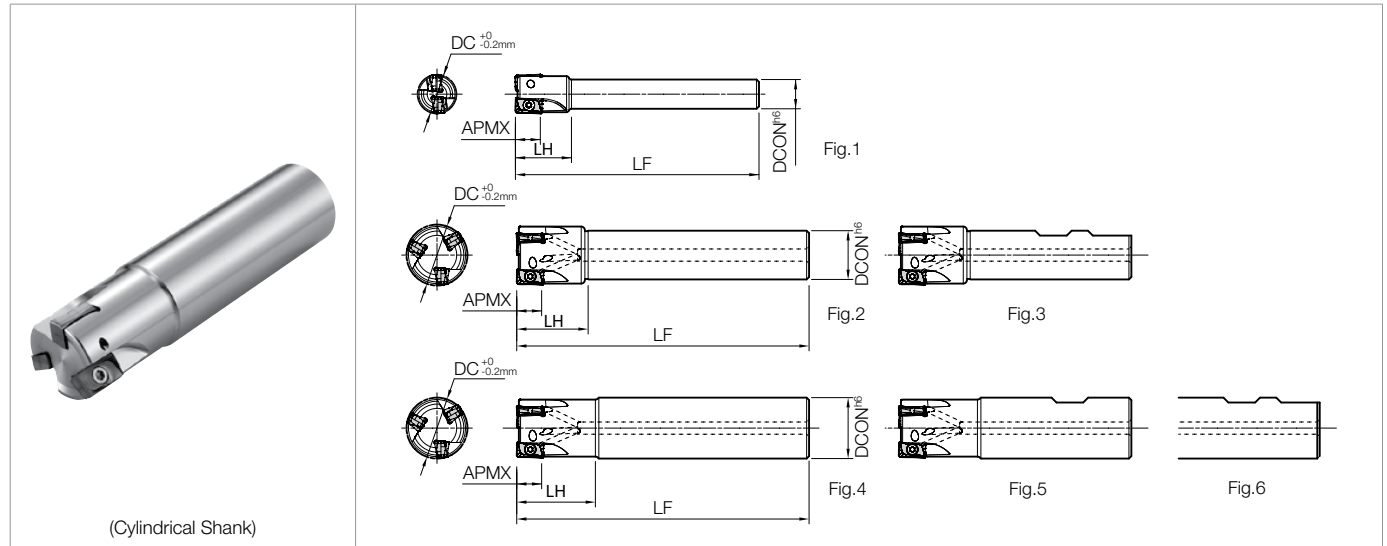
Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Spare Parts & Applicable Inserts M66

M-FOUR (MEW)

MEW End Mill (Metric)



Toolholder Dimensions (Metric)

Shank	Part Number	Stock	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Coolant Hole	Drawing	Max RPM*
				DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			
Cylindrical	Standard Shank	MEW 16-S12-10-2T	●	16	12		23			-22°	No	Fig. 1	43,750
		16-S16-10-2T	●	16	12	100	26			-22°	No	Fig. 4	43,750
		18-S16-10-2T	●	18	16		25			-21°	No	Fig. 2	43,000
		20-S16-10-2T	●	20			26			-21°	No	Fig. 2	41,000
		20-S20-10-2T	●	20		110	30			-21°	No	Fig. 4	41,000
		20-S20-10-3T	●	20	20		26			-21°	No	Fig. 2	39,600
		22-S20-10-3T	●	22	20		29			-21°	No	Fig. 2	37,500
		25-S20-10-3T	●	25			32	10	+7°	-20°	Yes	Fig. 4	37,500
		25-S25-10-2T	●	25		120	32			-20°	Yes	Fig. 4	37,500
		25-S25-10-3T	●	25	25		29			-20°	Yes	Fig. 2	35,800
		28-S25-10-3T	●	28	25		32			-20°	Yes	Fig. 2	34,800
		30-S25-10-4T	●	30			32			-20°	Yes	Fig. 2	33,900
		32-S25-10-4T	●	32		130	40			-20°	Yes	Fig. 4	33,900
		32-S32-10-3T	●	32			40			-20°	Yes	Fig. 4	33,900
		32-S32-10-4T	●	32			40			-20°	Yes	Fig. 2	30,000
		40-S32-10-5T	●	40	32	150	50			-19°	Yes	Fig. 2	22,500
		50-S32-10-5T	●	50		120	40			-19°	Yes	Fig. 2	22,500
	Long Shank	MEW 20-S20-10-150-2T	●	20	20	150	40	10	+7°	-20°	Yes	Fig. 4	41,000
		25-S25-10-170-2T	●	25	25	170	50			-20°	Yes	Fig. 4	37,500
Weldon	Standard Shank	MEW 25-S20-15-2T	●	25	20	120	29			-22°	No	Fig. 2	35,000
		25-S25-15-2T	●	25	25		32			-22°	No	Fig. 2	35,000
		32-S25-15-2T	●	32	25	130	40	15	+10°	-22°	Yes	Fig. 2	30,000
		32-S32-15-2T	●	32	32		40			-22°	Yes	Fig. 4	30,000
		32-S32-15-3T	●	32		130	40			-22°	Yes	Fig. 4	30,000
		40-S32-15-3T	●	40	32	150	50			-21°	Yes	Fig. 2	25,000
		40-S32-15-4T	●	40		120	40			-21°	Yes	Fig. 2	25,000
		50-S32-15-4T	●	50		120	40			-21°	Yes	Fig. 2	17,000
		MEW 16-W16-10-2T	□	16	16	75	25			-22°	No	Fig. 5	43,750
		20-W20-10-2T	□	20	20	77	25			-22°	No	Fig. 5	41,000
	Standard Shank	20-W20-10-3T	●	20	20		32	10	+7°	-20°	Yes	Fig. 6	41,000
		25-W25-10-2T	□	25	25	90	32			-20°	Yes	Fig. 6	37,500
		25-W25-10-3T	●	25	25		40			-20°	Yes	Fig. 6	37,500
		32-W32-10-4T	□	32	32	102	50			-19°	Yes	Fig. 3	33,900
		40-W32-10-5T	●	40		111	50			-19°	Yes	Fig. 3	30,000
		MEW 25-W25-15-2T	□	25	25	90	32	15	+10°	-22°	Yes	Fig. 6	35,000
		32-W32-15-3T	□	32	32	102	40			-22°	Yes	Fig. 6	30,000
		40-W32-15-4T	□	40	32	111	50			-21°	Yes	Fig. 3	25,000

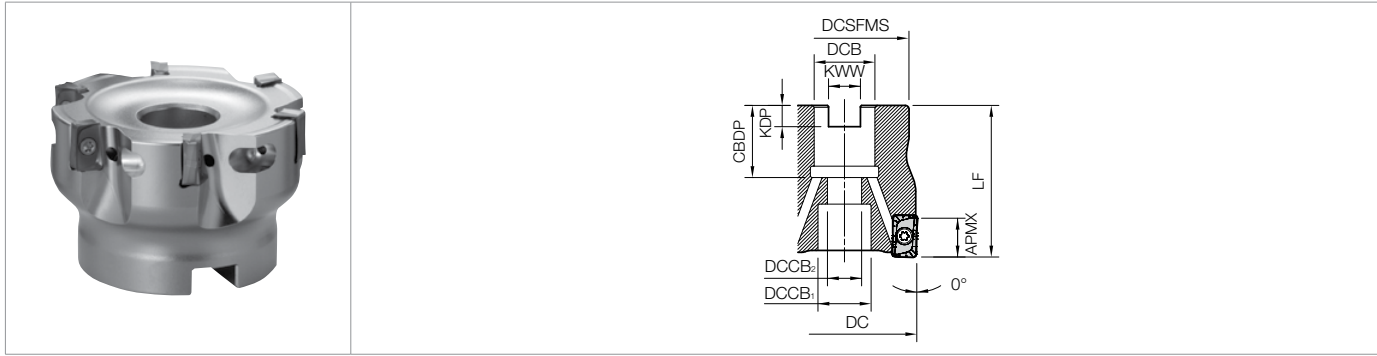
Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Spare Parts & Applicable Inserts M66

M-FOUR (MEW)

MEW Face Mill (Inch)







Toolholder Dimensions (Inch)

Part Number	Stock	No. of Inserts	Dimensions (in)										Rake Angle (°)		Coolant Hole	Weight (kg)	Max RPM*
			DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R. (Max)	R.R.			
MEW 1500R-10-5T	●	5	1.50	1.457	0.750	0.669	0.433	1.575	0.826	0.188	0.312	0.393	+7°	-19°	Yes	0.2	30,700
	●	5	2.00	1.811												0.4	22,300
	●	6	2.50	1.969												0.6	20,400
MEW 2000R-15-4T	●	4	2.00	1.811	0.750	0.669	0.433	1.575	0.826	0.188	0.312	0.590	+10°	-21°	Yes	0.4	16,800
	●	5														0.4	16,800
	●	5														2.50	1.969
	●	6	3.00	2.362	1.000	0.866	0.551	1.969	1.063	0.236	0.381	0.590	+10°	-20°		1.0	12,250
	●	8	4.00	3.504	1.500	2.047	-		1.181	0.393	0.625					1.8	10,400

Max. Revolution*

When running the face mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Spare Parts & Applicable Inserts (Inch)

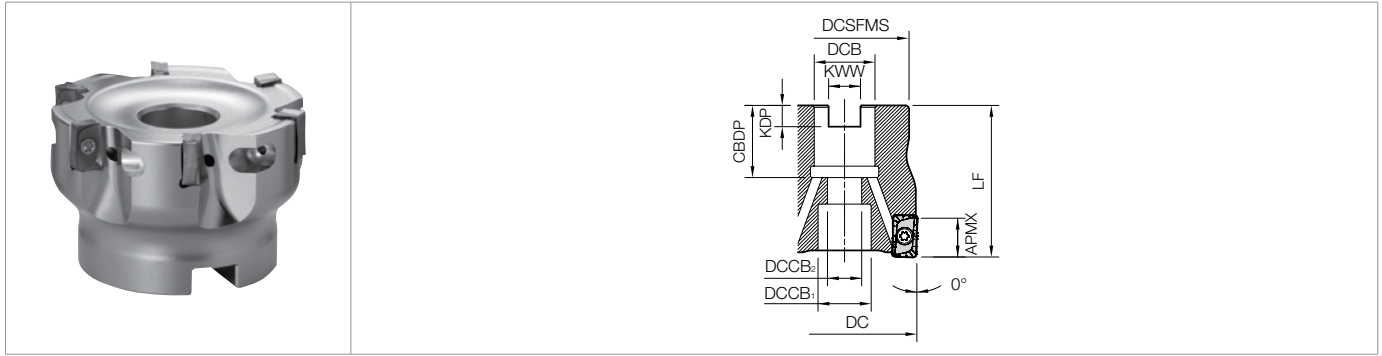
Part Number	Spare Parts				Applicable Inserts ➡ M16				
	Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt	 General Purpose	 Low Cutting Force	 Tough Edge (Heavy Milling)	 Aluminum / Non-ferrous	
MEW ...-10-_T	SB-3065TRP	DTPM-8	P-37	-	LOMU1004..ER-GM	LOMU100408ER-SM	LOMU100408ER-GH	LOGT100408FR-AM	
MEW 1500R-10-5T				Recommended Torque for Insert Screw 1.2N · m					HH3/8-1.25 (HH3/8-1.25H)
2000R-10-5T									
2500R-10-6T									
MEW ...-15-_T	SB-4090TRP	DTPM-15	P-37	-	LOMU1505..ER-GM	LOMU150508ER-SM	LOMU150508ER-GH	LOGT150508FR-AM	
MEW 2000R-15-4T				Recommended Torque for Insert Screw 3.5N · m					HH3/8-1.25 (HH3/8-1.25H)
2500R-15-5T									
3000R-15-6T									
4000R-15-8T									

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Recommended Cutting Conditions **M70**

*If through spindle coolant is required please order arbor bolt in () separately.

MEW Face Mill (Metric)












Toolholder Dimensions (Metric)

Part Number	Stock	No. of Inserts	Dimensions (mm)										Rake Angle (°)		Coolant Hole	Weight (kg)	Max RPM*
			DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R. (Max)	R.R.			
MEW 032R-10-4T-M 040R-10-5T-M 050R-10-5T-M 063R-10-6T-M	●	4	32	30	16	14	9	35	19	5.6	8.4	10	+7°	-20°	Yes	0.1	33,900
	●	5	40	34				40						-19°		0.2	30,000
	●		50	45	22	18	11		21	6.3	10.4					0.4	22,500
	●	6	63	47				0.5								20,500	
MEW 040R-15-4T-M 050R-15-4T-M 063R-15-5T-M 080R-15-6T-M 080R-15-6T	●	4	40	34	16	14	9	40	19	5.6	8.4	15	+10°		-21°	Yes	0.2
	●		50	45	22	18	11		21	6.3	10.4			0.3			17,000
	●	5	63	47				27						20	13		50
	●	6	80	60	25.4	27	6		9.5	1.0	12,000						
	●							1.0		12,000							

Max. Revolution*

When running the face mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Spare Parts & Applicable Inserts (Metric)

Part Number	Spare Parts				Applicable Inserts  M16				
	Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt					
					General Purpose	Low Cutting Force	Tough Edge (Heavy Milling)	Aluminum / Non-ferrous	
MEW ...-10-_T				-	LOMU1004..ER-GM	LOMU100408ER-SM	LOMU100408ER-GH	LOGT100408FR-AM	
MEW 032R-10...-M	SB-3065TRP	DTPM-8		HH8X25 (HH8X25H)					
040R-10...-M	Recommended Torque for Insert Screw 1.2N · m		P-37	HH10X30 (HH10X30H)					
050R-10...-M									
063R-10...-M									
MEW ...-15-_T				-	LOMU1505..ER-GM	LOMU150508ER-SM	LOMU150508ER-GH	LOGT150508FR-AM	
MEW 040R-15...-M	SB-4090TRP	DTPM-15	P-37	HH8X25 (HH8X25H)					
050R-15...-M				HH10X30 (HH10X30H)					
063R-15...-M				Recommended Torque for Insert Screw 3.5N · m					HH12X35 (HH12X35H)
080R-15...(-M)									
4000R-15-8T									

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Recommended Cutting Conditions M70

*If through spindle coolant is required please order arbor bolt in () separately.

Wrench Specifications

Wrenches and clamp screws are "Torx Plus".

- 1) Ref. to Fig. 2 for "Torx Plus" Wrench. (Purple grip)
- 2) Ref. to Fig. 3 for "Torx" Wrench. (Black grip)

A "Torx Plus" Wrench and a "Torx" Wrench have different top shapes. Please use a "Torx Plus" Wrench.

* If a "Torx" Wrench is used to tighten, the screw head might become damaged and then the screw cannot be removed.

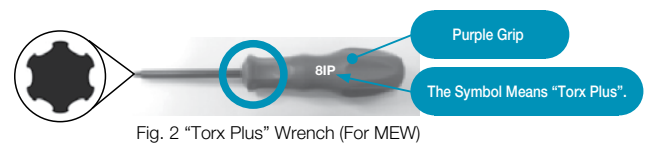


Fig. 2 "Torx Plus" Wrench (For MEW)

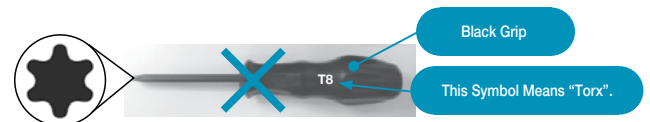
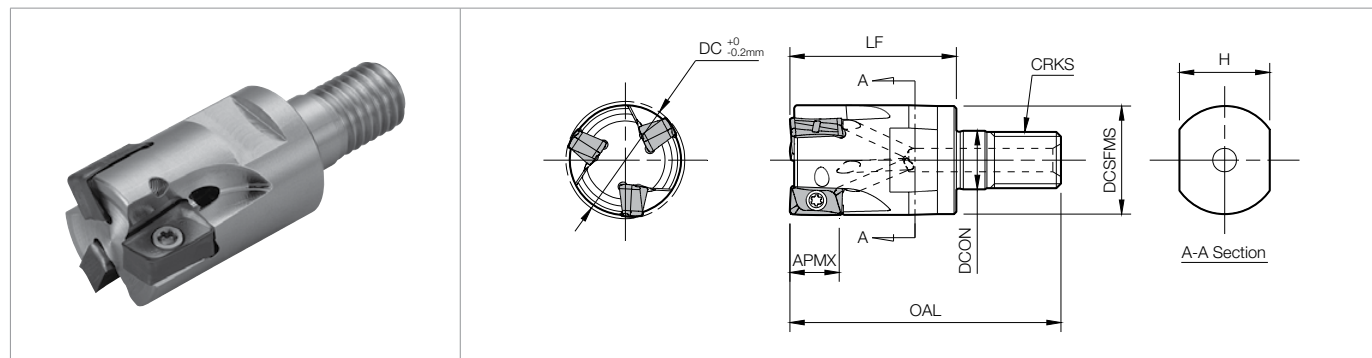


Fig. 3 "Torx" Wrench (Do NOT use it for MEW)

MEW Modular End Mill



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)								Rake Angle (°)		Coolant Hole	Applicable Inserts 🔧 M16	Max RPM*
			DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R. (Max)	R.R.			
MEW 16-M08-10-2T	●	2	16	14.7	8.5	43	25	M8xP1.25	12	10	+7°	-22°	Yes	LOMU1004... LOGT1004...	43,750
	●		3	20	18.7	10.5	49	30	M10xP1.5			15			-20°
	●	25		23	12.5	57	35	M12xP1.75	19			41,000			
	●	32		30	17	63	40	M16xP2.0	24			37,500			
	●	4	32	30	17	63	40	M16xP2.0	24			33,900			
MEW 25-M12-15-2T	●	2	25	23	12.5	57	35	M12xP1.75	19	15	+10°	-22°	Yes	LOMU1505... LOGT1505...	35,000
	●	3	32	30	17	63	40	M16xP2.0	24						30,000

Max. Revolution*

When running the face mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Spare Parts & Applicable Inserts

Part Number	Spare Parts			Applicable Inserts M16			
	Insert Screw	Wrench	Anti-seize Compound	General Purpose	Low Cutting Force	Tough Edge (Heavy Milling)	Aluminum / Non-ferrous
MEW 16-M08-10-2T	SB-3065TRP	DTPM-8	P-37	LOMU1004..ER-GM	LOMU100408ER-SM	LOMU100408ER-GH	LOGT100408FR-AM
20-M10-10-2T							
20-M10-10-3T							
25-M12-10-3T							
32-M16-10-4T							
MEW 25-M12-15-2T	SB-4090TRP	DTPM-15	P-37	LOMU1505..ER-GM	LOMU150508ER-SM	LOMU150508ER-GH	LOGT150508FR-AM
32-M16-15-3T							

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

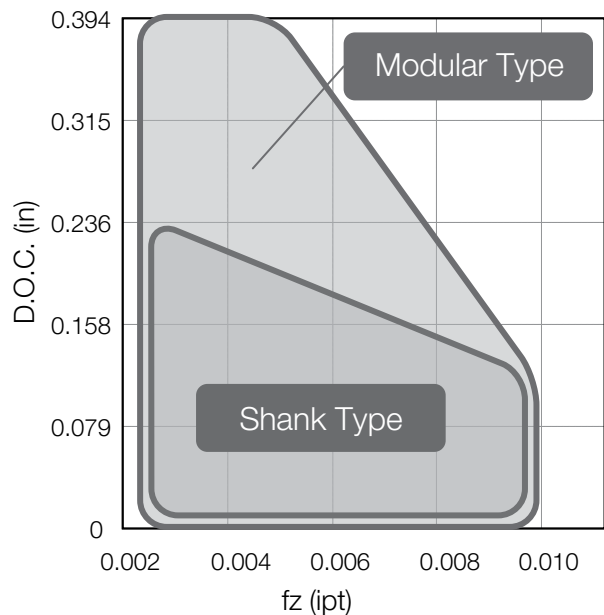
Recommended Cutting Conditions M70

Modular End Mill Identification System

MEW 16 - M08 - 10 - 2T

Series	Cutting Dia.	Thread Dia. Tolerance	Insert Size	No. of Inserts
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Modular End Mill Features



<Cutting Conditions>

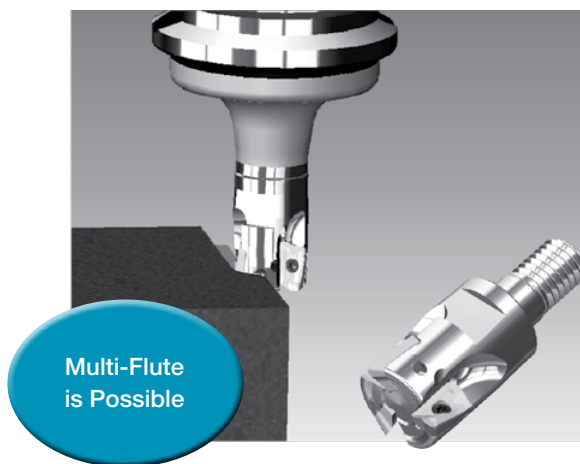
- Cutting Speed : $V_c = 490 \text{ sfm}$ ($n = 2,390 \text{ min}^{-1}$)
- Width of Cut : $a_e = 0.394"$ (Shouldering)
- Workpiece Material : 1055 Dry
- Machine : BT30 M/C

<Cutting Tool>

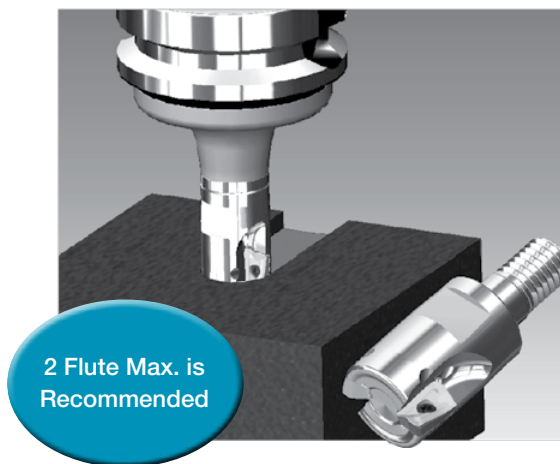
- Modular type
 - Head : MEW20-M10-10-3T
 - Arbor : BT30K-M10-45
 - Insert : LOMU100408ER-GM (PR1525)
- Shank type
 - Toolholder : MEW20-S20-10-3T
 - Arbor : BT30 Milling Chuck (Two-face clamping)
 - Insert : LOMU100408ER-GM (PR1525)

Flute Recommendation for Shouldering and Slotting

Shouldering ($a_e = 0.394"$)

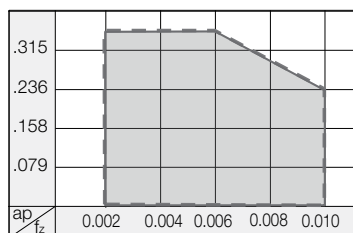


Slotting



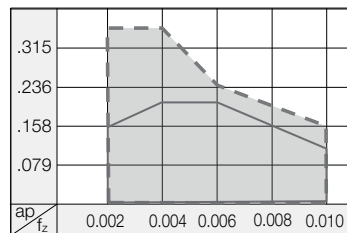
Modular End Mill Cutting Conditions by Application

Shouldering



- Available Cutting Condition for 2 Flutes
- Available Cutting Condition for 3 Flutes

Slotting



For high efficiency shouldering with higher feed rates, 3 or more flutes is possible.
For slotting applications, use 2 flutes maximum to lower cutting forces.

INSERT GRADES	A
TURNING INSERTS	B
GBN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

How to Mount Insert

- Be sure to remove dust and chips from the insert mounting pocket.
- Apply anti-seize compound on portion of taper and thread of clamp screw.
 - Attach the screw (magnetic head) to the front end of the wrench.
 - While lightly pressing the insert against the pocket walls, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1.) Tighten M3 screws (SB-3065TRP) slightly inclined from the insert. (Ref. to Fig. 2.) surface of the insert.
- When tightening the screw, make sure that the wrench is parallel to the screw. For recommended torque, Ref. to [M66-M67](#)
- After tightening the screw, make sure that there is no clearance between the insert seat surface and the pocket floor of the holder or between the insert side surfaces and the pocket walls of the holder. If there is any clearance, remove the insert and mount it again according to the above steps.

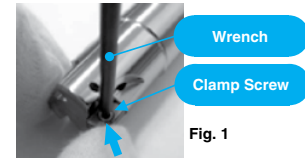


Fig. 1

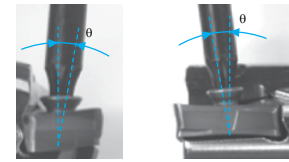


Fig.2

Recommended Cutting Conditions

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grade Vc (sfm)							Applicable Chipbreaker Range (Shouldering)
		Toolholder Description		MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide	DLC Coated Carbide	Carbide	
		MEW0625-MEW0750 MEW16-MEW18	MEW1000-MEW1500 MEW1500R-MEW3000R MEW20-MEW50 MEW032R-MEW080R	PR1535	PR1525	PR1510	PR015S	CA6535	PDL025	GW25	
GM	Carbon Steel	0.002-0.004-0.008	0.003-0.006-0.010	☆ 390-590-820	★ 390-590-820	-	-	-	-	-	
	Alloy Steel	0.002-0.004-0.006	0.003-0.006-0.008	☆ 330-520-720	★ 330-520-720	-	-	-	-	-	
	Mold Steel	0.002-0.003-0.005	0.003-0.005-0.008	☆ 260-460-590	★ 260-460-590	-	-	-	-	-	
	Austenitic Stainless Steel	0.002-0.003-0.005	0.003-0.005-0.006	☆ 330-520-660	★ 330-520-660	-	-	-	-	-	
	Martensitic Stainless Steel	0.002-0.003-0.005	0.003-0.005-0.008	☆ 490-660-820	-	-	-	★ 590-790-980	-	-	
	Precipitation Hardened Stainless Steel	0.002-0.003-0.005	0.003-0.005-0.008	☆ 300-390-490	-	-	-	-	-	-	
	Gray Cast Iron	0.002-0.004-0.007	0.003-0.007-0.010	-	-	★ 390-590-820	-	-	-	-	
	Nodular Cast Iron	0.002-0.003-0.005	0.003-0.006-0.008	-	-	★ 330-490-660	-	-	-	-	
	Ni-base Heat Resistant Alloy	0.002-0.003-0.005	0.003-0.005-0.006	☆ 70-100-160	-	-	-	★ 70-100-160	-	-	
	Titanium Alloys	0.002-0.003-0.005	0.003-0.006-0.008	☆ 130-200-260	-	☆ 100-160-230	-	-	-	-	
SM	Carbon Steel	0.002-0.004-0.007	0.003-0.006-0.008	☆ 390-590-820	★ 390-590-820	-	-	-	-	-	
	Alloy Steel	0.002-0.003-0.005	0.003-0.005-0.007	☆ 330-520-720	★ 330-520-720	-	-	-	-	-	
	Mold Steel	0.002-0.003-0.005	0.003-0.004-0.006	☆ 260-460-590	★ 260-460-590	-	-	-	-	-	
	Austenitic Stainless Steel	0.002-0.003-0.005	0.003-0.004-0.006	☆ 330-520-660	★ 330-520-660	-	-	-	-	-	
	Martensitic Stainless Steel	0.002-0.003-0.005	0.003-0.004-0.006	☆ 490-660-820	-	-	-	★ 590-790-980	-	-	
	Precipitation Hardened Stainless Steel	0.002-0.003-0.005	0.003-0.004-0.006	☆ 300-390-490	-	-	-	-	-	-	
	Gray Cast Iron	0.002-0.004-0.007	0.003-0.007-0.010	-	-	★ 390-590-820	-	-	-	-	
	Nodular Cast Iron	0.002-0.003-0.005	0.003-0.006-0.008	-	-	★ 330-490-660	-	-	-	-	
	Ni-base Heat Resistant Alloy	0.002-0.003-0.004	0.003-0.004-0.005	☆ 70-100-160	-	-	-	★ 70-100-160	-	-	
	Titanium Alloys	0.002-0.003-0.005	0.003-0.005-0.006	☆ 130-200-260	-	☆ 100-160-230	-	-	-	-	
GH	Carbon Steel	0.002-0.004-0.008	0.003-0.008-0.012	☆ 390-590-820	★ 390-590-820	-	-	-	-	-	
	Alloy Steel	0.002-0.004-0.006	0.003-0.008-0.010	☆ 330-520-720	★ 330-520-720	-	-	-	-	-	
	Mold Steel	0.002-0.003-0.005	0.003-0.006-0.009	☆ 260-460-590	★ 260-460-590	-	-	-	-	-	
	Austenitic Stainless Steel	0.002-0.003-0.005	0.003-0.005-0.006	☆ 330-520-660	★ 330-520-660	-	-	-	-	-	
	Martensitic Stainless Steel	0.002-0.003-0.005	0.003-0.005-0.008	☆ 490-660-820	-	-	-	★ 590-790-980	-	-	
	Precipitation Hardened Stainless Steel	0.002-0.003-0.005	0.003-0.005-0.008	☆ 300-390-490	-	-	-	-	-	-	
	Gray Cast Iron	0.002-0.004-0.008	0.003-0.009-0.012	-	-	☆ 390-590-820	-	-	-	-	
	Nodular Cast Iron	0.002-0.003-0.006	0.003-0.007-0.010	-	-	☆ 330-490-660	-	-	-	-	
	Ni-base Heat Resistant Alloy	0.002-0.003-0.005	0.003-0.005-0.006	☆ 70-100-160	-	-	-	☆ 70-100-160	-	-	
	Titanium Alloys	0.002-0.003-0.005	0.003-0.006-0.008	☆ 130-200-260	-	☆ 100-160-230	-	-	-	-	
AM	Hard Materials	0.002-0.003-0.005	0.003-0.006-0.009	-	-	-	★ 260-390-520	-	-	-	
	Aluminum Alloy	0.002-0.004-0.008	0.003-0.006-0.010	-	-	-	-	-	★ 660-1,970-2,950	☆ 660-1,640-2,620	

※ Bold numbers in the graph indicate the most recommended value of feed (f). Adjust cutting speed and feed rate according to the actual machining conditions

※ Coolant is recommended for Ni-base heat resistant alloy and titanium alloy with MEW

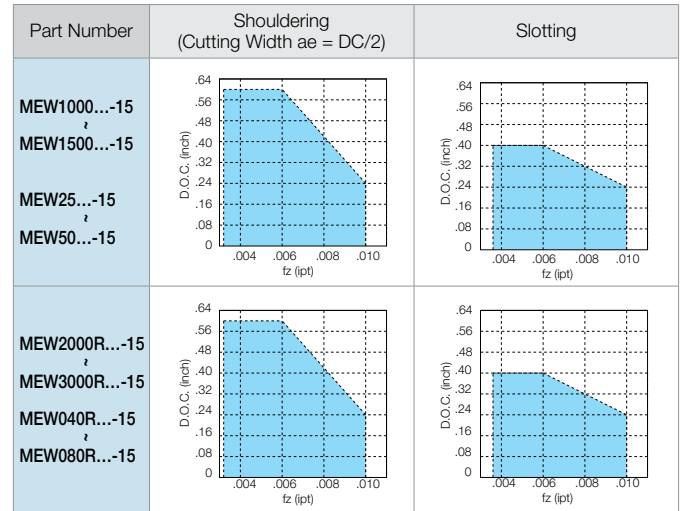
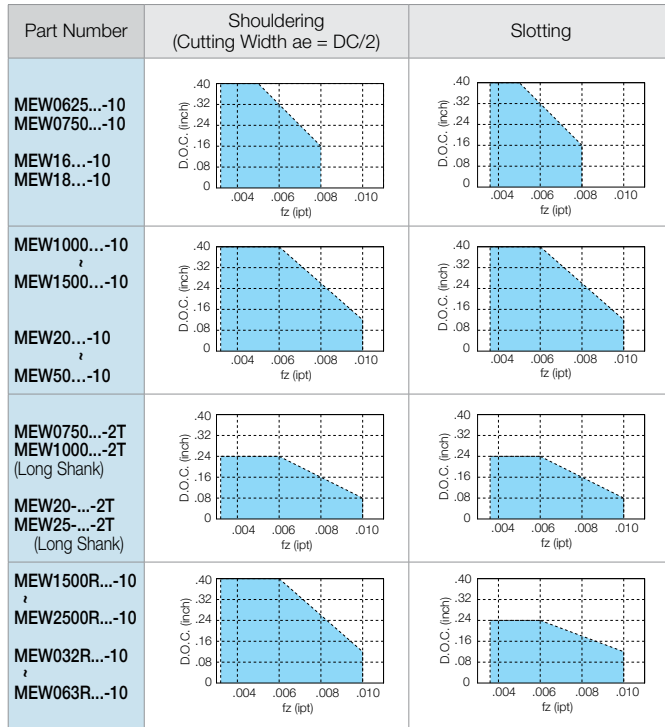
★ : 1st Recommendation
☆ : 2nd Recommendation

Ramping, Helical Milling and Plunging

- Available for vertical milling.
- NOT available for ramping and helical milling, because interference between workpiece and insert may occur.

Plunging		
	Insert Description	Max. Width of Cut (ae)
	LOMU10	0.197" (5mm)
	LOMU15	0.276" (7mm)

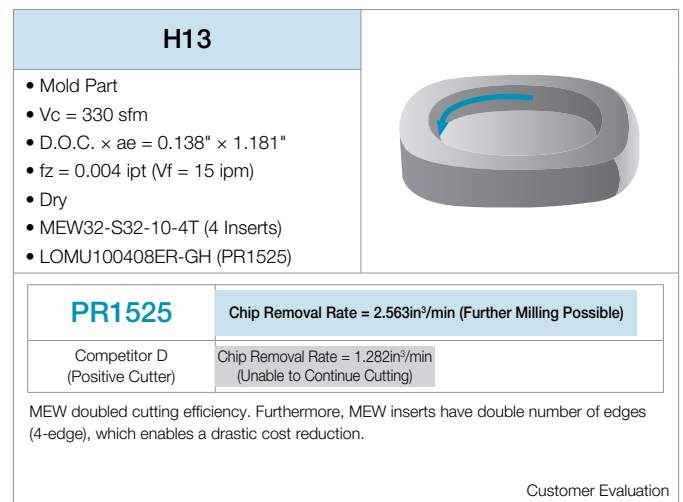
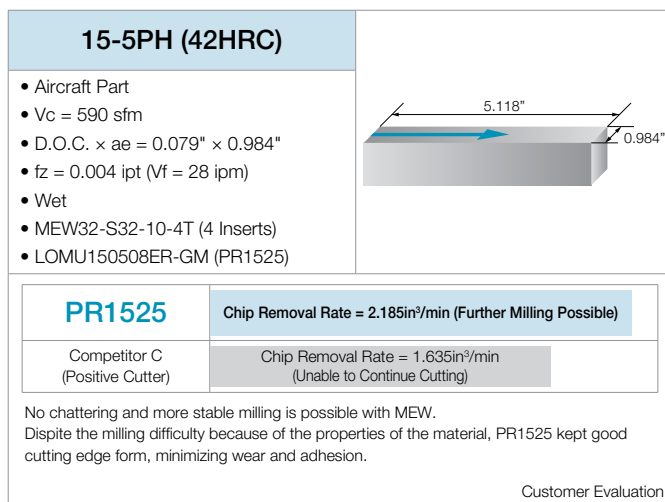
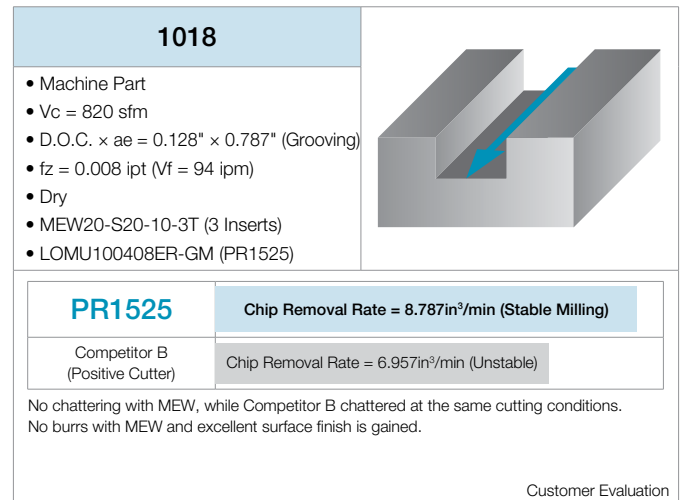
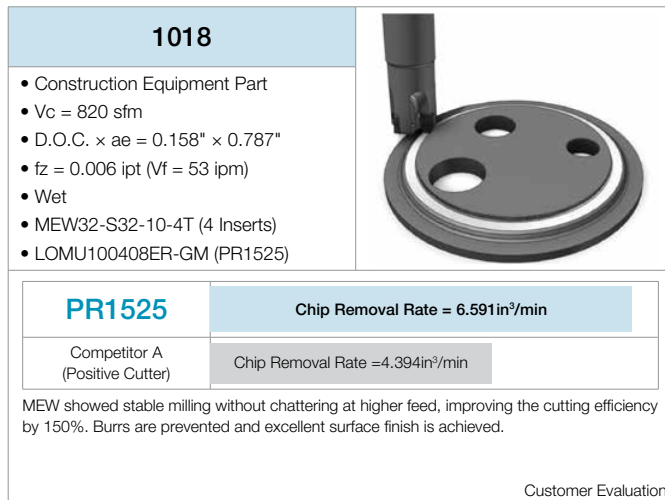
Cutting Performance



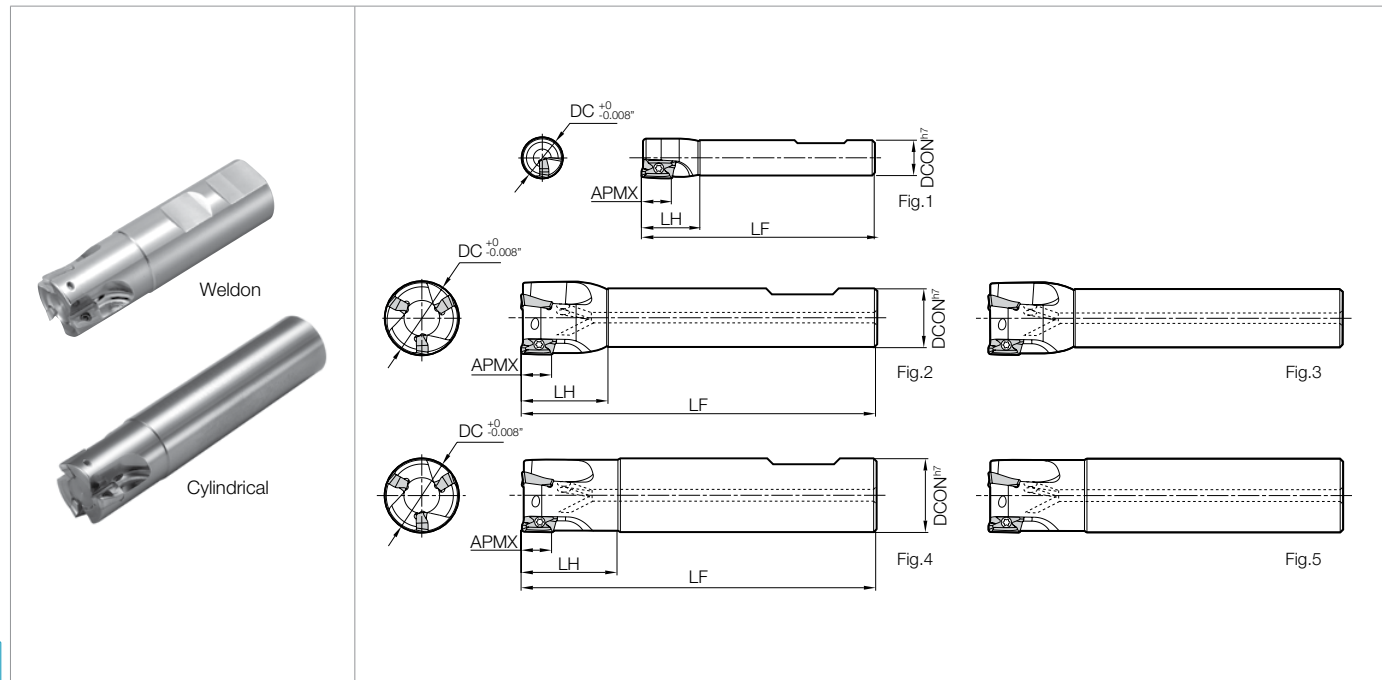
<Cutting Conditions>

- Vc = 600 sfm
- GM Chipbreaker
- Workpiece Material: 1049
- Overhang Length
- 1. End Mill: Same length as LH of the dimension
- 2. Face Mill: LF of the dimension + minimum overhang length of the arbor



Case Studies



MEC End Mill (Inch)



● Toolholder Dimensions (Inch)

Shank		Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Coolant Hole	Drawing	Spare Parts		Max. RPM*			
					DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			Insert Screw	Wrench				
																			
Weldon	Standard Shank	MEC 0500-S500-11	●	1	0.500	0.500	2.650	0.787	0.400	12°	-21°	No	Fig.1	SB-2545TR	DTM-8	50,800			
		MEC 0625-S500-11T	●	2	0.625	0.500	2.750	0.906	0.400	18°	-14°		Yes	Fig.4	SB-2555TRG	DTM-8	43,750		
		0625-S625-11T	●			0.625	3.000	1.024		20°	-10°	Fig.2					43,750		
		0750-S625-11T	●	3	0.750	0.625	3.050	21°	-10°			Fig.2					41,000		
		0750-S750-11T	●		0.750	0.750	3.250					1.142					23°	-9°	Fig.2
		1000-S750-11T	●		1.000	0.750	3.750			1.260	24°	-8°							Fig.4
		1000-S100-11T	●	1.000		4		1.000	3.750										1.260
		1250-S100-11T	●	1.250				1.000	4.000								1.575	Fig.2	33,900
		1250-S125-11T	●	1.250	1.250		4.000	1.575	Fig.4	33,900									
		1500-S125-11T	●	5	1.500	1.250	4.350	1.969	0.400	24°	-8°	Fig.2					30,000		
		MEC 1000-S750-17	●	2	1.000	0.750	3.500	1.417	0.618	16°	-11°	Fig.2					SB-4070TRN	DTM-15	35,000
		1000-S100-17	●		1.000	1.000	3.750	1.417		17°	-7°	Fig.4							35,000
		1250-S100-17	●	3	1.250	1.000	4.000	1.575	0.618	19°	-7°	Fig.2					30,000		
		1250-S125-17	●		1.250	1.250	4.000	1.575				Fig.4					30,000		
		1500-S125-17	●	4	1.500	1.250	4.350	1.969	0.618	19°	-7°	Fig.2					25,000		
Cylindrical	Long Shank	MEC 0750-S750-5.2-11T	●	2	0.750	0.750	5.200	2.362	0.400	20°	-10°						Fig.5	SB-2555TRG	DTM-8
		1000-S100-6.3-11T	●		1.000	1.000	6.300	2.559	0.400	21°	-9°		37,500						
		1250-S125-7.9-11T	●		1.250	1.250	7.870			23°	-8°		33,900						
		1500-S125-9.5-11T	●		1.500	1.250	9.450	2.559	0.400	23°	-8°		Fig.3	30,000					
		MEC 1000-S100-6.3-17	●	2	1.000	1.000	6.300	2.362	0.618	16°	-11°		Fig.5	SB-4070TRN	DTM-15	35,000			
		1250-S125-7.9-17	●		1.250	1.250	7.870	2.559	0.618	17°	-7°		Fig.5			30,000			
		1500-S125-9.5-17	●		1.500	1.250	9.450	2.559	0.618	17°	-7°		Fig.3			25,000			

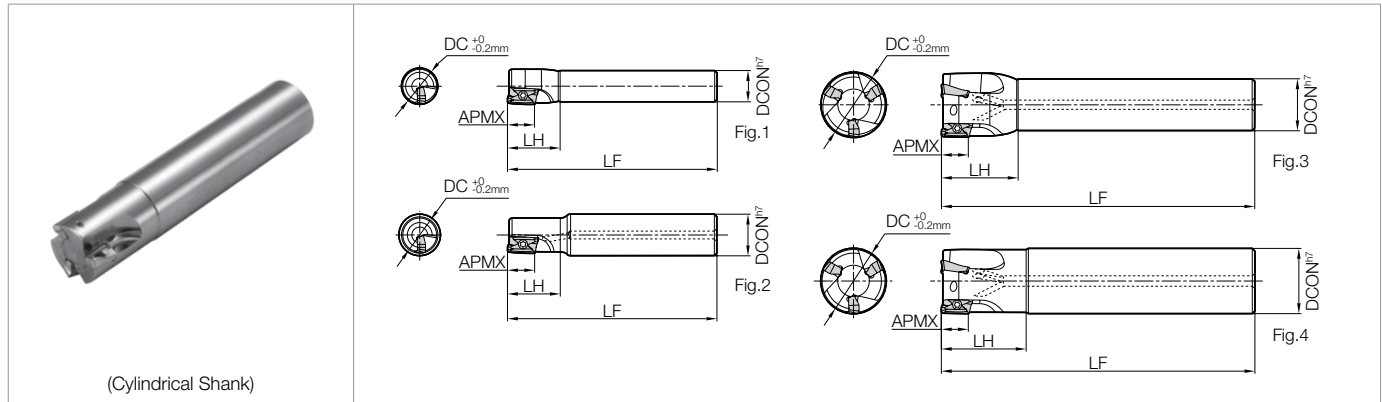
Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Max. Revolution*


























When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Applicable Inserts M74

MEC End Mill (Metric)



Toolholder Dimensions for 11mm Inserts (Metric)

Shank		Part Number	Stock	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Coolant Hole	Drawing	Spare Parts		Max RPM*							
					DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			Insert Screw	Wrench								
																							
Cylindrical	Standard Shank	MEC 10-S10-11 10-S16-11 12-S10-11 12-S12-11 12-S16-11 13-S12-11 14-S12-11 14-S16-11		1	10	10	80	17	10	+10°	-24°	No	Fig.1	SB-2545TR	DTM-8	54,800							
						16						Yes	Fig.2			50,800							
						10						No	Fig.1				49,200						
						12						Yes	Fig.2					47,700					
					13	No		Fig.1	43,750														
					14	Yes		Fig.2		43,500													
					12	No		Fig.1			43,000												
					16	Yes		Fig.2				42,000											
		MEC 16-S12-11T 16-S16-11T 17-S16-11T 18-S16-11T 19-S16-11T 20-S16-11T 20-S20-11T 21-S20-11T 22-S20-11T 24-S20-11T 25-S20-11T 25-S20-11T-4 25-S25-11T 25-S25-11T-4 28-S25-11T 30-S25-11T 32-S25-11T 32-S25-11T-5 32-S32-11T 32-S32-11T-5 40-S32-11T 50-S32-11T		2	16	12	100	23	10				+18°	-14°	No	Fig.1	SB-2555TRG	DTM-8	43,750				
						16		30		Yes					Fig.4	43,750							
						17		16		23	+19°				-13°	Yes			Fig.3	43,500			
						18		26		10	+20°	-10°			Yes	Fig.3			42,000				
					19	20		110	30	10	+20°	-10°	Yes	Fig.3	SB-2555TRG	DTM-8			41,000				
					20	21													-9°	Fig.4	40,300		
					21	22													+21°	-10°	Yes	Fig.3	39,600
					22	24													Fig.3	38,200			
		25	20	120	29	10	+21°	-10°	Yes	Fig.3	SB-2555TRG	DTM-8	37,500										
		25	32										Fig.3	37,500									
		25	3										Fig.4	35,800									
		25	4										Fig.4	34,800									
		28	3	25	32	10	+23°	-9°	Yes	Fig.3	SB-2555TRG	DTM-8	33,900										
		30	4										Fig.3	33,900									
		32	5										Fig.3	30,000									
		32	4										Fig.4	22,500									
		Long Shank	MEC 20-S18-170-11T 20-S20-140-11T 20-S20-170-11T 22-S20-170-11T 25-S23-210-11T 25-S25-160-11T 25-S25-210-11T 28-S25-210-11T 32-S30-250-11T 32-S32-200-11T 32-S32-250-11T 35-S32-250-11T 40-S32-240-11T 20-S20-150-11T-3 25-S25-170-11T-3 25-S25-170-11T-4 30-S25-180-11T-3 32-S32-200-11T-3 32-S32-200-11T-4 32-S32-200-11T-5	                    	2	20	18	170	30	10	+20°	-10°	Yes	Fig.3	SB-2555TRG	DTM-8	41,000						
							20	140	60									39,600					
							22	170	30										37,500				
							25	210	32											35,800			
						25	160	60	33,900														
						25	210	32		32,600													
						28	32	250	40		30,000												
						32	30	200	65	41,000													
32	32					250	40	37,500															
35	40					240	65		34,800														
40	20					20	150	10		+20°	-10°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900							
20	25					170	60		+21°								-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900	
25	30					180	32	+23°		-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900								
32	32					200	65		+23°							-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900		
32	4					200	65	+23°		-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900								
32	5					200	65		+23°							-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900		
32	5					200	65	+23°		-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900								
32	5					200	65		+23°							-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900		
32	5					200	65	+23°		-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900								
32	5					200	65		+23°							-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900		
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200	65	+23°	-9°	Yes	Fig.4	SB-2555TRG		DTM-8	33,900												
32	5	200	65						+23°			-9°	Yes	Fig.4	SB-2555TRG	DTM-8	33,900						
32	5	200																					

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Applicable Inserts M74



Shouldering

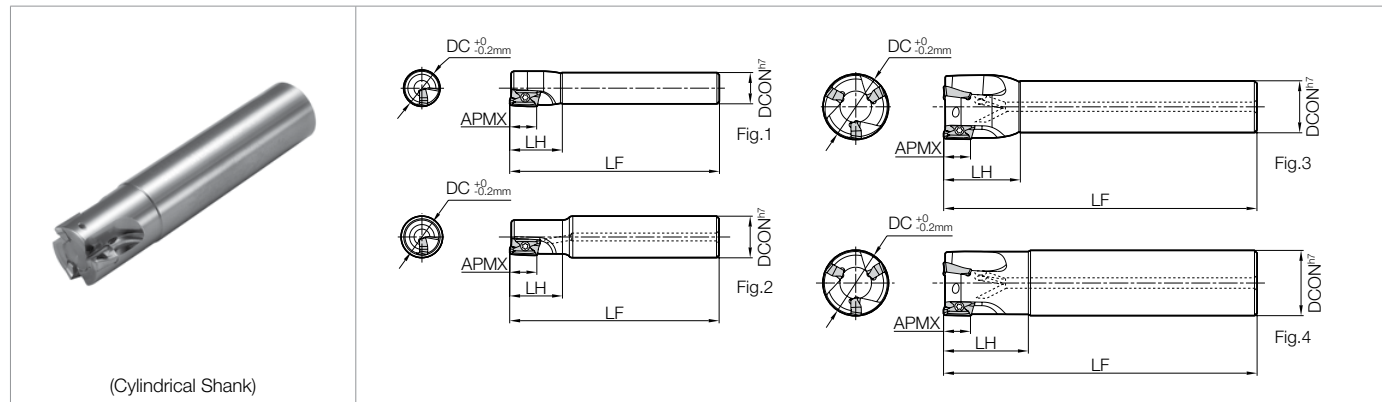


Slotting



Facing

MEC End Mill (Metric)



Toolholder Dimensions for 17mm Inserts (Metric)

Shank	Part Number	Stock	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Coolant Hole	Drawing	Spare Parts		Max RPM*
				DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			Insert Screw	Wrench	
Standard Shank	MEC 25-S20-17	●	2	25	20	120	36	15.7	+16°	-11°	Yes	Fig.3	SB-4070TRN	DTM-15	35,000
	25-S25-17	●		25	25	120	36		+16°	-11°		Fig.4			35,000
	32-S25-17	●	3	32	25	130	40	15.7	+17°	-7°		Fig.3			30,000
	32-S32-17	●		32	25	130	40		+17°	-7°		Fig.4			30,000
	40-S32-17	●	4	40	32	150	50	15.7	+19°	-7°		Fig.3			25,000
	50-S32-17	●		50	32	150	50		+19°	-7°		Fig.3			17,000
Cylindrical	MEC 25-S25-160-17	●	2	25	25	160	60	15.7	+16°	-11°	Yes	Fig.4	SB-4070TRN	DTM-15	35,000
	25-S25-210-17	●		25	25	210	36		+16°	-11°		Fig.3			32,500
	28-S25-210-17	●	2	28	32	200	65	15.7	+17°	-7°		Fig.4			30,000
	32-S32-200-17	●		32	32	200	65		+17°	-7°		Fig.4			30,000
	32-S32-250-17	●	2	35	32	250	40	15.7	+19°	-6°		Fig.3			27,700
	35-S32-250-17	●		35	32	250	40		+19°	-6°		Fig.3			25,000
Long Shank	40-S32-240-17	●	3	40	42	240	64	15.7	+19°	-6°	Yes	Fig.4	SB-4070TRN	DTM-15	30,000
	MEC 32-S32-250-17-3	●		32	32	250	65		+17°	-7°		Fig.3			25,000
	40-S32-250-17-3	●	4	40	42	250	64		+19°	-6°		Fig.3			17,000
	40-S32-250-17-4	●		40	42	250	64		+19°	-6°		Fig.3			17,000
	50-S42-250-17-4	●		50	42	250	64		+19°	-6°		Fig.3			17,000
	50-S42-250-17-4	●		50	42	250	64		+19°	-6°		Fig.3			17,000

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

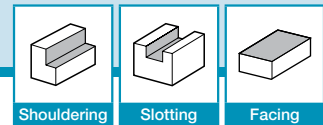
Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

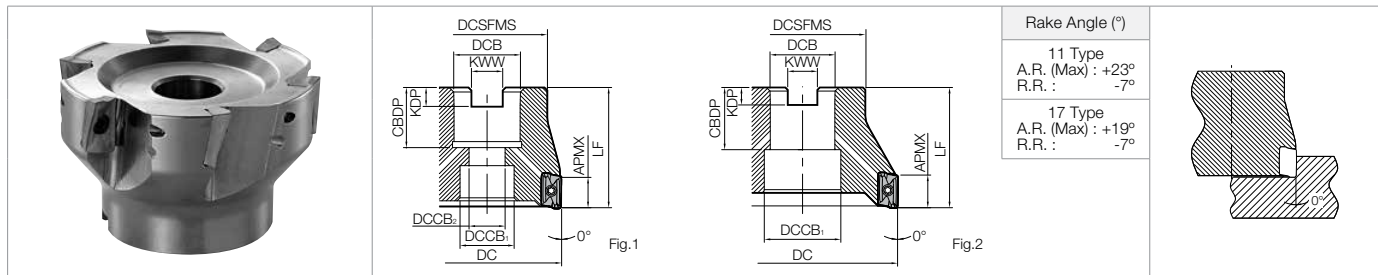
Applicable Inserts

Part Number	Applicable Inserts M22, M23			Applicable PCD Inserts M30	
MEC...-11	BDMT 1103○○ER-JT	BDMT 1103○○ER-JS	-	-	-
MEC...-11T	BDMT 11T3○○ER-JT	BDMT 11T3○○ER-JS	BDGT 11T3○○FR-JA	BDGT 11T3○○FR(-LE)	BDMT 11T3○○FR
MEC...-17	BDMT 1704○○ER-JT	BDMT 1704○○ER-JS	BDGT 1704○○FR-JA	-	BDMT 1704○○FR

Recommended Cutting Conditions M78-M79



MEC Face Mill (Inch)



Toolholder Dimensions (Inch)

Part Number	Stock	No. of Inserts	Dimensions (in)										Coolant Hole	Drawing	Weight (kg)	Spare Parts		Max RPM*
			DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KDP	KWW	APMX				Insert Screw	Wrench	
MEC 1500R-11T-5T	●	5	1.500	1.263		0.63			0.807						0.2	SB-2555TRG	DTM-8	30,700
2000R-11T-5T	●	5	2.000	1.606	0.750	0.646	0.417	1.575	0.819	0.188	0.312				0.3			22,300
2500R-11T-6T	●	6	2.500	1.594		0.63			0.819			0.400	Yes	Fig.1	0.7			20,400
3000R-11T-7T	●	7	3.000	1.917	1.000	0.827	0.555	1.969	0.878	0.223	0.375				1.0			18,500
4000R-11T-9TN	●	9	4.000	2.622	1.500	1.969	-	2.48	1.654	0.375	0.625				1.6			16,800
MEC 2000R-17-4T	●	4	2.000			0.646			0.819						0.4	SB-4070TRN	DTM-15	16,800
NEW 2000R-17-5T	●	5	2.000	1.606	0.750	0.646	0.417	1.575	0.819	0.188	0.312			Fig.1	0.4			16,800
2500R-17-5T	●	5	2.500	1.634		0.646			0.819			0.618	Yes		0.8			14,400
3000R-17-6T	●	6	3.000	1.969	1.000	0.827	0.555	1.969	0.878	0.223	0.375				1.0			12,250
4000R-17-7TN	●	7	4.000	2.622	1.500	1.969	-	2.48	1.654	0.375	0.625			Fig.2	1.8			10,400

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

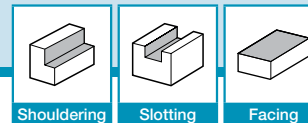
Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Applicable Inserts

Part Number	Applicable Inserts ➡ M22, M23			Applicable PCD Inserts ➡ M30	
MEC...R-11	BDMT 1103○○ER-JT	BDMT 1103○○ER-JS	-	-	-
MEC...R-11T	BDMT 11T3○○ER-JT	BDMT 11T3○○ER-JS	BDGT 11T3○○FR-JA	BDGT 11T3○○FR(-LE)	BDMT 11T3○○FR
MEC...R-17	BDMT 1704○○ER-JT	BDMT 1704○○ER-JS	BDGT 1704○○FR-JA	-	BDMT 1704○○FR

Recommended Cutting Conditions ➡ M78-M79

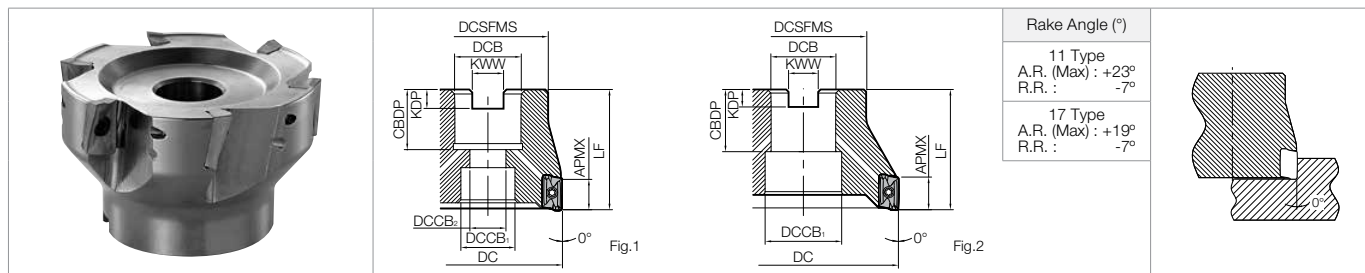


Shouldering

Slotting

Facing

MEC Face Mill (Metric)



Toolholder Dimensions (Metric)

Part Number		Stock	No. of Inserts	Dimensions (mm)										Coolant Hole	Drawing	Weight (kg)	Spare Parts		Max RPM*
				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX				Insert Screw	Wrench	
Inch Bore Dia.	Coarse Pitch	MEC 063R-11-6T	●	63	40	1.000"	20	14	50	1.024"	0.236"	0.375"	10	Yes	Fig.1	0.8	SB-2555TRG	DTM-8	20,500
		080R-11-7T	●	80	52.5	1.000"	20	14	50	1.024"	0.236"	0.375"	10	Yes	Fig.1	1.0			18,500
		100R-11-9TN	●	100	65	1.250"	26	17.6	63	1.260"	0.315"	0.500"	10	Yes	Fig.1	1.8			17,000
		125R-11-11T	□	125	80	1.500"	45	32	63	1.496"	0.394"	0.625"	10	Yes	Fig.1	3.4			15,000
	Fine Pitch	MEC 063R-11-8T	●	63	40	1.000"	20	14	50	1.024"	0.236"	0.375"	10	Yes	Fig.1	0.8	SB-2555TRG	DTM-8	20,500
		080R-11-10T	●	80	52.5	1.000"	20	14	50	1.024"	0.236"	0.375"	10	Yes	Fig.1	1.0			18,500
		MEC 063R-17-5T	●	63	40	1.000"	20	14	50	1.024"	0.236"	0.375"	15.7	Yes	Fig.1	0.8			14,500
		080R-17-6T	●	80	52.5	1.000"	20	14	50	1.024"	0.236"	0.375"	15.7	Yes	Fig.1	1.0			12,000
	Coarse Pitch	100R-17-7TN	●	100	65	1.250"	26	17.6	63	1.260"	0.315"	0.500"	15.7	Yes	Fig.1	1.8	SB-4070TRN	DTM-15	10,500
		125R-17-9T	●	125	80	1.500"	45	32	63	1.496"	0.394"	0.625"	15.7	Yes	Fig.1	3.4			8,900
		MEC 063R-17-6T	●	63	40	1.000"	20	14	50	1.024"	0.236"	0.375"	15.7	Yes	Fig.1	0.8			14,500
		080R-17-8T	●	80	52.5	1.000"	20	14	50	1.024"	0.236"	0.375"	15.7	Yes	Fig.1	1.0			12,000
Metric Bore Dia.	Standard Pitch	MEC 040R-11-5T-M	●	40	34	16	14	8.5	40	20	5.5	8.5	10	Yes	Fig.1	0.2	SB-2555TRG	DTM-8	30,000
		050R-11-5T-M	●	50	40	22	18	12	40	22	6.3	10.4	10	Yes	Fig.1	0.3			22,500
		063R-11-6T-M	●	63	40	22	18	12	40	22	6.3	10.4	10	Yes	Fig.1	0.7			20,500
		080R-11-7T-M	●	80	52.5	27	20	14	50	26	7	12.4	10	Yes	Fig.1	1.0			18,500
		100R-11-9T-MN	●	100	65	32	26	17.6	55	26	8	14.4	10	Yes	Fig.1	1.6			17,000
		125R-11-11T-M	●	125	80	40	45	32	63	33	9.5	16.4	10	Yes	Fig.1	3.1			15,000
		160R-11-14T-M	△	160	100	40	68	-	63	33	9.5	16.4	10	No	Fig.2	4.5			13,900
		MEC 032R-11-5T-M	●	5	32	30	11.5	8.5	35	20	5.6	8.4	10	Yes	Fig.1	0.1	SB-2555TRG	DTM-8	33,900
	Fine Pitch	040R-11-6T-M	●	40	34	16	14	8.5	40	20	5.6	8.4	10	Yes	Fig.1	0.2			30,000
		050R-11-7T-M	●	50	40	22	18	12	40	22	6.3	10.4	10	Yes	Fig.1	0.4			22,500
		063R-11-8T-M	●	63	40	22	18	12	40	22	6.3	10.4	10	Yes	Fig.1	0.6			20,500
		080R-11-10T-M	●	80	52.5	27	20	14	50	26.5	7	12.4	10	Yes	Fig.1	0.9			18,500
		100R-11-11T-M	●	100	65	32	26	17.6	55	34	8	14.4	10	Yes	Fig.1	1.7			17,000
		MEC 040R-17-4T-M	●	40	34	16	14	8.5	40	20	5.5	8.5	15.7	Yes	Fig.1	0.3	SB-4070TRN	DTM-15	25,000
		050R-17-4T-M	●	50	40	22	18	12	40	22	6.3	10.4	15.7	Yes	Fig.1	0.4			17,000
	Standard Pitch	063R-17-5T-M	●	63	40	22	18	12	40	22	6.3	10.4	15.7	Yes	Fig.1	0.6			14,500
		080R-17-6T-M	●	80	52.5	27	20	14	50	26	7	12.4	15.7	Yes	Fig.1	1.0			12,000
		100R-17-7T-MN	●	100	65	32	26	17.6	55	26	8	14.4	15.7	Yes	Fig.1	1.8			10,500
		125R-17-9T-M	●	125	80	40	45	32	63	33	9.5	16.4	15.7	Yes	Fig.1	3.1			8,900
		160R-17-12T-M	●	160	100	40	68	-	63	33	9.5	16.4	15.7	No	Fig.2	4.5			7,400
		MEC 050R-17-5T-M	●	50	40	22	18	12	40	22	6.3	10.4	15.7	Yes	Fig.1	0.4			17,000
		063R-17-6T-M	●	63	40	22	18	12	40	22	6.3	10.4	15.7	Yes	Fig.1	0.6			14,500
	Fine Pitch	MEC 050R-17-5T-M	●	50	40	22	18	12	40	22	6.3	10.4	15.7	Yes	Fig.1	0.4			17,000
		063R-17-6T-M	●	63	40	22	18	12	40	22	6.3	10.4	15.7	Yes	Fig.1	0.6			14,500

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

(Table 1)

When using Center-through Air / Coolant / Mist

If Center Through Air (Coolant, Mist) is used, please use appropriate arbor and clamp with arbor bolt. (Table 1)

MEC's surface finish when shouldering with multiple passes

In order to obtain smoothly finished shoulder wall with multiple passes of MEC Milling Cutter, please keep D.O.C. less than 0.217" (5.5mm) for 11T3 type insert and also keep D.O.C. less than 0.354" (9mm) for 1704 type insert.

Applicable Inserts

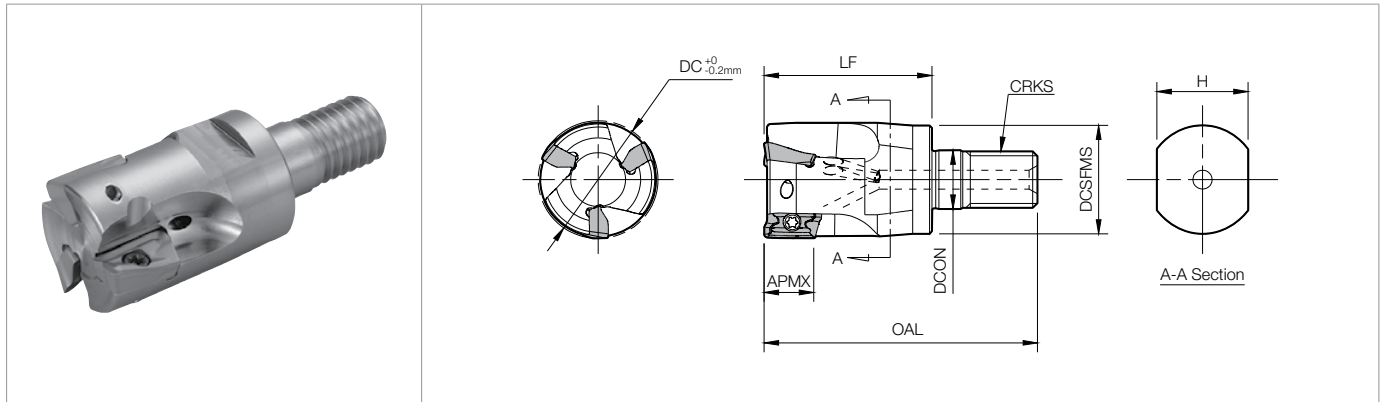
Toolholder	Arbor Bolt	Wrench	Toolholder	Arbor Bolt	Wrench
MEC040R....M	HH8X25H	LW-5 (Double width 5mm)	MEC160R....	HF24×60H	LW-17 (Double width 17mm)
MEC050R....M	HH10X30H	LW-6 (Double width 6mm)	MEC1500....	HH3/8-1.25H	
MEC063R....M	HH12X35H	LW-8 (Double width 8mm)	MEC2500....	HH1/2-1.25H	
MEC080R....	HH16X52H	LW-12 (Double width 12mm)	MEC3000....	HH3/4-2.30H	
MEC100R....(M) N	HF20X53H	LW-14 (Double width 14mm)	MEC4000....		

Wrench is not included. Please purchase separately.

Part Number	Applicable Inserts M22, M23			Applicable PCD Inserts M30	
MEC...R-11	BDMT 11T300ER-JT	BDMT 11T300ER-JS	BDGT 11T300FR-JA	BDGT 11T300FR(-LE)	BDMT 11T300FR
MEC...R-17	BDMT 170400ER-JT	BDMT 170400ER-JS	BDGT 170400FR-JA	-	BDMT 170400FR

Recommended Cutting Conditions M78-M79

MEC Modular



Toolholder Dimensions (Metric)







Part Number	Stock	No. of Inserts	Dimensions (mm)								Rake Angle (°)		Coolant Hole	Applicable Inserts ➡ M22, M23 ➡ M30	Max RPM*
			DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R. (Max)	R.R.			
MEC 16-M08-11T-2T	●	2	16	14.7	8.5	43	25	M8xP1.25	12	10	+18°	-14°	Yes	BDMT11T3 BDGT11T3	43,750
20-M10-11T-2T	●	2	20	18.7	10.5	49	30	M10xP1.5	15		+20°	-10°			41,000
20-M10-11T-3T	●	3	20	18.7	10.5	49	30	M10xP1.5	15		+20°	-10°			41,000
25-M12-11T-3T	●	3	25	23	12.5	57	35	M12xP1.75	19		+21°	-10°			37,500
32-M16-11T-4T	●	4	32	30	17	63	40	M16xP2.0	24		+23°	-9°			33,900
MEC 25-M12-17-2T	●	2	25	23	12.5	57	35	M12xP1.75	19	15.7	+16°	-11°	Yes	BDMT1704 BDGT1704	35,000
32-M16-17-3T	●	3	32	30	17	63	40	M16xP2.0	24		+17°	-7°			30,000


Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Recommended Cutting Conditions ➡ M78-M79

Spare Parts

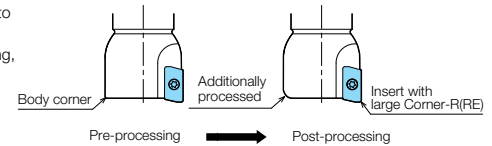
Part Number	Spare Parts		
	Insert Screw	Wrench	Anti-seize Compound
MEC 16-M08-11T-2T	 SB-2555TRG	 DTM-8	 P-37
20-M10-11T-2T			
20-M10-11T-3T			
25-M12-11T-3T			
32-M16-11T-4T			
MEC 25-M12-17-2T	 SB-4070TRN	 DTM-15	 P-37
32-M16-17-3T			

 Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

■ When using inserts with corner-R (RE)1.6 or larger, additional modifications of the cutter body will be necessary. Ref. to the chart below for the recommended modifications.

Insert Corner-R(RE)	Additional Modifications of the Cutter Body Corner
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5

* R shape is recommended for additional processing to the body corner.
When applying chamfer shaped additional processing, do not cut away too much.



◆ Recommended Cutting Conditions

• JT Chipbreaker

Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grade Vc (sfm)					
	Toolholder Description		Cermet	MEGACOAT NANO	MEGACOAT		PVD Coated Carbide	CVD Coated Carbide
	MEC0500~MEC0750 MEC10~MEC19	MEC1000~MEC1500 MEC20~MEC40 MEC1500R~MEC4000R MEC040R~MEC160R	TN100M	PR1535	PR1225	PR1210	PR830	CA6535
Carbon Steel	0.002~ 0.004 ~0.006	0.003~ 0.006 ~0.010	☆ 390~ 520 ~660	☆ 390~ 590 ~820	★ 390~ 590 ~820	-	☆ 390~ 520 ~660	-
Alloy Steel	0.002~ 0.004 ~0.005	0.003~ 0.006 ~0.008	☆ 330~ 460 ~590	☆ 330~ 520 ~720	★ 330~ 520 ~720	-	☆ 330~ 460 ~590	-
Mold Steel	0.002~ 0.003 ~0.004	0.003~ 0.005 ~0.008	☆ 260~ 390 ~490	☆ 260~ 460 ~590	★ 260~ 460 ~590	-	☆ 260~ 390 ~490	-
Austenitic Stainless Steel	0.002~ 0.003 ~0.004	0.003~ 0.005 ~0.006	-	☆ 330~ 520 ~660	☆ 330~ 520 ~660	-	☆ 330~ 460 ~590	-
Martensitic Stainless Steel	0.002~ 0.003 ~0.004	0.003~ 0.005 ~0.008	-	☆ 490~ 660 ~820	-	-	-	★ 590~ 790 ~980
Precipitation Hardened Stainless Steel	0.002~ 0.003 ~0.004	0.003~ 0.005 ~0.008	-	★ 300~ 390 ~490	-	-	-	-
Gray Cast Iron	0.002~ 0.004 ~0.006	0.003~ 0.007 ~0.010	-	-	-	★ 390~ 590 ~820	-	-
Nodular Cast Iron	0.002~ 0.003 ~0.004	0.003~ 0.006 ~0.008	-	-	-	★ 330~ 490 ~660	-	-
Ni-base Heat Resistant Alloy	0.002~ 0.003 ~0.004	0.003~ 0.005 ~0.006	-	☆ 70~ 100 ~160	-	-	-	★ 70~ 100 ~160
Titanium Alloys	0.002~ 0.003 ~0.004	0.003~ 0.006 ~0.008	-	☆ 130~ 200 ~260	-	☆ 100~ 160 ~230	-	-

※ Bold numbers in the graph indicate the most recommended value of feed (fz) Adjust cutting speed and feed rate according to the actual machining conditions
※ Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys

★ : 1st Recommendation
☆ : 2nd Recommendation

• JS Chipbreaker

Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grade Vc (sfm)				
	Toolholder Description		MEGACOAT NANO	MEGACOAT		PVD Coated Carbide	CVD Coated Carbide
	MEC0500-MEC0750 MEC10-MEC19	MEC1000-MEC1500 MEC20-MEC40 MEC1500R-MEC4000R MEC040R-MEC160R	PR1535	PR1225	PR1210	PR830	CA6535
Carbon Steel	0.002~ 0.004 ~0.005	0.003~ 0.006 ~0.007	☆ 390~ 590 ~820	★ 390~ 590 ~820	-	☆ 390~ 520 ~660	-
Alloy Steel	0.002~ 0.003 ~0.004	0.003~ 0.005 ~0.006	☆ 330~ 520 ~720	★ 330~ 520 ~720	-	☆ 330~ 460 ~590	-
Mold Steel	0.002~ 0.003 ~0.004	0.003~ 0.004 ~0.005	☆ 260~ 460 ~590	★ 260~ 460 ~590	-	☆ 260~ 390 ~490	-
Austenitic Stainless Steel	0.002~ 0.003 ~0.004	0.003~ 0.004 ~0.005	★ 330~ 520 ~660	☆ 330~ 520 ~660	-	☆ 330~ 460 ~590	-
Martensitic Stainless Steel	0.002~ 0.003 ~0.004	0.003~ 0.004 ~0.005	☆ 490~ 660 ~820	-	-	-	★ 590~ 790 ~980
Precipitation Hardened Stainless Steel	0.002~ 0.003 ~0.004	0.003~ 0.004 ~0.005	☆ 300~ 390 ~490	-	-	-	-
Ni-base Heat Resistant Alloy	0.002~ 0.003 ~0.004	0.003~ 0.004 ~0.005	☆ 70~ 100 ~160	-	-	-	★ 70~ 100 ~160
Titanium Alloys	0.002~ 0.003 ~0.004	0.003~ 0.004 ~0.005	★ 130~ 200 ~260	-	-	-	-

※ Bold numbers in the graph indicate the most recommended value of feed (fz) Adjust cutting speed and feed rate according to the actual machining conditions
 ※ Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys

★ : 1st Recommendation
 ☆ : 2nd Recommendation

• JA Chipbreaker

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade Vc (sfm)	
		DLC Coated Carbide	Carbide
		PDL025	GW25
Aluminum Alloy (Si 13% or Less)	0.002~0.012	660~3280	660~2620
Aluminum Alloy (Si 13% and Over)	0.002~0.008	660~980	660~980

• PCD

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade Vc (sfm)	
		PCD	
		KPD230 (KPD001)	
Aluminum Alloy (Si 13% or Less)	0.002~0.008	1640~4,920	
Aluminum Alloy (Si 13% and Over)	0.002~0.006	980~3,280	

⚠ Warning

Please observe below precautions fully.
 Failure to observe the precautions may cause serious damage to human body.

Warning about Max. Revolution indicated on main body

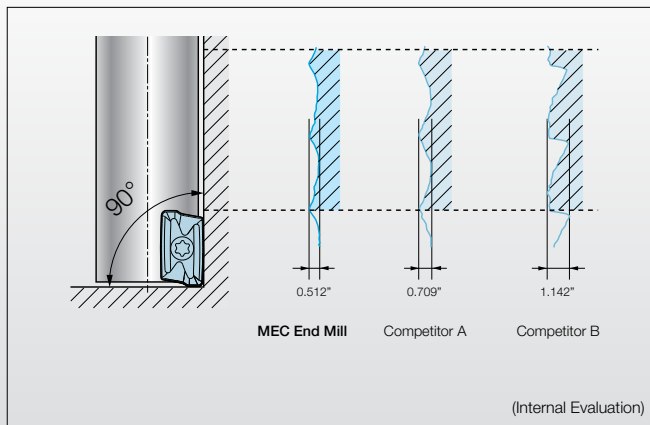
- When running the end mill and the face mill at revolutions exceeding the maximum revolution limit, the inserts or toolholder may be damaged due to the centrifugal force.
- For actual practical revolution, please set within recommended cutting condition.
- When using at a higher revolution (over 10,000min⁻¹), refer to the table to adjust the balance of MEC and suitable arbor.

Max RPM*	Balance quality grade G ISO 1940-1 / 8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

Features of MEC

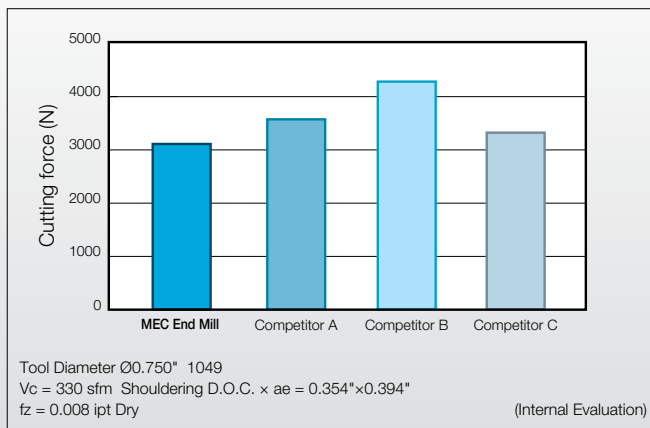
Perfect 90° Shoulders

<Cutting Surface Comparison>



Low cutting force

<Cutting Force Comparison>



Cutting Performance of MEC End Mill

(1) Overhang Length When Using BDMT 11mm-type Insert (Standard / Straight Shank)

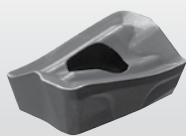
Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)		Shape
Ø10mm	MEC10-S10-11	0.670	-	
Ø0.500" Ø12mm	MEC0500... MEC12-S16-11	0.787	1.180	
Ø0.625" Ø16mm	MEC0625-S625-11T MEC16-S16-11T	1.180	1.790	
Ø0.750" Ø20mm	MEC0750-S750-11T MEC20-S20-11T	1.180	1.790	
Ø1.000" Ø25mm	MEC1000-S100-11T MEC25-S25-11T	1.260	1.890	
Ø1.250" Ø32mm	MEC1250-S125-11T MEC32-S32-11T	1.580	2.360	

(JT Chipbreaker Vc = 400 sfm Workpiece : 1049)

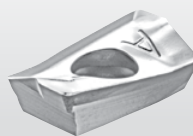
Part Number	Shouldering (Cutting Width ae = DC/2)		Slotting Ramping and Helical Milling	
	D.O.C. (in)		D.O.C. (in)	
MEC10-S10-11				
MEC0500... MEC12-S16-11				
MEC0625-S625-11T MEC16-S16-11T				
MEC0750-S750-11T MEC20-S20-11T				
MEC1000-S100-11T MEC25-S25-11T				
MEC1250-S125-11T MEC32-S32-11T				

Chipbreaker

JT Chipbreaker (General Purpose)

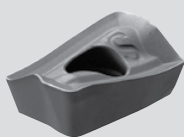


JA Chipbreaker (for Aluminum)

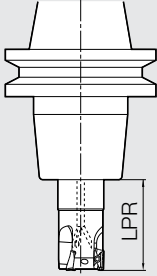


JS chipbreaker (Low Cutting Force)

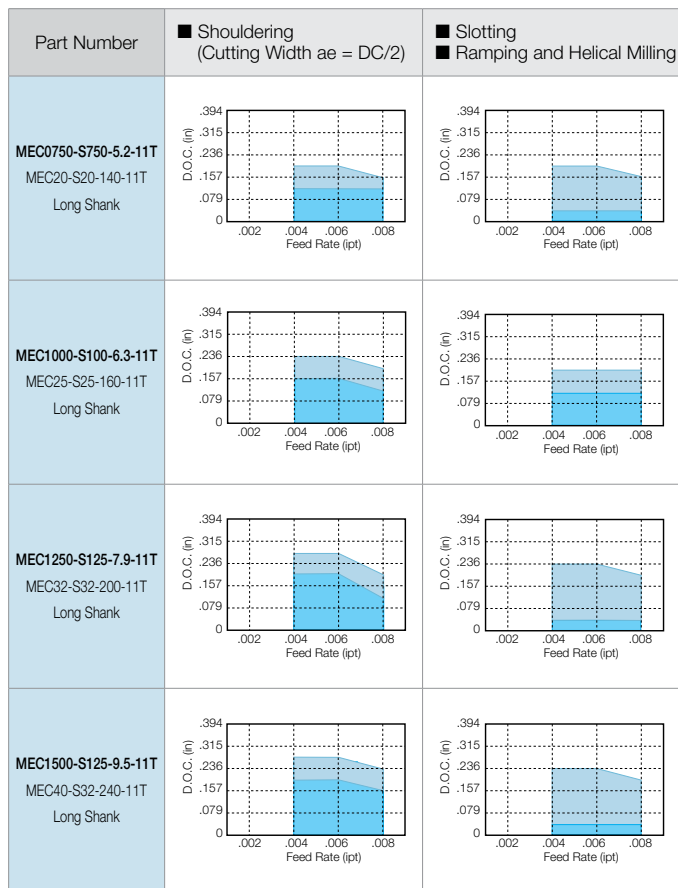
Cutting Force 20% Lower



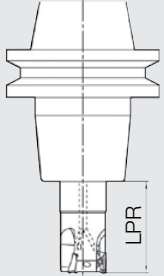
(2) Overhang Length When Using BDMT 11mm-type Insert
(Long Shank)

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)		Shape
Ø0.750" Ø20mm Long Shank	MEC0750-S750-5.2-11T MEC20-S20-140-11T	2.362	3.543	
Ø1.000" Ø25mm Long Shank	MEC1000-S100-6.3-11T MEC25-S25-160-11T	2.362	3.957	
Ø1.250" Ø32mm Long Shank	MEC1250-S125-7.9-11T MEC32-S32-200-11T	3.957	5.118	
Ø1.500" Ø40mm Long Shank	MEC1500-S125-9.5-11T MEC40-S32-240-11T	3.957	5.119	

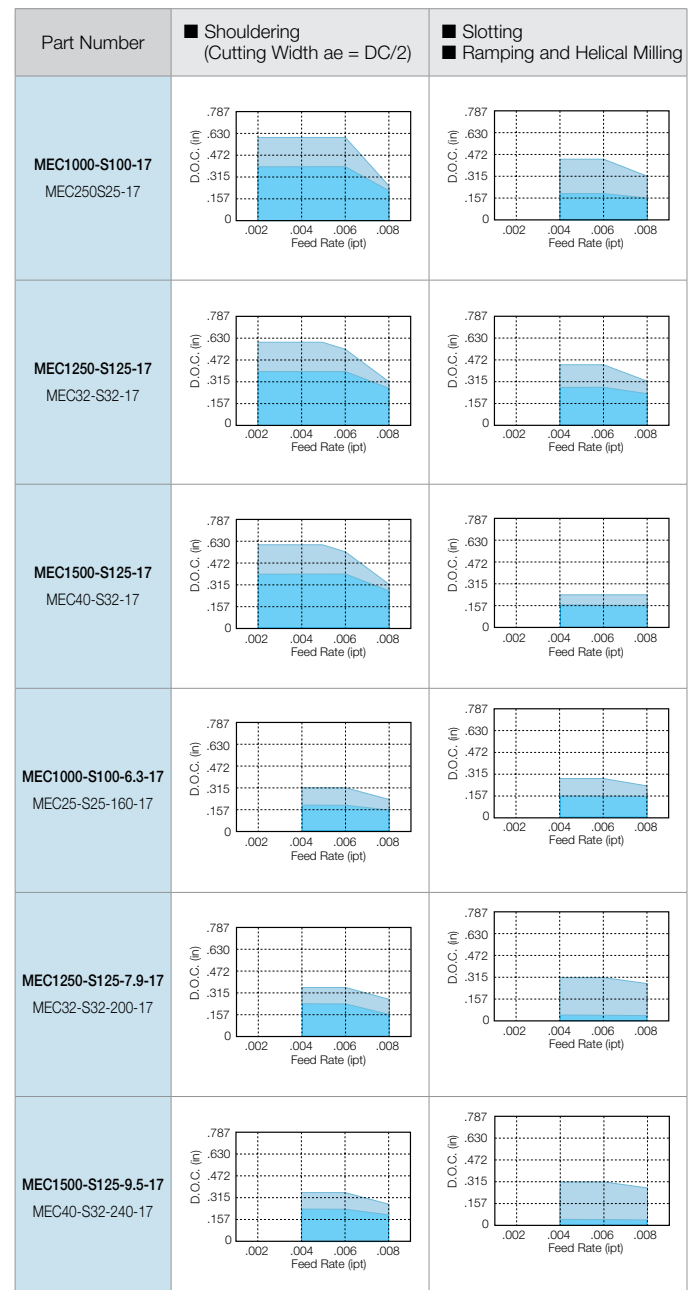
(JT Chipbreaker Vc = 400 sfm Workpiece :1049)



(3) Overhang Length When Using BDMT 17mm-type Insert

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)		Shape
Ø1.000" Ø25mm	MEC1000-S100-17 MEC25-S25-17	1.417	2.126	
Ø1.250" Ø32mm	MEC1250-S125-17 MEC32-S32-17	1.575	2.362	
Ø1.500" Ø40mm	MEC1500-S125-17 MEC40-S32-17	1.969	2.953	
Ø1.000" Ø25mm Long Shank	MEC1000-S100-6.3-17 MEC25-S25-160-17	2.362	3.937	
Ø1.250" Ø32mm Long Shank	MEC1250-S125-7.9-17 MEC32-S32-200-17	3.937	5.118	
Ø1.500" Ø40mm Long Shank	MEC1500-S125-9.5-17 MEC40-S32-240-17	3.937	5.118	

(JT Chipbreaker Vc = 400 sfm Workpiece :1049)



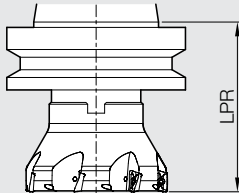
Cutting Performance of MEC Face Mill

(1) Overhang Length When Using BDMT 11mm-type Insert

(JT Chipbreaker Vc = 400 sfm Workpiece :1049)

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)
Ø1.500" Ø40mm	MEC1500R-11T-5T MEC040R-11-5T-M	4.528
Ø2.000" Ø50mm	MEC2000R-11T-5T MEC050R-11-OT-M	3.937
Ø2.500" Ø63mm	MEC2500R-11T-6T MEC063R-11-OT	3.740
	MEC063R-11-OT-M	
Ø3.000" Ø80mm	MEC3000R-11T-7T MEC080R-11-OT	3.740
Ø4.000" Ø100mm	MEC4000R-11T-9TN MEC100R-11-9TN	4.252
Ø125mm	MEC125R-11-11T	
Ø160mm	MEC160R-11-14T	

Shape



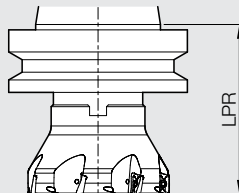
Part Number	Shouldering (Cutting Width ae = DC/2)	Slotting
MEC1500R-11T-5T MEC040R-11-5T-M		
MEC2000R-OT-OT MEC4000R-OT-OT MEC050R-11-OT-M MEC100R-11T-9TN MEC100R-11-9T-MN		
MEC125R-11-11T(-M) MEC160R-11-14T(-M)		

(2) Overhang Length When Using BDMT 17mm-type Insert

(JT Chipbreaker Vc = 400 sfm Workpiece :1049)

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)
Ø40mm	MEC040R-17-4T-M	4.528
Ø2.000" Ø50mm	MEC2000R-17-OT MEC050R-17-OT-M	3.937
Ø2.500" Ø63mm	MEC2500R-17-4T MEC063R-17-OT	3.740
	MEC063R-17-OT-M	
Ø3.000" Ø80mm	MEC3000R-17-6T MEC080R-17-OT	4.252
Ø4.000" Ø100mm	MEC4000R-17-7T MEC100R-17-OTN	
Ø125mm	MEC125R-17-9T(-M)	
Ø160mm	MEC160R-17-12T(-M)	

Shape

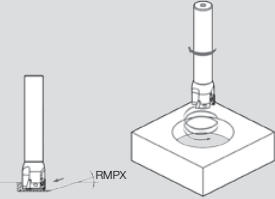


Part Number	Shouldering (Cutting Width ae = DC/2)	Slotting
MEC040R-17-4T-M		
MEC2000R-17-OT MEC050R-17-OT-M		
MEC2500R-17-OT MEC4000R-17-OTN MEC063R-17-OT(-M) MEC100R-17-OTN MEC100R-17-7T-MN		
MEC125R-17-9T(-M) MEC160R-17-12T(-M)		

Ramping / Helical Milling / Plunging

Ramping / Helical Milling

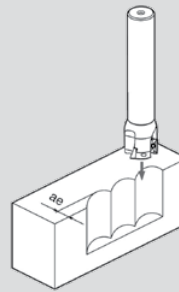
- Ramping angle should be under RMPX.
- For plunge depth per revolution when helical milling, see the cutting performance data of each tool. Use compressed air during machining.



Cutting Dia.	Applicable Inserts	Max. Ramping Angle (RMPX)
Ø0.625", Ø16-Ø18mm	BDMT 11T3 BDGT 11T3	3°
Ø0.750", Ø19-Ø21mm		5°
Ø1.000", Ø22-Ø25mm		2.5°
Ø1.250", Ø28-Ø32mm		1.5°
Ø1.500", Ø40mm		0.7°
Ø50mm~	BDMT 1704	Not Recommended
Ø1.000", Ø25mm		8°
Ø1.250", Ø32mm		5°
Ø1.500", Ø40mm		2.5°
Ø50mm~		Not Recommended

BDMT/BDGT1103.. insert not recommended for ramping or helical milling.

Plunging



Cutting Dia.	Applicable Inserts	Max. Width of Cut (ae)
Ø0.625" Ø16-Ø19mm	BDMT 11T3 BDGT 11T3	0.060" 1.5mm
Ø0.750"~Ø4.000" Ø20-Ø160mm	BDMT 11T3 BDGT 11T3	0.197" 5mm
Ø1.000"~Ø4.000" Ø25-Ø160mm	BDMT 1704 BDGT 1704	0.315" 8mm

BDMT1103.. insert not recommended for plunging.

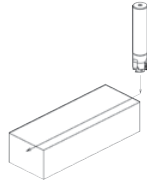
Minimum Cutting Dia. for Helical Milling

MEC	Cutting Dia.	Ø0.625"	Ø0.750"	Ø1.000"	Ø1.250"	Ø1.500"	Ø16mm	Ø18mm	Ø20mm	Ø22mm	Ø25mm	Ø28mm	Ø30mm	Ø32mm	Ø40mm	Ø50mm
BD_T11T3 Type	Min. Cutting Dia.	Ø0.827"	Ø1.102"	Ø1.575"	Ø2.087"	Ø2.598"	Ø21mm	Ø25mm	Ø29mm	Ø33mm	Ø39mm	Ø45mm	Ø49mm	Ø53mm	Ø69mm	Not recommended for helical milling.
	Min. Cutting Dia. for Flat Bottom	Ø1.102"	Ø1.339"	Ø1.850"	Ø2.362"	Ø2.835"	Ø28mm	Ø32mm	Ø36mm	Ø40mm	Ø46mm	Ø52mm	Ø56mm	Ø60mm	Ø76mm	
MEC	Cutting Dia.	Ø1.000"	Ø1.250"	Ø1.500"	Ø25mm	Ø32mm	Ø40mm	Ø50mm								
BD_T1704 Type	Min. Cutting Dia.	Ø1.339"	Ø1.850"	Ø2.362"	Ø34mm	Ø48mm	Ø64mm	Not recommended for helical milling.								
	Min. Cutting Dia. for Flat Bottom	Ø1.850"	Ø2.323"	Ø2.835"	Ø46mm	Ø60mm	Ø76mm									

Case Studies

Pre-Hardened Tool Steel

- Test Piece (54~56HRC)
- Vc = 160 sfm (n = 800min⁻¹)
- D.O.C. x ae = 0.079" x 0.551"
- fz = 0.005 ipt (Vf = 2.28 ipm)
- Dry
- MEC20-S20-11T (3 Flute)
- BDMT11T308ER-JT (PR830)



MEC

Chip Removal Amount = 28.1in³

Competitor's End Mill A

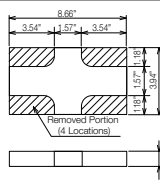
Chip Removal Amount = 1.1in³ (Chipping Occurred)

Competitor's End Mill A [Ø25 (2 inserts) Vc = 130 sfm fz = 0.003 ipt D.O.C. x ae = 0.079"x0.118"] had chipping occur in 10 minutes and it was noisy. MEC withstood increased feed rates, and the cutting edge remained in extremely good condition and is still available for further machining.

(User Evaluation)

304

- Plate
- Vc = 410 sfm (n = 1,600min⁻¹)
- D.O.C. = 0.354"
- fz = 0.004 ipt (Vf = 12.6 ipm)
- Dry
- MEC25-S25-17 (2 Flute)
- BDMT170408ER-JT (PR830)



MEC

4 pcs/edge or More

Competitor's End Mill C

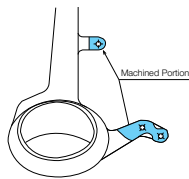
1 pcs/edge or Less

Competitor's End mill C (indexable roughing end mill) had high cutting force and insert breakage occurred, but MEC had no breakage and was still usable for further machining, after machining 4 pieces (16 points).

(User Evaluation)

4118

- Knuckle Steering
- Vc = 490 sfm (n = 1,200min⁻¹)
- D.O.C. = 0.020"~0.197" (Shouldering)
- fz = 0.004 ipt (Vf = 18.8 ipm)
- Dry
- MEC40-S32-17 (4 Flute)
- BDMT170408ER-JT (PR830)



MEC

150 pcs/edge

Competitor's End Mill E

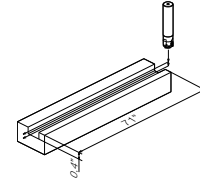
40 pcs/edge

MEC had a better surface finish compared to Competitor's End mill E and also tripled the tool life.

(User Evaluation)

Structural Steel

- Plate
- Vc = 290 sfm (n = 1,400min⁻¹)
- D.O.C. = 0.197" x 2 Passes
- fz = 0.005 ipt (Vf = 19.7 ipm)
- Dry
- MEC20-S20-11T (3 Flute)
- BDMT11T308ER-JT (PR830)



MEC

23 pcs/edge

Competitor's End Mill B

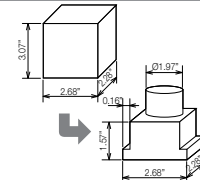
10~11 pcs/edge

MEC doubled Competitor B's tool life under the same conditions.

(User Evaluation)

Die Steel

- Mold
- Vc = 430 sfm (n = 1,040min⁻¹)
- D.O.C. x ae = ~0.118" x ~0.197"
- fz = 0.007 ipt (Vf = 36.8 ipm)
- Dry (Air Blow)
- MEC40-S32-11T (5 Flute)
- BDMT11T308ER-JT (PR830)



MEC

2 Hours (Small Wear : Extendible)

Competitor's End Mill D

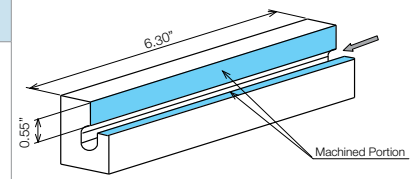
2 Hours (Halted due to Insert Breakage)

MEC had better cutting performance / insert life compared to Competitor's End Mill D, and the insert maintained small wear and was usable for further machining after the same duration as Competitor's End Mill D. Competitor's End Mill D (6 flute) was used with Vf = 3070 sfm (fz = 0.006 ipt).

(User Evaluation)

Ni-Base HRSA

- Turbine Parts
- Vc = 50 sfm (n = 120min⁻¹)
- D.O.C. = 0.020"
- fz = 0.003 ipt (Vf = 1.5 ipm)
- Wet
- MEC40R-17-4T-M (4 Flute)
- BDMT170408ER-JS (PR1025)



MEC

9 pcs/edge

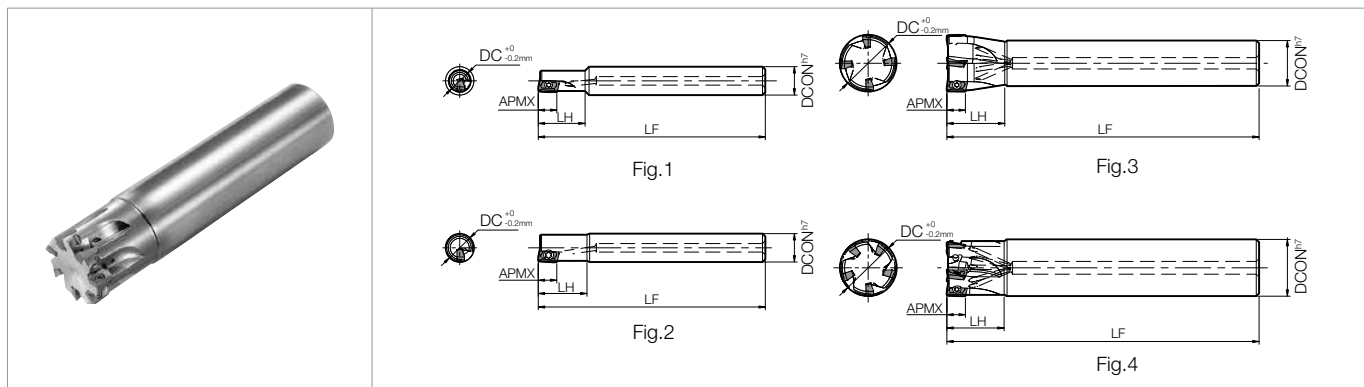
Competitor's End Mill F

1 pcs/edge or Less



Competitor's End Mill F (Coated Carbide Insert) could not finish machining of 1 workpiece, but MEC could cut 9 pcs/edge and the finished surface was good.

(User Evaluation)

MECX End Mill



Toolholder Dimensions

Shank	Part Number	Stock	Unit	No. of Inserts	Dimensions					Rake Angle (°)		Coolant Hole	Drawing	Spare Parts		Max RPM*												
					DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			Insert Screw	Wrench													
																												
Standard Shank	MECX 0375-S375-07-1T	●	inch	1	0.375	0.375	3.00	0.669	0.236	12.8°	-19.7°	Yes	Fig.1	SB-2035TRG	DTM-6	47,150												
	0500-S500-07-2T	●		2	0.500	0.500	3.27	0.709		14.3°	-12.9°		Fig. 2	SB-2042TRG		45,800												
	0625-S625-07-3T	●		3	0.625	0.625	3.50	0.787		16.3°	-11.3°		Fig. 3			43,300												
	0750-S625-07-4T	●		4	0.750		4.00				-10.9°		Fig. 2			40,900												
	0750-S750-07-4T	●		4		0.750	4.00	0.984	0.236		16.3°	-9.5°	Yes	Fig. 2	SB-2042TRG	40,900												
	0750-S750-07-5T	●		5	1.000											4.50	0.984	16.3°	-9.5°	Yes	Fig. 2	SB-2042TRG	40,900					
	1000-S100-07-5T	●		5		1.000	4.50	0.984		16.3°													-9.5°	Yes	Fig. 2	SB-2042TRG	36,900	
	1000-S100-07-7T	●		7	1.000											4.50	0.984										16.3°	-9.5°
	1000-S750-07-5T	●		5		0.750	4.50	0.984	16.3°		-9.5°	Yes	Fig. 3	SB-2042TRG	36,900													
	1000-S750-07-7T	●		7	0.750										4.50	0.984	16.3°	-9.5°	Yes	Fig. 3	SB-2042TRG	36,900						
	1250-S125-07-6T	●		6		1.250	1.250	5.00		1.181												0.236	16.3°	-8.9°	Yes	Fig. 2		
	1250-S125-07-8T	●		8	1.250										1.250	5.00											1.181	0.236
Long Shank	MECXL 0625-S625-07-3T	●	inch	3		0.625	0.625	5.10	2.175	0.236	16.3°	-11.3°	Yes	Fig. 4														
	0750-S750-07-4T	●		4	0.750	0.750	5.50	2.362	16.3°						-10.9°	Yes	Fig. 4	SB-2042TRG	DTM-6	40,900								
	1000-S100-07-5T	●		5	1.000	1.000	6.30	2.362												16.3°	-9.5°	Yes	Fig. 4	SB-2042TRG	DTM-6	36,900		
	1250-S125-07-6T	●		6	1.250	1.250	7.90	2.559																		16.3°	-8.9°	Yes
Standard Shank	MECX 08-S10-07-1T	●	mm	1	8	10	80	16		6	11.7°	-24.0°	Yes	Fig.1														
		●			10			17	12.8°		-18.7°	Fig.2		47,100														
		●		2	12	12		18	14.3°		-13.7°	Fig.4		46,200														
		●			14				16.3°		-12.1°	Fig.3		44,800														
		●		3	16	16	100	20	6		16.3°	-11.3°	Yes	Fig.4	SB-2042TRG	DTM-6	43,200											
		●			17							-11.0°					Fig.3	42,400										
		●			18					-10.9°		Fig.3						41,600										
		●		4	20	20	110			-10.4°								Yes	Fig.4	40,200								
		●			20					-10.4°			Fig.3	40,200														
		●			21			-10.1°		Fig.3		39,500																
		●		5	25	20	120	25	6		16.3°	-9.7°		Yes	Fig.3	SB-2042TRG	DTM-6	37,000										
		●			25							-9.5°	Fig.4					37,000										
	●	26								-8.8°		Fig.3						36,500										
	33-S32-07-6T	●		6	33	32	130	30		-8.8°								Fig.3	33,100									
	MECX 16-S16-07-4T	●		mm	4	16	16	100		20			6	16.3°	-11.3°			Yes	Fig.4	SB-2042TRG	DTM-6	43,200						
		●				20						110			25							-10.4°	Fig.3	40,200				
		●			20		110	25	-9.7°	Fig.3	40,200																	
		●				25					120	25			-8.9°	Fig.4	37,000											
		●			25		120	25									-8.9°	Fig.4	37,000									
		●				32					32	130							30			-8.9°	Fig.4	33,600				
		●			32		32	130	30	-8.9°			Fig.4	33,600														
		●				32					32	130		30	-8.9°	Fig.4			33,600									
	Long Shank	MECX 17-S16-130-07-3T		●	mm		3	17	16								130	20	6	16.3°	-11.0°			Yes	Fig.3	SB-2042TRG	DTM-6	42,400
				●		4	21	20	140		-10.1°	39,500																
●			5	26		25	160	25	-9.5°	36,500																		

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

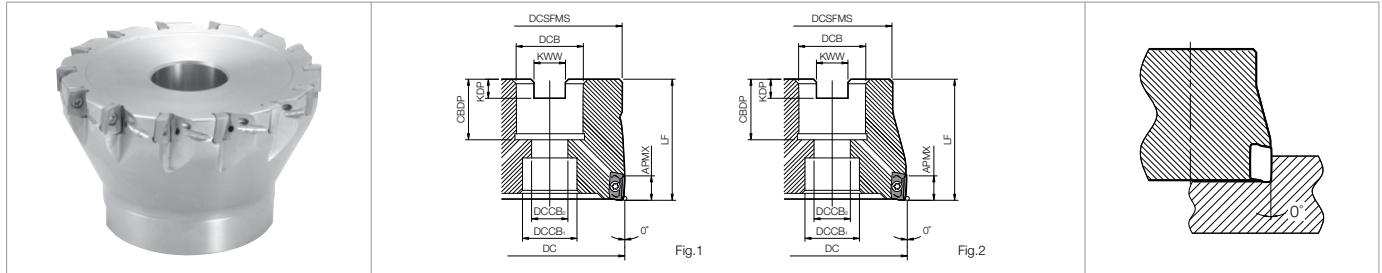
Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.




Applicable Inserts ● M85

Recommended Cutting Conditions ● M86

MECX Face Mill



Toolholder Dimensions

Part Number	Stock	Unit	No. of Inserts	Dimensions										Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Spare Parts			Max RPM*					
				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R. (Max)	R.R.				Insert Screw	Wrench	Arbor Bolt						
																											
MECX 1250R-07-8T	●	inch	8	1.250	1.181	0.75	0.630	0.417	1.575	0.807		0.187	0.313	0.236	+7°	Yes	Fig.1	0.15	SB-2042TRG	DTM-6	HH3/8-1.25H	33,600					
1500R-07-10T	●		10	1.500	1.496																	30,500					
2000R-07-12T	●		12	2.000	1.575																	0.646	0.417	1.575	0.819	0.125	27,700
2500R-07-14T	●		14	2.500																		0.630				0.50	24,900
MECX 032R-07-8T-M	●	mm	8	32	30	16	14	8.5	40	20	5.5	8.5	6	+7°	Yes	Fig.1	0.15	SB-2042TRG	DTM-6	HH8x25H	33,600						
040R-07-10T-M	●		10	40	38	22	18	12		22	6.3	10.4								-8.4°	0.25	HH10x30H	30,500				

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Recommended Cutting Conditions **M86**

Max. Revolution*

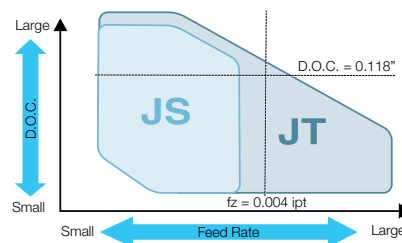
When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

- To obtain a smooth shoulder wall finish using step milling, set D.O.C. within 0.197" for each cut.

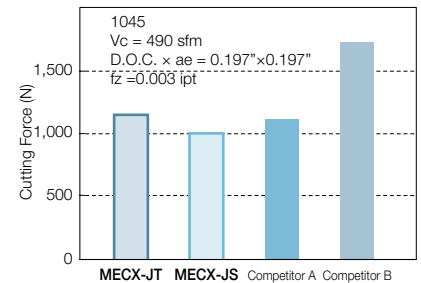
Applicable Inserts

Part Number	Applicable Inserts M22	
MECX...-07...	BDMT 070300ER-JT	BDMT 070300ER-JS

Selecting Chipbreaker



Cutting Force Comparison



Warning

Please observe below precautions fully.
Failure to observe the precautions may cause serious damage to human body.

Warning about Max. Revolution indicated on main body

- When running the end mill and the face mill at revolutions exceeding the maximum revolution limit, the inserts or toolholder may be damaged due to the centrifugal force.
- For actual practical revolution, please set within recommended cutting condition.
- When using at a higher revolution (over 10,000min⁻¹), refer to the table to adjust the balance of MECX and suitable arbor.

Max RPM*	Balance quality grade G ISO 1940-1 / 8821 (JIS B905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

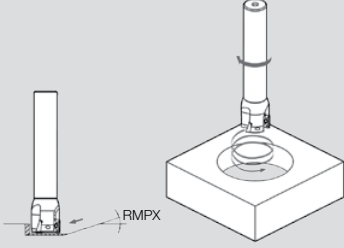
◆ Recommended Cutting Conditions

Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grade Vc (sfm)				
	JS Chipbreaker	JT Chipbreaker	MEGACOAT NANO	MEGACOAT		PVD Coated Carbide	CVD Coated Carbide
			PR1535	PR1225	PR1210	PR830	CA6535
Carbon Steel	0.0016~ 0.0031 ~0.0039	0.0024~ 0.0039 ~0.0047	☆ 390~ 590 ~820	★ 390~ 590 ~820	-	☆ 390~ 490 ~590	-
Alloy Steel	0.0016~ 0.0024 ~0.0031	0.0024~ 0.0031 ~0.0039	☆ 330~ 520 ~720	★ 330~ 520 ~720	-	☆ 330~ 460 ~590	-
Mold Steel	0.0016~ 0.0024 ~0.0031	0.0024~ 0.0031 ~0.0039	☆ 260~ 460 ~590	★ 260~ 460 ~590	-	☆ 260~ 390 ~490	-
Austenitic Stainless Steel	0.0012~ 0.0016 ~0.0020	0.0020~ 0.0024 ~0.0028	★ 330~ 520 ~660	☆ 330~ 520 ~660	-	-	-
Martensitic Stainless Steel	0.0012~ 0.0016 ~0.0020	0.0020~ 0.0024 ~0.0039	☆ 490~ 660 ~820	-	-	-	★ 590~ 790 ~980
Precipitation Hardened Stainless Steel	0.0012~ 0.0016 ~0.0020	0.0020~ 0.0024 ~0.0039	★ 300~ 390 ~490	-	-	-	-
Gray Cast Iron	0.0016~ 0.0031 ~0.0039	0.0031~ 0.0039 ~0.0059	-	-	★ 390~ 590 ~820	-	-
Nodular Cast Iron	0.0016~ 0.0024 ~0.0031	0.0031~ 0.0039 ~0.0047	-	-	★ 330~ 490 ~660	-	-
Ni-base Heat Resistant Alloy	0.0012~ 0.0016 ~0.0020	0.0020~ 0.0024 ~0.0028	☆ 70~ 100 ~160	-	-	-	★ 70~ 100 ~160
Titanium Alloys	0.0016~ 0.0024 ~0.0031	0.0031~ 0.0039 ~0.0047	★ 130~ 200 ~260	-	☆ 100~ 160 ~230	-	-

※ Bold numbers in the graph indicate the most recommended value of feed (fz) Adjust cutting speed and feed rate according to the actual machining conditions
 ※ Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys

★ :1st Recommendation
 ☆ : 2nd Recommendation

■ Ramping / Helical Milling

Ramping / Helical Milling																												
<ul style="list-style-type: none"> Ramping angle should be under RMPX. For plunge depth per revolution when helical milling, see the cutting performance data of each tool. Use compressed air during machining. 		<table> <tr> <th>Cutting Dia.</th><th>Applicable Inserts</th><th>Max. Ramping Angle (RMPX)</th></tr> <tr> <td>Ø0.375", Ø8mm</td><td rowspan="11">BDMT 0703</td><td>Not Recommended</td></tr> <tr> <td>Ø10mm</td><td>1.5°</td></tr> <tr> <td>Ø0.500" Ø12mm, Ø14mm</td><td>2°</td></tr> <tr> <td>Ø0.625", Ø16mm</td><td>3°</td></tr> <tr> <td>Ø17mm, Ø18mm</td><td>1.5°</td></tr> <tr> <td>Ø0.750", Ø20mm</td><td>2°</td></tr> <tr> <td>Ø21mm</td><td>1.8°</td></tr> <tr> <td>Ø1.000", Ø25mm</td><td>1.3°</td></tr> <tr> <td>Ø26mm</td><td>1.2°</td></tr> <tr> <td>Ø1.250", Ø32mm</td><td>0.8°</td></tr> <tr> <td>Ø33mm</td><td>0.5°</td></tr> </table>	Cutting Dia.	Applicable Inserts	Max. Ramping Angle (RMPX)	Ø0.375", Ø8mm	BDMT 0703	Not Recommended	Ø10mm	1.5°	Ø0.500" Ø12mm, Ø14mm	2°	Ø0.625", Ø16mm	3°	Ø17mm, Ø18mm	1.5°	Ø0.750", Ø20mm	2°	Ø21mm	1.8°	Ø1.000", Ø25mm	1.3°	Ø26mm	1.2°	Ø1.250", Ø32mm	0.8°	Ø33mm	0.5°
Cutting Dia.	Applicable Inserts	Max. Ramping Angle (RMPX)																										
Ø0.375", Ø8mm	BDMT 0703	Not Recommended																										
Ø10mm		1.5°																										
Ø0.500" Ø12mm, Ø14mm		2°																										
Ø0.625", Ø16mm		3°																										
Ø17mm, Ø18mm		1.5°																										
Ø0.750", Ø20mm		2°																										
Ø21mm		1.8°																										
Ø1.000", Ø25mm		1.3°																										
Ø26mm		1.2°																										
Ø1.250", Ø32mm		0.8°																										
Ø33mm		0.5°																										

■ Minimum Cutting Dia. for Helical Milling

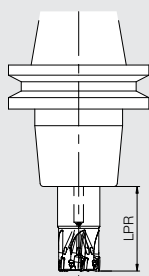
MECX	Cutting Dia.	Ø0.375"	Ø0.500"	Ø0.625"	Ø0.750"	Ø8mm	Ø10mm	Ø12mm	Ø14mm	Ø16mm	Ø17mm	Ø18mm	Ø20mm
BDMT0703 Type	Min. Cutting Dia.	Ø0.512"	Ø0.748"	Ø0.984"	Ø1.260"	Not recommended for helical milling.	Ø14mm	Ø18mm	Ø22mm	Ø26mm	Ø28mm	Ø30mm	Ø34mm
	Min. Cutting Dia. for Flat Bottom	Ø0.630"	Ø0.866"	Ø1.142"	Ø1.378"		Ø17mm	Ø21mm	Ø25mm	Ø29mm	Ø31mm	Ø33mm	Ø37mm
MECX	Cutting Dia.	Ø1.000"	Ø1.250"	Ø21mm	Ø25mm	Ø26mm	Ø32mm	Ø33mm					
BDMT0703 Type	Min. Cutting Dia.	Ø1.732"	Ø2.244"	Ø36mm	Ø44mm	Ø46mm	Ø58mm	Ø60mm					
	Min. Cutting Dia. for Flat Bottom	Ø1.890"	Ø2.362"	Ø39mm	Ø47mm	Ø49mm	Ø61mm	Ø63mm					

MECX End Mill Cutting Performance

(JT Chipbreaker Vc = 400 sfm Workpiece :1049)

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)	
Ø8mm	MECX08-S10-07-1T	0.630	-
Ø0.375" Ø10mm	MECX0375-S375-07-1T MECX10-S10-07-1T	0.670	-
Ø0.500" Ø12mm	MECX0500-S500-07-2T MECX12-S12-07-2T	0.709	1.180
Ø0.625" Ø16mm	MECX0625-S625-07-3T MECX16-S16-07-3T	0.787	1.570
Ø0.750" Ø20mm	MECX0750-S750-07-4T MECX20-S20-07-4T	0.787	1.570
Ø1.000" Ø25mm	MECX1000-S100-07-5T MECX25-S25-07-5T	1.000	1.970
Ø1.250" Ø32mm	MECX1250-S125-07-6T MECX32-S32-07-6T	1.180	1.970

Shape



- Machining with extended overhang length is not recommended for Ø0.315" and Ø0.394".
- The cutting performance list shows applicable range of JT Chipbreaker (PR830) with Standard flute-number type.
For Multi-Edge type, use with 70% or less of D.O.C..

- Cutting conditions of JS Chipbreaker

(1) For MECX0375~MECX0500 / MECX08~MECX12

Decrease the feed rate by 25% according to cutting capability list.

(2) For MECX 0625 / MECX16 and over

Decrease the feed rate and D.O.C. by 30% according to cutting capability list.

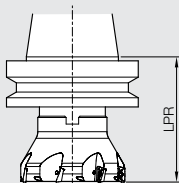
Part Number	Shouldering (Cutting Width ae = DC/2)	Slotting Ramping and Helical Milling
MECX08-S10-07-1T		
MECX0375-S375-07-1T MECX10-S10-07-1T		
MECX0500-S500-07-2T MECX12-S12-07-2T		
MECX0625-S625-07-3T MECX16-S16-07-3T		
MECX0750-S750-07-4T MECX20-S20-07-4T		
MECX1000-S100-07-5T MECX25-S25-07-5T		
MECX1250-S125-07-6T MECX32-S32-07-6T		

MECX Face Mill Cutting Performance

(JT Chipbreaker Vc = 400 sfm Workpiece :1049)

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)	
Ø1.250" Ø32mm	MECX1250R-07-8T MECX032R-07-8T-M	3.937	
Ø1.500" Ø40mm	MECX1500R-07-10T MECX040R-07-10T-M		
Ø2.000" Ø50mm	MECX2000R-07-12T MECX050R-07-12T-M		
Ø2.500" Ø63mm	MECX2500R-07-14T MECX063R-07-14T-M		

Shape



Part Number	Shouldering (Cutting Width ae = DC/2)
MECX1250R-07-8T MECX032R-07-8T-M	
MECX1500R-07-10T MECX040R-07-10T-M	
MECX2000R-07-12T MECX050R-07-12T-M	
MECX2500R-07-14T MECX063R-07-14T-M	

- Not recommended for slotting

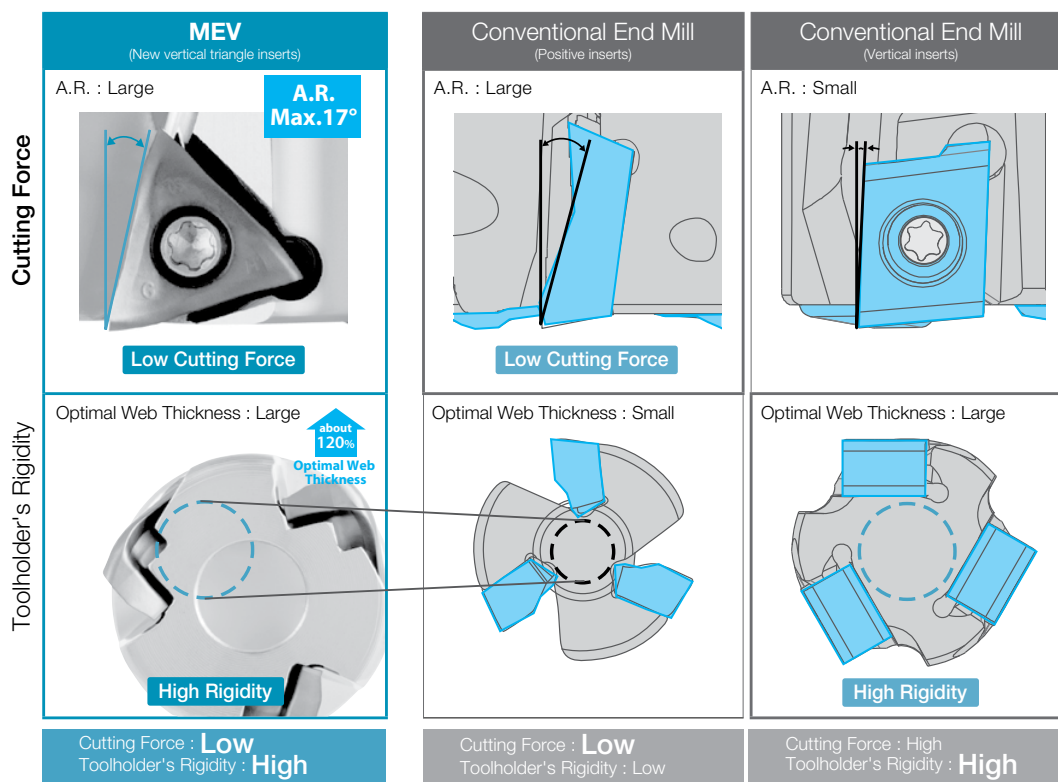
M-THREE (MEV)

High Performance Milling Series

Newly Developed Triangular Inserts Provide Low Cutting Forces and Increased Rigidity
High Performance, Economical, and Multi-functional Milling Solutions

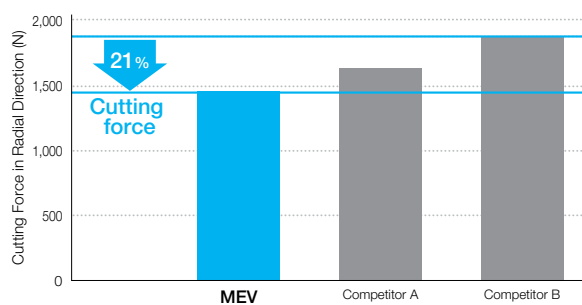
1 High Performance: Low Cutting Force and High Rigidity

Newly developed vertical triangle inserts with 3 cutting edges for stable machining and reduced chattering
MEV vs Competitor



Keeping the max rake angle at 17°, provides lower cutting forces than the positive insert types of competitors

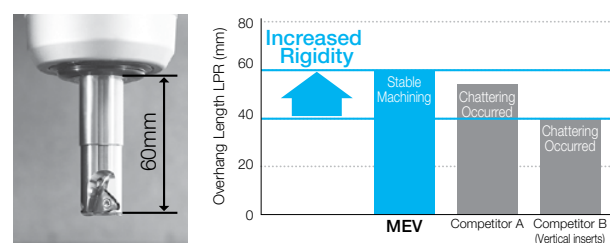
Cutting Force Comparison (Internal Evaluation)



Cutting Conditions: $V_c = 655$ sfm, D.O.C. \times ae = 0.118" \times 0.709", fz = 0.004 ipt, $\varnothing 0.750$ " (3 flutes), Dry Workpiece : 4140

Low cutting force and large optimal web thickness provides excellent chattering resistance

Chatter Resistance Comparison (Internal Evaluation)



Cutting Conditions: $V_c = 655$ sfm, D.O.C. \times ae = 0.118" \times 0.71", fz = 0.004 ipt, $\varnothing 0.750$ " (3 flutes), Dry Workpiece : 4140 (H)



Cutting Conditions: $V_c = 655$ SFM, D.O.C. = 0.118" (Slotting), fz = 0.004 ipt, $\varnothing 0.750$ " (3 flutes), Dry Workpiece : 4140 (H)

2 The Economical Choice: Improved Insert Life with 3 Cutting Edges

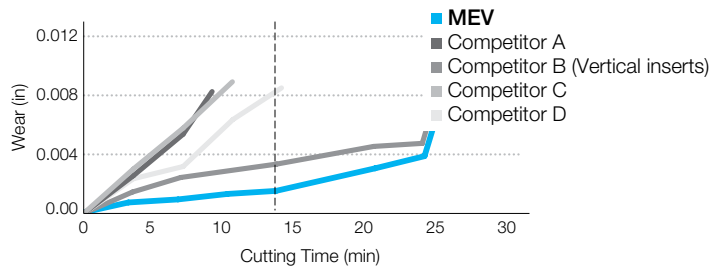
Insert

Unique triangle inserts with 3 cutting edges

PR15-series utilizes excellent MEGACOAT NANO coating technology with wear and adhesion resistance

Long Tool Life with Excellent Wear Resistance

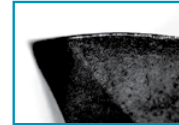
Wear Resistance Comparison (Internal Evaluation)



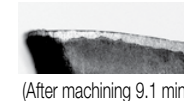
Cutting conditions : Vc = 590 sfm, D.O.C. x ae = 0.118" x 0.394", fz = 0.004 ipt, Ø0.750", Dry
Workpiece : D2 (30-35HS)

Cutting Edge (After Machining 14 min)

MEV



Competitor A



Competitor B (Vertical inserts)



Competitor C



Competitor D



Improved Stability with Superior Fracture Resistance



Cutting Edge Cross-Section

MEV

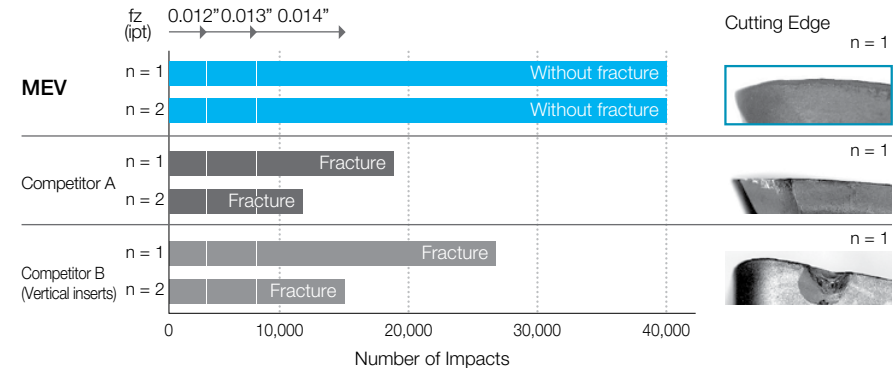


Conventional



The MEV features a convex cutting edge to increase strength

Fracture Resistance Comparison (Internal Evaluation)



Cutting conditions : Vc = 394 sfm, D.O.C. x ae = 0.079" x 0.393", fz = 0.012" - 0.014" ipt, Ø0.750" (1 Flute), Dry
Workpiece : 4140 (H)

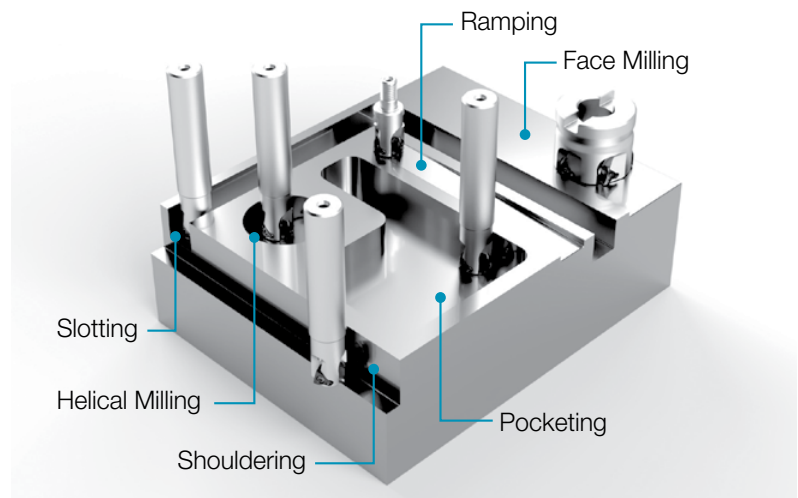
3 Multi-functional: The MEV Can Perform a Wide Variety of Machining Processes

Great performance in shouldering, slotting, and ramping applications (D.O.C. 0.236" or less)

Chip Example (Slotting)



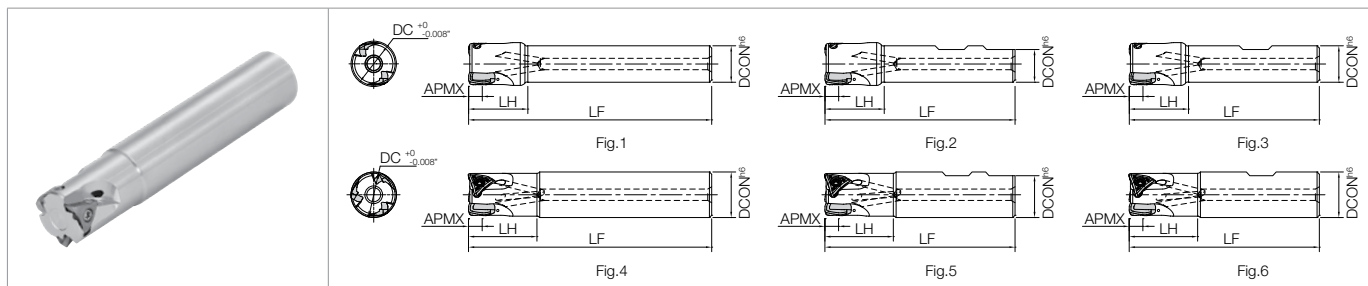
Cutting conditions : Vc = 490 sfm, D.O.C. = 0.236" (Slotting)
fz = 0.008 ipt, Ø0.750" (3 insert), Dry Workpiece : SS400



INSERT GRADES	A
TURNING INSERTS	B
GBN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

M-THREE (MEV)

MEV End Mill



Toolholder Dimensions

Shank		Part Number	Stock	Unit	No. of Inserts	Dimensions				APMX	Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM*
						DC	DCON	LF	LH		A.R. (Max)	R.R.				
Weldon	Standard Shank	MEV 0750-W625-06-2T	●	inch	2	0.750	0.625	3.056	1.150	0.236	+17°	-38°	Yes	Fig.3	0.1	32,000
		0750-W750-06-2T	●		2	0.750	0.750	3.229	1.150					Fig.6	0.2	32,000
		1000-W750-06-3T	●		3	1.000	0.750	3.231	1.200					Fig.3	0.2	25,000
		1000-W100-06-3T	●		3	1.000	1.000	3.737	1.400		+17°	-37°		Fig.5	0.3	25,000
		1250-W100-06-4T	●		4	1.250	1.000	3.731	1.450					Fig.2	0.4	20,000
		1250-W125-06-4T	●		4	1.250	1.250	3.987	1.650			-35°		Fig.5	0.5	20,000
Cylindrical	Long Shank	MEV 0750-S750-6-06-2T	●	inch	2	0.750	0.750	6.000	1.600	0.236	+17°	-38°	Yes	Fig.5	0.3	32,000
		1000-S100-7-06-2T	●		2	1.000	1.000	7.000	2.000					Fig.5	0.6	25,000
		1000-S100-7-06-3T	●		3	1.000	1.000	7.000	2.000			-37°		Fig.5	0.6	25,000
		1250-S125-8-06-4T	●		4	1.250	1.250	8.000	2.600			-35°		Fig.5	1.1	20,000
Cylindrical	Standard Shank	MEV 20-S16-06-2T	●	mm	2	20	16	110	26	6	+17°	-38°	Yes	Fig.1	0.2	32,000
		20-S20-06-2T	●		2	20	20	110	30					Fig.4	0.2	32,000
		20-S20-06-3T	●		3	20	20	110	30					Fig.4	0.2	32,000
		22-S20-06-3T	●		3	22	20	110	26					Fig.1	0.2	29,000
		25-S20-06-3T	●		3	25	20	120	29			-37°		Fig.1	0.3	25,000
		25-S25-06-2T	●		2	25	25	120	32					Fig.4	0.4	25,000
		25-S25-06-3T	●		3	25	25	120	32					Fig.4	0.4	25,000
		28-S25-06-3T	●		3	28	25	120	29					Fig.1	0.4	23,000
		30-S25-06-4T	●		4	30	25	130	32					Fig.1	0.5	21,500
		32-S25-06-4T	●		4	32	25	130	32					Fig.1	0.5	20,000
		32-S32-06-3T	●		3	32	32	130	40			-36°		Fig.4	0.7	20,000
		32-S32-06-4T	●		4	32	32	130	40					Fig.4	0.7	20,000
		40-S32-06-5T	●		5	40	32	150	50					Fig.1	1.0	16,000
		50-S32-06-5T	●		5	50	32	120	40			+16°		Fig.1	0.9	13,000
	Long Shank	MEV 20-S18-06-150-2T	●		2	20	18	150	30	6	+17°	-38°	Yes	Fig.1	0.3	32,000
		20-S20-06-150-2T	●		2	20	20	150	40					Fig.4	0.3	32,000
		25-S25-06-170-2T	●		2	25	25	170	50			-37°		Fig.4	0.6	25,000
		32-S32-06-200-2T	●		2	32	32	200	65			-36°		Fig.4	1.1	20,000
	Long Shank (Fine Pitch)	MEV 20-S18-06-150-3T	●		3	20	18	150	30	6	+17°	-38°	Yes	Fig.1	0.3	32,000
		20-S20-06-150-3T	●		3	20	20	150	40					Fig.4	0.3	32,000
		25-S25-06-170-3T	●		3	25	25	170	50			-37°		Fig.4	0.6	25,000
		32-S32-06-200-3T	●		3	32	32	200	65			-35°		Fig.4	1.1	20,000

Max. Revolution*

Set the number of revolutions per minute within the recommended cutting speed on P10

When running an end mill or a cutter at the maximum revolution, the insert or the cutter may be damaged by centrifugal force.

Coat anti-seize compound thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions M93

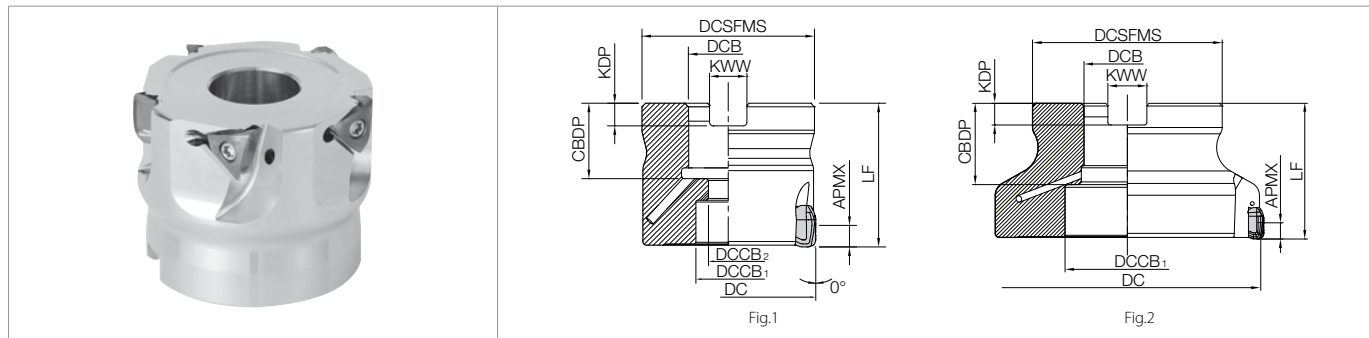
Spare Parts & Applicable Inserts (End Mills & Face Mills)

Part Number		Spare Parts				Applicable Inserts M20	
		Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt	General Purpose	Low Cutting Force
End Mills	MEV ...-06-...T				-		
Face Mills	MEV 1500R-06-5T	SB-3076TRP	DTPM-10	P-37	HH3/8-1.25	TOMT06...-GM	TOMT06...-SM
	2000R-06-6T						
	2500R-06-6T						
	MEV 032R-06-4T-M				HH8X25		
	040R-06-5T-M				HH10X30		
	050R-06-5T-M				HH10X30		
	063R-06-6T-M				HH12X35		
	080R-06-7T(-M)				-		
Modular Heads	100R-06-9T(-M)				-		
	MEV 20-M10-06-2T				-		
	20-M10-06-3T				-		
	25-M12-06-3T				-		
	32-M16-06-4T				-		

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread prior to installation
 (Customer Service) 800.823.7284 - Option 1
 (Technical Support) 800.823.7284 - Option 2
 Visit us online at KyoceraPrecisionTools.com

● : Standard Item △ : Phaseout Item (will be removed from next catalog)
 Contact your local Kyocera sales engineer to upgrade old products to new technology

MEV Face Mill



Toolholder Dimensions

Part Number			Stock	Unit	No. of Inserts	Dimensions										Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM*
						DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R. (Max)	R.R.				
Coarse Pitch	Inch Bore Dia.	MEV 1500R-06-5T	●	inch	5	1.500	1.457		0.669	0.433	1.575	0.750	0.187	0.312	0.236	+17°	-35°	Yes	Fig.1	0.2	16,000
		2000R-06-6T	●		6	2.000	1.811									+16°				0.4	12,500
		2500R-06-6T	●		6	2.500	1.969													0.6	10,000
	Metric Bore Dia.	MEV 080R-06-7T	●	mm	7	80	60	1.000*	20	13	50	1.063*	0.236*	0.375*	*6	+15°	-35°	Yes	Fig.1	1.1	7,900
		NEW 100R-06-9T	●		9	100	70	1.250*	46	-	63	1.339*	0.315*	0.500*		Fig.2			1.4	6,300	
		MEV 032R-06-4T-M	●	mm	4	32	30	16	13.5	9	35	19	5.6	8.4	*6	+17°	-35°	Yes	Fig.1	0.1	20,000
			040R-06-5T-M		●	5	40									38				15	40
		050R-06-5T-M	●		5	50	48	22	18	11	21	6.3	10.4	+16°		0.4				13,000	
		NEW 063R-06-6T-M	●	mm	6	63	48	22	18	11	40	21	6.3	10.4	+16°	0.6	10,000				
		NEW 080R-06-7T-M	●		7	80	60	27	20	13	50	24	7	12.4	+15°	1.1	7,900				
		NEW 100R-06-9T-M	●		9	100	70	32	46	-	50	30	8	14.4		Fig.2	1.4	6,300			

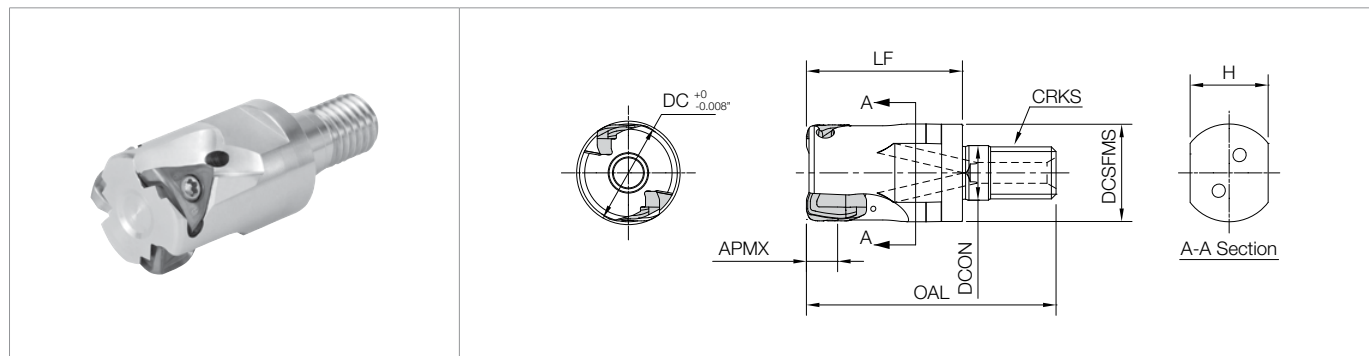
Max. Revolution*

When running the face mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.
Coat anti-seize compound thinly on portion of taper and thread prior to installation.

*For cutting depth when shouldering with cutter diameter DC = Ø2.500" (Ø63mm) or more (Width of cut $a_e \geq DC/4$) and slotting, refer to the recommended chipbreaker range on M93.

Recommended Cutting Conditions M94

MEV Modular End Mill



Toolholder Dimensions

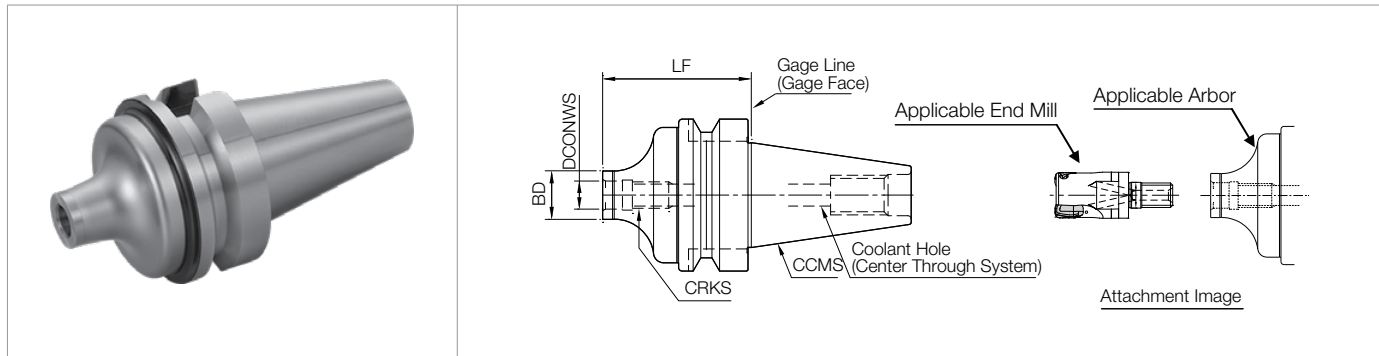
Part Number	Stock	No. of Inserts	Dimensions (mm)								Rake Angle (°)		Coolant Hole	Max RPM*
			DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R. (Max)	R.R.		
MEV 20-M10-06-2T	●	2	20	18.7	10.5	48	30	M10xP1.5	15			-38°		32,000
20-M10-06-3T	●	3	20	18.7	10.5	48	30	M10xP1.5	15		+17°	-38°	Yes	32,000
25-M12-06-3T	●	3	25	23	12.5	56	35	M12xP1.75	19			-37°		25,000
32-M16-06-4T	●	4	32	30	17	62	40	M16xP2.0	24			-36°		20,000

Max. Revolution*

Set the number of revolutions per minute within the recommended cutting speed on M94
When running an end mill or a cutter at the maximum revolution, the insert or the cutter may be damaged by centrifugal force.
Coat anti-seize compound thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions M94

BT Arbor for MEV Modular End Mills



Toolholder Dimensions

Part Number		Stock	Dimensions (mm)				Coolant Hole	Arbor (Double-face Clamping Spindle)	Applicable End Mills
			LF	BD	DCONWS	CRKS		CCMS	
BT30K-	M10-45	●	45	18.7	10.5	M10xP1.5	Yes	BT30	MEV20-M10-..
	M12-45	●	45	23	12.5	M12xP1.75			MEV25-M12-..
BT40K-	M10-60	□	60	18.7	10.5	M10xP1.5	Yes	BT40	MEV20-M10-..
	M12-55	□	55	23	12.5	M12xP1.75			MEV25-M12-..
	M16-65	□	65	30	17	M16xP2.0			MEV32-M16-..

Actual End Mill Depth

Arbor Part Number	Applicable End Mill			Actual End Mill Depth (mm)
	Part Number	Cutting Dia.	Dimensions	
		DC (mm)	LF (mm)	
BT30K- M10-45	MEV20-M10..	20	30	36.8
	MEV25-M12..	25	35	42.8
BT40K- M10-60	MEV20-M10..	20	30	38.7
	MEV25-M12..	25	35	44.6
	MEV32-M16..	32	40	51.2

Case Studies

Parts for machinery: 420

Vc = 590 sfm
D.O.C. x ae = 0.040" x ~1.97"
fz = 0.004 ipt Dry
MEV50-S32-06-5T (5 Flutes)
TOMT060508ER-GM PR1535

Cutting time

MEV

$v_f=22.50$ ipm

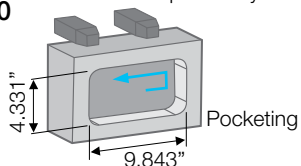
Competitor E

$v_f=13.75$ ipm

Quiet machining even when cutting speed increased

The MEV shows 1.6 times machining efficiency and good bottom surface finish
(User Evaluation)

Not clamped firmly



Machining Efficiency

x1.6

Plate: SS400

Vc = 590 sfm
D.O.C. = 0.118"
fz = 0.005 ipt Dry
MEV22-S20-06-3T (Ø22 - 3 Flutes)
TOMT060508ER-GM PR1525

Number of parts produced

MEV

160 pcs/corner

Competitor F

65 pcs/corner

The MEV achieved 2.4 times longer tool life than competitor F.

Quieter machining with excellent surface finish

Tool life

x2.4



(User Evaluation)

● Applicable Inserts

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice (Hardness Under 45HRC)

P	Free-Cutting Steel	☆	★		
	Carbon/Alloy Steel	☆	★		
M	Austenitic Stainless Steel	★	☆		
	Martensitic Stainless Steel	☆			★
	Precipitation Hardened Stainless Steel	★			
K	Gray Cast Iron		☆	★	
	Nodular Cast Iron		☆	★	
N	Non-ferrous Metals				
S	Heat-Resistant Alloys	☆			★
	Titanium Alloy	★		☆	
H	Hard Materials		■		

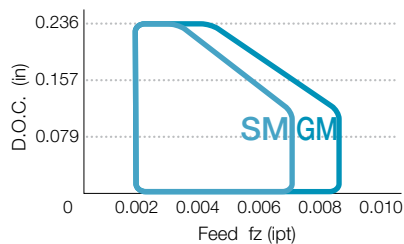
Insert (Right-hand Shown)	Part Number	Dimensions (in)					MEGACOAT NANO			CVD*
		IC	S	D1	BS	RE	PR1535	PR1525	PR1510	
 General Purpose	TOMT 060504ER-GM	0.283	0.224	0.134	0.075	1/64	●	●	●	●
	060508ER-GM				0.059	1/32	●	●	●	●
 Low Cutting Force	TOMT 060508ER-SM	0.283	0.224	0.134	0.059	1/32	●	●		●

● Recommended Chipbreaker Range

GM type for General Purpose : Edge Shape Optimized for Various Machining Applications
SM type with Low Cutting Force Design : Sharp Cutting and Large Rake Angle

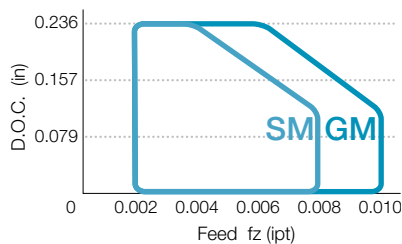
Cutter Dia. : Ø0.750"~Ø2.000" (Ø20mm~Ø50mm)

Shouldering



Cutting conditions : Vc = 490 sfm, ae = DC/2, Workpiece : 1049

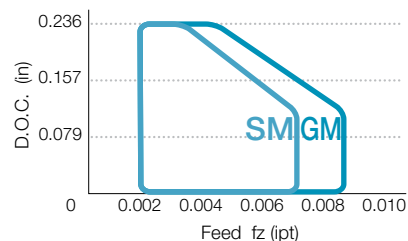
Slotting



Cutting conditions : Vc = 490 sfm, ae = DC, Workpiece : 1049

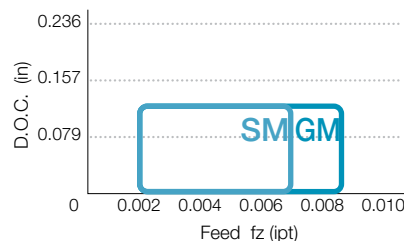
Cutter Dia. : Ø2.500"~Ø4.000" (Ø63mm~Ø100mm)

Shouldering (Width of cut ae ≤ DC/4)



Cutting Conditions : Vc = 490 sfm, ae = DC/4, Workpiece : 1049

Shouldering (Width of cut ae ≥ DC/4), Slotting



Cutting conditions : Vc = 490 sfm, ae = DC, Workpiece : 1049

◆ Recommended Cutting Conditions

★ : 1st Recommendation ☆ : 2nd Recommendation

Chipbreaker	Workpiece	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)			
			MEGACOAT NANO			CVD Coated Carbide
			PR1535	PR1525	PR1510	CA6535
GM	Carbon Steel	0.003- 0.006 -0.010	☆ 390- 590 -820	★ 390- 590 -820	-	-
	Alloy Steel	0.003- 0.006 -0.008	☆ 330- 520 -720	★ 330- 520 -720	-	-
	Mold Steel	0.003- 0.005 -0.008	☆ 260- 460 -590	★ 260- 460 -590	-	-
	Austenitic Stainless Steel	0.003- 0.005 -0.006	☆ 330- 520 -660	☆ 330- 520 -660	-	-
	Martensitic Stainless Steel	0.003- 0.005 -0.008	☆ 490- 660 -820	-	-	★ 590- 790 -980
	Precipitation Hardened Stainless Steel	0.003- 0.005 -0.008	★ 300- 390 -490	-	-	-
	Gray Cast Iron	0.003- 0.007 -0.010	-	☆ 390- 590 -820	★ 390- 590 -820	-
	Nodular Cast Iron	0.003- 0.006 -0.008	-	☆ 330- 490 -660	★ 330- 490 -660	-
	Ni-base Heat-Resistant Alloy	0.003- 0.005 -0.006	☆ 70- 100 -160	-	-	★ 70- 100 -160
	Titanium Alloy	0.003- 0.006 -0.008	☆ 130- 200 -260	-	☆ 100- 160 -230	-
SM	Carbon Steel	0.003- 0.006 -0.008	☆ 390- 590 -820	★ 390- 590 -820	-	-
	Alloy Steel	0.003- 0.005 -0.007	☆ 330- 520 -720	★ 330- 520 -720	-	-
	Mold Steel	0.003- 0.004 -0.006	☆ 260- 460 -590	★ 260- 460 -590	-	-
	Austenitic Stainless Steel	0.003- 0.004 -0.006	★ 330- 520 -660	☆ 330- 520 -660	-	-
	Martensitic Stainless Steel	0.003- 0.004 -0.006	☆ 490- 660 -820	-	-	★ 590- 790 -980
	Precipitation Hardened Stainless Steel	0.003- 0.004 -0.006	☆ 300- 390 -490	-	-	-
	Ni-base Heat-Resistant Alloy	0.003- 0.004 -0.005	☆ 70- 100 -160	-	-	★ 70- 100 -160
	Titanium Alloy	0.003- 0.005 -0.006	★ 130- 200 -260	-	-	-

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.

Set the cutting speed and feed rate for wet machining to 70% in the table above.

For high-speed machining, set the feed rate in the table above to 70% (When the cutting speed increases more than the center value of the recommended condition).

Cutting with coolant is recommended for Precipitation Hardening Stainless Steel, Ni-base Heat Resistant Alloy and Titanium Alloy.

Cutting with coolant is recommended for finishing.

Regularly changing the clamp screw is recommended. This is because the clamp screw may be damaged by long-term use or machining under high cutting conditions as shown in the table above.



Ramping Reference Data

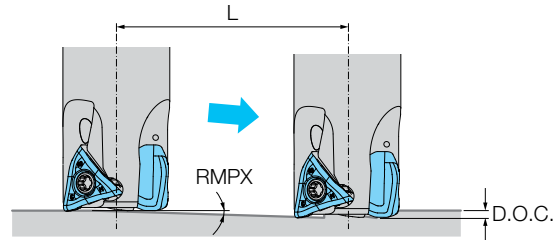
Part Number	Cutter Dia. DC (in)	0.750"	-	1.000"	-	-	1.250"	1.500"	2.000"	2.500" or larger
	Cutter Dia. DC (mm)	20mm	22mm	25mm	28mm	30mm	32mm	40mm	50mm	63mm or larger
MEV...-06-...	Max. Ramping Angle α max (°)	1.00	0.80	0.65	0.60	0.55	0.50	0.40	0.30	Not Recommended
	tan RMPX	0.017	0.014	0.011	0.010	0.010	0.009	0.007	0.005	

* Reduce ramping angle if chips are too long

Ramping Tips

- Ramping angle should not exceed maximum ramping angle RMPX in above conditions
- Reduce recommended feed rate by 70%

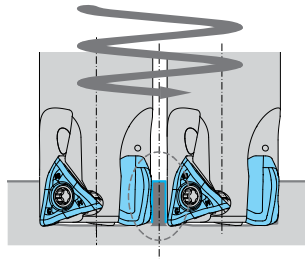
Formula for Max. Cutting max Length (L) at Max. Ramping Angle

$$L = \frac{D.O.C.}{\tan RMPX}$$


Helical Milling Tips

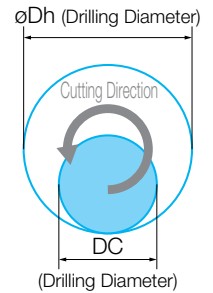
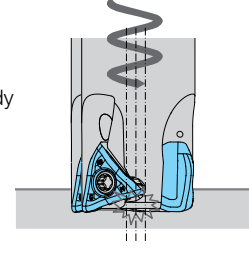
Exceeding Max. Machining Dia.

Center Core Remains After Machining



Under Min. Machining Dia.

Center Core Hits Holder Body

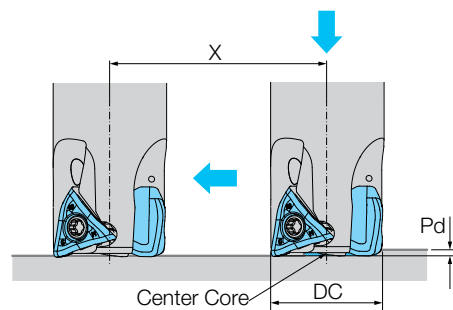


Unit: inch

Part Number	Min. Drilling Dia.	Max. Drilling Dia.
MEV...-06-...	$2 \times DC - 0.197"$	$2 \times DC - 0.079"$

For helical milling, stay within the recommended min. and max. drilling dia.
Keep machine depth (h) per rotation less than max. D.O.C. (APMX) in the cutter dimensions chart
Use caution to eliminate incidences caused by producing long chips
Cutter diameters Ø2.500" (Ø63mm) and above are not recommended for helical milling.

Drilling Tips



Unit: inch

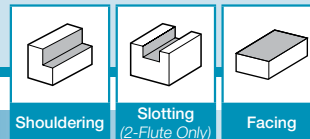
Part Number	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface
MEV...-06-...	0.010"	$DC - 0.118"$

Drilling Depth

Please refer to the figure on the left (Pd: Max. Drilling depth)

Traversing after Drilling

- It is recommended to reduce feed by 25% until the center core is removed
- Axial feed rate recommendation per revolution is $f = 0.004$ ipr or less



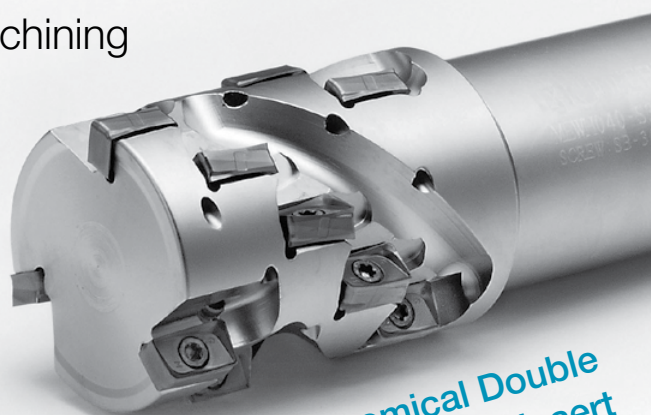
Shouldering

Slotting
(2-Flute Only)

Facing

MEWH Helical End Mill

Excellent Surface Finish and Stable Machining
due to Innovative Toolholder Design



Economical Double
Sided 4-edge Insert

Chip Evacuation

	Chipbreaker	Workpiece Material	fz = 0.006 ipt	fz = 0.008 ipt
Inserts				
45°~70° Lead Angle	GM	4137		
75° Lead Angle	GM	SS400		
90°/88° Lead Angle	GM			
High Feed Milling	SM			
Finish Milling				
Multi-Function				

Vc = 390 sfm
D.O.C. x ae = 0.787" x 0.591"
Dry

Chips are constantly evacuated in the opposite direction of the cutter feed without clogging

Surface Finish Comparison

	MEWH	Competitor A
Inserts		
45°~70° Lead Angle		
75° Lead Angle		
90°/88° Lead Angle		
High Feed Milling		
Finish Milling		
Multi-Function		

4137
Vc = 390 sfm
D.O.C. x ae = 1.772" x 0.197"
Dry

Better surface quality than competitor A.



Corner-R(RE) 0.4 ,1.0 ,1.2 ,1.6 and 2.0 Added to GM Chipbreaker Lineup



04 Marking
on Insert

LOMU100404ER-GM
LOMU150504ER-GM



08 Not
Marked

LOMU100408ER-GM
LOMU150508ER-GM



10 Marking
on Insert

LOMU150510ER-GM



12 Marking
on Insert

LOMU100412ER-GM
LOMU150512ER-GM



16 Marking
on Insert

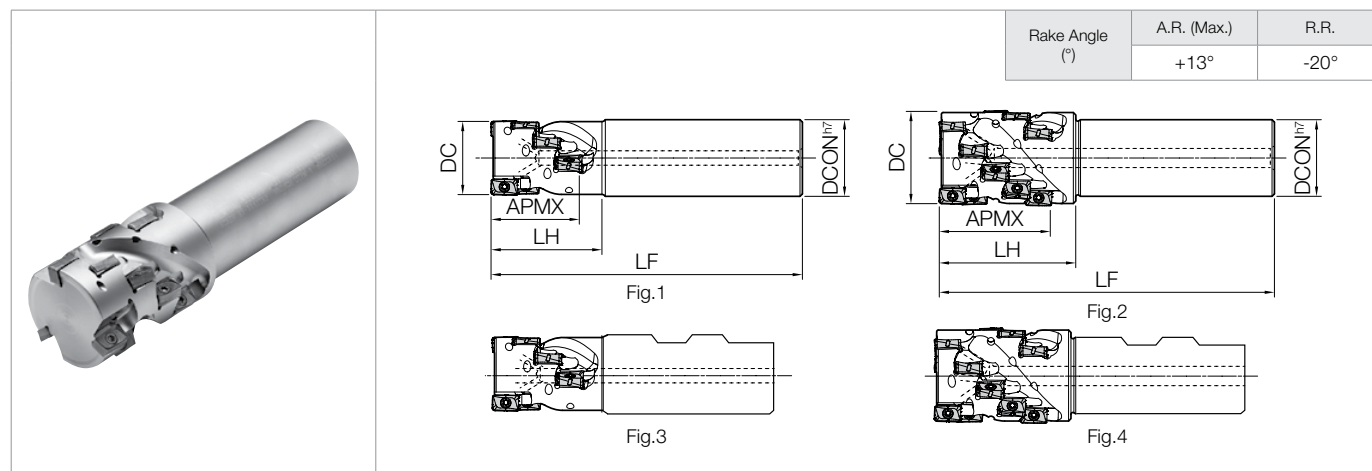
LOMU100416ER-GM
LOMU150516ER-GM






20 Marking
on Insert

LOMU100420ER-GM
LOMU150520ER-GM




MEWH Helical End Mill (Coolant Hole for Bottom Insert)



Toolholder Dimensions (Inch)

Shank	Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (in)					Coolant Hole	Drawing	Spare Parts			Applicable Inserts
						DC	DCON	LF	LH	APMX			Insert Screw	Wrench	Anti-seize Compound	
																
Weldon	MEWH 1000-W100-10-3-2T	●	2	3	6	1.000	1.000	3.806	1.523	1.102	Yes	Fig.3	SB-3065TRP	DTPM-8	P-37	LOMU1004..
	1250-W125-10-4-2T	●		4	8	1.250	1.250	4.161	1.878	1.456		Fig.4	Recommended Torque for Insert Screw 1.2N · m			
	1500-W125-10-5-3T	●	3	5	15	1.500		4.610	2.244	1.811				Fig.3		
	1500-W150-10-5-3T	●					1.500					4.957	2.267			
	MEWH 1500-W125-15-4-2T	●	2	4	8	1.500	1.250	4.846	2.480	2.086	Yes	Fig.4	SB-4090TRP	DTPM-15	P-37	LOMU1505..
	1500-W150-15-4-2T	□					5.193	2.504	1.500			5.252	2.480	Fig.3		
	2000-W150-15-4-3T	●	3	12	2.000	Fig.4										

Toolholder Dimensions (Metric)

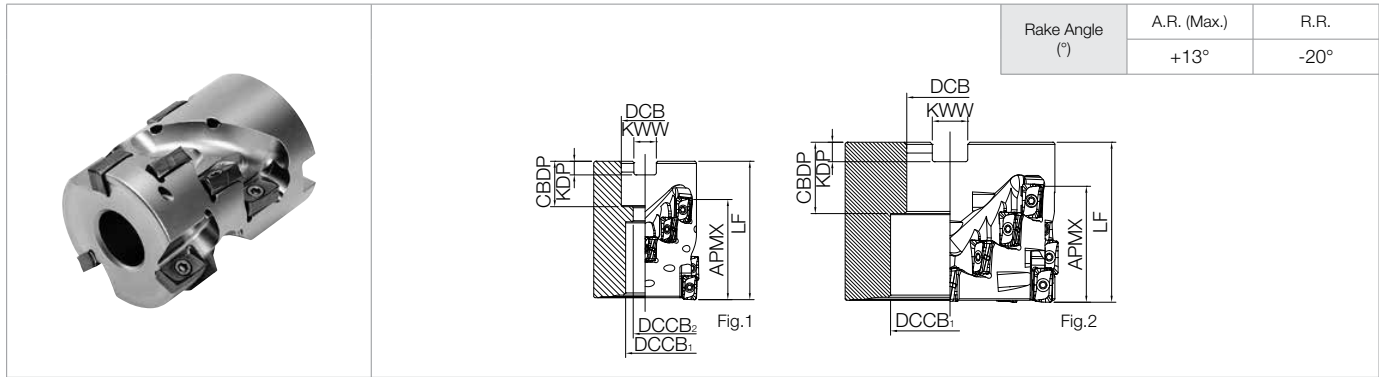
Shank	Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)					Coolant Hole	Drawing	Spare Parts			Applicable Inserts
						DC	DCON	LF	LH	APMX			Insert Screw	Wrench	Anti-seize Compound	
																
Cylindrical	MEWH 025-S25-10-3-2T	●	2	3	6	25	25	120	37	28	Yes	Fig.1	SB-3065TRP	DTPM-8	P-37	LOMU1004..
	032-S32-10-4-2T	●		4	8	32		130	46	37			Fig.2	Recommended Torque for Insert Screw 1.2N · m		
	040-S32-10-5-2T	●	3	5	10	40	32	140	57	46						
	040-S32-10-5-3T	●			15											
	MEWH 040-S32-15-4-2T	●	2	4	8	40	32	160	63	53	Yes	Fig.2	SB-4090TRP	DTPM-15	P-37	LOMU1505..
	050-S42-15-4-2T	●				50	42									
	050-S42-15-4-3T	●	3	12									Recommended Torque for Insert Screw 3.5N · m			

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed












Recommended Cutting Conditions ➔ M99

Aluminum machining is not recommended (AM chipbreaker is not available for MEWH)






MEWH Shell Mill (without Coolant Hole)



Toolholder Dimensions (Inch)

Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (in)									Drawing	Spare Parts				Applicable Inserts 
					DC	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX		Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt	
																			
MEWH 1500R-10-4-3T		3	4	12	1.50	0.75	0.669	0.433	2.087	0.750	0.187	0.312	1.456	Fig.1	SB-3065TRP	DTPM-8	P-37	HH3/8-1.25	LOMU1004..
2000R-10-5-3T			5	15	2.00				2.520				1.811		Recommended Torque for Insert Screw 1.2N · m				
MEWH 2000R-15-4-3T		3	4	12	2.00	0.75	0.669	0.433	2.756	0.750	0.187	0.312	2.086	Fig.1	SB-4090TRP	DTPM-15	P-37	HH3/8-1.25	LOMU1505..
2500R-15-3-3T			3	9	2.50				2.283				1.614		Recommended Torque for Insert Screw 3.5N · m				
3000R-15-4-4T		4	16	3.00	1.00	0.866	0.551	2.756	1.063	0.236	0.381	2.086	Fig.2	Recommended Torque for Insert Screw 3.5N · m		HH1/2-1.25			
4000R-15-4-5T			20	4.00	1.50			2.047	-			2.913		1.142	0.393	0.625		2.086	

Toolholder Dimensions (Metric)

Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)								Drawing	Spare Parts				Applicable Inserts  M16	
					DC	DCB	DCCB	DCCB ₂	LF	CBDP	KDP	KWW		APMX	Insert Screw 	Wrench 	Anti-seize Compound 		Arbor Bolt 
MEWH 040R-10-4-3T-M	●	3	4	12	40	16	15	9	53	19	5.6	8.4	37	Fig.1	SB-3065TRP	DTPM-8	P-37	HH8X25	LOMU1004..
050R-10-5-3T-M	●		5	15	50	22	18	11	64	21	6.3	10.4	46		Recommended Torque for Insert Screw 1.2N · m			HH10X30	
MEWH 050R-15-4-3T-M	●	3	4	12	50	22	18	11	70	21	6.3	10.4	53	Fig.1	SB-4090TRP	DTPM-15	P-37	HH10X30	LOMU1505..
063R-15-3-3T-M	●		3	9	63	27	20	13	58	24	7	12.4	41		Recommended Torque for Insert Screw 3.5N · m			HH12X35	
080R-15-4-4T-M	●	4	16	80	32	26	18	70	28	8	14.4	53	Fig.2	Recommended Torque for Insert Screw 3.5N · m				HH16X45	
100R-15-4-5T-M	●		5	20	100	40	55	-	74	33	9							16.4	

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Aluminum machining is not recommended (AM chipbreaker is not available for MEWH)

Applicable Inserts

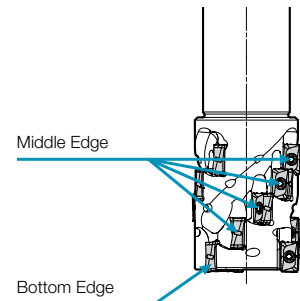
Part Number	Applicable Inserts ➔ M16		
	General Purpose	Low Cutting Force	Tough Edge (Heavy Milling)
MEWH ...-10-...	LOMU1004..ER-GM	LOMU100408ER-SM	LOMU100408ER-GH
MEWH ...-15-...	LOMU1505..ER-GM	LOMU150508ER-SM	LOMU150508ER-GH

Applicable Insert Guide for MEWH

Recommended Cutting Conditions ➔ M99

Insert Location	Toolholder Part Number									
	MEWH...-10-...					MEWH...-15-...				
	Corner-R (RE) (mm)					Corner-R (RE) (mm)				
Bottom Edges	0.4	0.8	1.2	1.6	2.0	0.4	0.8	1.0	1.2	1.6
*Middle Edges	0.4 / 0.8	0.4 / 0.8	0.4 / 0.8	0.4	0.4	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6

*For Middle Edges, it is not recommended to use the insert with larger corner-R(RE) than shown in the table, because it will make finished surface uneven.



◆ Recommended Cutting Conditions

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grade Vc (sfm)					
		Toolholder Part Number		MEGACOAT NANO			CVD Carbide	DLC Carbide	Carbide
		Helical End Mill	Shell Mill	PR1535	PR1525	PR1510	CA6535	PDL025	GW25
GM	Carbon Steel	0.002- 0.004 -0.008		☆ 390- 590 -820	★ 390- 590 -820	-	-	-	-
	Alloy Steel	0.002- 0.004 -0.006		☆ 330- 520 -720	★ 330- 520 -720	-	-	-	-
	Mold Steel	0.002- 0.003 -0.005		☆ 260- 460 -590	★ 260- 460 -590	-	-	-	-
	Austenitic Stainless Steel	0.002- 0.003 -0.005		☆ 330- 520 -660	☆ 330- 520 -660	-	-	-	-
	Martensitic Stainless Steel	0.002- 0.003 -0.004		☆ 490- 660 -820	-	-	★ 590- 790 -980	-	-
	Precipitation Hardened Stainless Steel	0.002- 0.003 -0.004		★ 300- 390 -490	-	-	-	-	-
	Gray Cast Iron	0.002- 0.004 -0.007		-	-	★ 390- 590 -820	-	-	-
	Nodular Cast Iron	0.002- 0.003 -0.005		-	-	★ 330- 490 -660	-	-	-
	Ni-base Heat Resistant Alloy	0.002- 0.003 -0.004		☆ 70- 100 -160	-	-	★ 70- 100 -160	-	-
	Titanium Alloys	0.002- 0.003 -0.005		☆ 130- 200 -260	-	☆ 100- 160 -230	-	-	-
SM	Carbon Steel	0.002- 0.004 -0.007		☆ 390- 590 -820	★ 390- 590 -820	-	-	-	-
	Alloy Steel	0.002- 0.003 -0.005		☆ 330- 520 -720	★ 330- 520 -720	-	-	-	-
	Mold Steel	0.002- 0.003 -0.005		☆ 260- 460 -590	★ 260- 460 -590	-	-	-	-
	Austenitic Stainless Steel	0.002- 0.003 -0.005		★ 330- 520 -660	☆ 330- 520 -660	-	-	-	-
	Martensitic Stainless Steel	0.002- 0.003 -0.004		☆ 490- 660 -820	-	-	★ 590- 790 -980	-	-
	Precipitation Hardened Stainless Steel	0.002- 0.003 -0.004		☆ 300- 390 -490	-	-	-	-	-
	Ni-base Heat Resistant Alloy	0.002- 0.003 -0.004		☆ 70- 100 -160	-	-	★ 70- 100 -160	-	-
	Titanium Alloys	0.002- 0.003 -0.005		★ 130- 200 -260	-	☆ 100- 160 -230	-	-	-
GH	Carbon Steel	0.002- 0.004 -0.008		☆ 390- 590 -820	★ 390- 590 -820	-	-	-	-
	Alloy Steel	0.002- 0.004 -0.006		☆ 330- 520 -720	★ 330- 520 -720	-	-	-	-
	Mold Steel	0.002- 0.003 -0.005		☆ 260- 460 -590	★ 260- 460 -590	-	-	-	-
	Austenitic Stainless Steel	0.002- 0.003 -0.005		☆ 330- 520 -660	☆ 330- 520 -660	-	-	-	-
	Martensitic Stainless Steel	0.002- 0.003 -0.004		☆ 490- 660 -820	-	-	☆ 590- 790 -980	-	-
	Precipitation Hardened Stainless Steel	0.002- 0.003 -0.004		☆ 300- 390 -490	-	-	-	-	-
	Gray Cast Iron	0.002- 0.004 -0.008		-	-	☆ 390- 590 -820	-	-	-
	Nodular Cast Iron	0.002- 0.003 -0.006		-	-	☆ 330- 490 -660	-	-	-
	Ni-base Heat Resistant Alloy	0.002- 0.003 -0.004		☆ 70- 100 -160	-	-	☆ 70- 100 -160	-	-
	Titanium Alloys	0.002- 0.003 -0.005		☆ 130- 200 -260	-	☆ 100- 160 -230	-	-	-

※ Bold numbers in the graph indicate the most recommended value of feed (fz) Adjust cutting speed and feed rate according to the actual machining conditions

※ Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys

★ : 1st Recommendation

☆ : 2nd Recommendation

MEWH Cutting Performance

● LOMU1004 Type

Cutting Dia.	Part Number	2 Flute D.O.C. x ae	Part Number	3 Flute D.O.C. x ae
Ø1.000" Ø25mm	MEWH1000 -W100-10-3-2T MEWH025 -S25-10-3-2T		-	-
Ø1.250" Ø32mm	MEWH1250 -W125-10-4-2T MEWH032 -S32-10-4-2T		-	-
Ø1.500" Ø40mm	MEWH1500 -W125-10-5-2T MEWH040 -S32-10-5-2T		MEWH1500 -W150-10-5-3T MEWH040 -S32-10-5-3T	

● LOMU1505 Type

Cutting Dia.	Part Number	2 Flute D.O.C. x ae	Part Number	3 Flute D.O.C. x ae
Ø1.500" Ø40mm	MEWH1500 -W125-15-4-2T MEWH040 -S32-15-4-2T		-	-
Ø2.000" Ø50mm	MEWH2000 -W150-15-4-2T MEWH050 -S42-15-4-2T		MEWH2000 -W150-15-4-3T MEWH050 -S42-15-4-3T	

Vc = 400 sfm

fz = 0.003-0.005 ipt

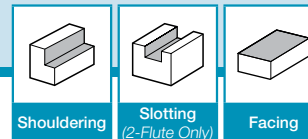
GM Chipbreaker

Workpiece: 4137

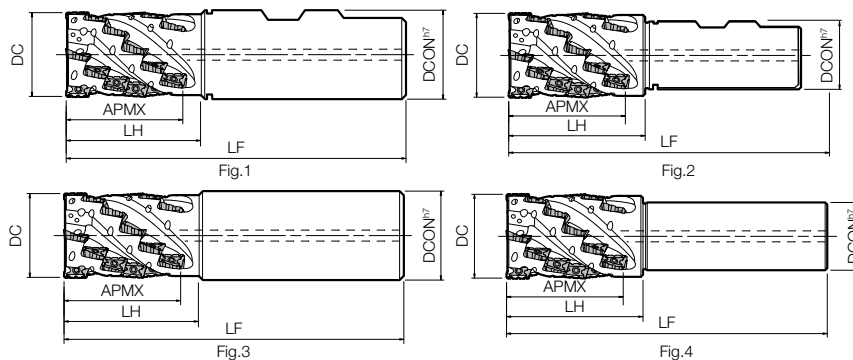
Overhang Length: End mill overhang length is "LH" of the dimension list

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MECH Helical End Mill (Coolant Hole for Bottom Insert)



Toolholder Dimensions (Inch)

Shank	Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (in)					Rake Angle (°)		Drawing	Coolant Hole	Spare Parts			Applicable Inserts M23
						DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			Insert Screw	Wrench	Anti-seize Compound	
Weldon	MECH 1000-W100-11-4-2T	●	2	4	8	1.00	1.00	4.17	1.81	1.46	+21°	-10°	Fig.1	No	SB-2555TRG	DTM-8	P-37	BDMT11T308ER-N2 BDMT11T308ER-N3
	1250-W125-11-5-2T	●		5	10	1.25	1.25	4.52	2.17	1.81		-9°						
	1250-W125-11-5-4T	●	4	6	24	1.50		4.90	2.52	2.16	+23°	-8°	Fig.2					
	1500-W125-11-6-4T	●		6	24	1.50		5.28	2.52	2.16	+23°	-8°	Fig.1					
	1500-W150-11-6-4T	●		6	24	1.50		5.28	2.52	2.16	+23°	-8°	Fig.1					
	2000-W150-11-7-4T	●		6	24	1.50		5.28	2.52	2.16	+23°	-8°	Fig.1					
	2000-W1500-11-7-6T	●	6	7	28	2.00	1.50	5.73	2.95	2.52		-7°	Fig.2					
	2000-W1500-11-7-6T	●		7	42	2.00	1.50	5.73	2.95	2.52		-7°	Fig.2					
	MECH 1500-W125-17-4-2T	●	2	4	8	1.50	1.25	5.26	2.87	2.32	+19°	-7°	Fig.2	No	SB-4070TRN	DTM-15	P-37	BDMT170408ER-N3 BDMT170408ER-N4
	1500-W150-17-4-2T	●		4	8	1.50	1.25	5.64	2.87	2.32	+19°	-7°	Fig.1					
	2000-W1500-17-5-4T	●	4	5	20	2.00	1.50	6.26	3.46	2.91			Fig.2					

Toolholder Dimensions (Metric)

Shank	Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Drawing	Coolant Hole	Spare Parts			Applicable Inserts M23
						DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.			Insert Screw	Wrench	Anti-seize Compound	
Cylindrical	MECH 025-S25-11-4-2T	●	2	4	8	25	25	120	46	37	+21°	-10°	Fig.3	Yes	SB-2555TRG	DTM-8	P-37	BDMT11T308ER-N2 BDMT11T308ER-N3
	032-S32-11-5-2T	●		5	10	32	32	140	55	46		-9°						
	032-S32-11-5-4T	●	4	6	24	40		150	64	55	+23°	-8°	Fig.4					
	040-S32-11-6-4T	●		6	24	40		160	64	55	+23°	-8°	Fig.3					
	040-S42-11-6-4T	●		6	24	40		160	64	55	+23°	-8°	Fig.3					
	050-S42-11-7-4T	●		6	24	40		160	64	55	+23°	-8°	Fig.3					
	050-S42-11-7-6T	●	6	7	28	50	42	172	75	64		-7°	Fig.4					
	050-S42-11-7-6T	●		7	42	50	42	172	75	64		-7°	Fig.4					
	MECH 040-S32-17-4-2T	●	2	4	8	40	32	160	73	59	+19°	-7°	Fig.4	Yes	SB-4070TRN	DTM-15	P-37	BDMT170408ER-N3 BDMT170408ER-N4
	040-S42-17-4-2T	●		4	8	40	32	170	73	59	+19°	-7°	Fig.3					
	050-S42-17-5-4T	●	4	5	20	50	42	185	88	74		-6°	Fig.4					

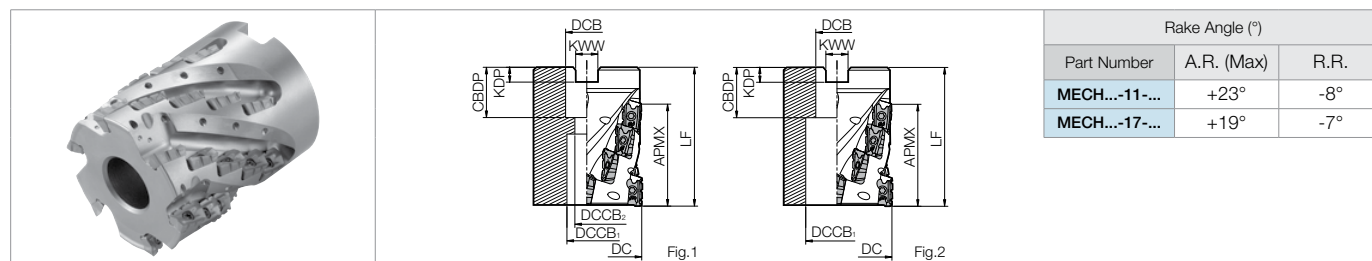
Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Applicable Inserts






Applicable Inserts M23				
Part Number	2-Notch	3-Notch	3-Notch	4-Notch
MECH...-11-...	BDMT 11T308ER-N2	BDMT 11T308ER-N3	-	-
MECH...-17-...	-	-	BDMT 170408ER-N3	BDMT 170408ER-N4

Recommended Cutting Conditions M105

MECH Shell Mill (without Coolant Hole)

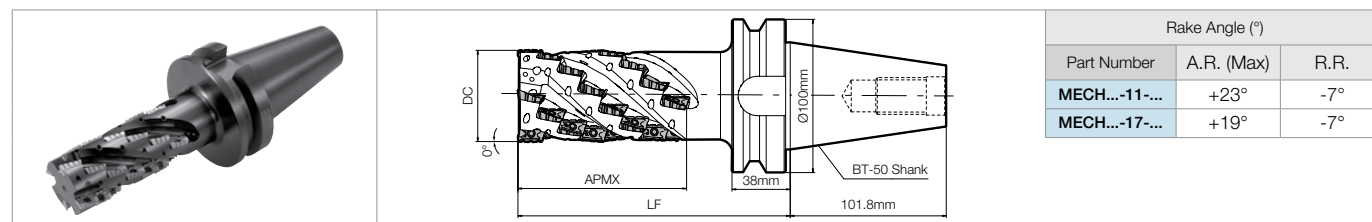


Toolholder Dimensions

Part Number	Stock	Unit	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (in)										Drawing	Spare Parts				Applicable Inserts  M23	
						DC	DCB	DCCB	DCCB ₂	LF	CBDP	KDP	KWW	APMX	Insert Screw		Wrench	Anti-seize Compound	Arbor Bolt			
																						
MECH 2000R-11-5-6T	●	inch	6	5	30	2.00	0.75	0.63	0.417	2.480	0.750	0.197	0.313	1.811	Fig.1	SB-2555TRG	DTM-8	P-37	HH3/8-1.5	BDMT11T308ER-N2 BDMT11T308ER-N3		
2000R-17-2-4T	●		4	2	8					2.047				1.181		SB-4070TRN	DTM-15		HH3/8-1.25	BDMT170408ER-N3 BDMT170408ER-N4		
2000R-17-4-4T	●		4	4	16					3.070				2.322								
MECH 040R-11-4-4T-M	●	mm	4	4	16	40	16	15	9	50	19	5.6	8.4	37	Fig.1	SB-2555TRG	DTM-8	P-37	HH8X25 HH10X30	BDMT11T308ER-N2 BDMT11T308ER-N3 BDMT170408ER-N3 BDMT170408ER-N4		
050R-11-5-6T-M	●		6	5	30	50	22	18	11	63	21	6.3	10.4	46		Fig.1	SB-4070TRN		DTM-15		P-37	HH10X30 HH10X40 HH12X35 HH16X45 -
MECH 050R-17-2-4T-M	●		4	2	8	50	22	18	11	52	21	6.3	10.4	30								
050R-17-4-4T-M	●		4	4	16	50	22	18	11	78	21	6.3	10.4	59								
063R-17-3-4T-M	●		4	3	12	63	27	20	14	70	24	7	12.4	45	Fig.2	SB-4070TRN	DTM-15	P-37	HH16X45 -			
080R-17-4-6T-M	●		6	4	24	80	32	26	18	85	28	8	14.4	59								
100R-17-4-6T-M	●		6	4	24	100	40	56	-	85	30	9	16.4	59								
MECH 063R-17-3-4T	●		mm	4	3	12	63	25.4	20	14	70	26	6	9.5	45	Fig.1	SB-4070TRN	DTM-15	P-37		HH12X35	
080R-17-4-6T	●	6		4	24	80	31.75	26	18	85	32	8	12.7	59	HH16X45							
100R-17-4-6T	●	6		4	24	100	38.1	56	-	85	38	10	15.9	59	-							

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

MECH-BT50 Integral Arbor (without Coolant Hole)



Toolholder Dimensions

Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)			Weight (kg)	Spare Parts			Applicable Inserts M23
					DC	LF	APMX		Insert Screw	Wrench	Anti-seize Compound	
MECH 050R11-8-4T-BT50	●	4	8	32	50	143	73	4.8	SB-2555TRG	DTM-8	P-37	BDMT11T308ER-N2 BDMT11T308ER-N3
MECH 050R17-7-4T-BT50	●	4	7	28	50	173	104	4.9	SB-4070TRN	DTM-15	P-37	BDMT170408ER-N3 BDMT170408ER-N4
063R17-7-4T-BT50	●				63			5.9				
080R17-7-4T-BT50	●				80			7.8				
100R17-7-6T-BT50	●	6		42	100			10.2				

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

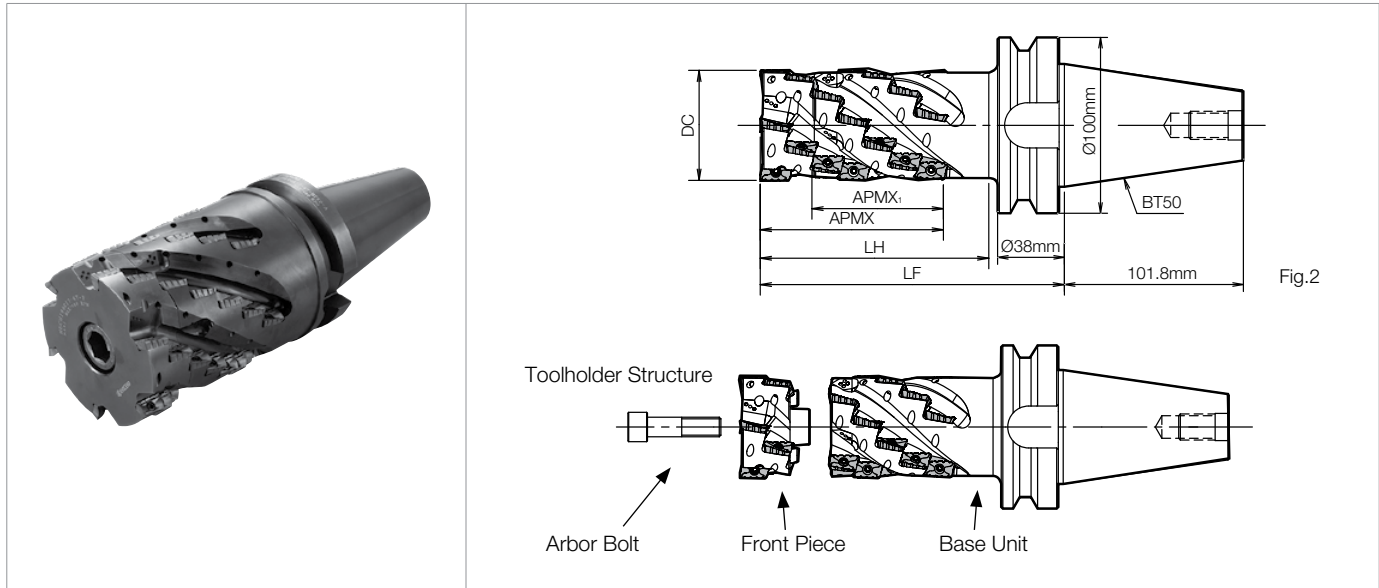
Applicable Inserts

Part Number	Applicable Inserts M23			
	2-Notch	3-Notch	3-Notch	4-Notch
MECH...-11-...	BDMT 11T308ER-N2	BDMT 11T308ER-N3	-	-
MECH...-17-...	-	-	BDMT 170408ER-N3	BDMT 170408ER-N4

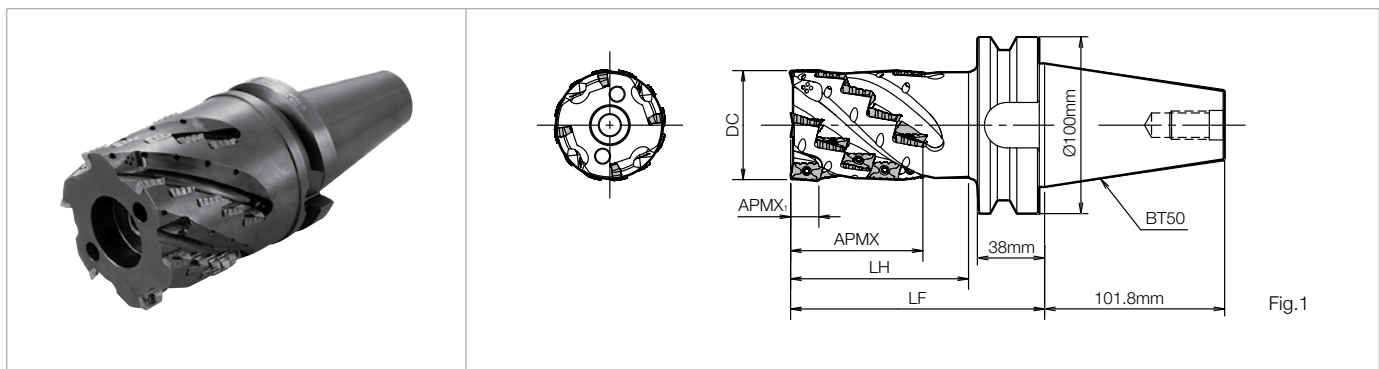
Recommended Cutting Conditions M105

MECH-BT50SA Integral Arbor Set (without Coolant Hole)

Base Unit / 1 Front Piece / Arbor Bolt



MECH-BT50-A Base Unit (without Coolant Hole)



Toolholder Dimensions

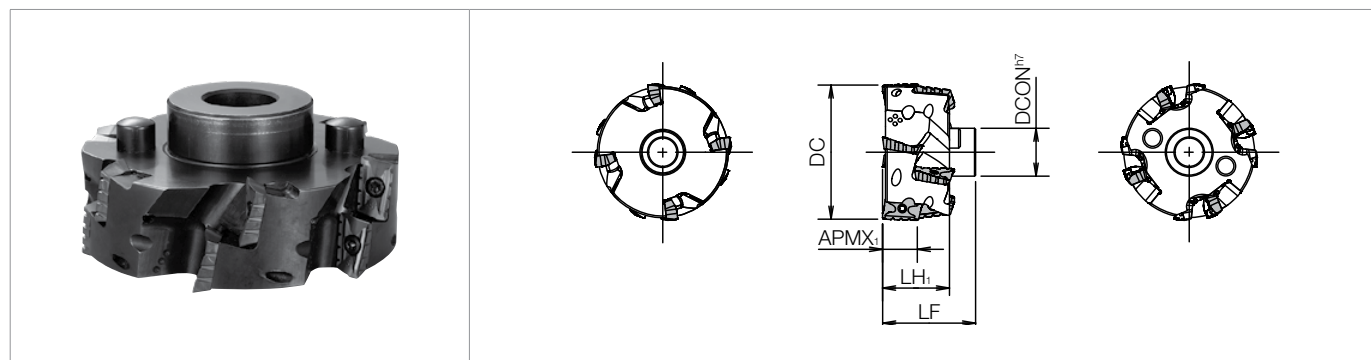
Part Number			Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Drawing	Weight (kg)
							DC	LF	LH	APMX	APMX ₁	A.R.	R.R.		
Integral Arbor (Set)	MECH	050R11-4T-BT50SA	☐	4	8	32	50	143	99	73	55	+23°	-7°	Fig.1	4.8
		063R17-4T-BT50SA	☐		7	28	63	173	130	104	75	+19°	-7°		5.8
		080R17-4T-BT50SA	☐				80								7.6
		100R17-6T-BT50SA	☐	6	7	42	100								9.8
Base Unit	MECH	050R11-4T-BT50-A	☐	4	6	24	50	125	81	55	10	+23°	-7°	Fig.2	4.6
		063R17-4T-BT50-A	☐		5	20	63	143	100	75	16	+19°	-7°		5.4
		080R17-4T-BT50-A	●				80								6.8
		100R17-6T-BT50-A	☐	6	5	30	100								8.5

Recommended Cutting Conditions ● M105

Toolholder Structure

End Mill (Above)		Base Unit (Above)		Front Piece (1pc) ● M103		Arbor Bolt
MECH 050R11-4T-BT50SA		MECH050R11-4T-BT50-A		MECH050R11-4T-F		HH12X35
063R17-4T-BT50SA	=	MECH063R17-4T-BT50-A	+	MECH063R17-4T-F	+	HH12X40
080R17-4T-BT50SA		MECH080R17-4T-BT50-A		MECH080R17-4T-F		HH16X40
100R17-6T-BT50SA		MECH100R17-6T-BT50-A		MECH100R17-6T-F		HH20X40

MECH-F Front Piece (without Coolant Hole)



Toolholder Dimensions


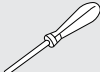


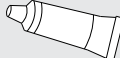
Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Weight (kg)
					DC	DCON	LF	LH ₁	APMX ₁	A.R.	R.R.	
MECH 050R11-4T-F	●	4	2	8	50	22	32	18	10	+23°	-7°	0.2
063R17-4T-F	●				63	22	44	30	16	+19°	-7°	0.4
080R17-4T-F	●				80	32						0.8
100R17-6T-F	●	6	2	12	100	45						1.3

Applicable Inserts

End Mill ● M102	Base Unit ● M102	Front Piece (1pc Above)	Applicable Inserts ● M23
MECH 050R11-4T-BT50SA	MECH050R11-4T-BT50-A	MECH050R11-4T-F	BDMT 11T308ER-N2 BDMT 11T308ER-N3
063R17-4T-BT50SA	MECH063R17-4T-BT50-A	MECH063R17-4T-F	BDMT 170408ER-N3 BDMT 170408ER-N4
080R17-4T-BT50SA	MECH080R17-4T-BT50-A	MECH080R17-4T-F	
100R17-6T-BT50SA	MECH100R17-6T-BT50-A	MECH100R17-6T-F	

Recommended Cutting Conditions ● **M105**

Toolholder Dimensions

Part Number			Spare Parts				
			Insert Screw	Wrench (for Insert Screw)	Arbor Bolt	Wrench (for Arbor Bolt)	Anti-seize Compound
							
Integral Arbor (Set)	MECH	050R11-4T-BT50SA	SB-2555TRG	DTM-8	HH12X35	LW-10	P-37
		063R17-4T-BT50SA	SB-4070TRN	DTM-15	HH12X40	LW-10	
		080R17-4T-BT50SA			HH16X40	LW-14	
		100R17-6T-BT50SA			HH20X40	LW-17	
Base Unit	MECH	050R11-4T-BT50-A	SB-2555TRG	DTM-8	HH12X35	LW-10	
		063R17-4T-BT50-A	SB-4070TRN	DTM-15	HH12X40	LW-10	
		080R17-4T-BT50-A			HH16X40	LW-14	
		100R17-6T-BT50-A			HH20X40	LW-17	
Front Piece	MECH	050R11-4T-F	SB-2555TRG	-	-	-	
		063R17-4T-F	SB-4070TRN	-	-	-	
		080R17-4T-F					
		100R17-6T-F					

● If you purchased the front piece only, the insert screw wrench, arbor bolt, and arbor bolt wrench are not included.

🔧 Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Enhanced Chip Evacuation

- Good Chip Evacuation

Notched Insert Breaks Chips into Small Pieces

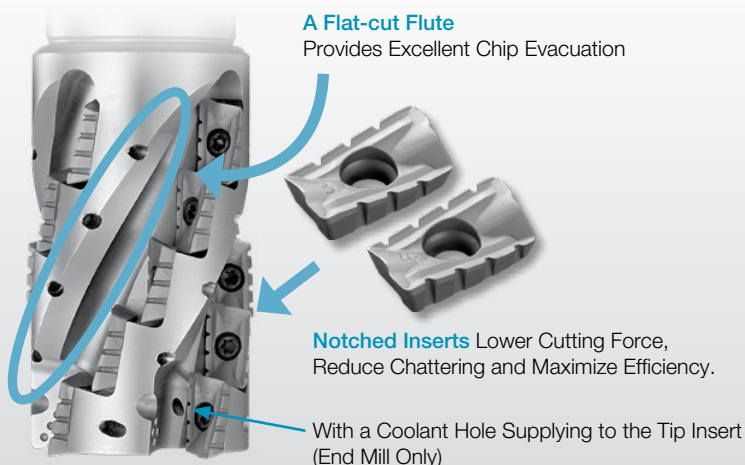


MECH



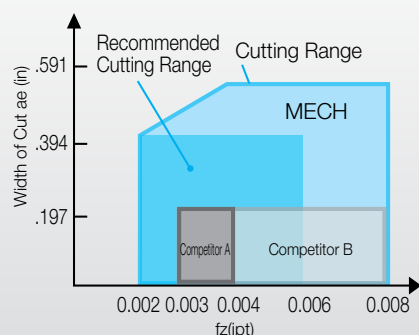
Competitor A

Workpiece Material: SS400
Vc = 400 sfm
D.O.C. x ae = 1.575" x 0.394"
fz = 0.005 ipt
MECH032-S32-11-5-4T



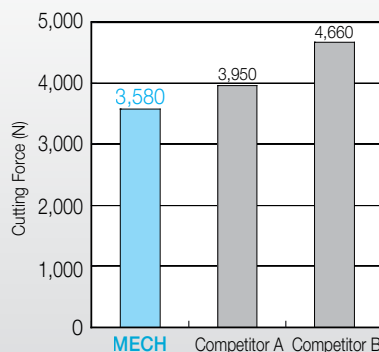
Low Cutting Force

- Low Cutting Force with Notched Inserts



Workpiece Material : 1049
Vc = 390 sfm
D.O.C. x ae = 1.575" x 0.197~0.512"
fz = 0.002~0.008 ipt
MECH032-S32-11-5-4T

Cutting Force (Principal Force)



Workpiece Material : 1049
Vc = 390 sfm
D.O.C. x ae = 1.575" x 0.394"
fz = 0.004 ipt
MECH032-S32-11-5-4T

(Internal Evaluation)

Number of Inserts to Install

MECH Helical End Mill

Part Number	No. of Flutes	No. of Inserts	No. of Inserts			
			BDMT11T308ER-		BDMT170408ER-	
MECH 1000-W1000-11-4-2T	2	8	4	4		
025-S25-11-4-2T						
1250-W1250-11-5-2T	10	10	5	5		
032-S32-11-5-2T						
1250-W1250-11-5-4T	20	20	10	10		
032-S32-11-5-4T						
1500-W1250-11-6-2T	4	24	12	12		
040-S32-11-6-4T						
1500-W1500-11-6-4T	4	24	12	12		
040-S42-11-6-4T						
2000-W1500-11-7-4T	28	28	14	14		
050-S42-11-7-4T						
2000-W1500-11-7-6T	6	42	21	21		
050-S42-11-7-6T						
MECH 1500-W125-17-4-2T	2	8			4	4
040-S32-17-4-2T						
1500-W150-17-4-2T	4	20			10	10
040-S42-17-4-2T						
2000-W1500-17-5-4T	4	20			10	10
050-S42-17-5-4T						

MECH Shell Mill

Part Number	No. of Flutes	No. of Inserts	No. of Inserts			
			BDMT11T308ER-		BDMT170408ER-	
MECH 040R-11-4-4T-M	4	16	8	8		
2000R-11-5-6T	6	30	15	15		
050R-11-5-6T-M						
MECH 2000R-17-2-4T	4	8			4	4
050R-17-2-4T-M						
2000R-17-4-4T	4	16			8	8
050R-17-4-4T-M						
063R-17-3-4T-M	12	12			6	6
080R-17-4-6T-M						
100R-17-4-6T-M	6	24			12	12
MECH 063R-17-3-4T		4	12		6	6
080R-17-4-6T	6	24			12	12
100R-17-4-6T						

■ Precautions when Installing Notched Inserts

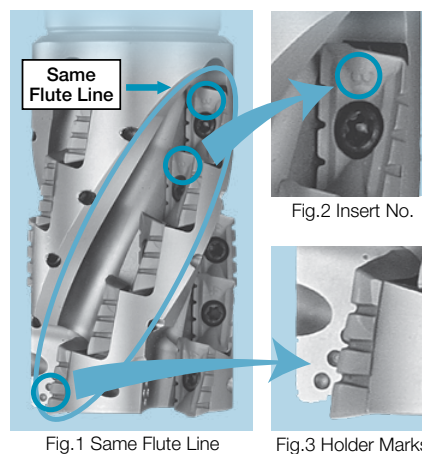
1. Install notched inserts by matching the insert with the number of marks on the holder body.

Insert Number and Holder Marks

Insert Size	11 Type		17 Type	
Insert No.	2	3	3	4
Marks				

* Using the cutter with the inserts installed incorrectly will damage the holder.

2. When installing notched inserts in flute line, ensure that the number on the insert is the same as the insert in first stage. (Ref. to Fig.1, 2 and 3.)



◆ Recommended Cutting Conditions (when Using a Notched Insert)

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade Vc (sfm)				
		MEGACOAT NANO	MEGACOAT			PVD Coated Carbide
		PR1535	PR1225	PR1230	PR1210	PR830
Carbon Steel	0.003~ 0.004 ~0.006	☆ 390~ 590 ~820	☆ 390~ 590 ~820	★ 390~ 590 ~720	-	☆ 330~ 460 ~590
Alloy Steel	0.003~ 0.004 ~0.006	☆ 330~ 520 ~720	☆ 330~ 520 ~720	★ 330~ 520 ~660	-	☆ 330~ 460 ~590
Mold Steel	0.003~ 0.004 ~0.006	☆ 260~ 460 ~590	☆ 260~ 460 ~590	★ 260~ 460 ~520	-	☆ 330~ 390 ~490
Gray Cast Iron	0.003~ 0.006 ~0.007	-	-	-	★ 390~ 590 ~820	-
Nodular Cast Iron	0.003~ 0.006 ~0.007	-	-	-	★ 330~ 490 ~720	-
Titanium Alloys	0.003~ 0.004 ~0.006	★ 130~ 200 ~260	-	-	☆ 100~ 160 ~230	-

※ Bold numbers in the graph indicate the most recommended value of feed (fz) Adjust cutting speed and feed rate according to the actual machining conditions

※ Machining with coolant is recommended for titanium alloys

• Recommended cutting conditions above are for notched inserts. If using an insert without a notch, the cutting depth (D.O.C.) and width (ae) should be 60% of that of notched inserts.

★ : 1st Recommendation
☆ : 2nd Recommendation

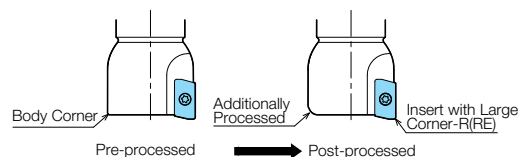
• JA Chipbreaker

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade Vc (sfm)
		Carbide
		GW25
Aluminum Alloy (Si ≤ 13%)	0.003~0.012	660~2620
Aluminum Alloy (Si > 13%)	0.003~0.008	660~980

■ When using inserts with corner-R (RE) 1.6mm or larger, additional modifications of the cutter body will be necessary. Ref. to the table below for the recommended modifications. (Additional grind off is not necessary when corner-R (RE) is 1.2mm or less.)

Insert Corner-R(RE)	Additional Processing Dimension to Body Corner
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5

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

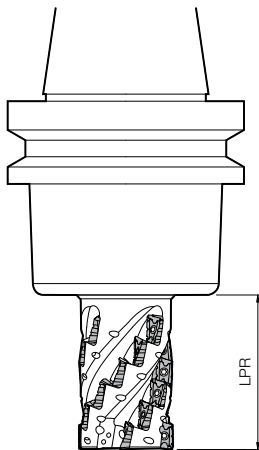


Cutting Performance (Used Machine: Machining Center Equivalent to AC15 / 18.5kW)

MECH Helical End Mill

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)
Ø1.000" Ø25mm	MECH1000-W1000-11-4-2T MECH025-S25-11-4-2T	1.89
Ø1.250" Ø32mm	MECH1250-W1250-11-5-2T MECH032-S32-11-5-2T MECH1250-W1250-11-5-4T MECH032-S32-11-5-4T	2.24
Ø1.500" Ø40mm	MECH1500-W1500-11-6-4T MECH040-S32-11-6-4T MECH1500-W1500-11-6-4T MECH040-S42-11-6-4T	2.56
Ø2.000" Ø50mm	MECH2000-W1500-11-7-4T MECH050-S42-11-7-4T MECH2000-W1500-11-7-6T MECH050-S42-11-7-6T	2.99
Ø1.500" Ø40mm	MECH1500-W1250-17-4-2T MECH040-S32-17-4-2T MECH1500-W1500-17-4-2T MECH040-S42-17-4-2T	2.91
Ø2.000" Ø50mm	MECH2000-W1500-17-5-4T MECH050-S42-17-5-4T	3.50

Shape



2 Flute Type

(Workpiece :1049)

Part Number	Shouldering	Slotting
	<p>Cutting Speed: Vc = 330~590 sfm Feed fz = 0.003~0.006 ipt</p>	<p>Cutting Speed: Vc = 330~390 sfm Feed fz = 0.003~0.005 ipt</p>
MECH1000-W1000-11-4-2T MECH025-S25-11-4-2T		
MECH1250-W1250-11-5-2T MECH032-S32-11-5-2T		
MECH1500-W1250-17-4-2T MECH1500-W1500-17-4-2T MECH040-S32-17-4-2T MECH040-S42-17-4-2T		

4 Flute / 6 Flute Type

MECH1250-W1250-11-5-4T MECH032-S32-11-5-4T	
MECH1500-W1250-11-6-4T MECH1500-W1500-11-6-4T MECH040-S32-11-6-4T MECH040-S42-11-6-4T	
MECH1200-W1500-11-7-4T MECH050-S42-11-7-4T	
MECH1200-W1500-11-7-6T MECH050-S42-11-7-6T	
MECH1200-W1500-17-5-4T MECH050-S42-17-5-4T	

*4 and 6 flute types are not recommended for slotting

Inserts

45°~70°
Lead Angle

75°
Lead Angle

90°/88°
Lead Angle

High Feed
Milling

Finish
Milling

Multi-
Function

Slot Mill

Ball-Nose
Radius

Other
Applications

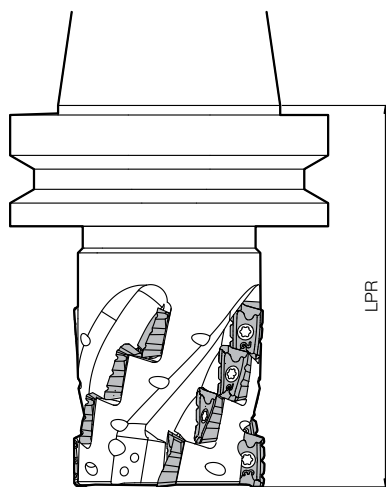
M

MILLING

● MECH Shell Mill

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)
Ø40mm	MECH040R-11-4-4T-M	4.92
Ø2.000" Ø50mm	MECH2000R-11-5-6T MECH050R-11-5-6T-M	4.84
	MECH2000R-17-2-4T MECH050R-17-2-4T-M	4.41
	MECH2000R-17-4-4T MECH050R-17-4-4T-M	5.43
Ø63mm	MECH063R-17-3-4T-M	4.53
Ø80mm	MECH080R-17-4-6T-M	5.12
Ø100mm	MECH100R-17-4-6T-M	5.12

Shape

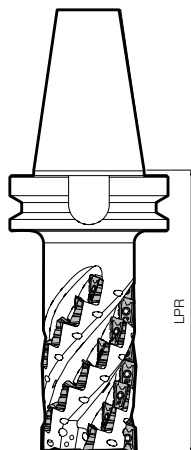


● MECH-BT50 Integral Arbor

● MECH-BT50SA Integral Arbor with Replaceable Front Piece

Cutting Dia.	Part Number Inch Size Metric Size	Overhang Length LPR (in)
Ø50mm	MECH050R11-8-4T-BT50 MECH050R11-4T-BT50SA	5.63
	MECH050R17-7-4T-BT50	6.81
Ø63mm	MECH063R17-7-4T-BT50 MECH063R17-4T-BT50SA	
Ø80mm	MECH080R17-7-4T-BT50 MECH080R17-4T-BT50SA	
Ø100mm	MECH100R17-7-6T-BT50 MECH100R17-6T-BT50SA	

Shape



(Workpiece :1049)

Part Number	Shouldering	
	Cutting Speed: $V_c = 330 \sim 590$ sfm Feed: $f_z = 0.003 \sim 0.006$ ipt	
MECH040R-11-4-4T-M		MECH063R-17-3-4T-M
MECH2000R-11-5-6T MECH050R-11-5-6T-M		MECH080R-17-4-6T-M
MECH2000R-17-2-4T MECH050R-17-2-4T-M		MECH100R-17-4-6T-M
MECH2000R-17-4-4T MECH050R-17-4-4T-M		

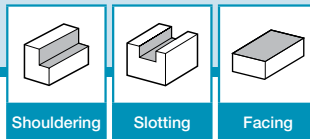
*Not recommended for slotting

(Workpiece :1049)

Part Number	Shouldering	
	Cutting Speed: $V_c = 330 \sim 590$ sfm Feed: $f_z = 0.003 \sim 0.006$ ipt	
MECH050R11-8-4T-BT50 MECH050R11-4T-BT50SA		MECH080R17-7-4T-BT50 MECH080R17-4T-BT50SA
MECH050R17-7-4T-BT50		MECH100R17-7-6T-BT50 MECH100R17-6T-BT50SA
MECH063R17-7-4T-BT50 MECH063R17-4T-BT50SA		

*Not recommended for slotting

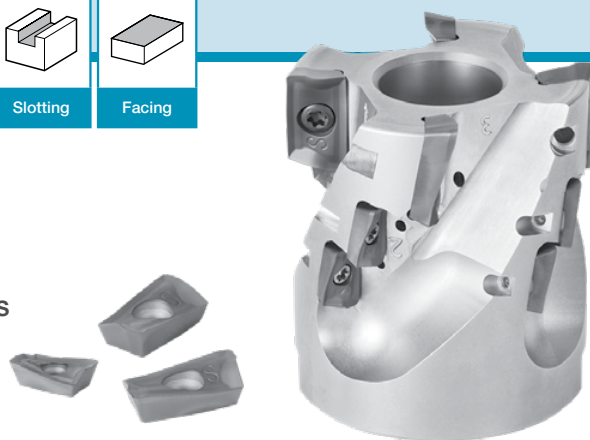
INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T



MECHT

Helical End Mill for Titanium Alloy Machining

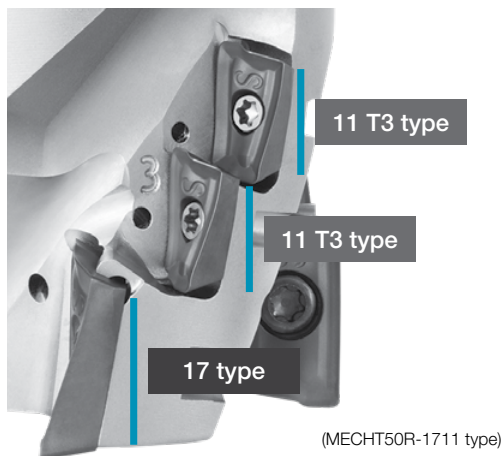
Insert Size Combination Improves Roughing Capabilities
Maintains Stable Machining and Long Tool Life



Developed to Reduce Chattering and Chip Recutting Issues

Unique Insert Combination

The larger bottom inserts are positioned to handle larger cutting forces (excluding $\phi 32$)
Stable machining with improved fracture resistance

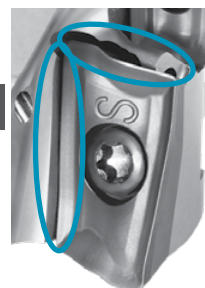


New Design for Higher Reliability

Bottom inserts are held in place by double-faced contacts

Holding Surface 1

Wide Holding Surface



Holding Surface 2

Additional Hold in the Axial Direction

Bore Dia.

Larger bore diameter improves fastening power and reduces chattering
 $\phi 50$ mm Cutter with a $\phi 27$ mm Bore (Conventional Bore : $\phi 22$ mm)

Toolholder Hardness Hardened 15% more than conventional holders

Toolholder Spec Custom ordering available
(Custom number of inserts and stages)

Excellent Chip Evacuation

New flute design

Large, smooth flutes prevent chip clogging

MECHT ($\phi 50$ -4T 3 Stages)

Conventional ($\phi 50$ -4T 4 Stages)

Large flute



Smooth design



All insert pockets have coolant holes

Optimized hole diameter controls flow amount and pressure

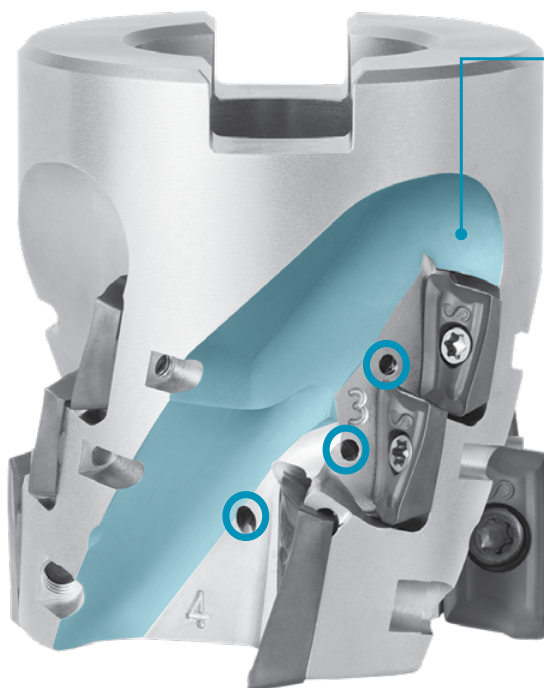
Smooth chip evacuation as well as superior cooling of the cutting edge



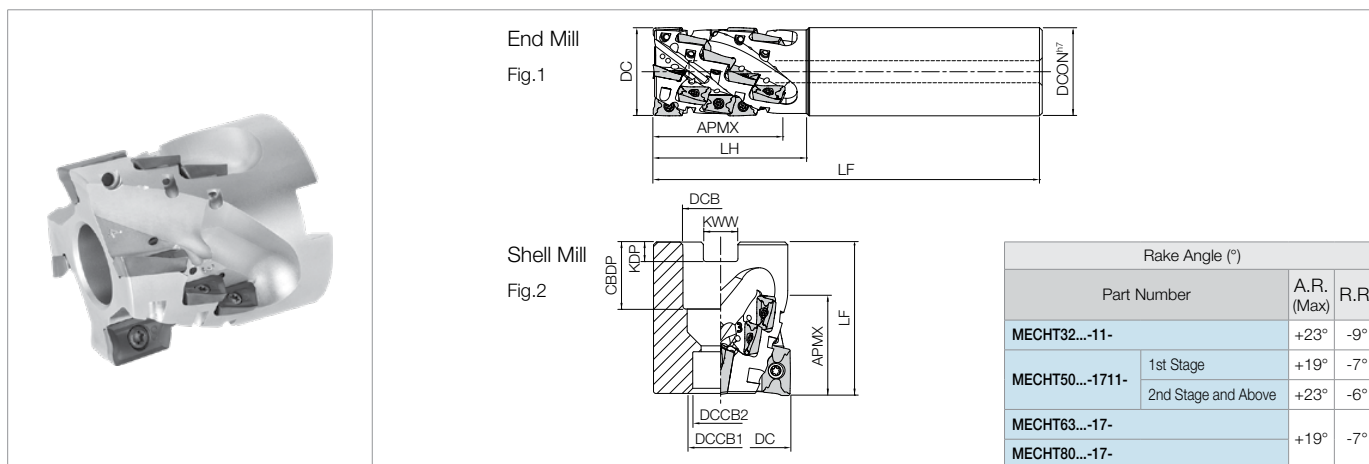
Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

M




MILLING










MECHT Helical Mill (with Coolant Holes)



Helical End Mill Dimensions (Metric)

Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)					Drawing	Spare Parts		Applicable Inserts  M22	
					DC	DCON	LF	LH	APMX		Insert Screw	Wrench	1st Stage	2nd Stage and Above
														
MECHT 32-S32-11-5-4T	●	4	5	20	32	32	140	55	46	Fig.1	SB-2555TRG	DTM-8	BDMT11T3...	*1 BDMT11T308...

Helical Shell Mill Dimensions (Metric)

Part Number	Stock	No. of Flutes	No. of Stages	No. of Inserts	Dimensions (mm)									Drawing	Spare Parts			Applicable Inserts  M22				
					DC	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX		Insert Screw	Wrench	Arbor Bolt	1st Stage	2nd Stage and Above			
																						
MECHT 50R-1711-3-4T-M	●	4	3	12	50	27	20	14	55	24	7	12.4	34	Fig.2				BDMT1704...	* ¹ BDMT11T308..			
50R-1711-4-5T-M	●	5	4	20					65				43						SB-4070TRN	DTM-15	HH12X50	
MECHT 63R-17-4-5T-M	●	5	4	20	63	27	20	14	80	24	7	12.4	60						SB-4070TRN	DTM-15	HH12X65	* ¹ BDMT170408..
80R-17-4-6T-M	●	6	4	24																	80	

*1. Use inserts with Corner R (RE) of 0.8mm or less for the 2nd and above stages

Machining with coolant is recommended (internal coolant pressure 218 psi or more)

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Applicable Inserts **M22**

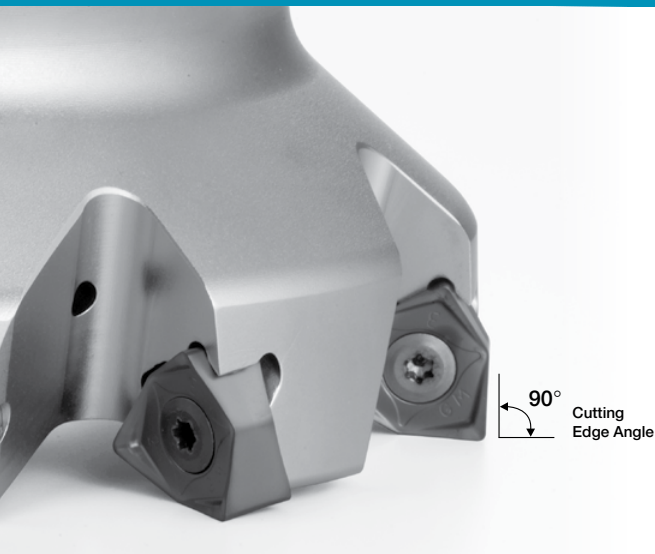
Insert	Part Number	Dimensions (mm)					Angle		MEGACOAT NANO
		W1	S	D1	L	RE	AS	AN	
 Low Cutting Force	BDMT 11T302ER-JS	6.7	3.8	2.8	11.0	0.2	18°	13°	●
	11T304ER-JS					0.4			●
	11T308ER-JS					0.8			●
	BDMT 170404ER-JS	9.6	4.9	4.4	17.0	0.4	18°	13°	●
	170408ER-JS					0.8			●

General JT chipbreaker and notched insert (only if holder has an even number of inserts) can also be used.

For more information, please contact your Kyocera sales representative.

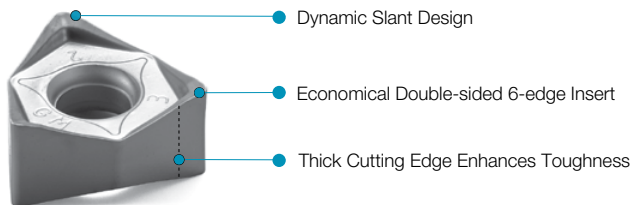
Recommended Cutting Conditions

Workpiece Material	Applications	Depth and Width of Cut (in)		Feed Rate fz (ipt)	Recommended Insert Grade Vc (sfm)
					MEGACOAT NANO
		D.O.C.	W.O.C.		PR1535
Titanium Alloy	Shouldering	~Length of Cut (APMX)	~0.5DC	0.004- 0.005 -0.006	100- 130 -200
	Slotting	~0.5DC	1DC	0.002- 0.003 -0.004	100- 130 -160



M-SIX (MFWN)

Low Cutting Forces for Reduced Chattering and Superior Fracture Resistance
Wide Application Range and Now Includes PDL025 DLC Coated Inserts for Aluminum

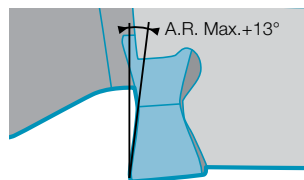


1 Sharp Cutting due to Lower Cutting Forces

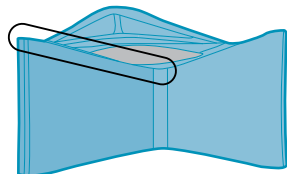
Low Cutting Force due to Steep Rake Angle

Dynamic Slant Design Reduces Initial Impact when Cutting Edge Enters the Workpiece

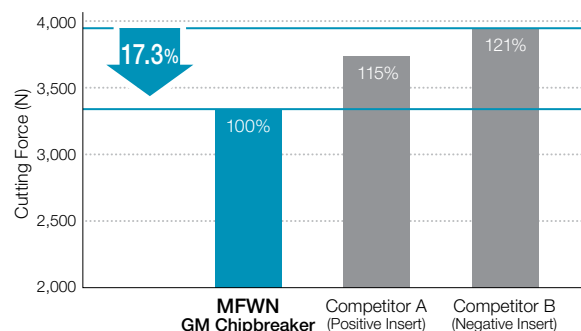
Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications



Dynamic Slant Design



Cutting Force Comparison (In-house Evaluation)



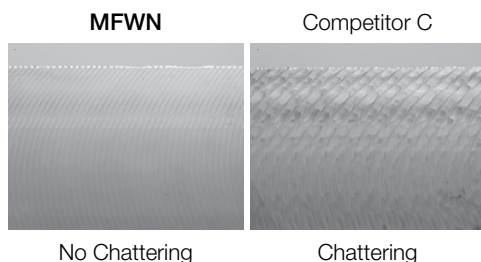
Cutting Force is the Resultant Force of the Principal Force and the Feed Force

Cutting Conditions: $V_c = 590$ sfm, D.O.C. \times ae = $0.275'' \times 0.400''$, fz = 0.008 ipt
Workpiece: 1049 Cutter Dia. $\varnothing 5.000''$

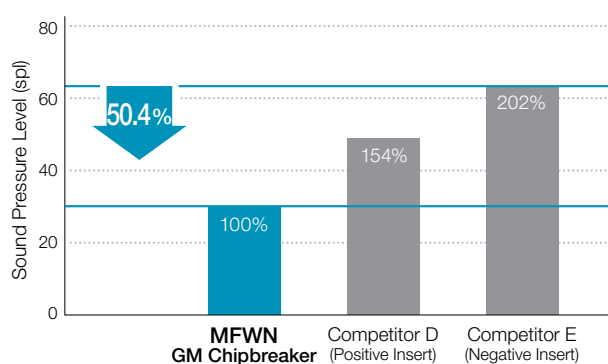
2 Reduced Chattering Even with Extended Milling Adapters

Resistant to Chattering due to Low Cutting Force Design and applicable to long overhang

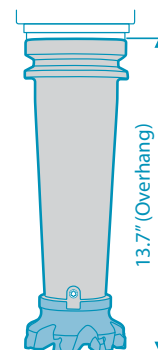
Surface Roughness Comparison (In-house Evaluation)

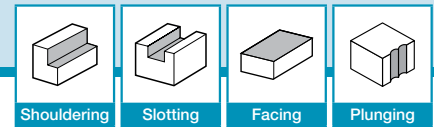


Cutting Noise Comparison (In-house Evaluation)



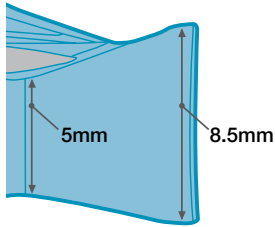
Cutting Conditions: $V_c = 660$ sfm, D.O.C. \times ae = $0.118'' \times 0.590''$, fz = 0.004 ipt
Workpiece: 1049 Cutter Dia. $\varnothing 3.000''$ (7 Inserts)



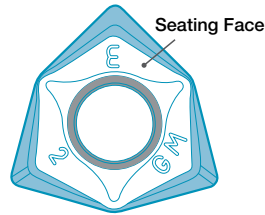


3 Superior Fracture Resistance with Thick Edge Design

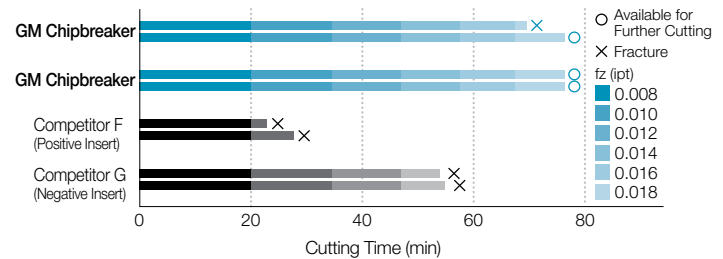
Cutting Edge
Thickness: 5 - 8.5mm



Stable Clamping with the
Unique Insert Face Design



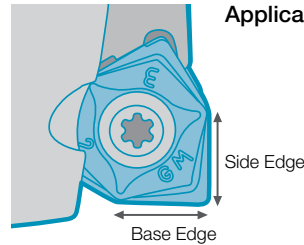
Fracture Resistance Comparison (In-house Evaluation)



Cutting Conditions: $V_c = 330$ sfm, D.O.C. \times ae = $0.080'' \times 4.000''$, $f_z = 0.004 \sim 0.018$ ipt, Dry Workpiece: 4140H (38 ~ 42HS) Interrupted with a Slot in the Workpiece

4 Neutral Inserts

Available for Shouldering and Facing
Neutral Inserts are Applicable to Left-hand Cutters
(Custom Order)



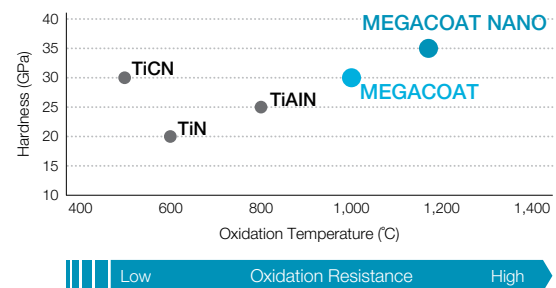
Applicable to a Wide Range of Applications

5 MEGACOAT NANO Coated Insert Grade for Long Tool Life

PR1525 for steel, PR1510 for cast iron and PR1535 for Ni-base heat-resistant alloy, titanium alloy and precipitation-hardened stainless steel

Prevents wear and fracturing with high hardness (35GPa) and superior oxidation resistance (oxidation temperature: 1,150°C)

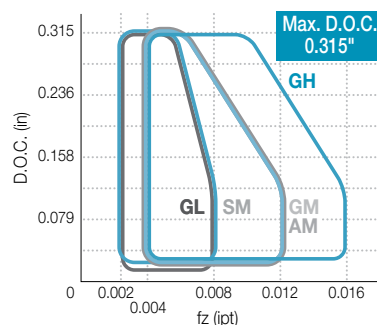
Coating Property



6 Extensive Insert Lineup Covering Various Applications

Chipbreaker	Applications	Shape
GM	General Purpose	
SM	Low Cutting Force	
GH	Heavy Milling	
GL	Surface-Finish Oriented	
AM	Aluminum / Non-ferrous Metals	

Application Range

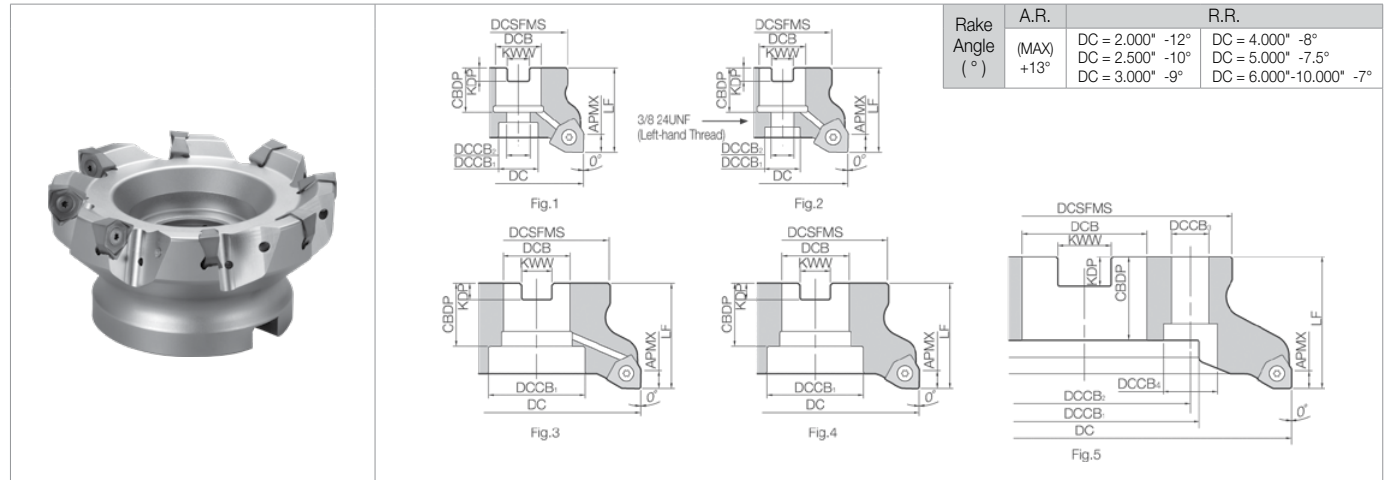


Smooth Chip Evacuation



Properly Curled Chips
(The Photo was Taken by a High Speed Camera)

M-SIX (MFWN) Face Mill (Inch)

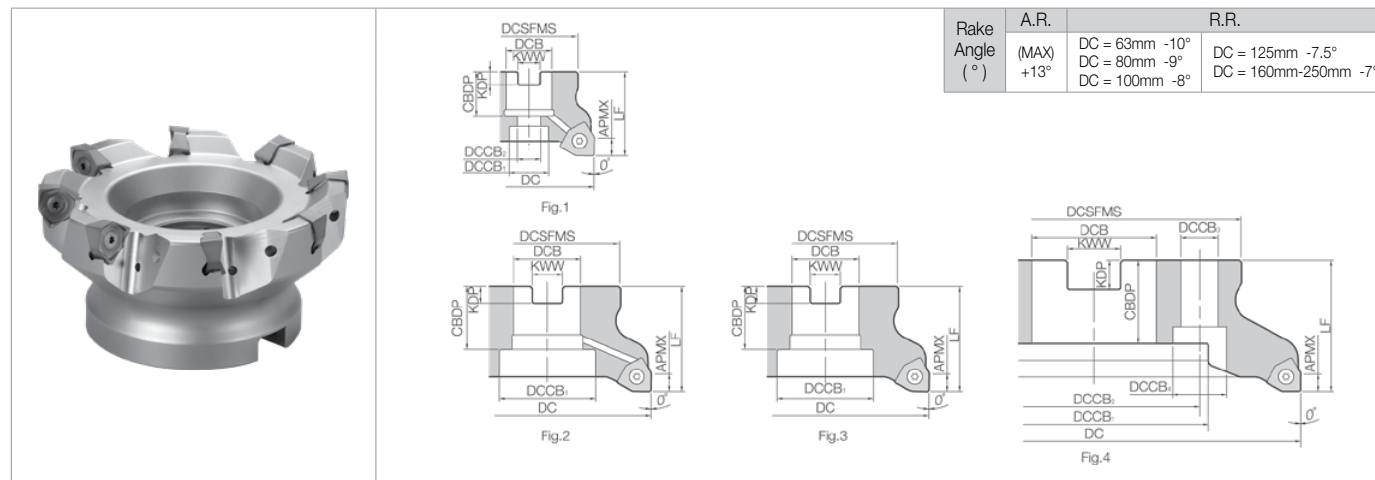


Toolholder Dimensions (Inch)

Part Number	Stock	No. of Inserts	Dimensions (in)											Drawing	Weight (kg)	Shim	Coolant Hole
			DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KDP	KWW	APMX	DCCB ₃	DCCB ₄			
Coarse Pitch Inserts 45°~70° Lead Angle 75° Lead Angle 90°/88° Lead Angle High Feed Milling Finish Milling Multi-Function Slot Mill Ball-Nose Radius Other Applications	MFWN 902500R-3T 903000R-4T 904000R-5T 905000R-6T 906000R-8T 908000R-10T 9010000R-12T	3	2.500	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.312	0.315	-	-	Fig.1	0.4	Yes
		4	3.000	2.283	1.000	0.875	0.551	1.968	1.063	0.236	0.381				Fig.1	0.8	
		5	4.000	2.756	1.500	2.047	-	1.968	1.142	0.393	0.625				Fig.3	1.1	
		6	5.000	3.425	1.500	2.175		2.480	1.496	0.393	0.625				Fig.3	2.5	
		8	6.000	4.016	2.000	2.835		2.480	1.496	0.433	0.752				Fig.4	3.4	
		10	8.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	6.0	No
		12	10.000	5.591	2.500	3.937	4.000	2.480	1.575	0.551	1.008		0.709	1.024	Fig.5	8.2	
Fine Pitch M	MFWN 902000R-4T 902500R-4T 903000R-5T 904000R-7T 905000R-8T	4	2.000	1.752	0.750	0.500	3/8 24UNF	1.968	0.830	0.187	0.312	0.315	-	-	Fig.2	0.4	No
		4	2.500	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.312				Fig.1	0.5	
		5	3.000	2.283	1.000	0.875	0.551	1.968	1.063	0.236	0.381				Fig.1	0.8	
		7	4.000	2.756	1.500	2.047	-	1.968	1.142	0.393	0.625				Fig.3	1.0	
		8	5.000	3.425	1.500	2.175		2.480	1.496	0.393	0.625				Fig.3	2.5	
Extra-Fine Pitch M	MFWN 902500R-5T 903000R-7T 904000R-9T 905000R-12T 906000R-14T	5	2.500	1.890	0.750	0.669	0.433	1.575	0.750	0.187	0.312	0.315	-	-	Fig.1	0.4	Yes
		7	3.000	2.283	1.000	0.875	0.551	1.968	1.063	0.236	0.381				Fig.1	0.8	
		9	4.000	2.756	1.500	2.047	-	1.968	1.142	0.393	0.625				Fig.3	1.0	
		12	5.000	3.425	1.500	2.175		2.480	1.496	0.393	0.625				Fig.3	2.4	
		14	6.000	4.016	2.000	2.835		2.480	1.496	0.433	0.752				Fig.4	3.4	No

Spare Parts **M114**
 Applicable Inserts **M115**

M-SIX (MFWN) Face Mill (Metric)



Toolholder Dimensions (Metric)



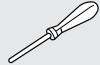






Part Number			Stock	No. of Inserts	Dimensions (mm)												Drawing	Weight (kg)	Shim	Coolant Hole			
					DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	DCCB ₃	DCCB ₄							
Inch Bore Dia.	Coarse Pitch	MFWN 90080R-4T	●	4	80	60	1.000"	20	13	50	1.063"	0.236"	0.375"	8	-	-	Fig.1	1.0	Yes	No			
		90100R-5T	●	5	100	70	1.250"	46	-	50	1.339"	0.315"	0.500"				Fig.2	1.3					
		90125R-6T	●	6	125	87	1.500"	55		63	1.496"	0.394"	0.625"				Fig.2	2.6					
		90160R-8T	●	8	160	102	2.000"	72		63	1.496"	0.433"	0.750"				Fig.3	3.9					
		90200R-10T	●	10	200	142	1.875"	110		101.6	63	1.575"	0.551"				1.000"	18			26	Fig.4	6.3
		90250R-12T	●	12	250	142	1.875"	110	101.6	63	1.575"	0.551"	1.000"				18	26			Fig.4	8.7	
	Fine Pitch	MFWN 90080R-5T	●	5	80	60	1.000"	20	13	50	1.063"	0.236"	0.375"	8	-	-	Fig.1	1.0	No	Yes			
		90100R-7T	●	7	100	70	1.250"	46	-	50	1.339"	0.315"	0.500"				Fig.2	1.4					
		90125R-8T	●	8	125	87	1.500"	55		63	1.496"	0.394"	0.625"				Fig.2	2.7					
		90160R-10T	●	10	160	102	2.000"	72		63	1.496"	0.433"	0.750"				Fig.3	4.0					
		90200R-12T	●	12	200	142	1.875"	110		101.6	63	1.575"	0.551"				1.000"	18			26	Fig.4	6.6
		90250R-14T	●	14	250	142	1.875"	110	101.6	63	1.575"	0.551"	1.000"				18	26			Fig.4	8.9	
	Extra-Fine Pitch	MFWN 90080R-7T	●	7	80	60	1.000"	20	13	50	1.063"	0.236"	0.375"	8	-	-	Fig.1	1.1	No	Yes			
		90100R-9T	●	9	100	70	1.250"	46	-	50	1.339"	0.315"	0.500"				Fig.2	1.3					
		90125R-12T	●	12	125	87	1.500"	55		63	1.496"	0.394"	0.625"				Fig.2	2.7					
		90160R-14T	●	14	160	102	2.000"	72		63	1.496"	0.433"	0.750"				Fig.3	4.1					
		90200R-16T	●	16	200	142	1.875"	110		101.6	63	1.575"	0.551"				1.000"	18			26	Fig.4	6.7
		90250R-18T	●	18	250	142	1.875"	110	101.6	63	1.575"	0.551"	1.000"				18	26			Fig.4	9.1	
Metric Bore Dia.	Coarse Pitch	MFWN 90063R-3T-M	●	3	63	47	22	19	11	40	21	6.3	10.4	8	-	-	Fig.1	0.5	Yes	No			
		90080R-4T-M	●	4	80	60	27	20	13	50	24	7	12.4				Fig.1	1.0					
		90100R-5T-M	●	5	100	70	32	46	-	50	30	8	14.4				Fig.2	1.3					
		90125R-6T-M	●	6	125	87	40	55		63	33	9	16.4				Fig.2	2.5					
		90160R-8T-M	●	8	160	102	40	68		66.7	63	32	9				16.4	14			20	Fig.4	3.8
		90200R-10T-M	●	10	200	142	60	110		101.6	63	40	14				25.7	18			26	Fig.4	6.0
		90250R-12T-M	●	12	250	142	60	110	101.6	63	40	14	25.7				18	26			Fig.4	8.4	
	Fine Pitch	MFWN 90063R-4T-M	●	4	63	47	22	19	11	40	21	6.3	10.4	8	-	-	Fig.1	0.5	No	Yes			
		90080R-5T-M	●	5	80	60	27	20	13	50	24	7	12.4				Fig.1	1.0					
		90100R-7T-M	●	7	100	70	32	46	-	50	30	8	14.4				Fig.2	1.3					
		90125R-8T-M	●	8	125	87	40	55		63	33	9	16.4				Fig.2	2.6					
		90160R-10T-M	●	10	160	102	40	68		66.7	63	32	9				16.4	14			20	Fig.4	3.9
		90200R-12T-M	●	12	200	142	60	110		101.6	63	40	14				25.7	18			26	Fig.4	6.3
		90250R-14T-M	●	14	250	142	60	110	101.6	63	40	14	25.7				18	26			Fig.4	8.7	
	Extra-Fine Pitch	MFWN 90063R-5T-M	●	5	63	47	22	19	11	40	21	6.3	10.4	8	-	-	Fig.1	0.5	No	Yes			
		90080R-7T-M	●	7	80	60	27	20	13	50	24	7	12.4				Fig.1	1.1					
		90100R-9T-M	●	9	100	70	32	46	-	50	30	8	14.4				Fig.2	1.3					
		90125R-12T-M	●	12	125	87	40	55		63	33	9	16.4				Fig.2	2.6					
		90160R-14T-M	●	14	160	102	40	68		66.7	63	32	9				16.4	14			20	Fig.4	3.9
			●																				



Spare Parts ● M114

Applicable Inserts ● M115

M-SIX (MFWN)









● Face Mill Spare Parts (Inch)


Part Number		Spare Parts												
		Insert Screw	Wrench		Shim	Shim Screw	Wrench	Anti-Seize Compound	Arbor Bolt	Mounting Screw				
			TT	DTM										
														
Coarse Pitch	MFWN 902500R-3T	SB-50140TR	TTW-15	-	MFWN-90	SPW-7050	LW-5	P-37	HH3/8-1.25 (HH3/8-1.25H)	-				
	903000R-4T								Recommended Torque for Insert Clamp 4.2 N·m	-	Recommended Torque for Insert Clamp 6.0 N·m	HH1/2-1.25 (HH1/2-1.25H)	-	
	904000R-5T ~ 9010000R-12T											-	-	
Fine Pitch	MFWN 902000R-4T	SB-50140TR	TTW-15	-	-	-	-	P-37	-	XNS610 ^{*1}				
	902500R-4T								Recommended Torque for Insert Clamp 4.2 N·m	-	-	-	HH3/8-1.25 (HH3/8-1.25H)	-
	903000R-5T												HH1/2-1.25 (HH1/2-1.25H)	-
	904000R-7T ~ 9010000R-14T												-	-
Extra-Fine Pitch	MFWN 902500R-5T	SB-50140TR	TTW-15	-	-	-	-	P-37	HH3/8-1.25 (HH3/8-1.25H)	-				
	903000R-7T	SB-40140TRN	-	DTM-15					HH1/2-1.25 (HH1/2-1.25H)	-				
	904000R-9T ~ 9010000R-18T	Recommended Torque for Insert Clamp 3.5 N·m							-	-				

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation. ^{*1}Differential screw (3/8-24UNF) Applicable Inserts  **M115**

If through spindle coolant is required, please order arbor bolt in () separately.

● Face Mill Spare Parts (Metric)

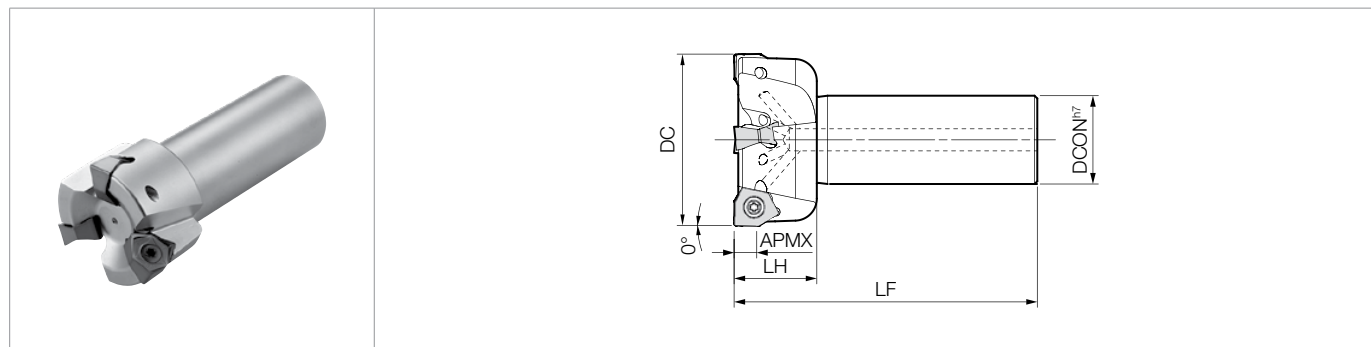
Part Number		Spare Parts							
		Insert Screw	Wrench		Shim	Shim Screw	Wrench	Anti-Seize Compound	Arbor Bolt
			TT	DTM					
									
Coarse Pitch	MFWN 90063R-3T-M	SB-50140TR	TTW-15	-	MFWN-90	SPW-7050	LW-5	P-37	HH10X30 (HH10X1.25H)
	90080R-4T-(M)								HH12X35 (HH12X35H)
	90100R-5T-(M) ~ 90250R-12T-(M)								-
Fine Pitch	MFWN 90063R-4T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30 (HH10X1.25H)
	90080R-5T-(M)								HH12X35 (HH12X35H)
	90100R-7T-(M) ~ 90250R-14T-(M)								-
Extra-Fine Pitch	MFWN 90063R-5T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30 (HH10X1.25H)
	90080R-7T-(M)	SB-40140TRN	-	DTM-15					HH12X35 (HH12X35H)
	90100R-9T-(M) ~ 90250R-18T-(M)	Recommended Torque for Insert Clamp 3.5 N·m							-

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.




Applicable Inserts  **M115**

If through spindle coolant is required, please order arbor bolt in () separately.

M-SIX (MFWN) End Mill (with Coolant Hole)



Toolholder Dimensions

Shank	Part Number	Stock	Unit	No. of Inserts	Dimensions					Rake Angle (°)		Coolant Hole	Spare Parts		
					DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.		Insert Screw	Wrench	Anti-seize Compound
															
Weldon	MFWN 902000R-W125-3T	●	inch	3	2.000	1.250	3.600	1.180	0.315	+13°	-12°	Yes	SB-50140TR	TTW-15	P-37
	902500R-W125-4T	●		4	2.500						-10°		Recommended Torque for Insert Clamp 4.2 N·m		
	903000R-W125-5T	●		5	3.000						-8°				
Cylindrical	MFWN 90050R-S32-3T	●	mm	3	50	32	110	30	8	+13°	-12°	Yes	SB-50140TR	TTW-15	P-37
	90063R-S32-4T	●		4	63						-10°		Recommended Torque for Insert Clamp 4.2 N·m		
	90080R-S32-5T	●		5	80						-9°				

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Applicable Inserts

Part Number	Applicable Inserts M21				
MFWN90...	WNEU 080608EN-GL	WNMU 080608EN-GM	WNMU 080608EN-SM	WNMU 080608EN-GH	WNGT 080608FN-AM

Recommended Cutting Conditions M116

● How to Mount the Insert

1. Be sure to remove dust and chips from the insert mounting pocket
2. After applying anti-seize compound on portion of taper and thread, 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 (See Fig. 1)
3. When tightening the screw, make sure that the wrench is parallel to the screw. Remember that the screw hole of the holder for Extra Fine pitch is angled to the pocket floor (See Fig. 2 and Fig. 3)



Fig.1



Fig.2



Fig.3

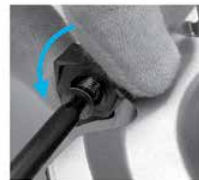


Fig.4

4. Be careful not to tighten the screw with excessive torque. Recommended torque is 4.2N·m for M5 screw (SB-50140TR) and 3.5N·m for M4 screw (SB-40140TRN)
5. After tightening the screw, make sure that there is no clearance between the insert seat surface and the pocket floor of the holder or between the insert side surfaces and the constraint surface of the holder. If there is any clearance, remove the insert and mount it again according to the above steps
6. To index the cutting edge of the insert, turn the insert counterclockwise. (See Fig. 4) The insert corner identification number is stamped on the top surface of the insert

● How to Replace the Shim

1. Be sure to remove dust and chips from the insert mounting pocket
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding constraint surface (see Fig. 1) and lightly pressing the shim toward the constraint surface of the pocket wall (see Fig. 2), insert the screw into the hole of the shim and tighten (See Fig. 3). When tightening screw, make sure that the screw is vertical to the pocket floor (See Fig. 3). Recommended torque is 6.0Nm

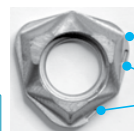


Fig.1

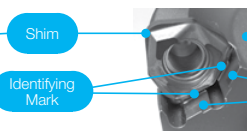


Fig.2

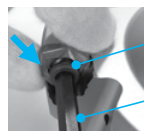
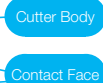
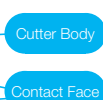


Fig.3

3. After tightening the screw, make sure that there is no clearance between the shim seat surface and the pocket floor. If there is any clearance, remove the shim and mount it again according to the above steps

◆ Recommended Cutting Conditions

Chipbreaker	Workpiece Material	Feed Rate fz (ipt) () : TN620M	Recommended Insert Grade (Vc sfm)							
			Cermet	MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide	DLC Coated Carbide	Carbide
			TN620M	PR1535	PR1525	PR1510	PR015S	CA6535	PDL025	GW25
High Feed Milling	Carbon Steel	0.004~0.008~0.012 (0.002~0.004~0.006)	★ 660~820~980	☆ 390~590~820	★ 390~590~820	-	-	-	-	-
	Alloy Steel	0.004~0.008~0.012 (0.002~0.004~0.006)	★ 590~720~820	☆ 330~520~720	★ 330~520~720	-	-	-	-	-
	Mold Steel	0.004~0.006~0.010 (0.002~0.004~0.005)	★ 490~590~720	☆ 260~460~590	★ 260~460~590	-	-	-	-	-
	Austenitic Stainless Steel	0.004~0.006~0.010	-	☆ 330~520~660	☆ 330~520~660	-	-	-	-	-
	Martensitic Stainless Steel	0.004~0.006~0.010	-	☆ 490~660~820	-	-	-	☆ 590~790~980	-	-
	Precipitation Hardened Stainless Steel	0.004~0.006~0.010	-	★ 300~390~490	-	-	-	-	-	-
	Gray Cast Iron	0.004~0.008~0.012	-	-	-	★ 390~590~820	-	-	-	-
	Nodular Cast Iron	0.004~0.006~0.010	-	-	-	★ 330~490~660	-	-	-	-
	Ni-base Heat Resistant Alloy	0.004~0.005~0.008	-	☆ 70~100~160	-	-	-	★ 70~130~160	-	-
	Other Applications									
Finish Milling	Carbon Steel	0.002~0.005~0.008 (0.002~0.003~0.005)	★ 660~820~980	☆ 390~590~820	☆ 390~590~820	-	-	-	-	-
	Alloy Steel	0.002~0.005~0.008 (0.002~0.003~0.005)	★ 590~720~820	☆ 330~520~720	☆ 330~520~720	-	-	-	-	-
	Mold Steel	0.002~0.003~0.006 (0.002~0.003~0.004)	★ 490~590~720	☆ 260~460~590	☆ 260~460~590	-	-	-	-	-
	Austenitic Stainless Steel	0.002~0.005~0.008	-	★ 330~520~660	☆ 330~520~660	-	-	-	-	-
	Martensitic Stainless Steel	0.002~0.005~0.008	-	☆ 490~660~820	-	-	-	★ 590~790~980	-	-
	Precipitation Hardened Stainless Steel	0.002~0.005~0.008	-	☆ 300~390~490	-	-	-	-	-	-
	Gray Cast Iron	0.002~0.005~0.008	-	-	-	☆ 390~590~820	-	-	-	-
	Nodular Cast Iron	0.002~0.003~0.006	-	-	-	☆ 330~490~660	-	-	-	-
	Ni-base Heat Resistant Alloy	0.002~0.004~0.006	-	☆ 70~100~160	-	-	-	☆ 70~130~160	-	-
	Titanium Alloy	0.002~0.003~0.006	-	★ 130~200~260	-	-	-	-	-	-
Multi-Function	Carbon Steel	0.008~0.012~0.016	-	☆ 390~590~820	☆ 390~590~820	-	-	-	-	-
	Alloy Steel	0.008~0.012~0.016	-	☆ 330~520~720	☆ 330~520~720	-	-	-	-	-
	Mold Steel	0.006~0.008~0.012	-	☆ 260~460~590	☆ 260~460~590	-	-	-	-	-
	Austenitic Stainless Steel	0.008~0.010~0.012	-	☆ 330~520~660	☆ 330~520~660	-	-	-	-	-
	Martensitic Stainless Steel	0.008~0.010~0.012	-	☆ 490~660~820	-	-	-	☆ 590~790~980	-	-
	Precipitation Hardened Stainless Steel	0.008~0.010~0.012	-	☆ 300~390~490	-	-	-	-	-	-
	Gray Cast Iron	0.008~0.012~0.016	-	-	-	☆ 390~590~820	-	-	-	-
	Nodular Cast Iron	0.006~0.008~0.012	-	-	-	☆ 330~490~660	-	-	-	-
	Ni-base Heat Resistant Alloy	0.006~0.008~0.010	-	☆ 70~100~160	-	-	-	☆ 70~130~160	-	-
	Hard Materials (≤ 60HRC)	0.006~0.008~0.010	-	-	-	-	★ 260~330~390	-	-	-
Slot Mill	Carbon Steel	0.004~0.008~0.012	-	-	-	-	-	-	★ 660~1970~2950	☆ 660~1640~2620
	Alloy Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Mold Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Austenitic Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Martensitic Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Precipitation Hardened Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Gray Cast Iron	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Nodular Cast Iron	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Ni-base Heat Resistant Alloy	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Hard Materials (≤ 60HRC)	0.004~0.008~0.012	-	-	-	-	-	-	-	-
Ball-Nose Radius	Carbon Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Alloy Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Mold Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Austenitic Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Martensitic Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Precipitation Hardened Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Gray Cast Iron	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Nodular Cast Iron	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Ni-base Heat Resistant Alloy	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Hard Materials (≤ 60HRC)	0.004~0.008~0.012	-	-	-	-	-	-	-	-
Other Applications	Carbon Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Alloy Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Mold Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Austenitic Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Martensitic Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Precipitation Hardened Stainless Steel	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Gray Cast Iron	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Nodular Cast Iron	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Ni-base Heat Resistant Alloy	0.004~0.008~0.012	-	-	-	-	-	-	-	-
	Hard Materials (≤ 60HRC)	0.004~0.008~0.012	-	-	-	-	-	-	-	-

● Bold numbers in the graph indicate the most recommended value of feed (fz) Adjust cutting speed and feed rate according to the actual machining conditions

● Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys

※1 GL Chipbreaker is recommended for surface finish oriented milling

※2 When using GH chipbreaker for fine pitch cutters, recommended feed is fz ≤ 0.012 ipt. GH chipbreaker is not recommended for extra-fine pitch cutter

★ :1st Recommendation

☆ : 2nd Recommendation

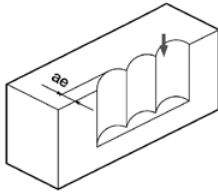
● Applicable Chipbreaker

Cutter	Chipbreaker			
	GM	SM (GL)	GH	AM
Coarse Pitch (with Shim)	✓	✓	✓	✓
Fine Pitch (without Shim)	✓	✓	✓ (fz ≤ 0.012 ipt Recommended)	✓
Extra Fine Pitch (without Shim)	✓	✓	Not Recommended	Not Recommended

● Cutter Type and Insert Selection Guide

Purpose	Cutter			Chipbreaker				
	Coarse Pitch	Fine Pitch	Extra-Fine Pitch	GM	SM	GH	GL	AM
General Milling for Steel and Alloy Steel		✓		✓				
Steel and Alloy Steel (to prevent chattering due to low rigidity machine or poor clamping power)	✓				✓			
Productivity Oriented (D.O.C. ≥ 0.158" fz ≥ 0.010 ipt)	✓					✓		
Surface Roughness Oriented	✓	✓					✓	
General Milling for Stainless Steel		✓			✓			
Stainless Steel (to prevent chattering due to low rigidity machine or poor clamping power)	✓				✓			
Cast Iron Milling (Improved Efficiency)			✓	✓				
Cast Iron (D.O.C. ≥ 0.158" fz ≥ 0.010 ipt)	✓					✓		
General Milling for Aluminum Alloys		✓						✓
Aluminum Alloys (to prevent chattering due to low rigidity)	✓							✓

● Plunging



Cutting Dia.	MAX. Width of Cut (ae)
All Items	0.315"



NOT available for ramping or helical milling, due to interference between workpiece and insert.

■ Case Studies

No.50

- Machine Part
- Vc = 560 sfm
- D.O.C. × ae = 0.098" × 5.118"
- fz = 0.007 ipt (Vf = 19.685 ipm)
- Wet
- MFWN90160R-8T (8 Inserts)
- WNMU080608EN-GM (PR1510)

PR1525	163 cc/min
Competitor A (Positive Cutter)	68 cc/min

Competitor A continued to cut under low cutting conditions as the workpiece was slipping due to unstable chucking. With MFWN, stable cutting was possible at higher feed rates.

(User Evaluation)

Manganese Steel

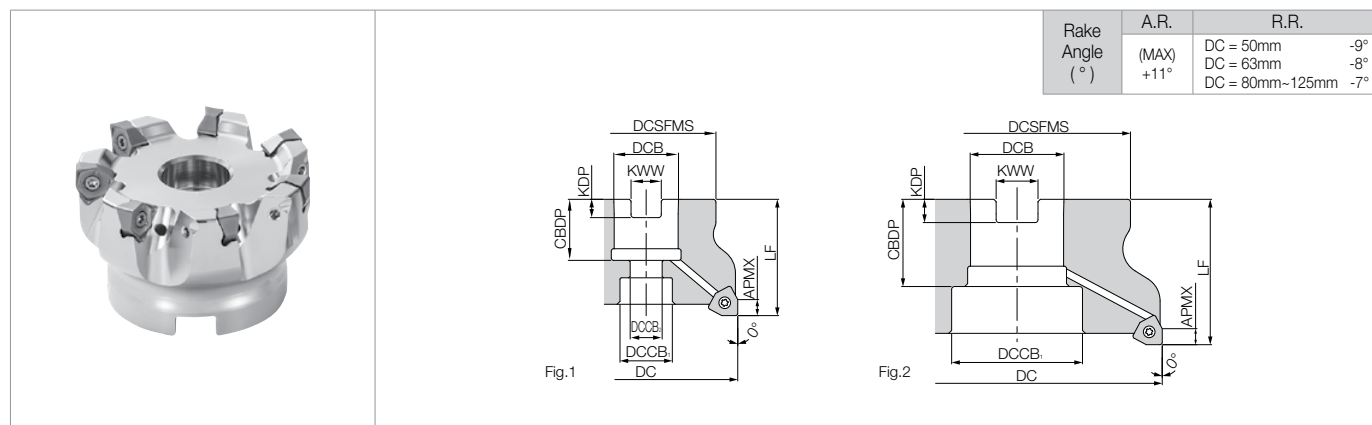
- Construction Equipment Part
- Vc = 490 sfm
- D.O.C. × ae = 0.039" × 3.937"
- fz = 0.008 ipt (Vf = 26.299 ipm)
- Dry
- MFWN90100R-7T (7 Inserts)
- WNMU080608EN-GM (PR1525)

PR1525	2 pcs/edge
Competitor B (Negative Cutter)	1 pcs/edge

Despite instability with the long overhang of the workpiece, MFWN doubled tool life and improved efficiency by 150%.

(User Evaluation)

MFWN-Mini Face Mill (Metric)



Toolholder Dimensions (Metric)

Part Number			Stock	No. of Inserts	Dimensions (mm)										Coolant Hole	Drawing	Weight (kg)	Max. RPM*	
					DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX					
Inch Bore Dia.	Coarse Pitch	MFWN	90080R-05-7T	●	7	80	70	1.000"	20	13	50	1.063"	0.236"	0.375"	5	Yes	Fig.1	1.3	10,900
			90100R-05-8T	●	8	100	78	1.250"	45	-		1.339"	0.315"	0.500"			Fig.2	1.6	9,700
			90125R-05-11T	●	11	125	89	1.500"	55			63	1.496"	0.394"			0.625"	2.9	8,700
	Fine Pitch	MFWN	90080R-05-9T	●	9	80	70	1.000"	20	13	50	1.063"	0.236"	0.375"	5	Yes	Fig.1	1.2	10,900
			90100R-05-11T	●	11	100	78	1.250"	45	-		1.339"	0.315"	0.500"			Fig.2	1.6	9,700
			90125R-05-14T	●	14	125	89	1.500"	55			63	1.496"	0.394"			0.625"	2.8	8,700
Metric Bore Dia.	Coarse Pitch	MFWN	90050R-05-5T-M	●	5	50	48	22	17.5	11	40	21	6.3	10.4	5	Yes	Fig.1	0.4	13,800
			90063R-05-6T-M	●	6	63		18	40		21	6.3	10.4	0.5				12,300	
			90080R-05-7T-M	●	7	80	70	27	20	13	50	24	7	12.4				1.2	10,900
			90100R-05-8T-M	●	8	100	78	32	45	-		30	8	14.4				1.6	9,700
			90125R-05-11T-M	●	11	125	89	40	55			63	33	9				16.4	2.8
	Fine Pitch	MFWN	90050R-05-6T-M	●	6	50	48	22	17.5	11	40	21	6.3	10.4	5	Yes	Fig.1	0.4	13,800
			90063R-05-7T-M	●	7	63		18	40		21	6.3	10.4	0.5				12,300	
			90080R-05-9T-M	●	9	80	70	27	20	13	50	24	7	12.4				1.2	10,900
			90100R-05-11T-M	●	11	100	78	32	45	-		30	8	14.4				1.5	9,700
			90125R-05-14T-M	●	14	125	89	40	55			63	33	9				16.4	2.7

Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Recommended Cutting Conditions **M121**

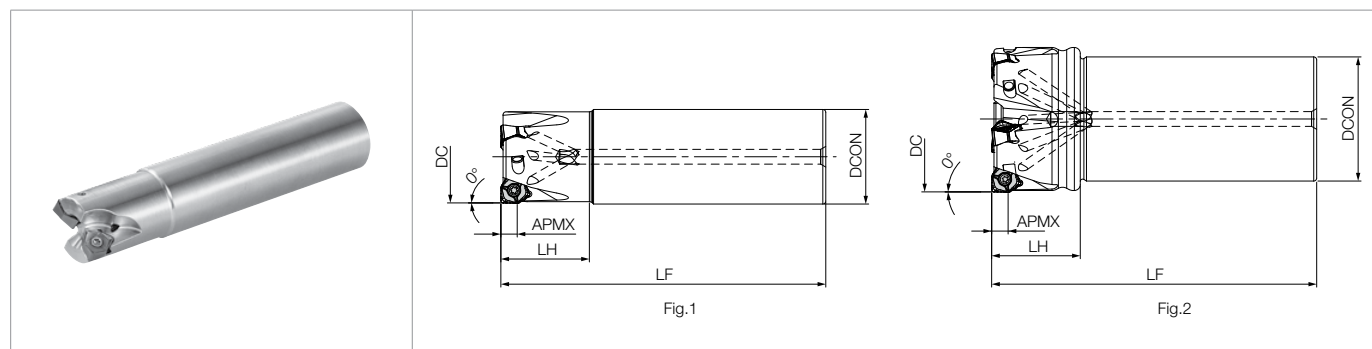
Applicable Inserts **M120**

Face Mill Spare Parts




Part Number		Spare Parts			
		Insert Screw	Wrench	Anti-Seize Compound	Arbor Bolt
Coarse Pitch	MFWN 90050R-05-5T-M	SB-3065TRP	DTPM-8	P-37	HH10×30
	90063R-05-6T-M				HH10×30
	90080R-05-7T(-M)				HH12×35
	90100R-05-8T(-M)				-
	90125R-05-11T(-M)				-
Fine Pitch	MFWN 90050R-05-6T-M	SB-3065TRP	DTPM-8	P-37	HH10×30
	90063R-05-7T-M				HH10×30
	90080R-05-9T(-M)				HH12×35
	90100R-05-11T(-M)				-
	90125R-05-14T(-M)				-

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

MFWN-Mini End Mill (Metric)



Toolholder Dimensions (Metric)

Shank	Part Number	Stock	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Coolant Hole	Drawing	Max. RPM*	Spare Parts		
				DC	DCON	LF	LH	APMX	A.R. (Max)	R.R.				Insert Screw	Wrench	Anti-seize Compound
																
Cylindrical	MFWN 90025R-S25-05-2T	●	2	25	25	120	32	5	+11°	-14.5°	Yes	Fig.1	19,500	SB-3065TRP	DTPM-8	P-37
	90032R-S32-05-3T	●	3	32		130	40			-12°		Fig.1	17,200			
	90040R-S32-05-4T	●	4	40		150	50			-10°		Fig.2	15,400			
	90050R-S32-05-5T	●	5	50	32	110	30			-9°			13,800			
	90063R-S32-05-6T	●	6	63						-8°			12,300			
	90080R-S32-05-7T	●	7	80						-7°			10,900			

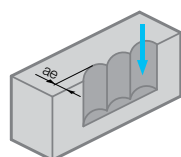
Max. Revolution*

When running the end mill and cutter at the maximum revolution, the insert or toolholder may be damaged by centrifugal force.

Recommended Cutting Conditions **M121**

Applicable Inserts **M120**

Plunging



Available for Plunging

Cutting Dia.	Maximum width of cut (ae)
All Cutters	5 mm

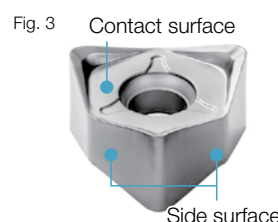
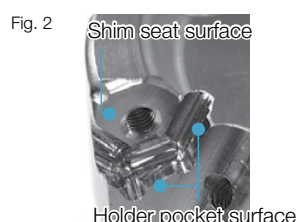
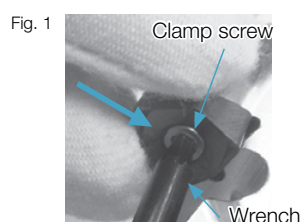
Ramping and helical milling are not recommended due to interference between workpiece and flank face

Applicable Chipbreaker by Cutter Type

Cutter Type	Chipbreaker		
	GM	SM	GH
Coarse Pitch	○	○	○
Fine Pitch	○	○	△ (fz = 0.008ipt or less)

How to Mount Inserts

1. Completely eliminate chips and dust from the insert mounting side
2. Coat anti-seize compound thinly on portion of taper and thread of clamp screw prior to installation.
After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the insert seat surface and holder surface (Fig.1)
3. Tighten the wrench while holding parallel to the clamp screw.
Recommended tightening torque ... 1.2 Nm
4. After tightening, check that there is no gap between the contact surface of the insert and the surface of the insert seat, or between the side surface of insert and the holder surface. If there is a gap, remount the insert using the directions above.






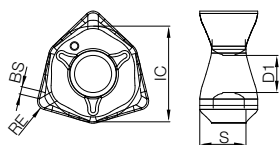
● Applicable Inserts

Usage Classification

- ★ Roughing / 1st Choice
 ☆ Roughing / 2nd Choice
 ■ Finishing / 1st Choice
 □ Finishing / 2nd Choice
 (Hardness Under 45HRC)

P	Free-Cutting Steel	☆	★		
	Carbon/Alloy Steel	☆	★		
M	Austenitic Stainless Steel	★	☆		
	Martensitic Stainless Steel	★			
	Precipitation Hardened Stainless Steel	★			
K	Gray Cast Iron			★	
	Nodular Cast Iron			★	
N	Non-ferrous Metals				
S	Heat-Resistant Alloys	★			
	Titanium Alloy	★			
H	Hard Materials				★

Insert (Right-hand Shown)		Part Number	Dimensions (mm)					MEGACOAT NANO				MEGACOAT HARD
			IC	S	D1	BS	RE	PR1535	PR1525	PR1510	PR015S	
	General Purpose	WNMU 050408EN-GM	8.8	4.2	3.4	0.7	0.8	●	●	●		
	Low Cutting Force	WNMU 050408EN-SM	8.8	4.2	3.4	0.7	0.8	●	●	●		
	Tough Edge (Heavy Milling)	WNMU 050408EN-GH	8.8	4.2	3.4	0.7	0.8	●	●	●	●	



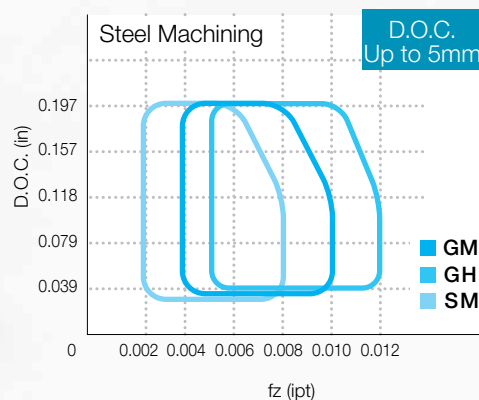
Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

M
MILLING

Three insert chipbreakers and four grades available



Applicable Chipbreaker Range



Steel, Cast Iron, Stainless Steel and Heat-Resistant Alloy Machining

PR1510 / PR1525 / PR1535 MEGACOAT NANO

For hardened materials (60 HRC or less)

PR015S (GH only) MEGACOAT HARD

Recommended Cutting Conditions

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade (Vc sfm)			
			MEGACOAT NANO			MEGACOAT HARD
			PR1535	PR1525	PR1510	PR015S
GM	Carbon Steel	0.004 ~ 0.008 ~ 0.010	☆ 390 ~ 590 ~ 820	★ 390 ~ 590 ~ 820	-	-
	Alloy Steel	0.004 ~ 0.008 ~ 0.010	☆ 330 ~ 520 ~ 720	★ 330 ~ 520 ~ 720	-	-
	Mold Steel	0.004 ~ 0.006 ~ 0.008	☆ 260 ~ 460 ~ 590	★ 260 ~ 460 ~ 590	-	-
	Austenitic Stainless Steel	0.004 ~ 0.006 ~ 0.008	☆ 330 ~ 520 ~ 660	☆ 330 ~ 520 ~ 660	-	-
	Martensitic Stainless Steel	0.004 ~ 0.006 ~ 0.008	☆ 490 ~ 660 ~ 820	-	-	-
	Precipitation Hardened Stainless Steel	0.004 ~ 0.006 ~ 0.008	★ 300 ~ 390 ~ 490	-	-	-
	Gray Cast Iron	0.004 ~ 0.008 ~ 0.010	-	-	★ 390 ~ 590 ~ 820	-
	Nodular Cast Iron	0.004 ~ 0.006 ~ 0.008	-	-	★ 330 ~ 490 ~ 660	-
	Ni-base Heat Resistant Alloy	0.004 ~ 0.005 ~ 0.006	☆ 70 ~ 100 ~ 160	-	-	-
SM	Carbon Steel	0.002 ~ 0.005 ~ 0.008	☆ 390 ~ 590 ~ 820	☆ 390 ~ 590 ~ 820	-	-
	Alloy Steel	0.002 ~ 0.005 ~ 0.008	☆ 330 ~ 520 ~ 720	☆ 330 ~ 520 ~ 720	-	-
	Mold Steel	0.002 ~ 0.003 ~ 0.006	☆ 260 ~ 460 ~ 590	☆ 260 ~ 460 ~ 590	-	-
	Austenitic Stainless Steel	0.002 ~ 0.005 ~ 0.008	★ 330 ~ 520 ~ 660	☆ 330 ~ 520 ~ 660	-	-
	Martensitic Stainless Steel	0.002 ~ 0.005 ~ 0.008	☆ 490 ~ 660 ~ 820	-	-	-
	Precipitation Hardened Stainless Steel	0.002 ~ 0.005 ~ 0.008	☆ 300 ~ 390 ~ 490	-	-	-
	Gray Cast Iron	0.002 ~ 0.005 ~ 0.008	-	-	☆ 390 ~ 590 ~ 820	-
	Nodular Cast Iron	0.002 ~ 0.003 ~ 0.006	-	-	☆ 330 ~ 490 ~ 660	-
	Ni-base Heat Resistant Alloy	0.002 ~ 0.003 ~ 0.006	★ 70 ~ 100 ~ 160	-	-	-
	Titanium Alloy	0.002 ~ 0.003 ~ 0.006	★ 130 ~ 200 ~ 260	-	☆ 130 ~ 200 ~ 260	-
GH	Carbon Steel	0.006 ~ 0.008 ~ 0.012	☆ 390 ~ 590 ~ 820	☆ 390 ~ 590 ~ 820	-	-
	Alloy Steel	0.006 ~ 0.008 ~ 0.012	☆ 330 ~ 520 ~ 720	☆ 390 ~ 520 ~ 720	-	-
	Mold Steel	0.006 ~ 0.008 ~ 0.010	☆ 260 ~ 460 ~ 590	☆ 260 ~ 460 ~ 590	-	-
	Austenitic Stainless Steel	0.006 ~ 0.008 ~ 0.010	☆ 330 ~ 520 ~ 660	☆ 330 ~ 520 ~ 660	-	-
	Martensitic Stainless Steel	0.006 ~ 0.008 ~ 0.010	☆ 490 ~ 660 ~ 820	-	-	-
	Precipitation Hardened Stainless Steel	0.006 ~ 0.008 ~ 0.010	☆ 300 ~ 390 ~ 490	-	-	-
	Gray Cast Iron	0.006 ~ 0.008 ~ 0.012	-	☆ 390 ~ 590 ~ 820	☆ 390 ~ 590 ~ 820	-
	Nodular Cast Iron	0.006 ~ 0.008 ~ 0.010	-	☆ 330 ~ 490 ~ 660	☆ 330 ~ 490 ~ 660	-
	Ni-base Heat Resistant Alloy	0.004 ~ 0.006 ~ 0.008	☆ 70 ~ 100 ~ 160	-	-	-
	Hard Materials (≤ 60HRC)	0.002 ~ 0.003 ~ 0.006	-	-	-	★ 160 ~ 260 ~ 330

- Bold numbers in the graph indicate the most recommended starting conditions. Adjust cutting speed and feed rate according to the actual machining conditions.
- Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys
- When using GH chipbreaker for fine pitch cutters, recommended feed is fz ≤ 0.008 ipt

★ : 1st Recommendation
☆ : 2nd Recommendation

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MFSN88

High Efficiency Milling with a 2° Lead Angle

Economical Double-sided 8-edge Insert

Reduces Chattering with a Low Cutting Force Design

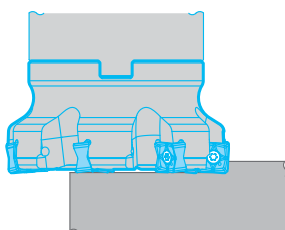
Good for Shoulder Roughing and Large Lineup of Sizes from Ø32mm for Various Machining Applications

1 Economical Double-sided 8-edge Insert Good for Shoulder Roughing

Cost reduction with a near 0° lead angle

Shoulder Roughing

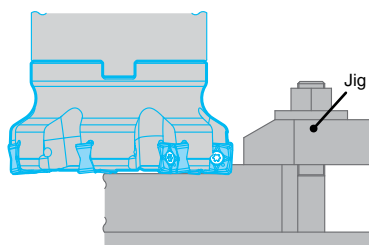
Cost reduction by switching from 0° lead angle cutter with positive inserts



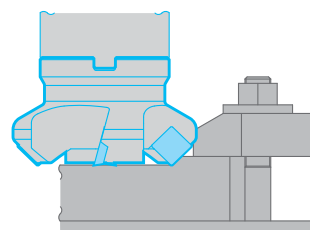
See page [M45](#) for unmachined corner portion

Facing Without Interfering with Fixtures

MFSN88



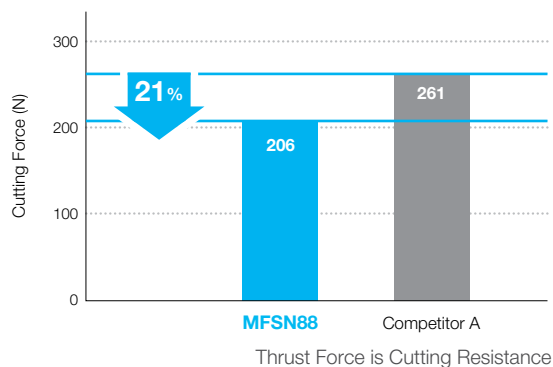
Conventional 45° Cutter



2 Reduces Chattering with a Low Cutting Force Design

Chatter resistant medium to rough machining range

Cutting Force Comparison (Internal Evaluation)



Cutting Conditions : $V_c = 660 \text{ sfm}$, $f = 0.006 \text{ ipt}$, $D.O.C. = 0.118''$
Cutter Diameter Ø63mm, Workpiece : 1049 Steel

3 Extended Tool Life with MEGACOAT NANO Technology

Insert grade and chipbreaker lineup for various machining applications



GM Chipbreaker
1st Recommendation
(General Purpose)



GH Chipbreaker
Tough Edge

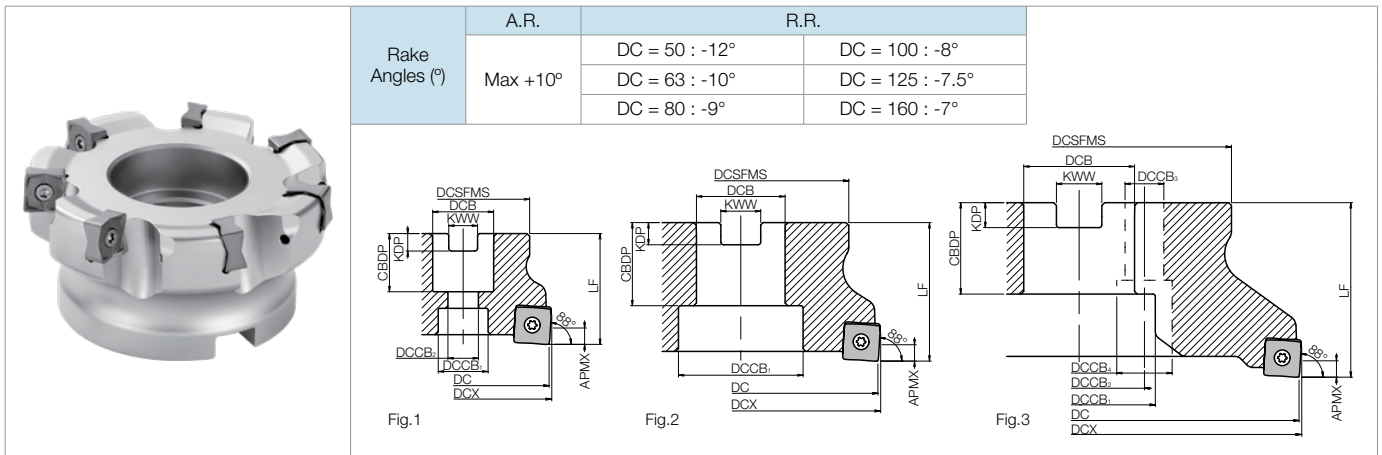


SM Chipbreaker
for Stainless Steel



Facing

MFSN88 Face Mill (Metric Size)



Toolholder Dimensions

Part Number			Stock	No. of Inserts	Dimensions (mm)										Drawing	Weight (kg)	Shim					
					DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW				DCCB ₃	DCCB ₄			
Inch Bore Dia.	Fine Pitch	MFSN 88080R-6T-G	●	6	80	82	70	1.000"	20	13	50	1.063"	0.236"	0.375"	-	-	Fig.1	1.1	No			
		88100R-7T-G	●	7	100	102	78	1.250"	45	-		1.339"	0.315"	0.500"			Fig.1	1.5				
		88125R-9T-G	●	9	125	127	89	1.500"	55		63	1.496"	0.394"	0.625"			Fig.2	2.5				
		88160R-11T-G	●	11	160	162	110	2.000"	70	0.433"		0.750"	Fig.2	4.1								
	Extra Fine Pitch	MFSN 88080R-9T-G	●	9	80	82	70	1.000"	20	13	50	1.063"	0.236"	0.375"	-	-	Fig.1	1.1	No			
		88100R-11T-G	●	11	100	102	78	1.250"	45	-		1.339"	0.315"	0.500"			Fig.1	1.5				
		88125R-13T-G	●	13	125	127	89	1.500"	55		63	1.496"	0.394"	0.625"			Fig.2	2.6				
		88160R-15T-G	●	15	160	162	110	2.000"	70	0.433"		0.750"	Fig.2	4.3								
Metric Bore Dia.	Fine Pitch	MFSN 88050R-4T-M-G	●	4	50	52	48	22	17.5	11	40	21	6.3	10.4	-	-	Fig.1	0.3	No			
		88063R-5T-M-G	●	5	63	65		18	40		21	7	12.4	0.4								
		88080R-6T-M-G	●	6	80	82	70	27	20	13	50	24	7	12.4			-	-		Fig.2	1.1	No
		88100R-7T-M-G	●	7	100	102	78	32	45	-		30	8	14.4							1.4	
		88125R-9T-M-G	●	9	125	127	89	40	55		63	33	9	16.4			14	20		Fig.3	2.4	
		88160R-11T-M-G	●	11	160	162	110		40	55		16.4	4.2									
	Extra Fine Pitch	MFSN 88050R-5T-M-G	●	5	50	52	48	22	17.5	11	40	21	6.3	10.4	-	-	Fig.1	0.3	No			
		88063R-7T-M-G	●	7	63	65		18	40		21	7	12.4	0.4								
		88080R-9T-M-G	●	9	80	82	70	27	20	13	50	24	7	12.4			-	-		Fig.1	1.1	No
		88100R-11T-M-G	●	11	100	102	78	32	45	-		30	8	14.4							1.4	
		88125R-13T-M-G	●	13	125	127	89	40	55		63	33	9	16.4			14	20		Fig.3	2.5	
		88160R-15T-M-G	●	15	160	162	110		40	55		16.4	4.3									

Recommended Cutting Conditions **M125**Applicable Inserts **M124**

Spare Parts (Both Metric & Inch Size Bore Dia.)

Part Number		Spare Parts			
		Insert Screw	Wrench	Anti-seize Compound	Arbor Bolt
Fine Pitch	MFSN 88050R-4T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
	88063R-5T-M-G				HH10X30
	88080R-6T-(M)-G				HH12X35
	88100R-7T-(M)-G				-
	88125R-9T-(M)-G				-
	88160R-11T-(M)-G				-
Extra Fine Pitch	MFSN 88050R-5T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
	88063R-7T-M-G				HH10X30
	88080R-9T-(M)-G				HH12X35
	88100R-11T-(M)-G				-
	88125R-13T-(M)-G				-
	88160R-15T-(M)-G				-

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard Item △ : Phaseout Item (will be removed from next catalog)

Contact your local Kyocera sales engineer to upgrade old products to new technology

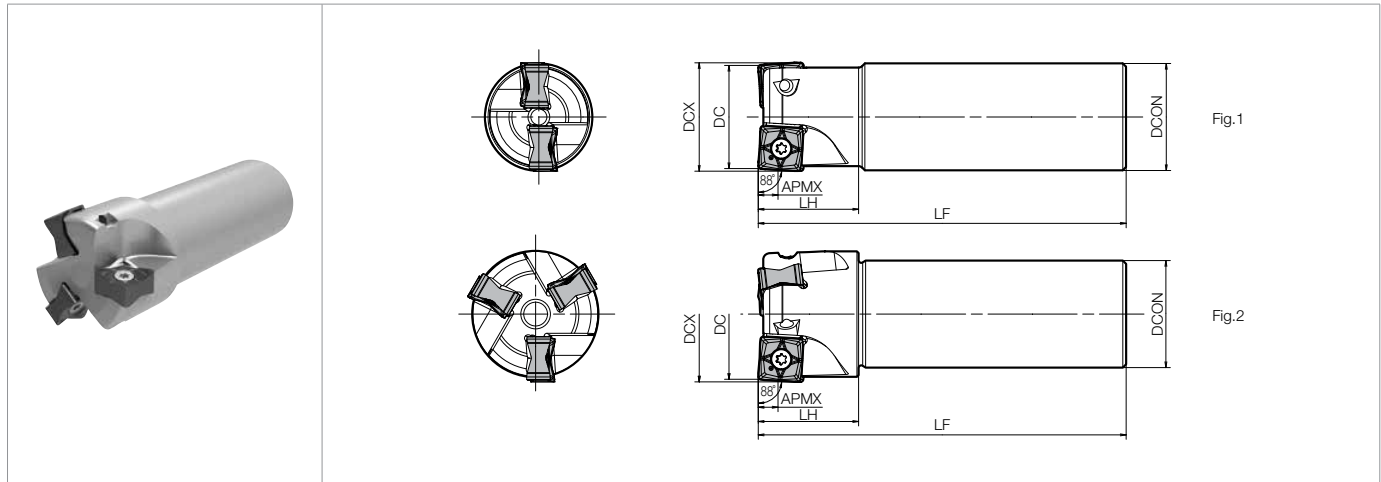
(Customer Service) 800.823.7284 - Option 1

(Technical Support) 800.823.7284 - Option 2




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MFSN88 End Mill (Metric Size)



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)							Rake Angles		Spare Parts		
												Insert Screw	Wrench	Anti-seize Compound
			DC	DCX	DCON	LF	LH	APMX	A.R. (Max)	R.R.				
MFSN 88032R-S32-2T-G	●	2	32	34	32	110	30	5	10°	-15.5°	SB-4090TRP	DTPM-15	P-37	
88040R-S32-3T-G	●	3	40	42						-13°	Recommended Tightening Torque 3.5 Nm			


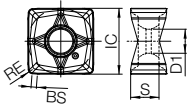

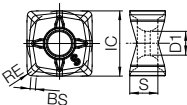

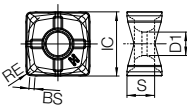
Recommended Cutting Conditions ➡ M125

Applicable Inserts

Usage Classification

- ★ Roughing / 1st Choice
- ☆ Roughing / 2nd Choice
- Finishing / 1st Choice
- Finishing / 2nd Choice
- (Hardness Under 45HRC)

P	Free-Cutting Steel	■	☆	★		
	Carbon/Alloy Steel	■	☆	★		
	Austenitic Stainless Steel		★	☆		
M	Martensitic Stainless Steel		★			
	Precipitation Hardened Stainless Steel		★			
K	Gray Cast Iron				★	
	Nodular Cast Iron				★	
N	Non-ferrous Metals					
S	Heat-Resistant Alloys		★			
	Titanium Alloy		★			
H	Hard Materials			□		★

Insert (Right-hand Shown)		Part Number	Dimensions (in)					Cermet	MEGACOAT NANO				MEGA COAT HARD
			IC	S	D1	BS	RE		TN620M	PR1535	PR1525	PR1510	
 General Purpose		SNMU 130508EN-GM	0.512	0.217	0.185	0.039	1/32	●	●	●	●		
 Low Cutting Force		SNMU 130508EN-SM							●	●	●		
 Tough Edge (Heavy Milling)		SNMU 130508EN-GH							●	●	●	●	

Recommended Cutting Conditions (Coated Carbide)

Coated Carbide

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc : sfm)			
			MEGACOAT NANO			MEGACOAT HARD
			PR1535	PR1525	PR1510	PR015S
GM	Carbon Steel	0.0039~0.0079~0.0118	☆ 390~590~820	★ 390~590~820	-	-
	Alloy Steel	0.0039~0.0079~0.0118	☆ 330~520~720	★ 330~520~720	-	-
	Mold Steel	0.0039~0.0059~0.0098	★ 260~460~590	★ 260~460~590	-	-
	Austenitic Stainless Steel	0.0039~0.0059~0.0098	☆ 330~490~660	☆ 330~490~660	-	-
	Martensitic Stainless Steel	0.0039~0.0059~0.0098	☆ 330~490~660	-	-	-
	Precipitation Hardened Stainless Steel	0.0039~0.0059~0.0098	★ 300~390~490	-	-	-
	Gray Cast Iron	0.0039~0.0079~0.0118	-	-	★ 390~590~820	-
	Nodular Cast Iron	0.0039~0.0059~0.0098	-	-	★ 330~490~660	-
	Ni-base Heat Resistant Alloys	0.0039~0.0047~0.0079	☆ 70~100~160	-	-	-
SM	Carbon Steel	0.0024~0.0047~0.0079	-	☆ 390~590~820	-	-
	Alloy Steel	0.0024~0.0047~0.0079	-	☆ 330~520~720	-	-
	Mold Steel	0.0024~0.0031~0.0059	-	☆ 260~460~590	-	-
	Austenitic Stainless Steel	0.0024~0.0047~0.0079	★ 330~490~660	☆ 330~490~660	-	-
	Martensitic Stainless Steel	0.0024~0.0047~0.0079	★ 330~490~660	-	-	-
	Precipitation Hardened Stainless Steel	0.0024~0.0047~0.0079	☆ 300~390~490	-	-	-
	Gray Cast Iron	0.0024~0.0047~0.0079	-	-	☆ 390~590~820	-
	Nodular Cast Iron	0.0024~0.0039~0.0059	-	-	☆ 330~490~660	-
	Ni-base Heat Resistant Alloys	0.0024~0.0031~0.0059	★ 70~100~160	-	-	-
GH	Titanium Alloys	0.0024~0.0031~0.0059	★ 130~200~260	-	-	-
	Carbon Steel	0.0059~0.0098~0.0138	-	☆ 390~590~820	-	-
	Alloy Steel	0.0059~0.0098~0.0138	-	☆ 330~520~720	-	-
	Mold Steel	0.0039~0.0079~0.0118	-	☆ 260~460~590	-	-
	Gray Cast Iron	0.0059~0.0098~0.0138	-	-	☆ 390~590~820	-
	Nodular Cast Iron	0.0039~0.0079~0.0118	-	-	☆ 330~490~660	-
GH	Hard Materials (≤ 60HRC)	0.0039~0.0079~0.0118	-	-	-	★ 260~330~390

- Center value in the table indicate the most recommended value. Adjust cutting speed and feed rate according to the actual machining conditions
- Machining with coolant is recommended for Ni-base heat resistant alloy and titanium alloys

★: 1st Recommendation ☆: 2nd Recommendation

Cermet

Chipbreaker	Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade (Cutting Speed Vc : sfm)
			Cermet
GM	Carbon Steel	0.002~0.005~0.006	★ 660~820~980
	Alloy Steel	0.002~0.005~0.006	★ 590~720~820
	Mold Steel	0.002~0.004~0.005	★ 490~590~720

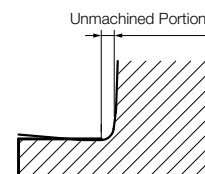
★: 1st Recommendation

Applicable Chipbreakers

Cutter Type	Chipbreaker		
	GM	SM	GH
Fine Pitch	✓	✓	✓
Extra Fine Pitch	✓	✓	✓ (Feed rate is recommended under fz = 0.008 ipt)

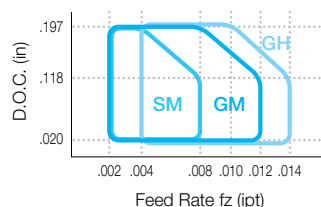
Reference Data for Unmachined Corner Portion

D.O.C.	1mm	2mm	3mm	4mm	5mm
Unmachined Portion	0.82mm	0.93mm	0.97mm	1.00mm	1.04mm

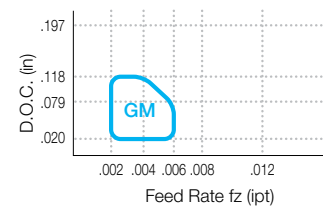


Applicable Chipbreaker Range

Coated Carbide



Cermet

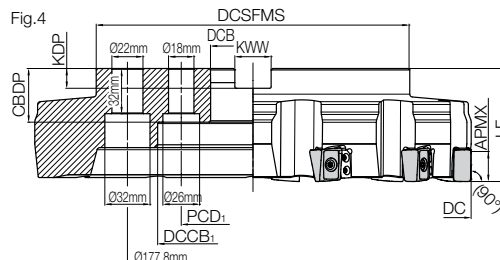
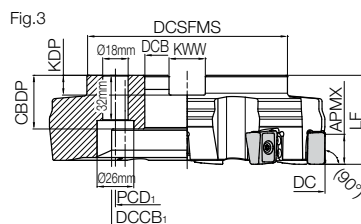
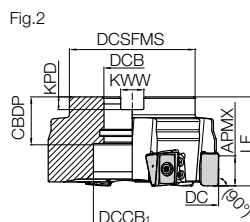
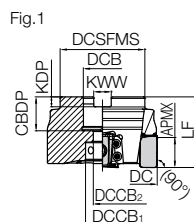




Facing

MFLN90 Face Mill

For MFLN45 and MFLN70, see page M42~M43

Rake
Angles
(°)

A.R.

Max. +4.5°

R.R.

-16.5° ~ 13.5°

Toolholder Dimensions (Metric)

Part Number				Stock	No. of Inserts	Dimensions (mm)										Coolant Hole	Drawing	Weight (kg)	
						DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX				PCD ₁
Inch Bore Dia.	MFLN	90080R-4T	●	4	80	60	1.000"	24	13	50	1.063"	0.236"	0.375"	20	-	Yes	Fig.1	1.0	
		90100R-4T	●		100	70	1.250"	45	1.339"		0.315"	0.500"	Fig.1				1.6		
		90125R-6T	●	6	125	89	1.500"	55	63	1.496"	0.394"	0.625"	Fig.2				3.0		
		90160R-7T	●	7	160	110	2.000"	90			0.433"	0.750"	Fig.2				4.6		
		90200R-8T	●	8	200	142	1.875"	132	-	63	1.496"	0.551"	1.000"			101.6	No	Fig.3	7.2
		90250R-10T	●	10	250			172										Fig.3	10.5
		90315R-12T	●	12	315	222		205		80	Fig.4	21.8							
Metric Bore Dia.	MFLN	90080R-4T-M	●	4	80	60	27	24	13	50	24	7	12.4	20	-	Yes	Fig.1	1.0	
		90100R-4T-M	●		100	70	32	45	30		8	14.4	Fig.2				1.5		
		90125R-6T-M	●	6	125	89	40	55	63	33	9	16.4	66.7				No	Fig.2	2.9
		90160R-7T-M	●	7	160	110		90										Fig.2	4.5
		90200R-8T-M	●	8	200	142	60	132	-	63	38	14	25.7			101.6		Fig.3	6.9
		90250R-10T-M	●	10	250			172										Fig.3	10.3
		90315R-12T-M	●	12	315	222		205		80							Fig.4	20.9	

Spare Parts

Part Number	Spare Parts						
	Insert Screw	Wrench	Shim	Shim Screw	Wrench	Anti-seize Compound	Arbor Bolt
MFPN ...080R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15	P-37	HH12X35
...100R-4T(-M)							-
...315R-12T(-M)							

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

Applicable Inserts M127

Applicable Insert Selection

	LOGU221616ER-GM (Corner-R)	LOGU2216PAER-GM (Corner Chamfer)
MFLN45	✓	Not Applicable
MFLN70	✓	Not Applicable
MFLN90	✓	✓

PR1525 : 1st recommendation for wear resistance. Great for scale removal and cast iron machining

PR1535 : Defect resistant, tough substrate for stable machining




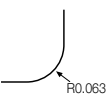

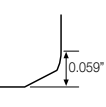
● Applicable Inserts

Usage Classification

★ Roughing / 1st Choice

☆ Roughing / 2nd Choice

P	Free-Cutting Steel	☆	★
	Carbon/Alloy Steel	☆	★
K	Gray Cast Iron	☆	★
	Nodular Cast Iron	☆	★

Insert (Right-hand Shown)	Part Number	Dimensions (in)					MEGACOAT NANO	
		W1	S	D1	INSL	BS	PR1535	PR1525
 Corner-R  R0.063"	LOGU 221616ER-GM	0.492	0.654	0.268	0.898	0.248	●	●
 Corner Chamfer  0.059"	LOGU 2216PAER-GM	0.492	0.665	0.268	0.898	0.189	●	●

● MFLN90

★: 1st Recommendation ☆: 2nd Recommendation

Workpiece Material	D.O.C. (in)		Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc : sfm)	
	Width of Cut (≤0.5xDC)	Width of Cut (>0.5xDC)		MEGACOAT NANO	
				PR1535	PR1525
Carbon Steel	~0.709	~0.591	0.004 ~ 0.008 ~ 0.016	☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Alloy Steel				☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Mold Steel				☆ 230 ~ 330 ~ 390	★ 260 ~ 390 ~ 490
Gray Cast Iron	~0.787	~0.709	0.004 ~ 0.008 ~ 0.016	☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590
Nodular Cast Iron				☆ 260 ~ 390 ~ 490	★ 330 ~ 490 ~ 590

- 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.

◆ How to Replace the Insert Shim Seat

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.

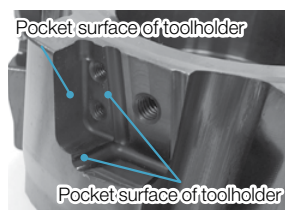


Fig.1

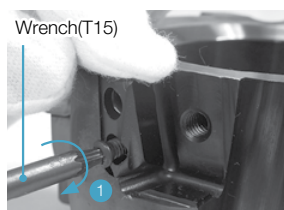


Fig.2

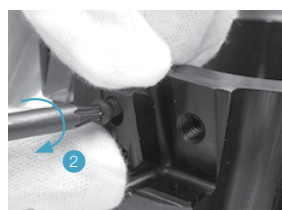


Fig.3



Fig.4

◆ How to Mount Inserts

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 (20IP) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 Nm)
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.

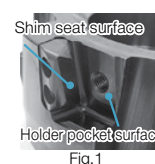


Fig.1



Fig.2

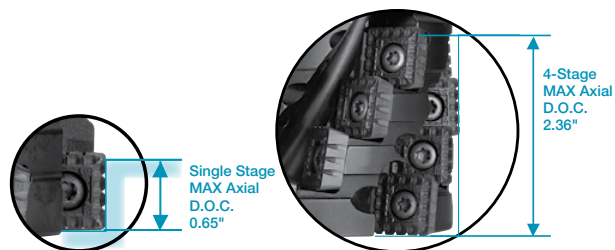


Fig.3

MSRS90 Heavy Milling Cutter



- Multiple Cutting Edge Lengths Available
1, 2, and 4-Stage (ø3.00in, ø80mm, ø100mm)



- High Efficiency, Low Cutting Force and Low Vibration Milling Cutter
- Neutral and Corner-R Insert

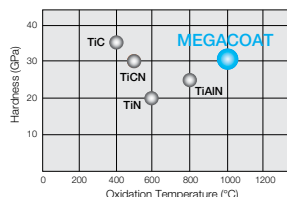
Applicable to Shouldering (Cutting Angle: 90°), High Feed Cutting (Cutting Angle: 30°), Plunging, and Side Cutting.

Custom-ordered Milling Cutter with High Performance Notched Neutral Inserts Offer Expansive Possibilities



Neutral Insert with Corner-R is Available for a Variety of Applications

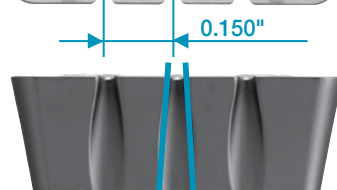
Long Tool Life with MEGACOAT



High Hardness and High Oxidation Resistance
Long Tool Life: MEGACOAT

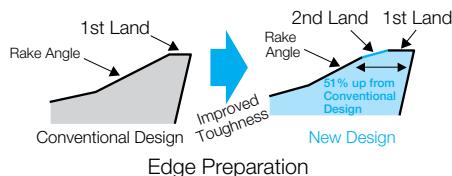


Notched Insert SPMT180616EN type



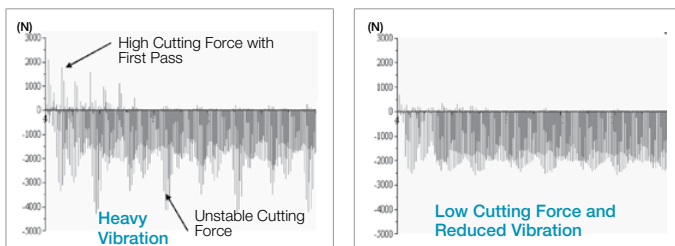
- Notched inserts break chips into smaller pieces and reduce cutting forces.
- Available for high feed cutting due to lower cutting forces at workpiece entry.
- New, double-land edge prep improves the cutting edge strength, while a small notch helps to reduce cutting forces

- Neutral Insert
- Available for Various cutting angles
- Cutting edge length 0.709"



● Low Cutting Force (Effect of Notched Insert)

Comparison of Cutting Forces



Competitor A

MSRS90

Notched Inserts Provide Lower Cutting Forces and Reduce Vibration



Tapered Cutter



Plunge Cutter



45° Face Mill










High Feed Cutter

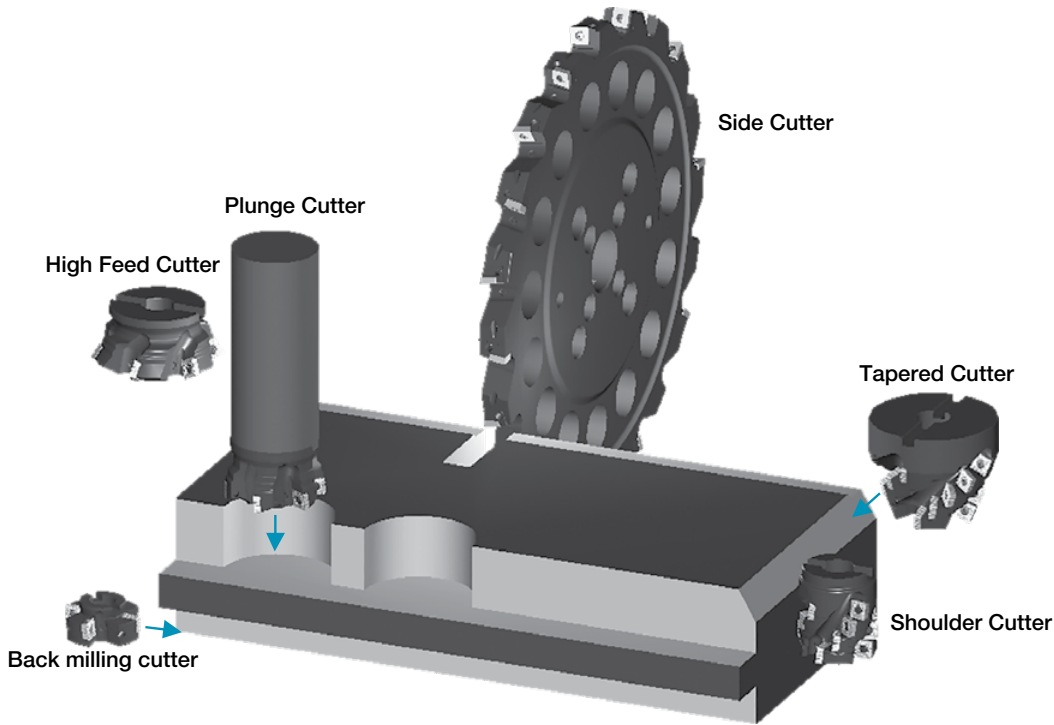


Shoulder Cutter

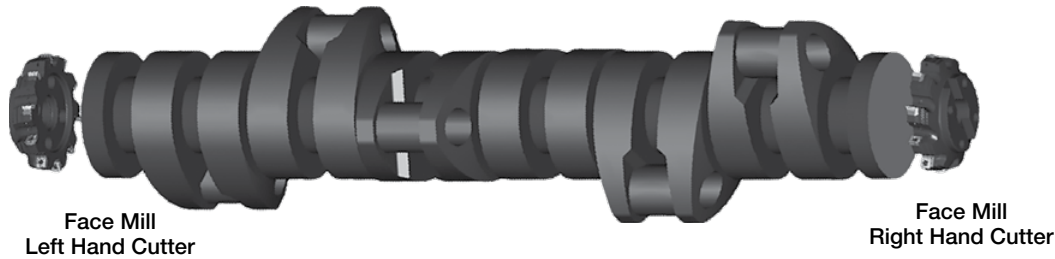
Applicable Inserts: Available for Various Applications

Applications	Chipbreaker Type	3-Notched	4-Notched		Solid Edge					
General Purpose (1st Recommendation)	Standard	 NB3	+	 NB4						
Low Cutting Force	Low Cutting Force	 NB3P	+	 NB4P						
Focusing on Edge Strength	Without Notch (Usable with Notched Inserts)	 NB3				or	 NB4)	+	

Various Cutting Possibilities with Custom-Design and Standard Cutters

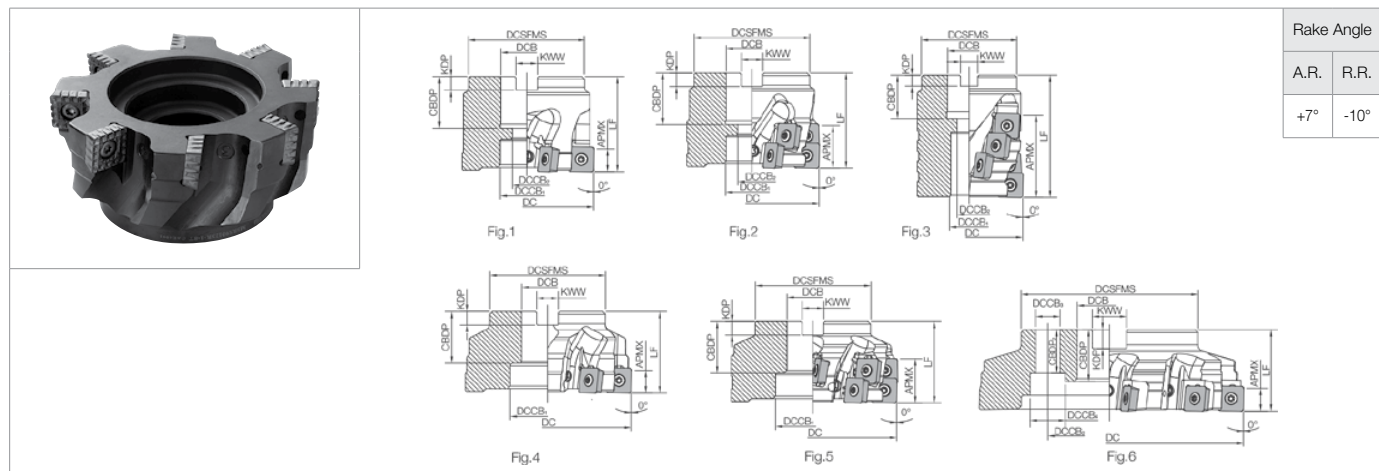


● Shaft Length Determination



INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MSRS90 Heavy Milling (Inch)



Rake Angle	
A.R.	R.R.
+7°	-10°

Toolholder Dimensions (Inch)

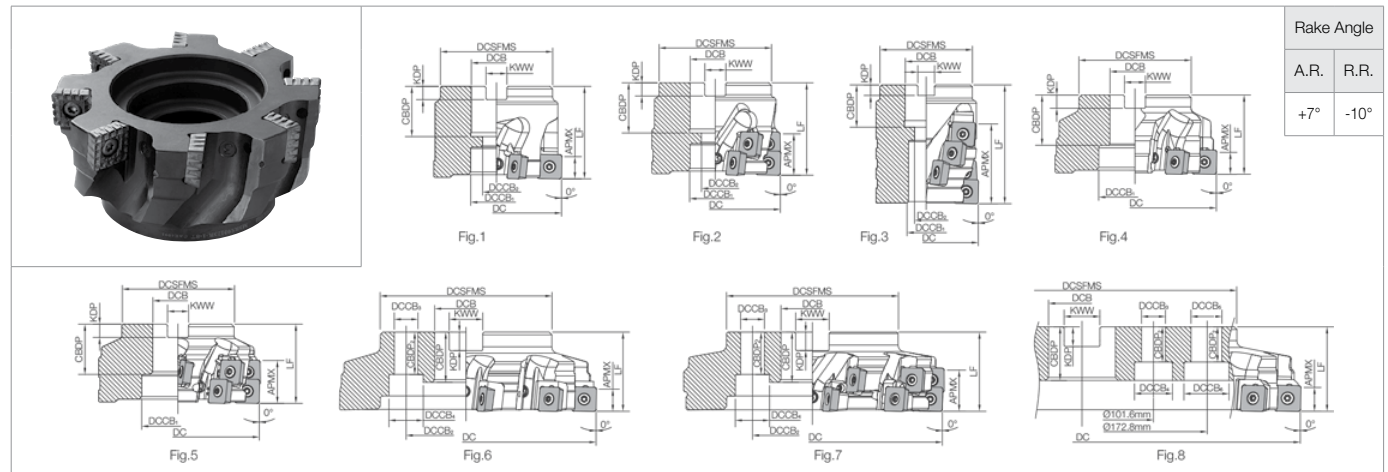
Part Number	Stock	No. of Inserts	No. of Flutes	No. of Stages	Dimensions (in)												Drawing	Weight (kg)	
					DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	DCCB ₃	DCCB ₄			CBDP ₂
MSRS 903000R-1-4T	●	4	4	1	3.00	2.75	1.00	0.87	0.55	2.36	1.06	0.24	0.38	0.65	-	-	-	Fig.1	2.43
	●	8	4	2										1.22				Fig.2	2.21
	903000R-2-4T	●	6	6										1				4.00	3.35

Applicable Inserts

Part Number	Applicable Inserts M28				
	3-Notch	4-Notch	3-Notch / Low Cutting Force	4-Notch / Low Cutting Force	Without Notch
MSRS90...	SPMT 180616EN-NB3	SPMT 180616EN-NB4	SPMT 180616EN-NB3P	SPMT 180616EN-NB4P	SPMT 180616EN-V

Spare Parts **M132**Recommended Cutting Conditions **M132~133**

MSRS90 Heavy Milling (Metric)



Toolholder Dimensions (Metric)

Part Number	Stock	No. of Inserts	No. of Flutes	No. of Stages	Dimensions (mm)															Drawing	Weight (kg)
					DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	CBDP ₂		
Inch Bore Dia.	MSRS 90080R-1-4T	● 4	4	1										16.5						Fig.1	1.4
	90080R-2-4T	● 8	4	2	80	70	1.250"	27	18	60	1.260"	0.315"	0.500"	31						Fig.2	1.2
	90080R-4-4T	● 16		4						85				60						Fig.3	1.5
	90100R-1-6T	● 6		1						70				16.5						Fig.1	2.3
	90100R-2-6T	● 12	6	2	100			39	21	90				31						Fig.2	2.1
	90100R-4-6T	□ 24		4		85	1.500"							60						Fig.3	3.2
	90125R-1-8T	□ 8		1										16.5						Fig.4	2.6
	90125R-2-8T	□ 16	8	2	125			55						31						Fig.5	2.4
	90160R-1-8T	● 8		1										16.5						Fig.4	4.3
	90160R-2-8T	□ 16	8	2	160	100	2.000"	70			1.496"	0.433"	0.750"	31						Fig.5	4.1
	90200R-1-10T	● 10	10	1	200					60				16.5						Fig.6	6.7
	90200R-2-10T	□ 20		2		130			101.6					31	18	26	-	-	32	Fig.7	6.6
	90250R-1-12T	● 12	12	1	250		1.875"	-				0.551"	1.000"	16.5						Fig.6	12.6
	90250R-2-12T	□ 24		2										31						Fig.7	12.5
	90315R-1-14T	● 14	14	1	315	220								16.5	17	27	22	32	25	Fig.8	16.1
	90315R-2-14T	□ 28		2																-	16.0
Metric Bore Dia.	MSRS 90080R-1-4T-M	● 4	4	1										16.5						Fig.1	1.3
	90080R-2-4T-M	● 8	4	2	80	70	27	20	13	60	24	7	12.4	31						Fig.2	1.1
	90080R-4-4T-M	● 16		4						85				60						Fig.3	1.4
	90100R-1-6T-M	● 6		1						70				16.5						Fig.1	2.2
	90100R-2-6T-M	● 12	6	2	100			32	45	90	30	8	14.4	31	-	-	-	-	-	Fig.2	2.0
	90100R-4-6T-M	□ 24		4		85								60						Fig.3	3.1
	90125R-1-8T-M	● 8		1										16.5						Fig.4	2.6
	90125R-2-8T-M	□ 16	8	2	125									31						Fig.5	2.4
	90160R-1-8T-M	● 8		1										16.5						Fig.6	4.2
	90160R-2-8T-M	□ 16	8	2	160	110			66.7					31	14	20	-	-	28	Fig.7	4.0
	90200R-1-10T-M	● 10	10	1	200					60				16.5						Fig.6	6.7
	90200R-2-10T-M	□ 20		2		140			101.6					31	18	26	-	-	32	Fig.7	6.6
	90250R-1-12T-M	● 12	12	1	250		60	-			40	14	25.7	16.5						Fig.6	12.6
	90250R-2-12T-M	□ 24		2										31						Fig.7	12.5
	90315R-1-14T-M	● 14	14	1	315	220								16.5	17	27	22	32	25	Fig.8	16.1
	90315R-2-14T-M	□ 28		2										31						-	16.0

Applicable Inserts

Part Number	Applicable Inserts M28				
MSRS90...	SPMT 180616EN-NB3	SPMT 180616EN-NB4	SPMT 180616EN-NB3P	SPMT 180616EN-NB4P	SPMT 180616EN-V

Spare Parts M132

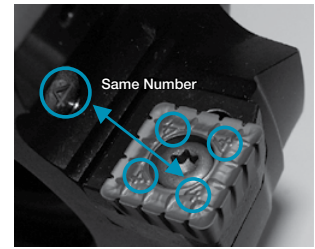
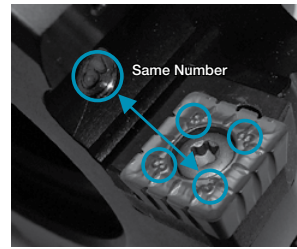
Recommended Cutting Conditions M132~133

● Caution when Installing Notched Inserts

It is important to install the appropriate notched insert into the correct position. Failure to do so may result in damage to the toolholder body. The appropriate insert is marked on the 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
90100R-2-6T	12		2	6	6
90100R-4-6T	24		4	12	12

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



● Spare Parts (Inch and Metric Toolholders)

Part Number		Spare Parts							
		Clamp Screw	Wrench	Cartridge		Clamp Screw	Wrench	Anti-Seize Compound	Arbor Bolt
				MAP-1806M	MAP-1806S (Bottom Edge Only)				
Without Cartridge	MSRS 903000R-1-4T	SB-60120TR	TT-25L	-	-	-	-	P-37	HH1/2-1.25
	903000R-2-4T								
	903000R-4-4T								
	MSRS 904000R-1-6T								
	904000R-2-6T								
With Cartridge	MSRS 905000R-1-8T								
	MSRS 906000R-1-8T								
	908000R-1-10T								
	9010000R-1-12T								
	MSRS 90080R-○-4T								
Without Cartridge	90100R-○-6T	SB-60120TR	TT-25L	-	-	-	-	P-37	HH16X45 HH20X55
	90125R-○-8T								
	MSRS 90160R-○-8T								
	90315R-○-14T								
	MSRS 90080R-○-4T-M								
With Cartridge	90100R-○-6T-M								
	90125R-○-8T-M								
	MSRS 90160R-○-8T-M								
	90315R-○-14T-M								
	MSRS 90160R-○-8T-M								

*1: MAP-1806M is only for applicable MSRS90...R-1... cutters

*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 (P-37) thinly on portion of taper and thread prior to installation.

◆ Recommended Cutting Conditions

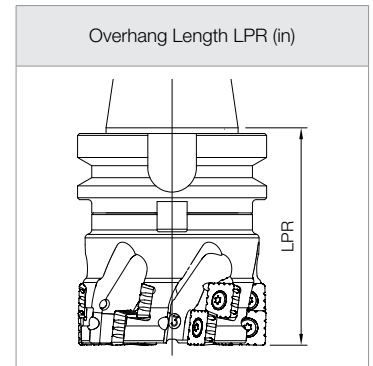
Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grade (Vc sfm)	
	General Purpose NB3+NB4	Low Cutting Force NB3P+NB4P	MEGACOAT	
			PR1230	PR1210
Soft Steel	0.004~0.008~0.010	0.004~0.008~0.010	★ 400~500~725	☆ 400~500~725
Carbon Steel	0.004~0.008~0.010	0.004~0.008~0.010	★ 325~500~650	☆ 325~500~650
Alloy Steel	0.004~0.006~0.008	0.004~0.006~0.008	★ 325~500~650	☆ 325~500~650
Die Steel	0.004~0.006~0.008	0.004~0.005~0.006	★ 325~500~600	☆ 325~500~600
Gray Cast Iron	0.004~0.008~0.012	0.004~0.008~0.010	☆ 325~600~825	★ 325~600~825
Nodular Cast Iron	0.004~0.008~0.010	0.004~0.007~0.008	☆ 325~600~725	★ 325~600~725
Stainless Steel	Not Recommended			
Non-Ferrous Metals	Not Recommended			

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ Recommended Cutting Conditions (Shouldering)

MSRS90100R-1-6T

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. × ae (in)	Chip Removal Rate (in ³ /min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	< 4.72	Vc = 590 sfm	fz = 0.008 ipt	0.59 × 3.15	50.41
	4.72~7.87	Vc = 590 sfm	fz = 0.008 ipt	0.59 × 1.57	25.20
	≥ 7.9	Vc = 425 sfm	fz = 0.004 ipt	0.59 × 1.57	16.05
Carbon Steel	< 4.72	Vc = 490 sfm	fz = 0.008 ipt	0.59 × 3.15	42.05
	4.72~7.87	Vc = 490 sfm	fz = 0.008 ipt	0.59 × 1.57	20.99
	≥ 7.91	Vc = 325 sfm	fz = 0.004 ipt	0.59 × 1.57	13.97



MSRS90100R-2-6T

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. × ae (in)	Chip Removal Rate (in ³ /min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	Less than 4.72in	Vc = 590 sfm	fz = 0.008 ipt	1.18 × 1.97	62.97
	4.72~7.87in	Vc = 590 sfm	fz = 0.008 ipt	1.18 × 1.18	37.77
	7.91in and over	Vc = 425 sfm	fz = 0.004 ipt	1.18 × 0.98	20.08
Carbon Steel	Less than 4.72in	Vc = 490 sfm	fz = 0.008 ipt	1.18 × 1.97	52.54
	4.72~7.87in	Vc = 490 sfm	fz = 0.008 ipt	1.18 × 1.18	31.55
	7.91in and over	Vc = 325 sfm	fz = 0.004 ipt	1.18 × 0.98	17.51

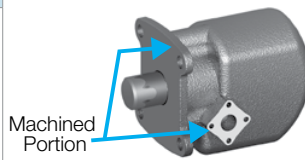
MSRS90100R-4-6T

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. × ae (in)	Chip Removal Rate (in ³ /min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	Less than 5.51in	Vc = 590 sfm	fz = 0.008 ipt	2.36 × 0.79	50.41
	5.51in~7.87in	Vc = 590 sfm	fz = 0.008 ipt	2.36 × 0.39	25.20
	7.91in and over	Vc = 425 sfm	fz = 0.004 ipt	2.36 × 0.39	16.05
Carbon Steel	Less than 5.51in	Vc = 490 sfm	fz = 0.008 ipt	2.36 × 0.79	42.05
	5.51in~7.87in	Vc = 490 sfm	fz = 0.008 ipt	2.36 × 0.39	20.99
	7.91in and over	Vc = 325 sfm	fz = 0.004 ipt	2.36 × 0.39	13.97

■ Case Studies

Ductile Iron, 60-40-8

- Industrial Parts
- Vc = 490 sfm
- D.O.C. × ae = 0.236" × 2.559"
- fz = 0.006 ipt (Vf = 16.93 ipm)
- MSRS90100R-1-6T (6 Flutes)
- SPMT180616EN-NB3/NB4 (PR1210)



MSRS90
(PR1210)

Chip Removal = 15.7 in³/min

Competitor A

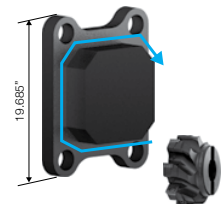
6.5 in³/min

MSRS90 doubled the cutting efficiency compared to competitor A. Competitor A required 2 passes (D.O.C. × ae = 0.118 × 2.56"). MSRS90 completed the cut in only 1 pass. Cutting time was reduced.

(User Evaluation)

Chrome-Moly Steel

- Construction Machine Part
- Vc = 660 sfm
- D.O.C. × ae = 0.394" × 1.968"
- fz = 0.004 ipt (Vf = 15.748 ipm)
- MSRS90125R-1-8T (8 Flutes)
- SPMT180616EN-NB3/NB4 (PR1230)



MSRS90
(PR1230)

Chip Removal = 12.2 in³/min

Competitor B

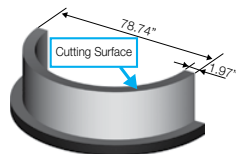
9.3 in³/min

MSRS90 improved the cutting efficiency to 1.3 times that of competitor B. Competitor C machined with D.O.C. × ae = 0.20 × 1.97". Tool cost is reduced to 1/3 although competitor C is expensive using 2-corner inserts. MSRS90 reduced machining cost as well as improved cutting efficiency.

(User Evaluation)

Tool Steel

- Shipbuilding Parts
- Vc = 490 sfm
- D.O.C. × ae = 0.394" × 0.394"~1.968"
- fz = 0.004 ipt (Vf = 9.449 ipm)
- MSRS90160R-1-8T (8 Flutes)
- SPMT180616EN-NB3/NB4 (PR1230)



MSRS90
(PR1230)

Chip Removal = 7.32 in³/min

Competitor C

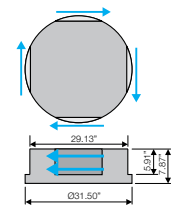
3.66 in³/min

MSRS90 doubled the cutting efficiency compared to competitor C (D.O.C. × ae = 0.197 × 0.394~1.968"). MSRS90 doubled the axial D.O.C. due to lower cutting forces. MSRS90 can increase D.O.C. as the cutting speed (Vc=325 increases to 490). This resulted in total cutting efficiency improvement.

(User Evaluation)

Structural Steel

- Power Generation Parts
- Vc = 530 sfm
- D.O.C. × ae = 0.394" × 0~0.787"
- fz = 0.006 ipt (Vf = 19.69 ipm)
- MSRS90125R-1-8T (8 Flutes)
- SPMT180616EN-NB3/NB4 (PR1230)



MSRS90
(PR1230)

12 faces/edge

Competitor D

8 faces/edge

MSRS90 improved tool life to 1.5 times that of competitor D. Competitor D required 2 passes (D.O.C. × ae = 0.472 × 0~0.394") with a low feed rate (Vf = 15.748 ipm). Competitor D was very noisy due to large cutting forces. MSRS90 reduces the cutting force and noise level.

(User Evaluation)

MSR Heavy Milling Cutter

PR1230
(for Steel)

Low Cutting
Force Design

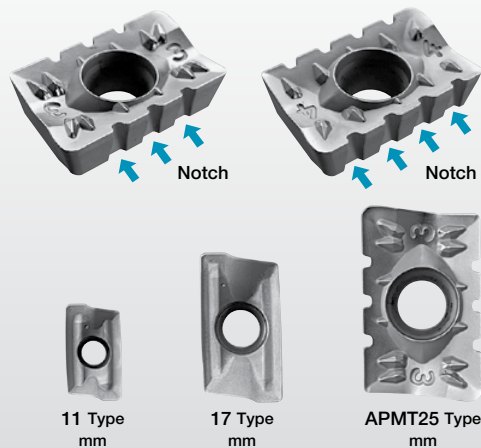
PR1210
(for Cast Iron)

High Efficiency Heavy Milling

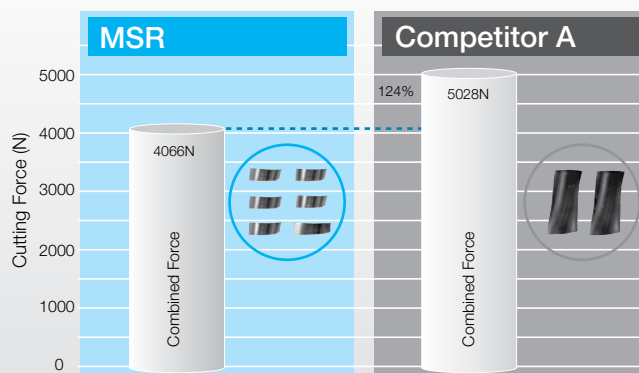
Notched inserts reduce cutting forces, and enable high feed rates by reducing chatter
Improved chip evacuation and low cutting forces due to the special chipbreaker designs
Enables heavy milling and deep cutting, and also drastically improves cutting efficiency (Reduced Cycle Time)

Notched Insert

Size Comparison (Full-Scale)



Cutting Force Comparison

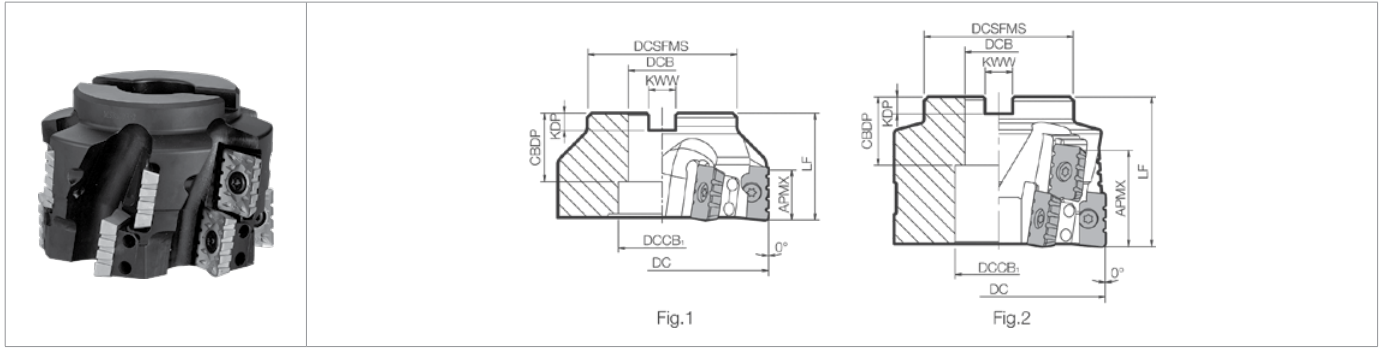


The exclusive notched chipbreakers provide low cutting resistance and good chip evacuation.

(User Evaluation)









MSR Heavy Milling (Inch)



Toolholder Dimensions (Inch)

Part Number	Stock	No. of Inserts	No. of Flutes	No. of Stages	Dimensions (in)										Rake Angle		Drawing	Weight (kg)
					DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KDP	KWW	APMX	A.R.	R.R.		
MSR 3000R-1	●	4	4	1	3.00	2.25	1.00	0.790	-	1.970	1.020	0.240	0.375	0.925	+9°	-5°	Fig.1	1.1
4000R-1-1.5ID	●	6	6	1	4.00	2.75	1.50	1.610	-	1.970	1.260	0.310	0.500	0.925			Fig.1	1.6
4000R-2-1.5ID	●	12	6	2						2.760				1.770			Fig.2	2.2

Spare Parts

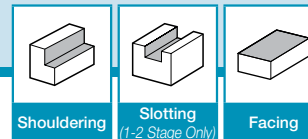
Part Number	Spare Parts					
	Clamp Screw	Wrench	Shim	Clamp Screw	Wrench	Anti-Seize Compound
						
MSR 3000R... MSR 4000R...	SB-60120TR	TT-25L	MAP-2506	SB-40140TR	DT-15	P-37
	For Insert Clamp		For Shim Clamp			

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

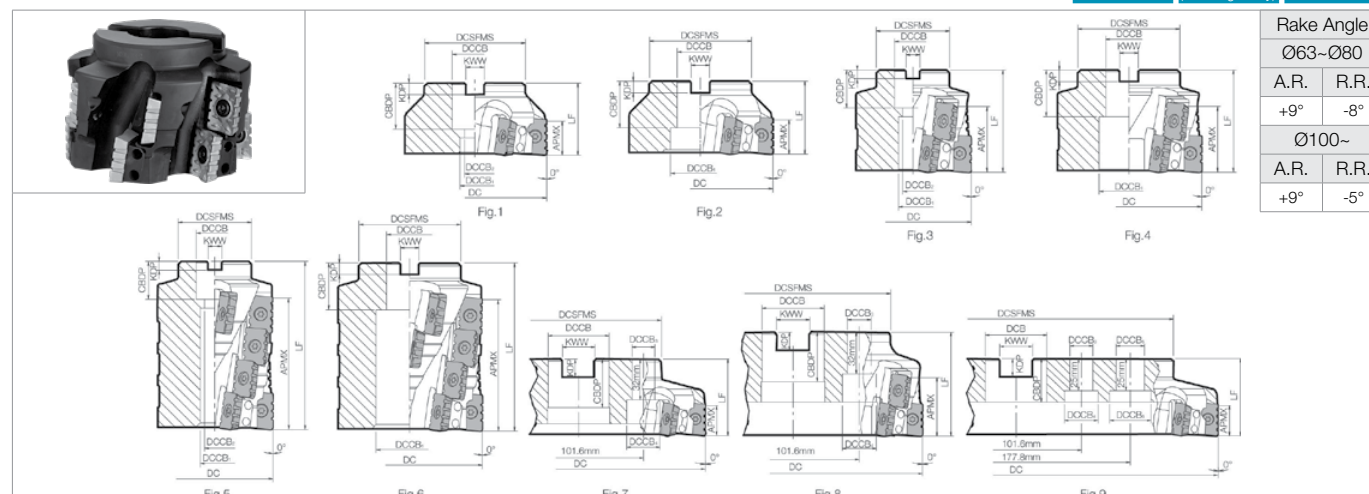
Applicable Inserts

Part Number	Applicable Inserts M22			
	3-Notch	4-Notch	3-Notch / Low Cutting Force	4-Notch / Low Cutting Force
MSR 3000R... MSR 4000R...	APMT 2506○○ER-NB3	APMT 2506○○ER-NB4	APMT 250616ER-NB3P	APMT 250616ER-NB4P
Custom-Ordered Left-hand Cutter	APMT 250616EL-NB3	APMT 250616EL-NB4	-	-

Recommended Cutting Conditions M138-M139



MSR Heavy Milling (Metric)



● Toolholder Dimensions (Inch Bore Dia.)

	Part Number	Stock	No. of Inserts	No. of Flutes	No. of Stages	Dimensions (mm)														Drawing	Weight (kg)
						DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KDP	KWW	APMX	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆		
Inserts	MSR 063R-1	●	4	1	1	63	50	1.000"	20	14	65	1.024"	0.236"	0.375"	23.5	-	-	-	-	Fig.1	0.8
	063R-2	●	8	2	2	63	50	1.000"	20	14	85	1.024"	0.236"	0.375"	45	-	-	-	-	Fig.3	1.0
	080R-1	●	4	1	1	80	55	1.000"	20	14	50	1.024"	0.236"	0.375"	23.5	-	-	-	-	Fig.1	1.1
	080R-2	●	8	2	2	80	55	1.000"	20	14	70	1.260"	0.315"	0.500"	45	-	-	-	-	Fig.3	1.6
	080R-2-31.75	●	8	4	4	80	70	1.250"	27	18	70	1.260"	0.315"	0.500"	45	-	-	-	-	Fig.3	1.7
	080R-4	●	16	4	4	80	55	1.000"	20	14	115	1.024"	0.236"	0.375"	90	-	-	-	-	Fig.5	2.6
	080R-4-31.75	●	16	4	4	80	70	1.250"	27	18	115	1.260"	0.315"	0.500"	90	-	-	-	-	Fig.5	2.7
	100R-1	●	6	1	1	100	70	1.250"	42	-	50	1.260"	0.315"	0.500"	23.5	-	-	-	-	Fig.2	1.6
	100R-2	●	12	2	2	100	70	1.250"	42	-	70	1.260"	0.315"	0.500"	45	-	-	-	-	Fig.4	2.2
	100R-4	●	24	4	4	100	70	1.250"	42	-	115	1.260"	0.315"	0.500"	90	-	-	-	-	Fig.6	3.6
High Feed Milling	125R-1	●	6	1	1	125	85	1.500"	54	-	60	1.496"	0.394"	0.625"	23.5	-	-	-	-	Fig.2	3.5
	125R-2	●	12	2	2	125	85	1.500"	54	-	70	1.496"	0.394"	0.625"	45	-	-	-	-	Fig.4	3.8
	125R-4	●	24	4	4	125	85	1.500"	54	-	115	1.496"	0.394"	0.625"	90	-	-	-	-	Fig.6	6.1
	160R-1	●	8	1	1	160	100	2.000"	68	-	60	1.496"	0.433"	0.750"	23.5	-	-	-	-	Fig.2	5.8
	160R-2	●	16	2	2	160	100	2.000"	68	-	70	1.496"	0.433"	0.750"	45	-	-	-	-	Fig.4	6.4
	160R-4	●	32	4	4	160	100	2.000"	68	-	115	1.496"	0.433"	0.750"	90	-	-	-	-	Fig.6	10.7
	200R-1	●	10	1	1	200	130	1.875"	-	-	60	1.496"	0.551"	1.000"	23.5	18	26	-	-	Fig.7	7.5
	200R-2	●	20	2	2	200	130	1.875"	-	-	80	1.496"	0.551"	1.000"	45	18	26	-	-	Fig.8	10.4
	250R-1	●	12	1	1	250	130	1.875"	-	-	60	1.496"	0.551"	1.000"	23.5	18	26	-	-	Fig.7	10.9
	250R-2	●	24	2	2	250	130	1.875"	-	-	80	1.496"	0.551"	1.000"	45	18	26	-	-	Fig.8	14.7
Other Applications	315R-1	□	14	14	1	315	220	1.875"	-	-	60	1.378"	0.551"	1.000"	23.5	17	27	22	32	Fig.9	16.0

- Shim is not available for MSR063R (DC=63).
- Mounting bolt (HH12x40) is included for MSR063R and MSR080R. Mounting bolt (HH16x45) is included for MSR080R-O-31.75.
- It is not recommended using only top edge part (D.O.C.=30mm) for 4 stages type. If D.O.C. is small, use 1 stage or 2 stage type.
- Deep slotting is not recommended with these cutters.

Spare Parts **M135**
Applicable Inserts **M135**

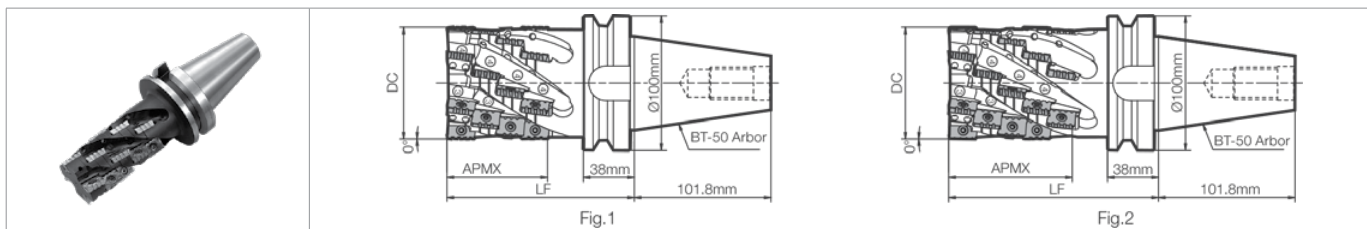
● Toolholder Dimensions (Metric Bore Dia.)

	Part Number	Stock	No. of Inserts	No. of Flutes	No. of Stages	Dimensions (mm)														Drawing	Weight (kg)
						DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LH	CDBP	KDP	KWW	APMX	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆		
Inserts	MSR 063R-1M	●	4	1	1	63	50	27	20	14	65	22	7.2	12.4	23.5	-	-	-	-	Fig.1	0.7
	063R-2M	●	8	2	2	63	50	27	20	14	85	22	7.2	12.4	45	-	-	-	-	Fig.3	0.9
	080R-1M	●	4	1	1	80	55	27	20	14	50	22	7.2	12.4	23.5	-	-	-	-	Fig.1	1.0
	080R-2M	●	8	2	2	80	55	27	20	14	70	22	7.2	12.4	45	-	-	-	-	Fig.3	1.5
	080R-4M	●	16	4	4	80	55	27	20	14	115	22	7.2	12.4	90	-	-	-	-	Fig.5	2.5
	100R-1M	●	6	1	1	100	70	32	42	-	50	28	8	14.4	23.5	-	-	-	-	Fig.2	1.5
	100R-2M	●	12	2	2	100	70	32	42	-	70	28	8	14.4	45	-	-	-	-	Fig.4	2.0
	100R-4M	●	24	4	4	100	70	32	42	-	115	28	8	14.4	90	-	-	-	-	Fig.6	3.2
	125R-1M	●	6	1	1	125	85	40	58	-	60	30	9	16.4	23.5	-	-	-	-	Fig.2	3.4
	125R-2M	●	12	2	2	125	85	40	58	-	70	30	9	16.4	45	-	-	-	-	Fig.4	3.7
High Feed Milling	125R-4M	●	24	4	4	125	85	40	58	-	115	30	9	16.4	90	-	-	-	-	Fig.6	6.0
	160R-1M	●	8	1	1	160	100	40	68	-	60	30	10	16.4	23.5	-	-	-	-	Fig.2	6.1
	160R-2M	●	16	2	2	160	100	40	68	-	70	30	10	16.4	45	-	-	-	-	Fig.4	6.8
	200R-1M	●	10	1	1	200	130	60	-	-	60	38	15	25.4	23.5	18	26	-	-	Fig.7	7.0
	200R-2M	●	20	2	2	200	130	60	-	-	80	38	15	25.4	45	18	26	-	-	Fig.8	9.9
	250R-1M	●	12	1	1	250	130	60	-	-	60	38	15	25.4	23.5	18	26	-	-	Fig.7	10.3
	250R-2M	●	24	2	2	250	130	60	-	-	80	38	15	25.4	45	18	26	-	-	Fig.8	14.2
	315R-1M	□	14	14	1	315	230	60	-	-	60	35	15	25.4	23.5	17	27	22	32	Fig.9	15.5

- Shim is not available for MSR063R (DC=63).
- Arbor bolt (HH12x35) is included for MSR063R / MSR080R.
- It is not recommended using only top edge part (D.O.C.=30mm) for 4 stages type. If D.O.C. is small, use 1 stage or 2 stage type.
- Deep slotting is not recommended with these cutters.

Spare Parts **M135**
Applicable Inserts **M135**

MSR-BT50



Toolholder Dimensions

Part Number	Stock	No. of Inserts	No. of Flutes	No. of Stages	Dimensions (mm)			Rake Angle		Drawing	Weight (kg)
					DC	LF	APMX	A.R.	R.R.		
MSR 063R-BT50-4	●	16	4	4	63	160	90	+9°	-8°	Fig.1	5.7
063R-BT50-5	●	20		5		180	111			Fig.2	6.2
080R-BT50-4	●	16	4	4	80	160	90			Fig.1	6.9
080R-BT50-5	●	20		5		180	111			Fig.2	7.4
100R-BT50-4	●	24	6	4	100	160	90	+9°	-5°	Fig.1	9.6
100R-BT50-5	●	30		5		180	111			Fig.2	10.5

Spare Parts

Part Number	Spare Parts					
	Clamp Screw	Wrench	Shim	Clamp Screw	Wrench	Anti-Seize Compound
MSR 063R-□□						
MSR 080R-□□	SB-60120TR	TT-25L	MAP-2506	SB-40140TR	DT-15	P-37
315R-□□	For Insert Clamp		For Shim Clamp			
MSR 063R-BT50-□	SB-60120TR	TT-25L	MAP-2506	SB-40140TR	DT-15	P-37
MSR 080R-BT50-□	For Insert Clamp		For Shim Clamp			
100R-BT50-□						

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Applicable Inserts

Part Number	Applicable Inserts			
MSR... MSR...M	APMT 2506□□ER-NB3	APMT 2506□□ER-NB4	APMT 250616ER-NB3P	APMT 250616ER-NB4P
Custom-Ordered Left-hand Cutter	APMT 250616EL-NB3	APMT 250616EL-NB4	-	-

Caution when Installing Notched Inserts

It is important to install the appropriate notched insert into the correct position. Failure to do so may result in damage to the toolholder body. The appropriate insert is marked on the pocket of the cutter body.

(3) is for APMT2506□□ER-NB3

(4) is for APMT2506□□ER-NB4

Recommended Cutting Conditions

(No. of Inserts - Example)

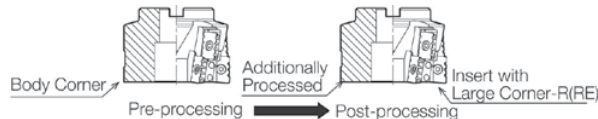
Part Number	No. of Inserts	No. of Flutes	No. of Inserts Notched	
			NB3	NB4
MSR 100R-1	6	6	3	3
100R-2	12		6	6
100R-4	24		12	12

Caution when Installing the Insert with Corner-R(RE) 4.0

When installing the insert with corner-radius 4.0mm, additional modifications for the body will be necessary. Refer to the table below for the recommended modifications.

Insert Corner-R (RE)	Additional Processing Dimension to Body Corner (mm)
4.0	R2.0

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



◆ Recommended Cutting Conditions

Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grade (Vc sfm)		
	General Purpose NB3+NB4	Low Cutting Force NB3P+NB4P	MEGACOAT		PVD Coated Carbide
			PR1230	PR1210	PR830
Carbon Steel	0.008	0.006	★ 330~490~660	-	☆ 300~490~590
Cast Iron	0.008	0.006	-	★ 330~490~660	-
Stainless Steel	Not Recommended				
Non-Ferrous Metals	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 protruding length of toolholder is small, set the cutting speed to slightly higher than the recommended cutting conditions.

· When the protruding length of toolholder is large, set the cutting speed to slightly lower than the recommended cutting conditions.

★ : 1st Recommendation ☆ : 2nd Recommendation

◆ Recommended Cutting Conditions (Shouldering)

MSR100R-1

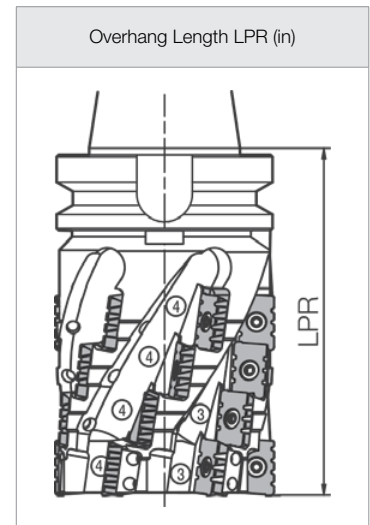
Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. × ae (in)	Chip Removal Rate (in³/min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Carbon Steel	< 3.94	Vc = 590 sfm	fz = 0.008 ipt	0.79 × 3.15	67.13
	3.94~7.87	Vc = 590 sfm	fz = 0.008 ipt	0.79 × 1.57	33.56
	≥ 7.91	Vc = 400 sfm	fz = 0.008 ipt	0.79 × 1.18	16.84
Cast Iron	< 3.94	Vc = 500 sfm	fz = 0.008 ipt	0.79 × 3.15	56.14
	3.94~7.87	Vc = 500 sfm	fz = 0.008 ipt	0.79 × 1.57	28.07
	≥ 7.91	Vc = 325 sfm	fz = 0.008 ipt	0.79 × 1.18	13.91

MSR100R-2

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. × ae (in)	Chip Removal Rate (in³/min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	< 5.12	Vc = 590 sfm	fz = 0.008 ipt	1.57 × 1.57	67.13
	5.12~9.06	Vc = 590 sfm	fz = 0.008 ipt	1.57 × 0.79	33.56
	≥ 9.09	Vc = 400 sfm	fz = 0.008 ipt	1.57 × 0.79	22.46
Carbon Steel	< 5.12	Vc = 500 sfm	fz = 0.008 ipt	1.57 × 1.57	56.14
	5.12~9.06	Vc = 500 sfm	fz = 0.008 ipt	1.57 × 0.79	28.07
	≥ 9.09	Vc = 325 sfm	fz = 0.008 ipt	1.57 × 0.79	18.55

MSR100R-4

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. × ae (in)	Chip Removal Rate (in³/min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	< 7.09	Vc = 590 sfm	fz = 0.008 ipt	2.95 × 0.79	63.16
	7.09~11.02	Vc = 590 sfm	fz = 0.008 ipt	2.95 × 0.39	31.61
	≥ 11.06	Vc = 400 sfm	fz = 0.008 ipt	2.95 × 0.39	21.05
Carbon Steel	< 7.09	Vc = 500 sfm	fz = 0.008 ipt	2.95 × 0.79	52.66
	7.09~11.02	Vc = 500 sfm	fz = 0.008 ipt	2.95 × 0.39	26.30
	≥ 11.06	Vc = 325 sfm	fz = 0.008 ipt	2.95 × 0.39	17.39



Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi- Function
Slot Mill
Ball-Nose Radius
Other Applications



◆ Recommended Cutting Conditions (Slotting)

MSR100R-1

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. \times ae (in)	Chip Removal Rate (in ³ /min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	< 3.94	Vc = 590 sfm	fz = 0.008 ipt	0.55 \times 3.94	58.95
	3.94~7.87	Vc = 500 sfm	fz = 0.008 ipt	0.28 \times 3.94	24.59
	\geq 7.91	Vc = 400 sfm	fz = 0.008 ipt	0.16 \times 3.94	11.23
Carbon Steel	< 3.94	Vc = 500 sfm	fz = 0.008 ipt	0.28 \times 3.94	24.59
	3.94~7.87	Vc = 400 sfm	fz = 0.008 ipt	0.16 \times 3.94	11.23
	\geq 7.91	Vc = 325 sfm	fz = 0.008 ipt	0.12 \times 3.94	6.96

MSR100R-2

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. \times ae (in)	Chip Removal Rate (in ³ /min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	< 5.12	Vc = 590 sfm	fz = 0.008 ipt	0.55 \times 3.94	58.95
	5.12~9.06	Vc = 500 sfm	fz = 0.008 ipt	0.28 \times 3.94	24.59
	\geq 9.09	Vc = 400 sfm	fz = 0.008 ipt	0.16 \times 3.94	11.23
Carbon Steel	< 5.12	Vc = 500 sfm	fz = 0.008 ipt	0.28 \times 3.94	24.59
	5.12~9.06	Vc = 400 sfm	fz = 0.008 ipt	0.16 \times 3.94	11.23
	\geq 9.09	Vc = 325 sfm	fz = 0.008 ipt	0.12 \times 3.94	6.96

MSR160R-1

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. \times ae (in)	Chip Removal Rate (in ³ /min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	< 3.94	Vc = 600 sfm	fz = 0.008 ipt	0.39 \times 6.30	56.63
	3.94~7.87	Vc = 500 sfm	fz = 0.008 ipt	0.20 \times 6.30	28.32
	\geq 7.91	Vc = 400 sfm	fz = 0.008 ipt	0.16 \times 6.30	14.83
Carbon Steel	< 3.94	Vc = 500 sfm	fz = 0.008 ipt	0.20 \times 6.30	23.43
	3.94~7.87	Vc = 400 sfm	fz = 0.008 ipt	0.12 \times 6.30	14.04
	\geq 7.91	Vc = 325 sfm	fz = 0.008 ipt	0.08 \times 6.30	6.22

MSR160R-2

Workpiece Material	Overhang Length LPR (in)	Cutting Conditions		D.O.C. \times ae (in)	Chip Removal Rate (in ³ /min)
		Cutting Speed (Vc)	Feed Rate (fz)		
Cast Iron	< 5.12	Vc = 600 sfm	fz = 0.008 ipt	0.39 \times 6.30	56.63
	5.12~9.06	Vc = 500 sfm	fz = 0.008 ipt	0.20 \times 6.30	23.43
	\geq 9.09	Vc = 400 sfm	fz = 0.008 ipt	0.16 \times 6.30	14.83
Carbon Steel	< 5.12	Vc = 500 sfm	fz = 0.008 ipt	0.20 \times 6.30	23.43
	5.12~9.06	Vc = 400 sfm	fz = 0.008 ipt	0.12 \times 6.30	11.11
	\geq 9.09	Vc = 325 sfm	fz = 0.008 ipt	0.08 \times 6.30	6.22

* Slotting is not recommended with 4 stage cutters

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

Q & A


Q-1 What cutting conditions are recommended in most cases for MSR?


A-1 $V_c = 500 \text{ sfm}$, $f_z = 0.008 \text{ ipt}$, larger cutting depth and smaller cutting width

In case of MSR100R-2

e.g.) Load Meter 120%

e.g.) Load Meter 90%

1st Pass	D.O.C. x ae: $0.59 \times 2.95''$
2nd Pass	
3rd Pass	

3rd Pass	2nd Pass	1st Pass
D.O.C x ae: $1.77 \times 0.98''$		

Q-2 What is the required equipment for MSR?

A-2 Maximum spindle revolution should be lower than 4000RPM. BT50 or larger.

* The reason it is not recommended for high RPM spindle machines is due to their lower torque value.

* Although MSR works with BT40 shank, maximum available f_z is about 0.004ipt.

Q-3 What are the points to remember when using a lower horsepower machine?

A-3 Do not use large size cutters. $\varnothing 2.5''$ or $\varnothing 3.0''$ are recommended

Increase cutting speed and decrease feed rate.

Set up conditions to get the largest available torque by checking torque curve of the machine.

In conditions of $V_c = 500 \text{ sfm}$, insufficient torque was available due to being in high gear.

In this case, use V_c which can exert enough torque, such as $V_c = 400 \text{ sfm}$.

* Machine torque curve is a priority.

Q-4 How do I deal with an unstable workpiece?

A-4 Decrease feed rate during the initial cut.

* Vibration and workpiece movement are most likely to occur upon the cutters initial entry into the cut.

• Effective combinations for maintaining cycle time while reducing the feedrate.

$V_c = 500 \text{ sfm}$, $f_z = 0.008 \text{ ipt}$

↓
 $V_c = 650 \text{ sfm}$, $f_z = 0.006 \text{ ipt}$

Q-5 What tool life can I expect?

A-5 Example:

Chip Weight: 1543lbs/Corner (Result by PR660)

Cutting Time: 90min. (Calculated Value)

Cutting Distance: 213.25ft (Calculated Value)

Metal Removal Rate? ➔ About 17.20lbs Chips Removed per Minute

Tool Life Time = 1543lbs (Chip Weight) ÷ 17.20lbs (Chip Evacuation Amount per 1min) = 90min

Cutting Distance = 90min (Time by the End of Tool Life) x 28.228ipm (Table Feed Ratio per 1min) = 213.25ft

* Cutting $V_c = 490 \text{ sfm}$, D.O.C. x ae: $0.787'' \times 2.756''$, $V_f = 28.228 \text{ ipm}$.

* Tool: MSR100R-2 (6 Flutes)

Q-6 How do I reduce chattering?

A-6 If chattering occurs, then the following conditions are recommended.

➔ Reduce cutting speed and increase feed rate.

In case of Steel

• $V_c = 250 \text{ sfm}$

• $f_z = 0.010 \text{ ipt}$

In case of Cast Iron

• $V_c = 250 \text{ sfm}$

• $f_z = 0.014 \text{ ipt}$

Inserts

45°~70°
Lead Angle

75°
Lead Angle

90°/88°
Lead Angle

High Feed
Milling

Finish
Milling

Multi-
Function

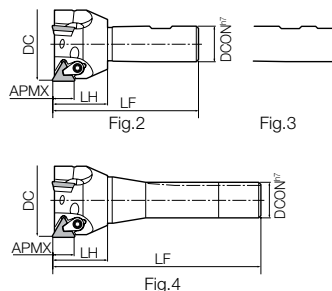
Slot Mill

Ball-Nose
Radius








Other
Applications

M
MILLING

MTP90 End Mill



Toolholder Dimensions

Part Number	Stock	Unit	No. of Inserts	Dimensions					Drawing	Rake Angle (°)		Spare Parts						
				DC	DCON	LF	LH	APMX		A.R. (Max)	R.R.	Clamp Set	Clamp	Clamp Screw	Wrench	Shim	Shim Clamp Screw	Wrench
															 FT LW		 SP SH	
MTP 90-075-75W	●	inch	2	0.75	0.750	3.28	1.25	0.34	Fig.2	+3°	-3°	CPS-2S	-	-	FT-15	-	-	-
90-100-75W	●		3	1.00				0.53										
90-125-75W	●		2	1.25														
90-150-75W	●		3	1.50														
90-200-75W	●		3	2.00	0.750	3.53	1.50	0.53	Fig.2	+5°	0°	CPS-3	-	-	LW-3	KPT-32	SH3X6	LW-2
90-200-125W	●		3	2.00	1.250	3.90	1.69	0.71										
90-250-125W	●		3	2.50														
MTP 90-200-R8	●		3	2.00	0.949	6.00	2.003	0.53	Fig.4	+5°		CPS-3	-	-	LW-3	KPT-32	SH3X6	LW-2

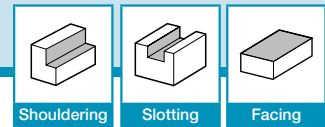
Applicable Inserts

Part Number	Applicable Inserts M14				Applicable PCD Inserts M30	
MTP90-075-75W MTP90-100-75W	-	-	-	-	-	TPG 22_
MTP90-125-75W MTP90-150-75W MTP90-200-75W MTP90-250-875W MTP90-200-R8	TPMR 32PDER-H	-	TPK 32PDTR TPK 32PDRF	TPG 32_ TPM 32_	-	-
MTP90...-125W	TPMR 43PDER-H	TPKR 43PDER-S	TPK 43PDTR TPK 43PDRF	-	-	-

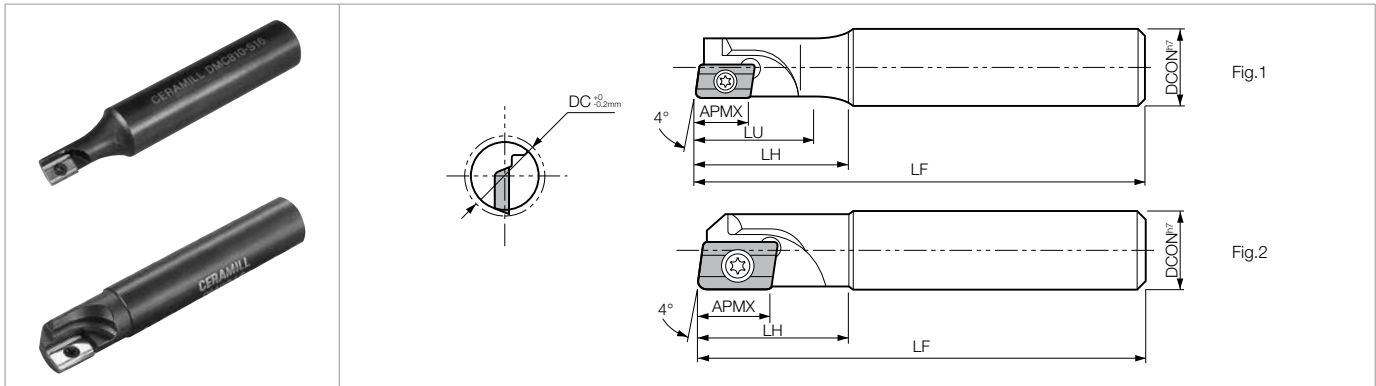
Recommended Cutting Conditions

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade (Vc sfm)					
		Cermet	MEGACOAT		PVD Coated Carbide	Carbide	PCD
		TN100M	PR1225	PR1210	PR830	KW10	KPD001 (KPD010)
Carbon Steel	~0.010	★ 390~660	★ 390~820	-	☆ 390~660	-	-
Alloy Steel	~0.010	★ 330~590	★ 330~720	-	☆ 330~590	-	-
Mold Steel	~0.008	★ 330~590	★ 260~590	-	☆ 260~490	-	-
Stainless Steel	~0.008	☆ 390~660	★ 390~720	-	☆ 390~660	-	-
Cast Iron	~0.010	-	-	★ 330~720	-	☆ 260~490	-
Non-ferrous Metals	~0.008	-	-	-	-	★ 330~980	★ 980~2620

★ : 1st Recommendation
☆ : 2nd Recommendation



DMC End Mill



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)						Rake Angle (°)		Drawing	Spare Parts	
			DC	DCON	LF	LH	LU	APMX	A.R.	R.R.		Clamp Screw	Wrench
DMC 810-S16	△	1	10	16	90	27	16	8.5	+3°	-11°	Fig.1	SB-2545TR	FT-8
811-S16	△		11			31	20		+5°	-10°			
812-S16	△		12			33.5	25		+6°	-8°			
814-S16	△		14		100	31	25		+8°	-6°			
815-S16	△		15			31	25		+8°	-6°			
816-S16	△	2	16	20	120	36	30	11.0	+5°	0°	Fig.2	SB-3060TR	FT-10
820-S20	△	3	20			36	30		+5°	0°			
DMC 810	△	1	10	10	70	20	-	8.5	+3°	-6°	Fig.2	SB-2545TR	FT-8
812	△		12	12	80	25	-		+3°	-5°			
DMC 020	△	2	20	20	110	30	-	11.0	+5°	0°	Fig.2	SB-3060TR	FT-10

Applicable Inserts

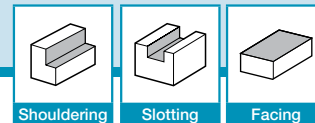
Part Number	Applicable Inserts ➡ M24	
DMC800(-S00)	NDCT 831TR NDCT 831FR	NDMM 831ER-SP
DMC000	NDCT 032TR NDCT 032FR	NDMM 031ER-SP NDMM 032ER-SP

DMC Recommended Cutting Conditions

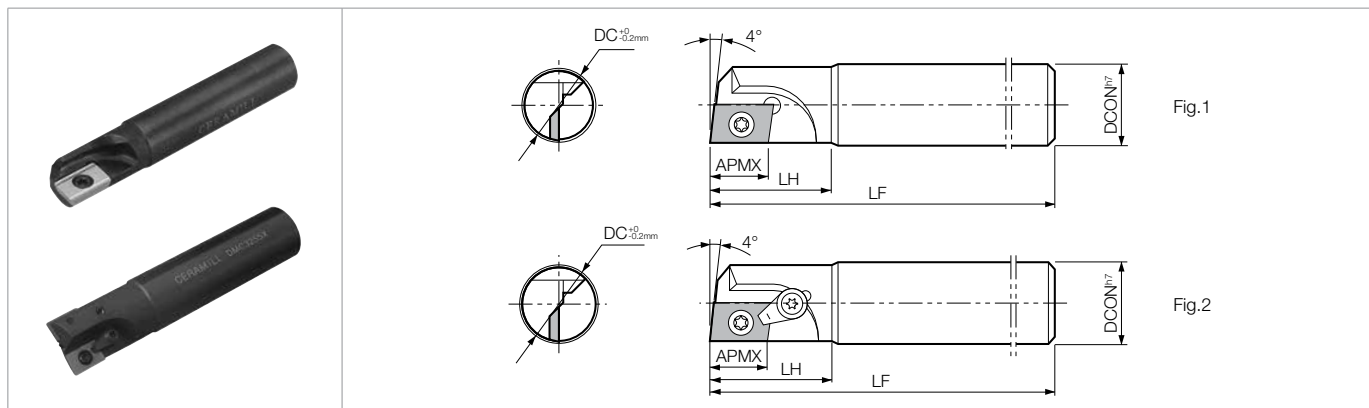
Workpiece Material	Feed Rate fz (ipr)	Recommended Insert Grade (Vc sfm)		Max. D.O.C. (in)		
		Cermet TN100M	Carbide KW10	Cutting Dia. (DC)	Slotting (D.O.C.)	Shouldering (D.O.C. x ae)
Carbon Steel	~0.008	★ 390~660	-	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Alloy Steel	~0.008	★ 330~590	-	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Mold Steel	~0.006	★ 330~590	-	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Stainless Steel	~0.006	☆ 390~660	-	~Ø12mm Ø14mm~	0.059 0.079	0.157 x 0.079 0.236 x 0.079
Cast Iron	~0.008	-	★ 260~490	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Non-ferrous Metals	~0.008	-	★ 330~980	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118

Use DMC800 with Max. D.O.C. = 0.236" for shouldering.




★ : 1st Recommendation ☆ : 2nd Recommendation



DMC-SX End Mill



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Drawing	Spare Parts		
			DC	DCON	LF	LH	APMX	A.R.	R.R.		Clamp Set	Clamp Screw	Wrench
													
DMC 316SXT 320SX 325SX 332SX 340SX	●	1	16	16	90	30	14.0	+3°	-3°	Fig.1	-	SB-4060TR	FT-15
	●		20	20	110				Fig.2		CPS-2TR	SB-4065TR	
	●	2	25	25	120	40				-2°			
	●		32	32	130					0°			
	●		40	32	150								
DMC 320SX-200 325SX-220 332SX-250	●	1	20	20	200	50	14.0	+3°	-3°	Fig.1	-	SB-4065TR	FT-15
	●	2	25	25	220	60			-2°				
	●		32	32	250	80			0°				

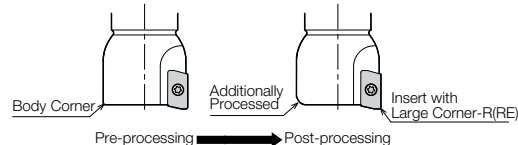
Applicable Inserts

Part Number	Applicable Inserts M24		
DMC 316SXT	NDCW 3205TR NDCW 321TR NDCW 322TR NDCW 325TR NDCW 3275TR NDCW 3210TR (NDCW 322TRX) (NDCW 322FRX)	NDCT 322TR NDCT 322FR (NDCT 322TRX)	NDMM 321ER-SP NDMM 322ER-SP
320SX			
325SX			
332SX			
340SX			
DMC 320SX-200			
325SX-220			
332SX-250			

When installing inserts with corner-R(RE) over 2.0mm, grind off the corner part of the tool's insert pocket to avoid contact with the workpiece.
Additional modifications for the body will be necessary. Ref. to the table below for the recommended modifications.
(Additional grind off is not necessary when corner-R(RE) is 0.8mm or less.)

Insert Corner-R(RE)	Additional Processing Dimension to Body Corner (mm)
2.0	R1.0
3.0	R1.6
4.0	R2.0

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



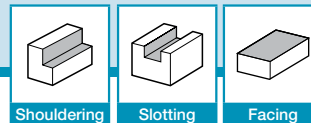
Inserts in parentheses () are applicable, however toolholder will be further out from insert bottom.
(See lower section of M141)

DMC-SX Recommended Cutting Conditions

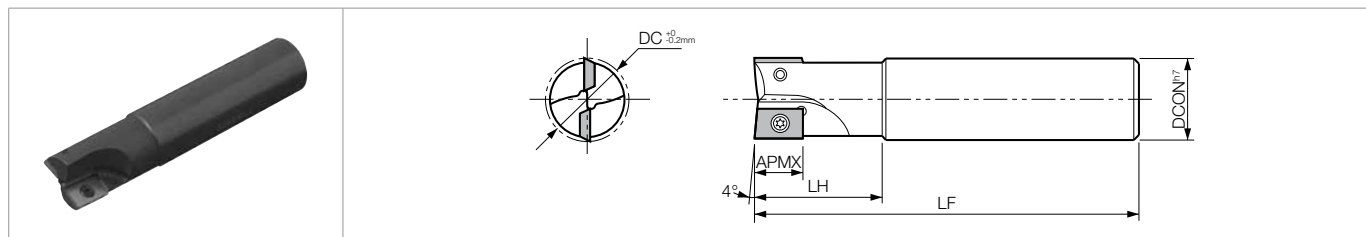
Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade (Vc sfm)		Max. D.O.C. (in)		
		Cermet	Carbide	Cutting Dia. (DC)	Slotting (D.O.C.)	Shouldering (D.O.C. x ae)
		TN100M	KW10			
Carbon Steel	~0.008	★ 390~660	-	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Alloy Steel	~0.008	★ 330~590	-	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Mold Steel	~0.006	★ 330~590	-	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Stainless Steel	~0.006	☆ 390~660	-	~Ø12mm Ø14mm~	0.059 0.079	0.157 x 0.079 0.236 x 0.079
Cast Iron	~0.008	-	★ 260~490	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118
Non-ferrous Metals	~0.008	-	★ 330~980	~Ø12mm Ø14mm~	0.079 0.118	0.236 x 0.079 0.354 x 0.118

Use DMC800 with Max. D.O.C. = 0.236" for shouldering.



★ : 1st Recommendation ☆ : 2nd Recommendation



DMC-H End Mill (High Rake)



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)					Rake Angle (°)		Spare Parts	
			DC	DCON	LF	LH	APMX	A.R.	R.R.	Clamp Screw	Wrench
											
DMC 316H	●	1	16	16	90	30	14.0	+5°	-3.5°	SB-4060TR	FT-15
	●		20	20	110			+6°	-2°		
	●	2	25	25	120	40		+8°	0°	SB-4065TR	
	●		32	32	130						
	●		40		150						

Applicable Inserts

Part Number	Applicable Inserts M24			Applicable PCD Inserts M30
DMC 316H	NDMM 321ER-SP NDMM 322ER-SP	NDCT 322TRX	NDCW 322TRX NDCW 322FRX	NDCW 3205FRX-NE NDCW 3205FRX (PCD)
320H				
325H				
332H				
340H				

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

◆ DMC-H Recommended Cutting Conditions

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grade (Vc sfm)				Max. D.O.C. (in)		
		Cermet	Carbide	PCD		Cutting Dia. (DC)	Slotting (D.O.C.)	Shouldering (D.O.C. x ae)
		TN100M	KW10	KPD230 (KPD001)	KPD010			
Carbon Steel	~0.008	★ 390~660	-	-	-	~Ø20mm	0.157	0.315 x 0.157
						Ø25mm~	0.315	0.551 x 0.236
Alloy Steel	~0.008	★ 330~590	-	-	-	~Ø20mm	0.157	0.315 x 0.157
						Ø25mm~	0.315	0.512 x 0.236
Mold Steel	~0.006	★ 330~590	-	-	-	~Ø20mm	0.118	0.197 x 0.079
						Ø25mm~	0.236	0.394 x 0.118
Stainless Steel	~0.006	☆ 390~660	-	-	-	~Ø20mm	0.118	0.236 x 0.079
						Ø25mm~	0.236	0.512 x 0.118
Cast Iron	~0.008	-	★ 260~490	-	-	~Ø20mm	0.157	0.315 x 0.157
						Ø25mm~	0.236	0.551 x 0.236
Non-ferrous Metals	~0.008	-	★ 330~980	★ 980~1640	☆ 980~1640	~Ø20mm	0.157	0.315 x 0.157
						Ø25mm~	0.236	0.551 x 0.236

★ : 1st Recommendation ☆ : 2nd Recommendation

• Above inserts are also applicable to DMC○○○SX type, but the conventional NDCW1503○○TR type insert is not applicable for this end mill.

Toolholder Part Number	Insert Part Number	NDC...TRX NDCW...(T/F)RX	NDCW...TR NDCW...(T/F)R	Toolholder Part Number	NDC...TRX NDCW...(T/F)RX	NDCW...TR NDCW...(T/F)R
DMC-H	No Interference of Relieve Surface		Less Relief (D.O.C. Must be Under 0.197") 	DMC-SX	No Interference of Relieve Surface	No Interference of Relieve Surface
DMC-SX	No Interference of Relieve Surface		Less Relief (D.O.C. Must be Under 0.197") 	DMC-H	No Interference of Relieve Surface	No Interference of Relieve Surface

MFAH

Milling Cutter for Finishing Aluminum

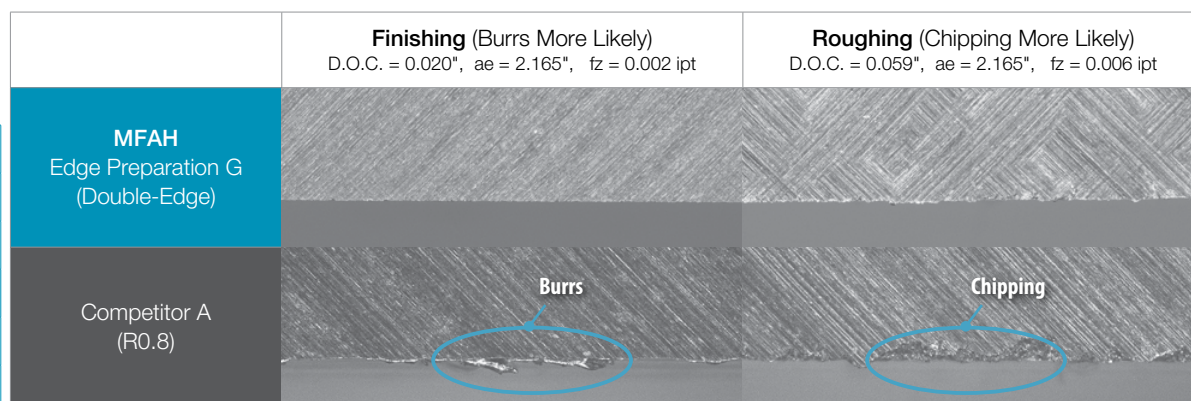
Low Cutting Forces Minimize Burrs for High Quality Machining Results

Easily Adjustable Blade Runout with 2 Body Types and 3 Inserts for a Variety of Milling Applications

1 Minimizes Burrs for High Quality Machining Results

Large True Rake Angle and Double-edge Insert Designs

Burr and Chipping Comparison (Internal Evaluation)

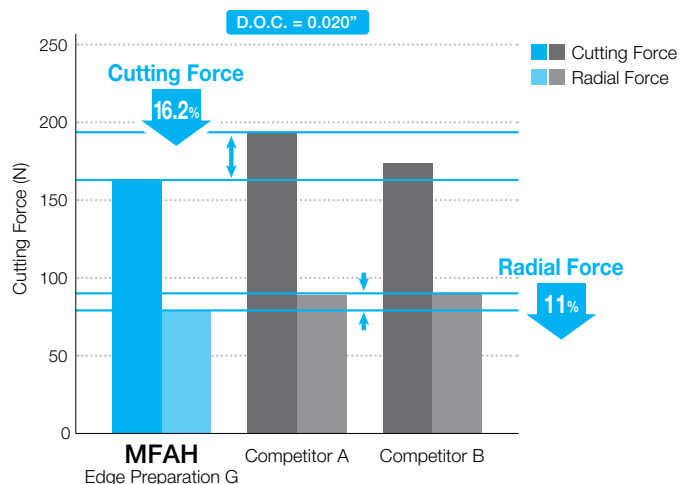


Cutting Conditions: Vc = 8,200 sfm, Wet, Cutting Dia. Ø80mm
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece: 383.0 Aluminum

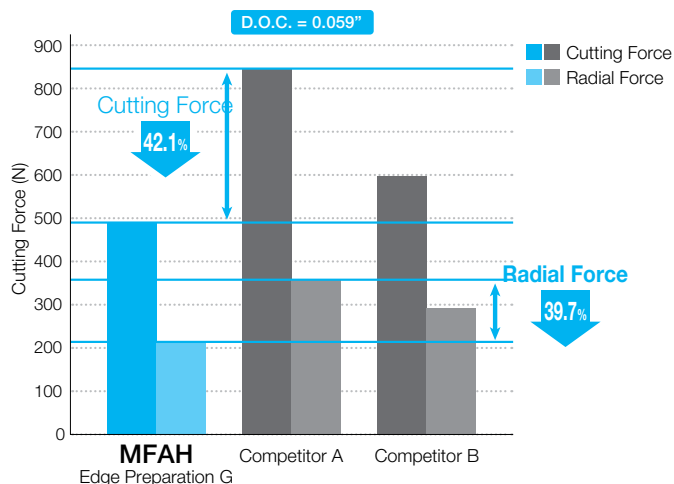
2 Low Cutting Force Design

Low Cutting Force, Reduced Chattering and High Efficiency Machining

Cutting Force Comparison (Internal Evaluation)



Cutting Conditions: Vc = 8,200 sfm, ae = 2.165", fz = 0.004 ipt Wet, Cutting Dia. Ø80mm
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece: 383.0 Aluminum



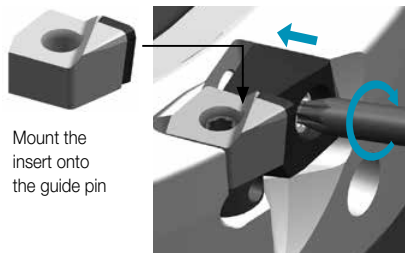
3 Adjustable Blade Runout

Easily Install Inserts and Adjust Blade Runout

Burr and Chipping Comparison (Internal Evaluation)

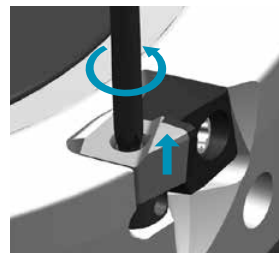
Easy Insert Installment

Guide Pin Allows for Easier Positioning



Easily Adjust Blade Runout

Adjustable from Both the Front and Outer Periphery

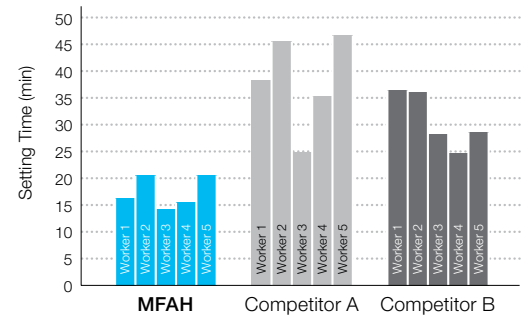


Unique Design for Easily Adjusting from the Front

Blade Runout Setting Time Comparison

(Internal Evaluation)

*Operation time of 5 workers



The MFAH can drastically shorten insert setting time

4 Large Tooling Lineup

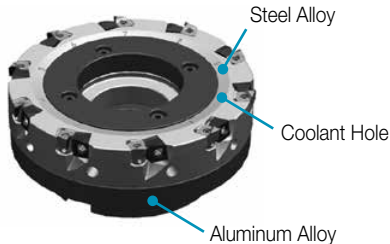
Steel Body and Light-weight Hybrid Body with Internal Coolant Available

3 Different Edge Designs Offer a Variety of Machining Applications

Cutter Body



Steel Body
Ø50mm – Ø125mm

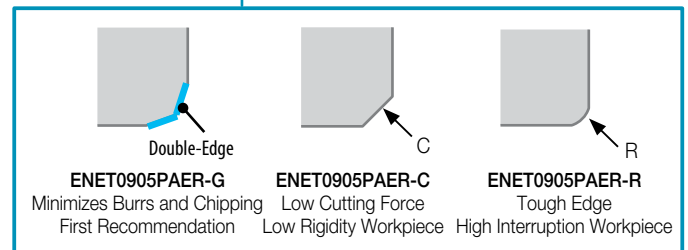


Light-Weight Hybrid Body
Ø80mm – Ø315mm

Insert (Edge Design)

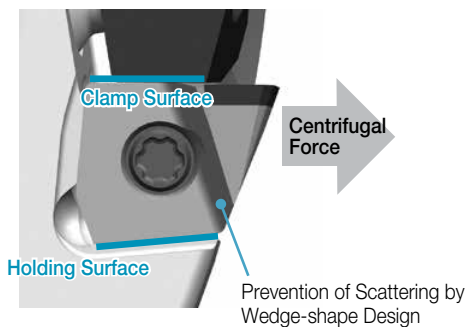
PCD (KPD001)

3 Different Edge Designs Offer a Variety of Machining Applications

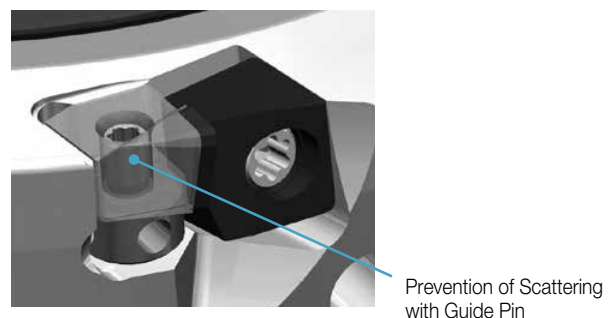


5 Safety Enhancements During High-Speed Revolution

- 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



MFAH Face Mill (Light-Weight Hybrid Body)

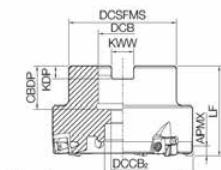


Fig.1

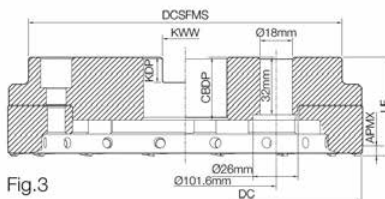


Fig.3

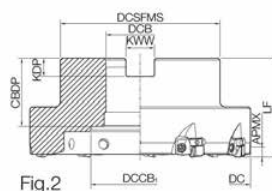


Fig.2

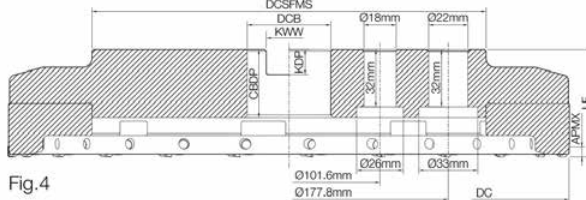


Fig.4

Toolholder Dimensions

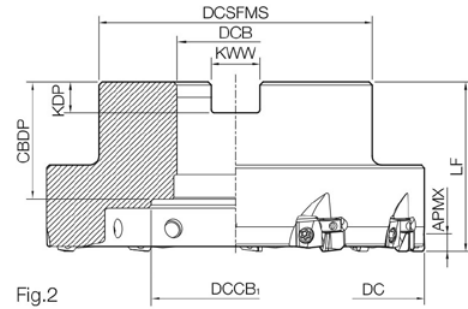
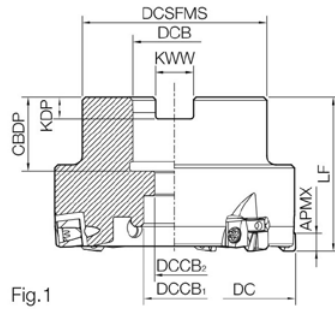
Part Number		Stock	No. of Inserts	Dimensions (mm)									Coolant Hole	Drawing	Max. RPM	Weight (kg)	Coolant Through Arbor Bolt	Coolant Cover (Included if Listed)	Coolant Cover (Optional / Sold Separately)			
				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW								APMX		
Inch Bore Dia.	MFAH 080RA-6T-SF	●	6	80	62	1.000"	20	13	50	1.063"	0.236"	0.375"	4.6	Yes	Fig.1	14,600	0.83	HH12X35HC (HF0500X35HC)	-			
	080RA-10T-SF	●	10							0.78												
	100RA-8T-254-SF	●	8	100	85	1.250"	42	-	50	0.945"	1.339"	0.315"				0.500"	13,000				1.21	1.16
	100RA-12T-254-SF	●	12							1.33												
	100RA-8T-SF	●	8	125	60	1.000"	20	13	50	0.945"	0.236"	0.375"			Fig.1	1.8	1.74	HH12X35HC (HF0500X35HC)	CC-125-MFAH			
	100RA-12T-SF	●	12							1.29						2					1.95	
	125RA-10T-254-SF	●	10	89	1.500"	55	55	1.496"	0.394"	0.625"	Fig.2	8,000			3.4	3.3	HF24X60HA	CC-160-MFAH				
	125RA-16T-254-SF	●	16									8,000			3.3							
	125RA-10T-SF	●	10	160	130	2.000"	70	55	1.496"	0.433"	0.750"	Fig.3			5,600	4.9	4.8			CC-200-MFAH		
	125RA-16T-SF	●	16												4,500	6.9					11.7	
	160RA-12T-SF	●	12	200	175		126	-	55	1.378"	0.551"	1.000"			Fig.4	3,500	11.5			CC-315-MFAH		
	160RA-20T-SF	●	20													250	140				1.875"	165
	200RA-16T-SF	□	16	250	140	1.875"	165	60	1.496"													
	200RA-24T-SF	□	24							315	220	220			60	1.496"						
	250RA-20T-SF	□	20	315	220	220	60	1.496"														
	250RA-32T-SF	□	32						315	220	220	60			1.496"							
315RA-24T-SF	□	24	315	220	220	60	1.496"															
315RA-40T-SF	□	40						315	220	220	60	1.496"										
Metric Bore Dia.	MFAH 080RA-6T-M-SF	●	6	80	62	27	20						13	50	27	7	12.4	4.6	Yes	Fig.1	14,600	0.82
	080RA-10T-M-SF	●	10					0.78														
	100RA-8T-M27-SF	●	8	100	85	32	42	-	50	24	30	8	14.4	13,000	1.2	1.15						
	100RA-12T-M27-SF	●	12							1.32												
	100RA-8T-M-SF	●	8	125	60	27	20	13	50	24	7	12.4	Fig.1	11,400	1.8	1.73	HH12X35H			CC-125-MFAH		
	100RA-12T-M-SF	●	12							1.27				2.1	2.1							
	125RA-10T-M27-SF	●	10	94	40	55	55	50	33	9	16.4	Fig.2	8,000	3.5		3.4	HF20X53HA			CC-160-MFAH		
	125RA-16T-M27-SF	●	16										8,000	3.4								
	125RA-10T-M-SF	●	10	160	125	40	57	55	35	14	25.7	Fig.3	5,600	4.7	4.6					CC-200-MFAH		
	125RA-16T-M-SF	●	16										4,500	6.8							11.7	
	160RA-12T-M-SF	●	12	200	175	60	165	60	38				Fig.4	3,500	11.5					CC-315-MFAH		
	160RA-20T-M-SF	●	20											250	140						220	220
	200RA-16T-M-SF	□	16	315	220	220	60	38														
	200RA-24T-M-SF	□	24						315	220	220	60	38									
	250RA-20T-M-SF	□	20	315	220	220	60	38														
	250RA-32T-M-SF	□	32						315	220	220	60	38									
315RA-24T-M-SF	□	24	315	220	220	60	38															
315RA-40T-M-SF	□	40						315	220	220	60	38										

* Confirm the total weight of the cutter and the arbor is within the machine's acceptable range
 • Inch thread coolant-through arbor bolts in () available (sold separately)

Recommended Cutting Conditions **M150**

Applicable Inserts **M150**

MFAH Face Mill (Steel Body)



Toolholder Dimensions

Part Number		Stock	No. of Inserts	Dimensions (mm)									Coolant Hole	Drawing	Max. RPM	Weight (kg)	Arbor Bolt (Included)	
				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW						APMX
Inch Bore Dia.	MFAH 080RS-6T-SF	●	6	80	50	1.000"	20	13	50	1.063"	0.236"	0.375"	4.6	No	Fig.1	14,600	1	HH12X35
	080RS-10T-SF	●	10															
	100RS-8T-SF	●	8	100	70	1.250"	45	55	1.339"	0.315"	0.500"	Fig.2	13,000	2	-			
	100RS-12T-SF	●	12															
	125RS-10T-SF	●	10	125	89	1.500"	55	1.496"	0.394"	0.625"	11,400	2.63						
	125RS-16T-SF	●	16															
Metric Bore Dia.	MFAH 050RS-4T-M-SF	●	4	50	48	16	13.6	9	40	19	5.6	8.4	4.6	No	Fig.1	19,200	0	HH8X25
	050RS-5T-M-SF	●	5															
	063RS-5T-M-SF	●	5	63	61	22	23	11	50	21	6.3	10.4			Fig.1	16,800	0.69	HH10X30
	063RS-6T-M-SF	●	6															
	080RS-6T-M-SF	●	6	80	60	27	20	13	55	24	7	12.4			Fig.1	14,600	1	HH12X35
	080RS-10T-M-SF	●	10															
	100RS-8T-M-SF	●	8	100	70	32	45	55	30	8	14.4	Fig.2			13,000	2	-	
	100RS-12T-M-SF	●	12															
	125RS-10T-M-SF	●	10	125	89	40	55	33	9	16.4	Fig.2	11,400			3			
	125RS-16T-M-SF	●	16															


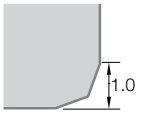
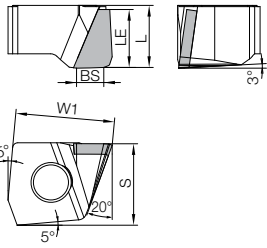

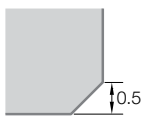


* Confirm the total weight of the cutter and the arbor is within the machine's acceptable range

Recommended Cutting Conditions ➡ **M150**

Spare Parts and Applicable Inserts (Metric Size)

Part Number		Spare Parts							Applicable Inserts ➡ M150
		Clamp	Clamp Screw	Wrench	Adjustment Screw	Wrench	Balance Screw	Anti-seize Compound	
Light-Weight Hybrid Body	MFAH080RA-... ~ MFAH315RA-...								ENET0905...
	MFAH050RS-... ~ MFAH125RS-...								

● Applicable Inserts

Insert			Part Number	Dimensions (mm)					PCD
				W1	S	L	BS	LE	
			ENET 0905PAER-G	9.61	7.9	6.02	2.6	5.6	●
			ENET 0905PAER-C	9.61	7.9	6.02	3.0	5.6	●
			ENET 0905PAER-R	9.61	7.9	6.02	3.1	5.6	●

◆ Recommended Cutting Conditions

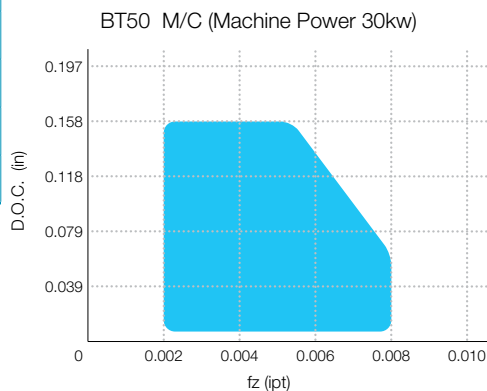
Workpiece Material	Property	Cutting Speed Vc (sfm)	Feed Rate fz (ipt)	Recommended Grade
Aluminum Alloy	Si Ratio ≤ 12.5%	3,280~8,200~9,840	0.002~0.004~0.008	KPD001
	Si Ratio ≥ 12.5%	1,310~1,970~2,630	0.002~0.004~0.008	

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



Cutting Conditions: Vc = 8,200 sfm, ae = 2.165", Wet, Cutting Dia. Ø80mm
MFAH080RS-10T-SF, ENET0905PAER-G KPD001, Workpiece: 383.0 Aluminum

● Max. Revolution and Max. Cutting Speed for Each Cutting Diameter

Cutting Diameter DC (mm)	Cutter RPM	Max. Cutting Speed Vc max (sfm)
Ø50	19,200	9,990
Ø63	16,800	10,910
Ø80	14,600	12,040
Ø100	13,000	13,400
Ø125	11,400	14,690
Ø160	8,000	13,190
Ø200	5,600	11,550
Ø250	4,500	11,590
Ø315	3,500	11,370

● Cautions

While in Use

⚠ Caution

Only 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 centrifugal force and cutting load

Please do not use under the following conditions:

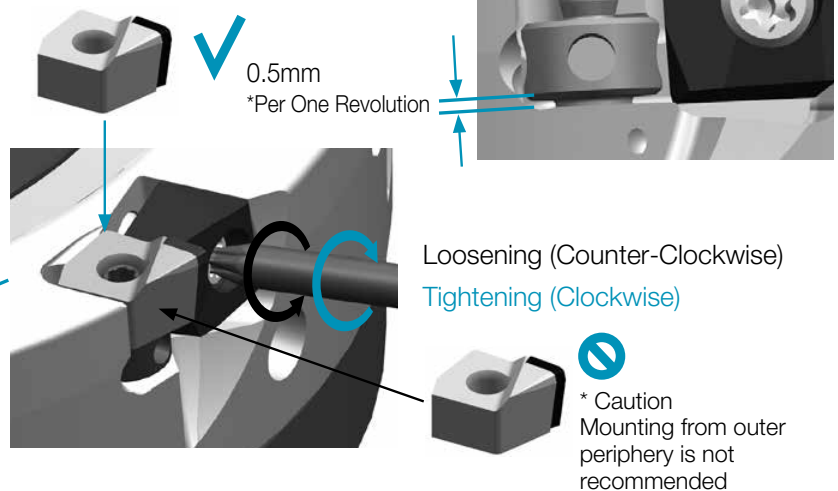
- When cutter is not fully loaded with inserts
- If the body and/or clamp is damaged
- If a clamp or clamp screw is removed
- If inserts that have different regrind amounts are mounted

Please wear protective equipment such as protective glove when changing inserts or adjusting edge fluctuation

- Injury can occur when touching the cutting edge

● How to Mount Inserts

- 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 4.2 Nm)
- 4 Make sure that there is no clearance between the insert and the mounting surface



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 grade (ISO1940/1) G2.5

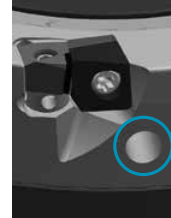
* See **M150** for Recommended Cutting Conditions at Max. Revolution

Do not adjust the balance screw

⇒ This could lead to improper dynamic balance

Do not completely remove clamp and clamp screw from cutter

⇒ This requires additional balance adjustment



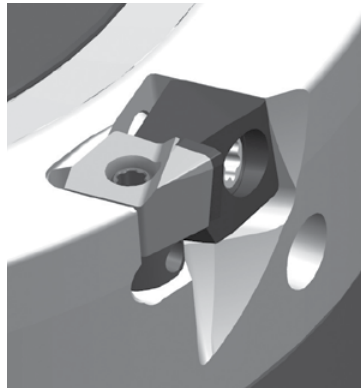
Balance Adjustment Screw is Mounted at the Necessary Point

* Do Not Adjust

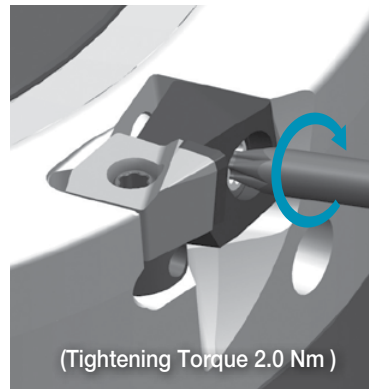
INSERT GRADES	A
TURNING INSERTS	B
CEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

● How to Adjust Blade Runout

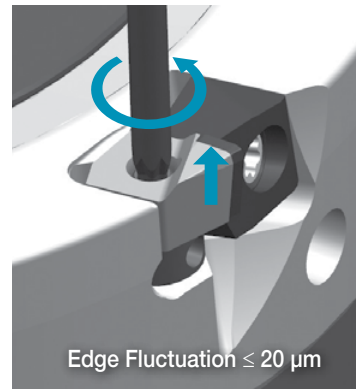
1 Install an Insert



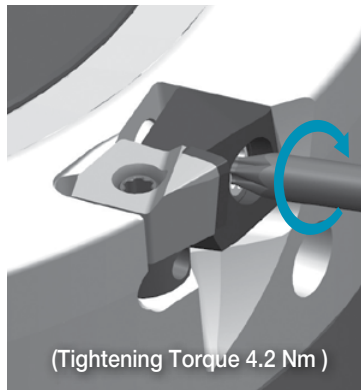
2 Partially Tighten



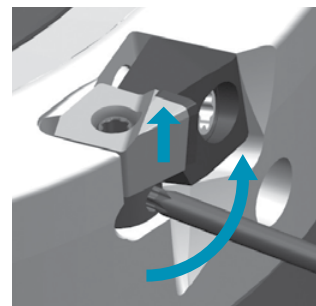
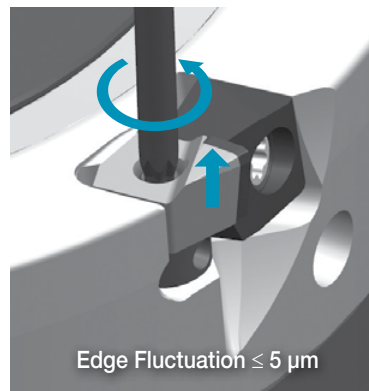
3 Adjustable Blade Runout



4 Fully Tighten



5 Adjustable Blade Runout



1 Install inserts into all pockets

2 Partially tighten the clamp screw (Recommended Torque 2.0 Nm)

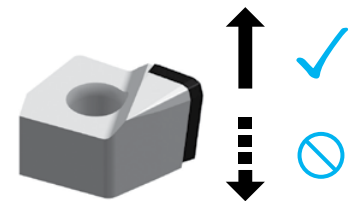
3 Turn the screw with the wrench to adjust and make sure that all screw heights are within 20 μm of each other (Recommended)

4 Fully tighten the clamp screw with tightening torque of 4.2 Nm

5 Slightly adjust position of cutting edge

(Recommended Position Difference: $\leq 5 \mu\text{m}$)

*All inserts should be fine-tuned



Adjustment must conclude with insert moving upward as shown above

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

M
MILLING

Replacing the Insert Clamp

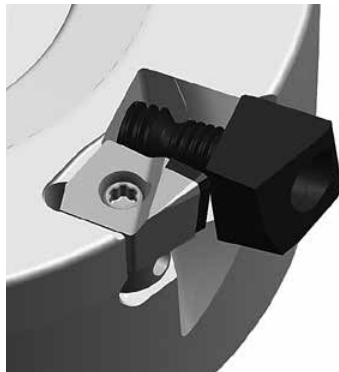
● Correct Mounting Procedure for Clamp and Clamp Screw

1 Assembly



Screw the clamp screw into the clamp
(About one revolution)

2 Installation



Attach to holder

3 Tightening



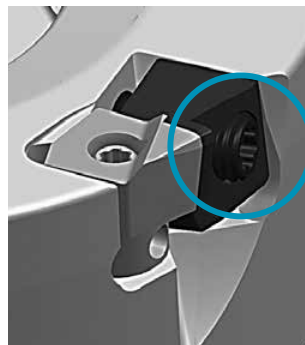
Tighten with recommended torque
(Installation complete)

● Mounting Position of Clamp Screw

✓ **Correct Positioning**
(There is no protruding head of the screw)



✗ **Wrong Positioning**
(The screw head is protruding outside the clamp)



After tightening the clamp screw with the recommended torque, please check the protrusion of the clamp screw.
If it is protruding outside the clamp, please reinstall

When clamp screws need to be replaced and completely removed, a balance adjustment is necessary after installation

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MEAS

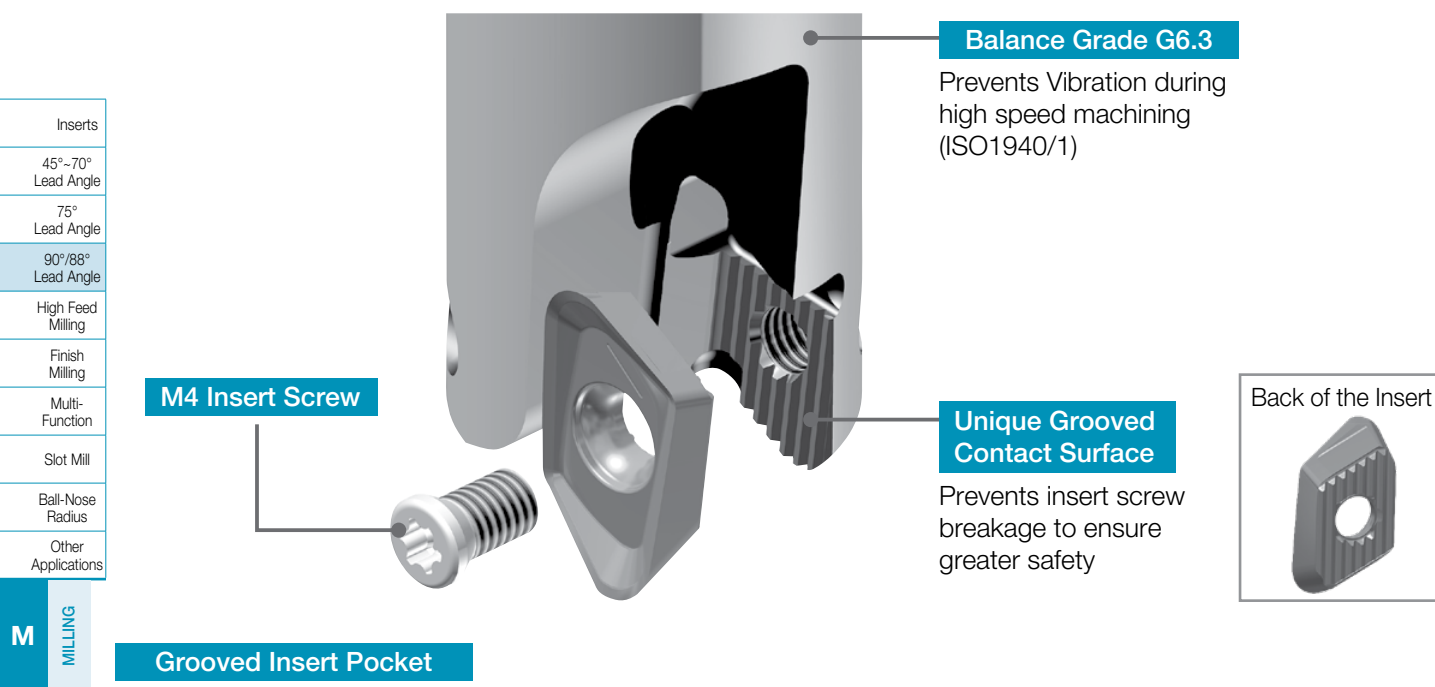
High Efficiency Milling Cutters for Aluminum Machining

Excellent Scatter Prevention to Ensure Stable, High Speed Aluminum Machining

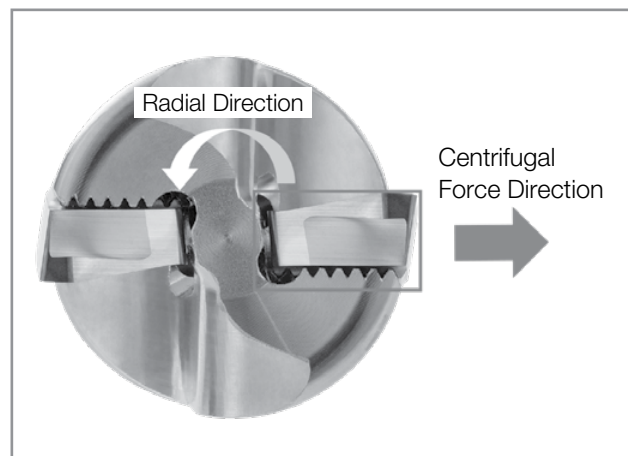
Simultaneous 3-axis with Large Ramping Angle for a Wide Range of Machining Applications

1 Reliable High Efficiency Machining

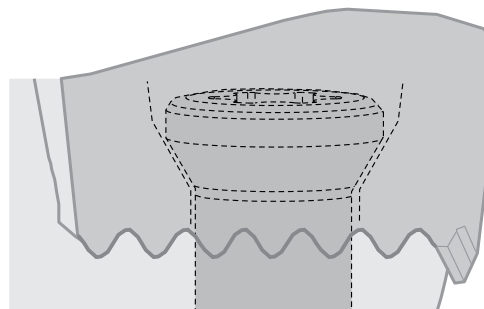
Grooved Connection Between the Insert and Holder for High Speed Aluminum Machining
(Ø1.250" / Ø32mm: Recommended Max. Cutting Speed $V_c = 9,842$ sfm)



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



Grooved Contact Surface



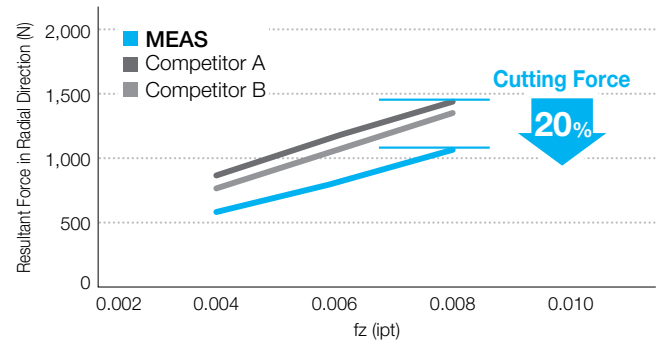
2 Low Cutting Force with Sharp Cutting Edge

True Rake Angle Max. 20°

Low Cutting Force and Excellent Chattering Resistance



Cutting Force Comparison (Internal Evaluation)

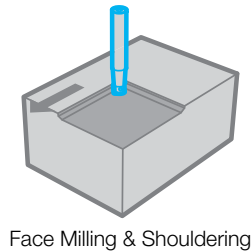


Cutting Conditions: $V_c = 1280$ sfm, D.O.C. \times ae = 0.315" \times 0.197", Dry
Cutter Diameter: $\varnothing 1.000$ " (2 Inserts) Workpiece: 7075

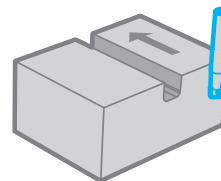
3 Machining for a Wide Variety of Applications

Max. Ramping Angle 20° ($\varnothing 1.000$ " / $\varnothing 25$ mm)

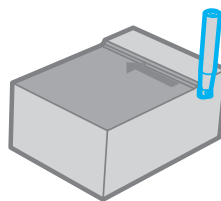
The MEAS can be used for shouldering, slotting, ramping, and helical milling applications



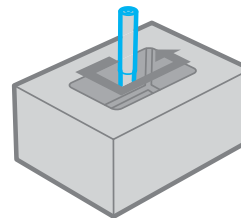
Face Milling & Shouldering



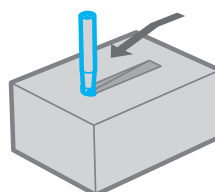
Slotting



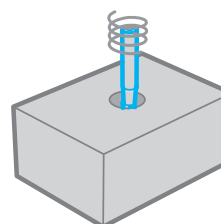
Contouring



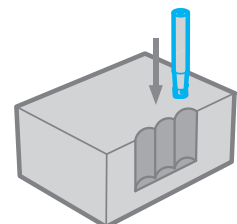
Pocketing



Ramping



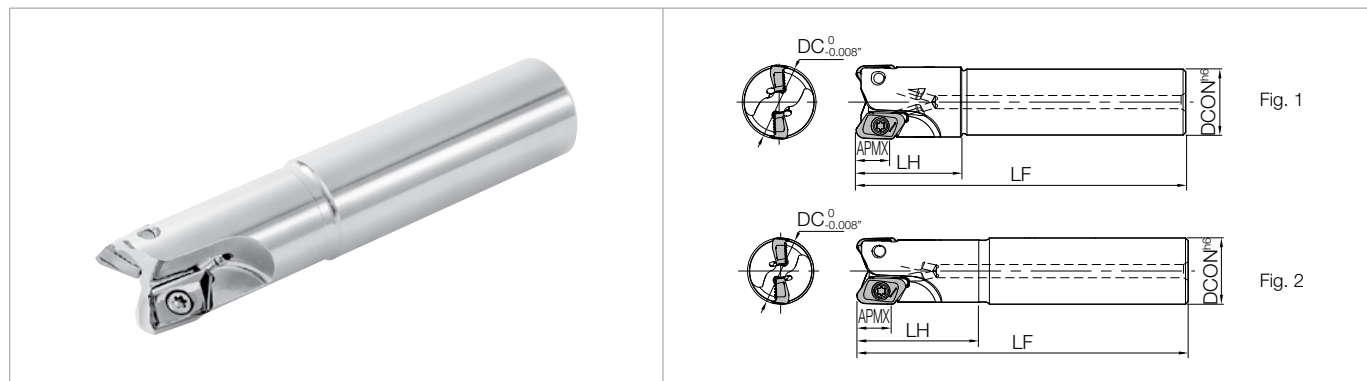
Helical Milling






Plunging

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MEAS End Mill



Toolholder Dimensions

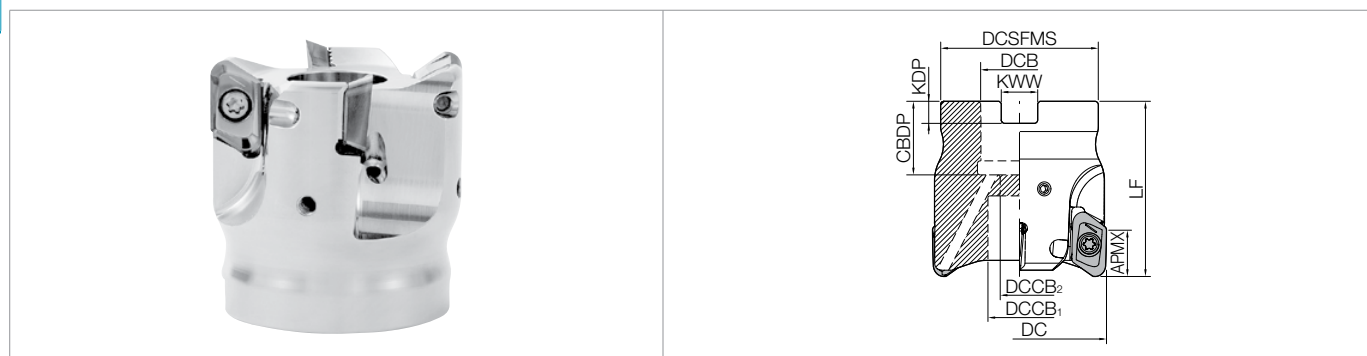
Part Number			Stock	Unit	No. of Inserts	Dimensions					Rake Angle		Coolant Hole	Drawing	Spare Parts			Weight (kg)	Max RPM
						DC	DCON	LF	LH	APMX	A.R. (Max.)	R.R.			Clamp Screw	Wrench	Anti-seize Compound		
																			
Cylindrical Shank	Standard	MEAS 1000-S1000-13-2T	●	inch	2	1.000	1.000	5.000	2.000	0.472	+10°	14°	Yes	Fig.2	SB-4075TRP	DTPM-15 Recommended Torque for Insert Screw 3.5 Nm	P-37	0.4	59,000
		1250-S1250-13-2T	●		2	1.250	1.250	6.000	2.750	0.472	+10°	13°		Fig.2	SB-4090TRP			0.8	49,000
		1500-S1250-13-3T	●		3	1.500	1.250	6.000	2.000	0.472	+10°	12°		Fig.1	SB-4075TRP			0.9	42,000
	Long	MEAS 1000S1000132T675	●	2	1.000	1.000	6.750	3.550	0.472	+10°	14°	Yes	Fig.2	SB-4075TRP	DTPM-15 Recommended Torque for Insert Screw 3.5 Nm	P-37	0.6	49,000	
		1250S1250132T800	●	2	1.250	1.250	8.000	4.800	0.472	+10°	13°		Fig.2	SB-4090TRP			1.1	39,000	
	Standard	MEAS 25-S25-13-2T	●	mm	2	25	25	125	49	12	+10°	-14°	Yes	Fig.2	SB-4075TRP	DTPM-15 Recommended Torque for Insert Screw 3.5 Nm	P-37	0.4	59,000
		28-S25-13-2T	●		2	28	25	125	40	12	+10°	-13°		Fig.1	SB-4090TRP			0.4	54,000
		32-S32-13-2T	●		2	32	32	150	69	12	+10°	-13°		Fig.2				0.8	49,000
		35-S32-13-2T	●		2	35	32	150	50	12	+10°	-13°		Fig.1				0.9	46,000
		40-S32-13-3T	●		3	40	32	150	50	12	+10°	-12°		Fig.1				0.9	42,000
	Long	MEAS 25-S25-13-2T-170	●	2	25	25	170	89	12	+10°	-14°	Yes	Fig.2	SB-4075TRP	DTPM-15 Recommended Torque for Insert Screw 3.5 Nm	P-37	0.5	49,000	
		32-S32-13-2T-200	●	2	32	32	200	119	12	+10°	-13°		Fig.2	SB-4090TRP			1.1	39,000	

When using inserts with a corner-R (RE) of 1/8" (3.2mm). or larger, additional modifications (R0.138" (3.5mm) or larger) on the corner of cutter body is necessary

















(If corner-radius is 0.118" (3.0mm) or smaller, additional modifications are not needed)

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is mounted.

MEAS Face Mill



Toolholder Dimensions


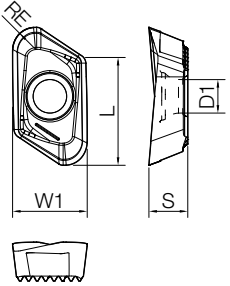
Part Number	Stock	Unit	No. of Inserts	Dimensions										Rake Angle		Coolant Hole	Spare Parts				Weight (kg)	Max RPM
				DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R. (Max.)	R.R.		Clamp Screw	Arbor Bolt	Wrench	Anti-seize Compound		
																						
MEAS 2000R-13-4T	●	inch	4	2.000	1.750	0.750	0.669	0.433	1.969	0.750	0.187	0.313	0.472	+10°	-10°	Yes	SB-4090TRP	HH3/8-1.25	DTPM-15 Recommended Torque for Insert Screw .35 Nm	P-37	0.4	36,000
MEAS 050R-13-4T-M	●	mm	4	50	45	22	18	11	50	21	6.3	10.4	12	+10°	-11°	Yes	SB-4090TRP	HH10X30H			0.4	36,000

When using inserts with a corner-R (RE) of 1/8" (3.2mm). or larger, additional modifications (R0.138" (3.5mm) or larger) on the corner of cutter body is necessary

(If corner-radius is 0.118" (3.0mm) or smaller, additional modifications are not needed)

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is mounted.

● Applicable Inserts

Insert	Part Number	Dimensions (in)					DLC Coating
		W1	S	D1	L	RE	PDL025
 	KCGT 130504FR-AL	0.390	0.201	0.173	0.555	1/64	●
	130508FR-AL				0.547	1/32	●
	130512FR-AL				0.543	3/64	●
	130516FR-AL				0.524	1/16	●
	130520FR-AL					5/64	●
	130524FR-AL					3/32	●
	130530FR-AL					0.118	●
	130532FR-AL				0.504	1/8	●
	130540FR-AL					0.157	●
	130550FR-AL					0.197	●

◆ Recommended Cutting Conditions

Workpiece	Property	Cutting Speed Vc (sfm)	Feed fz (ipt)
Aluminum Alloy	Si Ratio ≤ 12.5%	660 ~ 3,280 ~ 9,840	0.002" ~ 0.006" ~ 0.010"
	Si Ratio ≥ 12.5%	660 ~ 980 ~ 1,310	0.002" ~ 0.004" ~ 0.008"

- 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 exceed the maximum cutting speed limit (see page 6)
- Regularly changing the insert screw is recommended
Use appropriate safety covers to protect from tool breakage and chip scattering
- When using at a higher revolution (10,000 RPM or over), refer to the table below to adjust the balance of the MEAS and arbor

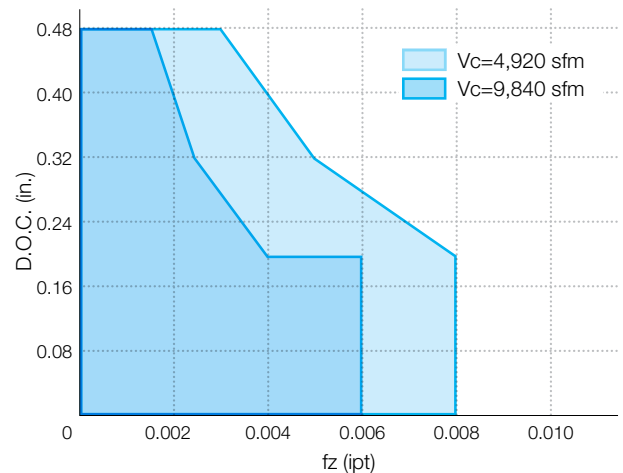
Spindle Revolution (RPM)	ISO Balance Grade ISO 1940-1/8821 (B0905)
~ 20,000	G16
~ 30,000	G6.3
30,000 ~	G2.5

Max. Revolution for Each Cutting Diameter

Cutting Diameter ØDC (mm)	Cutter Max. Revolutions (RPM)
Ø1.000" Ø25mm	59,000 (Long Shank: 49,000)
Ø28mm	54,000
Ø1.250" Ø32mm	49,000
Ø35mm	46,000 (Long Shank: 39,000)
Ø1.500" Ø40mm	42,000
Ø2.000" Ø50mm	36,000

MEAS Cutting Performance

ø50mm (4 Inserts) Shouldering $ae = 0.984"$ Workpiece: 7175

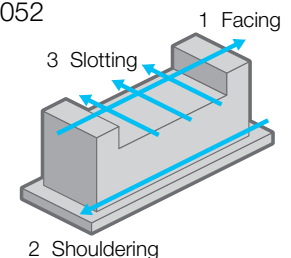


- Reduce the feed rate when machining at high speeds

Case Study

Industrial Machine Parts 5052

- Vc = 4920 sfm (n = 9,550 rpm)
- D.O.C. x ae = 0.118" x 1.575"
fz = 0.008 ipt (Vf = 300 ipm)
 - D.O.C. x ae = 0.315" x 0.197"
fz = 0.008 ipt (Vf = 300 ipm)
 - D.O.C. x ae = 0.079" x ~ 1.97"
fz = 0.006 ipt (Vf = 225 ipm)
- Wet
MEAS050R-13-4T-M
KCGT130504FR-AL PDL025



Cutting Time

MEAS ø50-4T

190 Sec

Cutting Time

50% ↓

Competitor C ø50-3T

430 Sec

MEAS showed 50% faster cycle time or more compared to Competitor C
(User Evaluation)

Ramping Reference Data

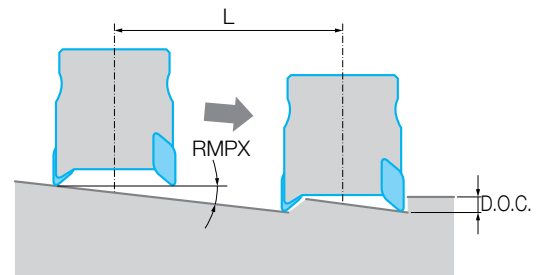
Cutting Dia. DC	1.000"	1.250"	1.500"	2.000"	25mm	28mm	32mm	35mm	40mm	50mm
Max. Ramping Angle RMPX	20°	12.5°	8.5°	6°	20°	16°	12.5°	11°	8.5°	6°
tan RMPX	0.363	0.221	0.149	0.105	0.363	0.287	0.221	0.194	0.149	0.105

Ramping Tips

Recommended ramping angle is \leq RMPX
(see chart above for recommended ramp angle)
Reduce recommended feed rate by 50%

Formula for Max. Cutting max Length (L) at Max. Ramping Angle

$$L = \frac{\text{D.O.C.}}{\tan \text{RMPX}}$$



Plunging Tips

* Reduce feed rate to $fz \leq 0.004$ ipt when plunging

Insert	Maximum Width of Cut (ae)
KCGT13...	0.315"

Helical Milling Tips

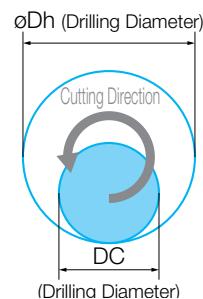
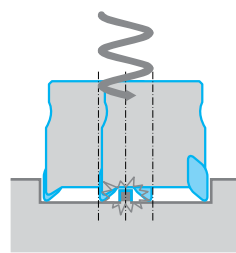
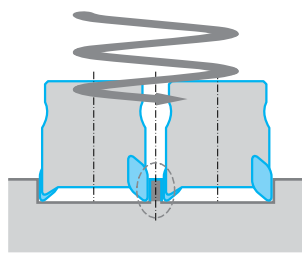
For Helical milling, use between Min. Drilling Dia. and Max. Drilling Dia.

Exceeding Max. Machining Dia.

Under Min. Machining Dia.

Center Core Remains After Machining

Center Core Hits Holder Body

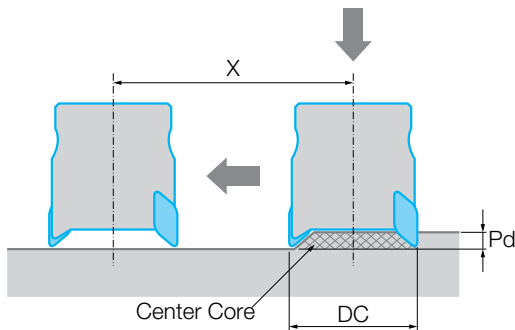


Cutter	Min. Drilling Dia.	Max. Drilling Dia.	Maximum Ramping Depth per Cycle
MEAS...-13-...	$2 \times \text{DC} - 0.630"$	$2 \times \text{DC} - 0.118"$	0.138"

Unit: inch

- Use climb milling. (Refer to detail on right above)
- Feed rates should be reduced to 50% of recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

Drilling Tips



Drilling Depth

Please refer to the figure on the left (Pd: Max. Drilling depth)

Traversing after Drilling

1. It is recommended to reduce feed by $f_z = 0.006$ ipt or less until the center core is removed
2. Axial feed rate recommendation per revolution is $f = 0.004$ ipr or less

Cutter	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface
MEAS...-13-...	0.138"	DC - 0.630"

Unit: inch

How to Mount Inserts

1. Completely eliminate chips and dust from the insert mounting side
2. Insert Screw
 - Coat anti-seize compound (P-37) 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 picture on the right)
 - (Recommended Torque 3.5Nm)



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

- Inserts 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 is damaged

Please wear protective equipment such as gloves when changing inserts

- 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 grade (ISO1940/1) G6.3

When using at a higher revolution (10,000 RPM or above), 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.

Spindle Revolution (RPM)	ISO Balance Grade ISO 1940-1/8821 (B0905)
~ 20,000	G16
~ 30,000	G6.3
30,000 ~	G2.5



Shouldering

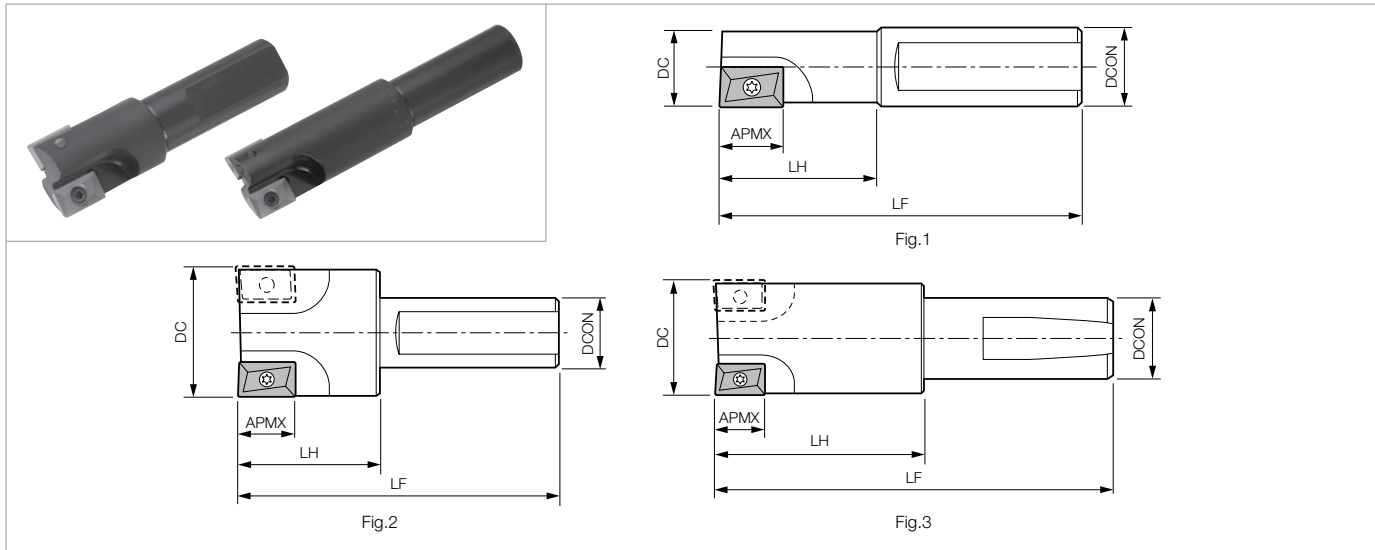


Slotting


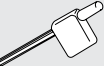


Facing

EM End Mill / Extended Length End Mill



Toolholder Dimensions

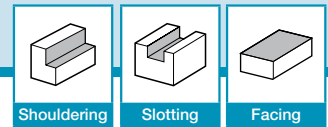
Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Drawing	Max. Ramping Angle (°)	Spare Parts	
			DC	DCON	LF	LH	APMX	A.R.	R.R.			Clamp Screw	Wrench
													
EM 0437-09	●	1	7/16	1/2	2.78	1.00	0.37	3°	-11°	Fig.1	3°	SCR-04	T7
0500-09	●		1/2						-9°				
0562-09	●		9/16						-7°				
0625-09	●	2	5/8	5/8	2.90	1.00	0.37	5°	-6°	Fig.2	8°	SCR-01	T7
0750-09	●		3/4	3/4	3.03			5°	-2°				
1000-09-3F	●	3	1							3°	-2°		
EM 0625	●	1	5/8	3/4	2.90	1.00			-14°	Fig.1	3°	SCR-16	T10
0688	●		11/16		-12°								
0750	●		3/4		-10°								
0875	●	2	7/8	3/4	3.40	1.50	0.60	5°	-7°	Fig.2		SCR-30	T10
0938	●		15/16		-5°								
1000	●		1		-5°								
1000-100S	●	2	1	1	3.78	1.50	0.60	5°	-5°	Fig.2		SCR-30	T10
1125	●		1-1/8	3/4	3.40				-4°				
1250	●		1-1/4						-3°				
1250-3F	●	3		1	3.78	1.50	0.60	5°	-3°	Fig.2		SCR-30	T10
1375	●	2	1-3/8	3/4	3.40				-2°				
1500	●		1-1/2						-2°				
1500-3F	●	3		1	3.78				-2°				
EM 1000-2.5	●	2	1	3/4	4.40	2.50	0.60	5°	-5°	Fig.3	8°	SCR-16	T10
1000-3.5	●			1	5.78	3.50			-5°			SCR-30	
1250-2.5	●		1-1/4		4.78	2.50			-3°				

Applicable Inserts

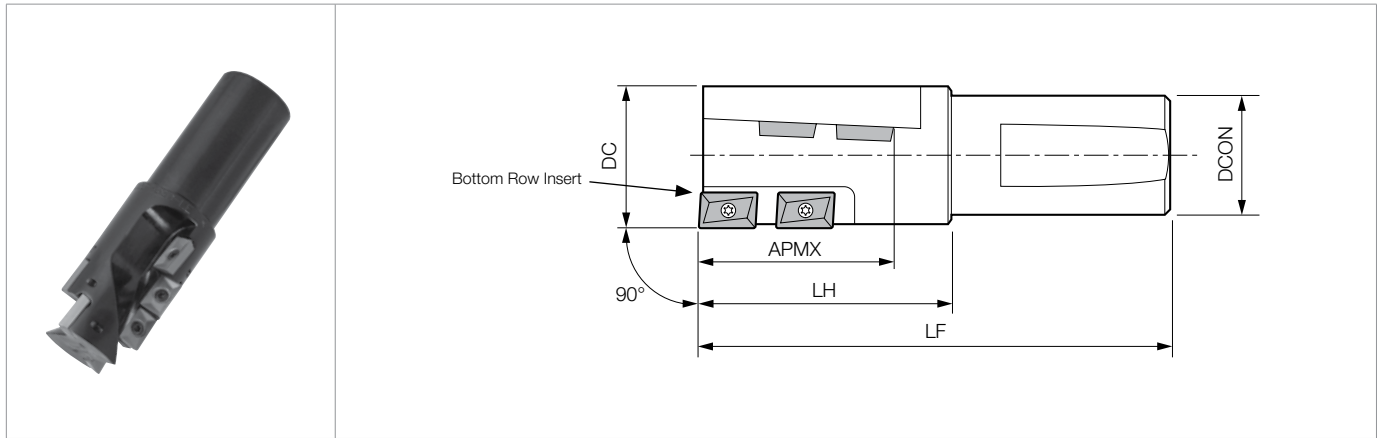
Part Number	Applicable Inserts
EM ○○○○-09(-3F)	XPMT 0902..
EM ○○○○ ○○○○-100S ○○○○-3F	*XPMT 15T3..
EM ○○○○-2.5	



*Toolholder modifications are necessary if using larger corner radius **XPMT15T324**, **XPMT15T331**, and **XPMT15T364** inserts due to interference between the holder and workpiece.



EM-LE Long Edge End Mill



Toolholder Dimensions

Part Number	Stock	No. of Inserts	No. of Flutes	Dimensions (in)					Rake Angle (°)		Spare Parts	
				DC	DCON	LF	LH	APMX	A.R.	R.R.	Clamp Screw	Wrench
EM 1500-2000-LE	●	8	2	1-1/2	1-1/4	4.91	2.63	2.00	5°	-2°	SCR-30	T10

Applicable Inserts

Part Number	Applicable Inserts M29	
EM ...-LE	*XPMT 15T3.. (Bottom Row)	XPMT 15T308 (Side Row)



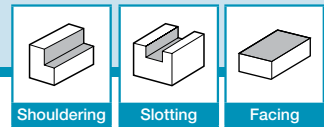
*Toolholder modifications are necessary if using larger corner radius **XPMT15T324**, **XPMT15T331**, and **XPMT15T364** inserts due to interference between the holder and workpiece.

Recommended Cutting Conditions (EM, EM-LE, FM, FM-AL, EM-AL)

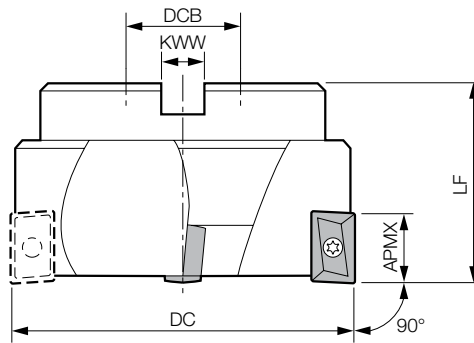
Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)									
		Cermet		MEGACOAT NANO			CVD Coated Carbide	PVD Coated Carbide			Carbide
		TN100M	TC60	PR1535	PR1525	PR1510	CA6535	PR930	PR905	PR830	KW10
Low Carbon Steel	0.003~0.006	☆ 800~1400	★ 800~1400	★ 400~800	★ 400~800	-	-	☆ 350~750	-	-	-
Carbon Steel	0.003~0.006	☆ 600~1200	★ 600~1200	★ 300~700	★ 300~700	-	-	☆ 250~650	-	-	-
Mold Steel	0.003~0.006	☆ 400~700	★ 400~700	★ 250~600	★ 250~600	-	-	☆ 250~600	-	-	-
Stainless Steel	0.002~0.006	☆ 300~800	☆ 300~800	★ 300~600	☆ 300~600	-	★ 550~950	☆ 300~500	-	☆ 300~800	-
Cast Iron	0.003~0.008	☆ 400~1200	★ 400~1200	-	-	★ 400~800	-	-	★ 400~800	-	☆ 300~500
Non-ferrous Metals	0.005~0.007	☆ 1500~1800	☆ 1500~1800	-	-	-	-	-	-	-	★ 2000~4000
Heat-resistant Alloy	0.002~0.005	-	-	☆ 70~160	-	-	★ 70~160	-	-	-	-
Titanium Alloy	0.002~0.005	-	-	★ 130~260	-	☆ 100~230	-	-	-	-	-

* Apply sufficient amount of coolant

★: 1st Recommendation ☆: 2nd Recommendation



FM-90 Fixed Pocket Face Mill



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Spare Parts	
			DC	DCB	LF	KWW	APMX	A.R.	R.R.	Clamp Screw	Wrench
FM 2000-90RH	●	3	2.0	3/4	1-13/32	5/16	0.6	+5°	+3°	SCR-30	T10
3000-90RH	●	4	3.0	1	1-25/32	3/8		+5°	+5°		

Applicable Inserts

Part Number	Applicable Inserts M29
FM 2000-90-RH 3000-90-RH	 *XPMT 15T3..



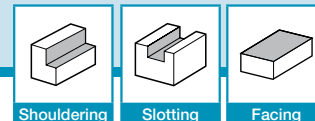
*Toolholder modifications are necessary if using larger corner radius **XPMT15T324**, **XPMT15T331**, and **XPMT15T364** inserts due to interference between the holder and workpiece.

Recommended Cutting Conditions (EM, EM-LE, FM, FM-AL, EM-AL)

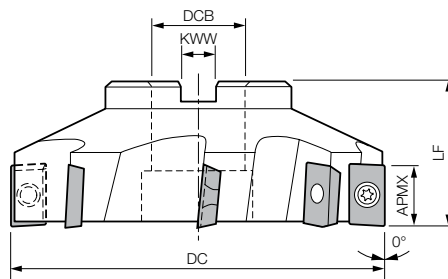
Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)									
		Cermet		MEGACOAT NANO			CVD Coated Carbide	PVD Coated Carbide			Carbide
		TN100M	TC60	PR1535	PR1525	PR1510	CA6535	PR930	PR905	PR830	KW10
Low Carbon Steel	0.003~0.006	☆ 800~1400	★ 800~1400	★ 400~800	★ 400~800	-	-	☆ 350~750	-	-	-
Carbon Steel	0.003~0.006	☆ 600~1200	★ 600~1200	★ 300~700	★ 300~700	-	-	☆ 250~650	-	-	-
Mold Steel	0.003~0.006	☆ 400~700	★ 400~700	★ 250~600	★ 250~600	-	-	☆ 250~600	-	-	-
Stainless Steel	0.002~0.006	☆ 300~800	☆ 300~800	★ 300~600	☆ 300~600	-	★ 550~950	☆ 300~500	-	☆ 300~800	-
Cast Iron	0.003~0.008	☆ 400~1200	★ 400~1200	-	-	★ 400~800	-	-	★ 400~800	-	☆ 300~500
Non-ferrous Metals	0.005~0.007	☆ 1500~1800	☆ 1500~1800	-	-	-	-	-	-	-	★ 2000~4000
Heat-resistant Alloy	0.002~0.005	-	-	☆ 70~160	-	-	★ 70~160	-	-	-	-
Titanium Alloy	0.002~0.005	-	-	★ 130~260	-	☆ 100~230	-	-	-	-	-

* Apply sufficient amount of coolant

★: 1st Recommendation ☆: 2nd Recommendation



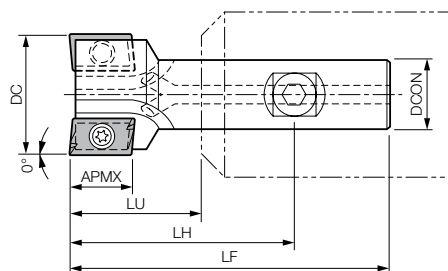
FM-AL Fixed Pocket Face Mill (Aluminum Machining)



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Max. Ramping Angle (°)	Spare Parts	
			DC	DCB	LF	KWW	APMX	A.R.	R.R.		Clamp Screw	Wrench
FM AL-2500-90-3	●	3	2-1/2	3/4	1.570	5/16	0.64	+5°	-3°	8°	SCR-02	T15
3000-90-AL	●	6	3	1		3/8		+5°	+0°			
4000-90-AL	●	8	4	1-1/4		1/2						
4000-90-AL-125	●	8	4	1-1/4		1/2						
AL-4000-90-5	●	5		1		3/8						

EM-AL Fixed Pocket End Mill (Aluminum Machining)



Toolholder Dimensions

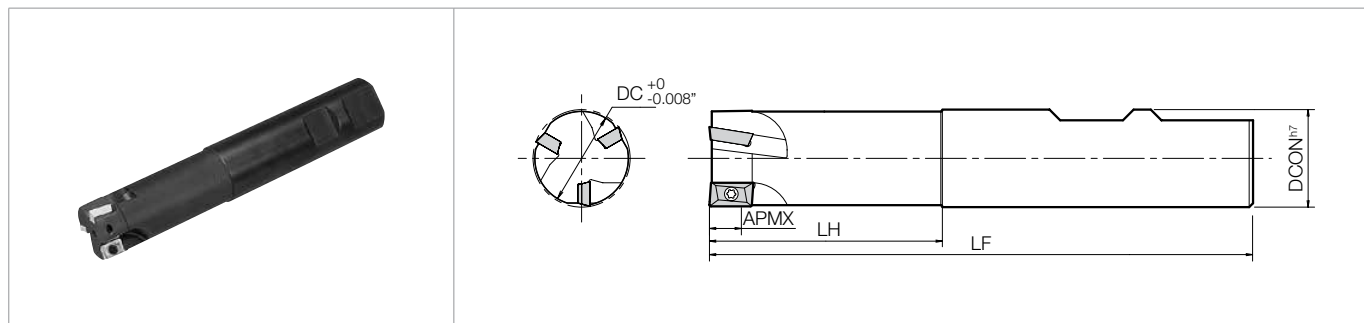
Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Max. Ramping Angle (°)	Spare Parts	
			DC	DCON	LF	LH	LU	APMX	A.R.	R.R.	Clamp Screw	Wrench
EM 1000-AL	●	2	1	3/4	3.380	2.365	1.360	0.64		-10°	SCR-02	T15
1250-AL	●		1-1/4							-7°		
1500-AL	●		1-1/2	1	4.000	2.864	1.740			-5°		
2000-AL	●	3	2		4.250	3.110	1.990		+5°	-2°		
EM 1000-2.75-AL	●	2	1	3/4	4.780	3.780	2.750	0.64		-10°	SCR-02	T15
1000-3.75-AL	●			1	6.015	4.875	3.750					
1250-2.125-AL	●		1-1/4		4.433	3.293	2.125			-7°		

Applicable Inserts

Part Number	Applicable Inserts M29	
FM AL-... ...-AL	APET 1604..	
EM ...-AL	APET 1604..	

For Chamfering End Mills CM-AL for Aluminum Cutting, See Page M259


MAP End Mill



Toolholder Dimensions

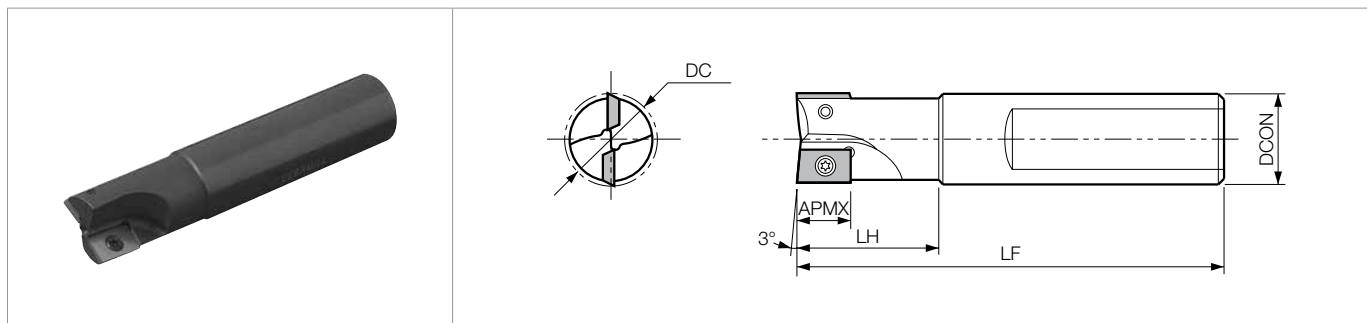
Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Spare Parts	
			DC	DCON	LF	LH	APMX	A.R.	R.R.	Clamp Screw	Wrench
MAP 100R10-S100	●	3	1.000	1.000	3.78	1.417	0.354	+9°	+10°	SB-2560TR	DT-8
100R16-S100	●	2					0.590		+13°	SB-4085TR	DT-15

Applicable Inserts



Part Number	Applicable Inserts ➔ M22	
		
MAP 100R10-S100	APKT 1003..	
100R16-S100	APKT 1604..	

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications





CEM End Mill



Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Spare Parts	
			DC	DCON	LF	LH	APMX	A.R.	R.R.	Clamp Screw	Wrench
											
CEM 0375-1W	△	1	0.375	0.375	3.08	0.75	0.374	+3°	-6°	SB-2545TR	FT-8
0500-1W	△	1	0.500	0.500		1.00			-5°		
0750-1W	△	1	0.750	0.750		1.18			-3°		
CEM 1000-2W	△	2	1.000	1.000	3.85	1.57	0.591	+3°	-2°	SB-4STR	FT-15
1000-2W-7.5	△	2			7.50						
CEM 1500-4W	△	4	1.500	1.250	3.85	1.57	0.591	+6°	0°	SB-4STR	FT-15

Applicable Inserts

Part Number	Applicable Inserts 		
			
CEM 0375-1W	NDCT 831FR 831R-B 832R-B	-	NDMM 831ER-SP
0500-1W			
CEM 0750-1W	NDCT 322FR 322FR-B	NDCW 322TRX 322FRX	NDMM 321ER-SP 322ER-SP
1000-2W			
1000-2W-7.5			
1500-4W			

MFH-MAX

(Cutter Dia. Ø1.000" ~ Ø3.000")
(Cutter Dia. Ø22mm ~ Ø80mm)

High Feed Milling with a Larger Depth of Cut

Newest Addition to the MFH High Feed Milling Family with Larger D.O.C. Capabilities

Excellent Performance in Various Applications, including Automotive Parts,
Difficult-to-cut Materials, and Mold Machining

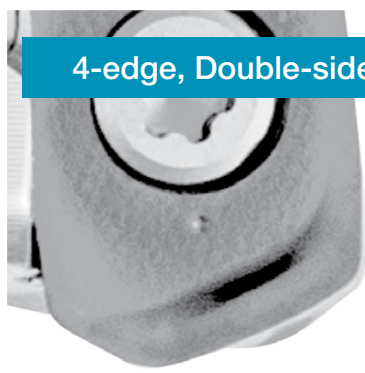
1 High Feed Milling with Large Depth of Cut Capabilities

A small 4-edge, double-sided insert supports depths of cut up to 0.098" (2.5mm) with cutting diameters available from Ø1.000" and Ø22mm.

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

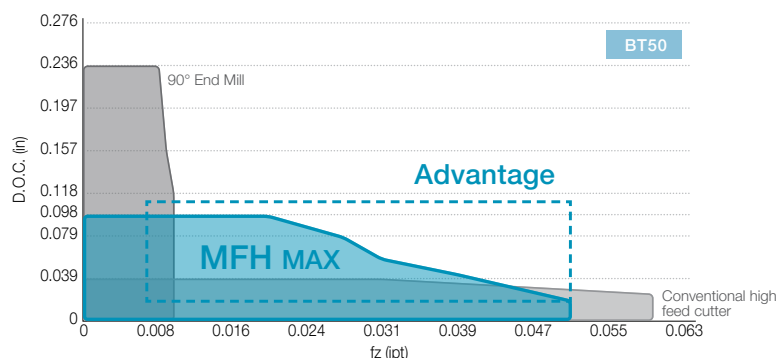
Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi- Function
Slot Mill
Ball-Nose Radius
Other Applications

4-edge, Double-sided Insert



Max. Depth of Cut
0.098"

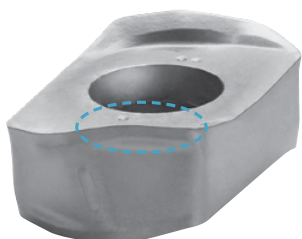
The MFH MAX Advantage



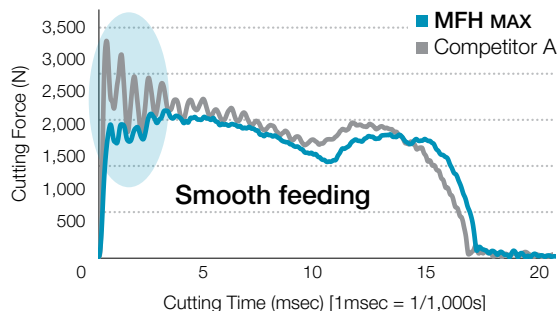
Vc = 490 sfm, ae = 0.492" (ae/DCX = 50%), 1049 Dry Ø1.000" Overhang length 2.362" BT50

Innovative Insert Design

Convex cutting edge design reduces impact when entering workpiece



Cutting Force when Entering Workpiece (Internal Evaluation)



Vc = 490 sfm, D.O.C. = 0.079",
ae = 1.000", fz = 0.028 ipt,
Dry 1049 Ø2.000" BT50

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

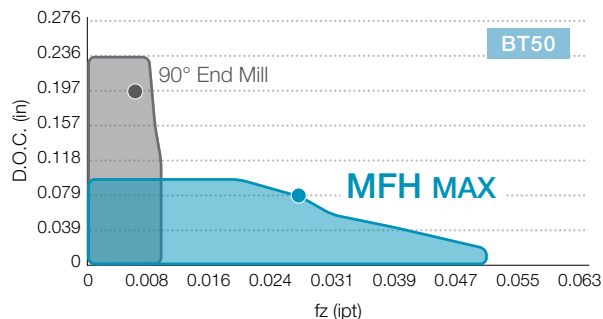
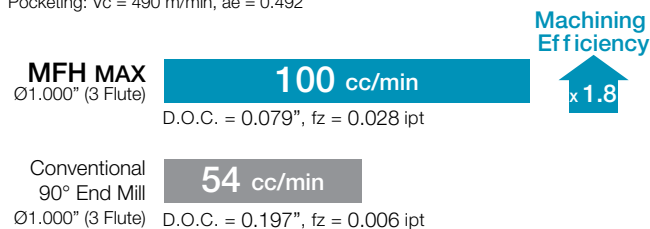
2 The MFH-MAX can cover a Large Variety of Machining Applications and Environments

1 A Better Alternative to 90° End Mills (Rough to Medium-Finish Machining)

High Feed Rates Dramatically Improve Machining Efficiency

Machining Efficiency Simulation Example

Pocketing: $V_c = 490$ m/min, $a_e = 0.492$ "

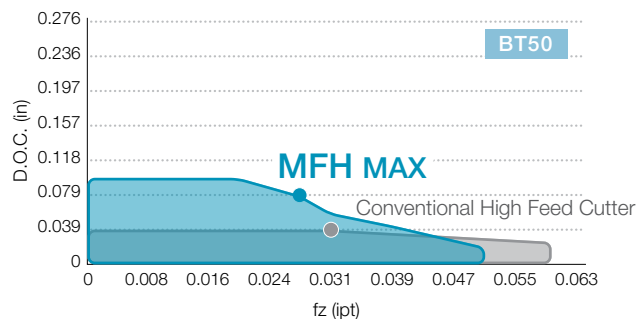
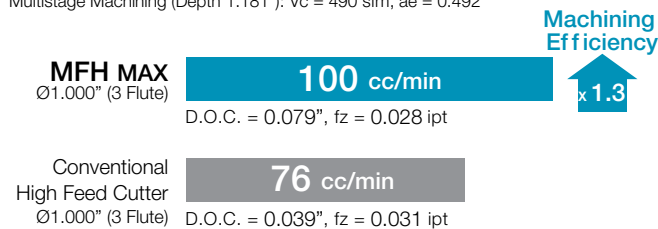


2 When Compared to Conventional High Feed Cutters

A Larger D.O.C. Dramatically Improves Machining Efficiency

Machining Efficiency Simulation Example

Multistage Machining (Depth 1.181"): $V_c = 490$ sfm, $a_e = 0.492$ "

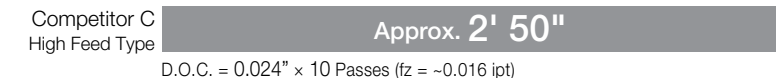
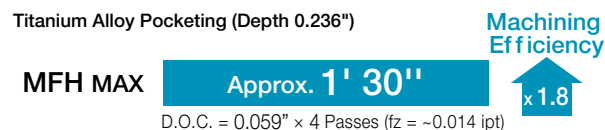


3 A Powerful Tool for Difficult-to-cut Materials

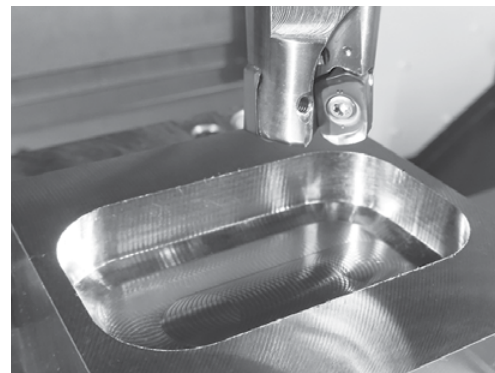
The MFH-MAX gained dramatic improvements in efficiency when machining titanium alloy, stainless steel, etc.

Machining Efficiency Comparison (Internal Evaluation)

Titanium Alloy Pocketing (Depth 0.236")



$V_c = 160$ sfm, $a_e = 0.492$ " ($a_e/DCX = 50\%$), Ramping Angle 3° Ti-6Al-4V Wet Ø1.000" (3 Flute) BT50



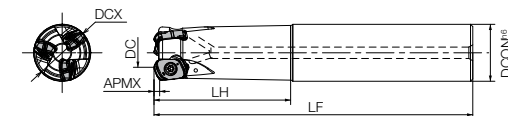
MFH MAX End Mill **NEW**

Fig.1

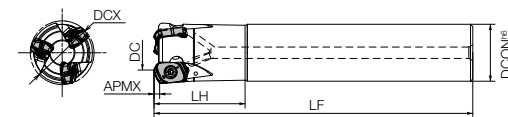


Fig.2

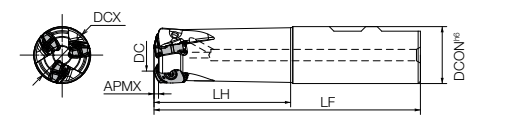


Fig.3

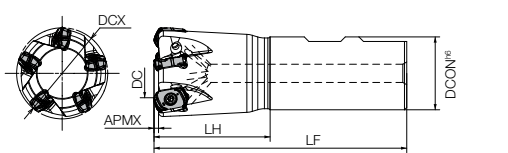


Fig.4

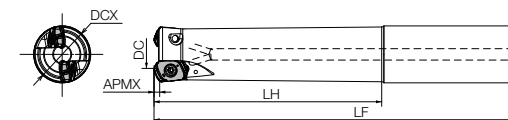


Fig.5

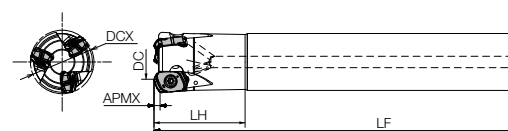


Fig.6

Inserts

45°~70°
Lead Angle75°
Lead Angle90°/88°
Lead AngleHigh Feed
MillingFinish
MillingMulti-
Function

Slot Mill

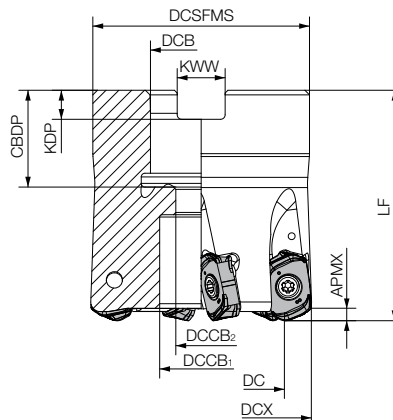
Ball-Nose
RadiusOther
Applications

● Toolholder Dimensions (Inch & Metric Sizes)

Part Number			Stock	Unit	No. of Inserts	Dimensions					Rake Angle	Coolant Hole	Drawing	Weight (kg)	Max RPM								
						DCX	DC	DCON	LH	LF	APMX	A.R.											
Cylindrical	Standard Shank	MFH 1000-S100-04-3T	●	inch	3	1.000	0.567	1.000	2.500	5.500	0.098	-10°	Yes	Fig.1	0.4	12,500							
		1250-S125-04-5T	●		5	1.250	0.817	1.250	2.750	6.000					0.7	11,000							
		Long Shank	MFH 1000-S100-04-3T-7	●	inch	3	1.000	0.567	1.000	4.000	7.000	0.098	-10°	Yes	Fig.5	0.7	12,500						
			1250-S125-04-4T-8	●		4	1.250	0.817	1.250	4.750	8.000					1.1	11,000						
Weldon	Standard Shank	MFH 1000-W100-04-3T	●	inch	3	1.000	0.567	1.000	2.000	4.600	0.098	-10°	Yes	Fig.3	0.4	12,500							
		1250-W125-04-5T	●		5	1.250	0.817	1.250	2.750	5.150					0.7	11,000							
Cylindrical	Standard Shank	MFH 25-S25-04-2T	●	mm	2	25	14	25	60	140	2.5	-10°	Yes	Fig.1	0.5	12,700							
		25-S25-04-3T	●		3										0.5	12,700							
		32-S32-04-4T	●		4	32	21	32	70	150					0.8	11,200							
		32-S32-04-5T	●		5										0.8	11,200							
			●																				
	Oversize	MFH 22-S20-04-2T	●	mm	2	22	11	20	30	130	2.5	-10°	Yes	Fig.2	0.3	13,600							
		28-S25-04-3T	●		3	28	17	25	40	140					0.5	12,000							
		28-S25-04-4T	●		4	35	24	32	50	150					0.5	12,000							
		35-S32-04-4T	●												0.8	10,700							
		35-S32-04-5T	●												0.8	10,700							
		40-S32-04-5T	●		5	40	29	32	50	150					250					0.9	10,000		
		40-S32-04-6T	●																	0.9	10,000		
			●																				
	Long Shank	MFH 25-S25-04-2T-180	●	mm	2	25	14	25	100	180	2.5	-10°	Yes	Fig.5	0.6	12,700							
		25-S25-04-3T-180	●		3				40	200					0.6	12,700							
		28-S25-04-3T-200	●		4	28	17	32	120	200					Fig.6	0.7	12,000						
		32-S32-04-4T-200	●			32	21		120						200	Fig.5	1.1	11,200					
		35-S32-04-4T-200	●			35	24		50						250	Fig.6	1.1	10,700					
		40-S32-04-5T-250	●			40	29		50						250	Fig.6	1.5	10,000					
		●	5																				
Weldon	Standard Shank	MFH 25-W25-04-2T	●	mm	2	25	14		25	60	117	2.5	-10°	Yes	Fig.3	0.4	12,700						
		25-W25-04-3T	●		3			60		117	0.4					12,700							
		32-W32-04-4T	●		4	32	21	32	70	131	0.7					11,200							
		32-W32-04-5T	●		5				50	111						0.7	11,200						
		40-W32-04-5T	●													0.7	10,000						
		40-W32-04-6T	●		6	40	29	32	50	111	111				Fig.4	0.7	10,000						
			●																				
			●																				
			●																				
			●																				

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

MFH MAX Face Mill **NEW**

● Toolholder Dimensions (Inch & Metric Sizes)

Part Number		Stock	Unit	No. of Inserts	Dimensions										Rake Angle (°)	Coolant Hole	Weight (kg)	Max RPM	
					DCX	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX				A.R.
Inch Bore	MFH 1500R-04-6T	●	inch	6	1.500	1.067	1.400	0.500	0.433	0.276	1.575	0.709	0.156	0.250	0.098	-10°	Yes	0.2	10,200
	2000R-04-7T	●		7	2.000	1.567	1.750	0.750	0.669	0.433	1.969	0.947	0.188	0.313				0.5	8,600
	2500R-04-9T	●		9	2.500	2.067	2.250					0.750						0.7	8,000
	3000R-04-10T	●		10	3.000	2.567	2.750	1.000	0.866	0.551	2.480	1.063	0.236	0.375				1.3	7,500
	MFH 080R-04-8T	●	mm	8	80	69	76	1.250"	26	17	63	1.260"	0.315"	0.500"	2.5	-10°	Yes	1.6	7,100
	080R-04-10T	●		10														1.6	
Metric Bore	MFH 040R-04-5T-M	●	mm	5	40	29	38	16	15	9	40	19	5.6	8.4	2.5	-10°	Yes	0.2	10,000
	040R-04-6T-M	●		6	50	39	47	22	18	11	50	21	6.3	10.4				0.2	9,000
	050R-04-6T-M	●																0.4	
	050R-04-7T-M	●		7	52	41	60	27	20	13	63	24	7.0	12.4				0.4	8,800
	052R-04-6T-M	●		6														0.5	
	052R-04-7T-M	●		7	63	52	60											0.4	8,000
	063R-04-7T-M	●																7	
	063R-04-9T-M	●		9	80	69	76											0.8	8,000
	063R-04-7T-27M	●		7														0.8	
	063R-04-9T-27M	●		9	0.7	7,100													
	080R-04-8T-M	●		8	1.8														
	080R-04-10T-M	●		10	1.7														

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

● Spare Parts and Applicable Inserts

Cutter Type	Part Number	Spare Parts				Applicable Inserts
		Clamp Screw	Wrench	Anti-seize Compound	Mounting Bolt	
End Mills	MFH-04-...	SB-3575TRP	DTPM-10	P-37	-	LOMU040410ER-GM
Face Mills	Inch Bore	SB-3575TRP	DTPM-10	P-37	HH1/4-0.75(H)	
					HH3/8-1.25(H)	
					HH3/8-1.25(H)	
					HH1/2-1.25(H)	
					HH16X40(H)	
	Metric Bore	SB-3575TRP	DTPM-10	P-37	HH16X40(H)	
					HH8X25(H)	
					HH10X30(H)	
					HH10X30(H)	
					HH10X30(H)	
Modular End Mills	MFH-04-...	SB-3575TRP	DTPM-10	P-37	HH12X35(H)	

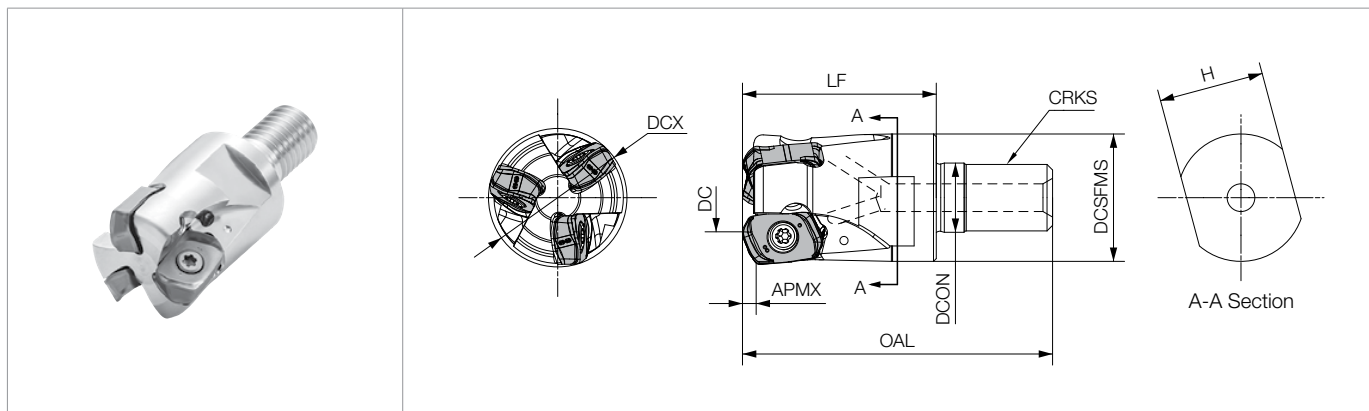
(H) Optional coolant thru bolt available.

Recommended Cutting Conditions ● M172

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

● Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

MFH MAX Modular End Mill **NEW**


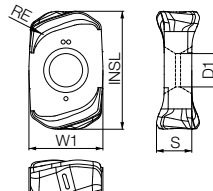
● Toolholder Dimensions (Inch & Metric Sizes)

Part Number	Stock	Unit	No. of Inserts	Dimensions									Rake Angle	Coolant Hole	Max RPM
				DCX	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R.		
MFH 1000-M12-04-3T	●	inch	3	1.000	0.567	0.900	0.492	2.205	1.380	M12xP1.75	0.748	0.098	-10°	Yes	12,500
1250-M16-04-5T	●		5	1.250	0.817	1.180	0.669	2.441	1.580	M16xP2.0	0.945				11,000
MFH 22-M10-04-2T	●	mm	2	22	11	18.7	10.5	48	30	M10XP1.5	15	2.5	-10°	Yes	13,600
25-M12-04-2T	●			25	14	23	12.5	56	35	M12XP1.75	19				12,700
25-M12-04-3T	●		3												28
28-M12-04-3T	●			4	32	21	30	24	11,200						
28-M12-04-4T	●		5						35	24	10,700				
32-M16-04-4T	●			5	40	29	10,000								
32-M16-04-5T	●		6					42	31	9,800					
35-M16-04-4T	●			6	42	31	9,800								
35-M16-04-5T	●		6					42	31	9,800					
40-M16-04-5T	●			6	42	31	9,800								
40-M16-04-6T	●		6					42	31	9,800					
42-M16-04-5T	●			6	42	31	9,800								
42-M16-04-6T	●		6					42	31	9,800					

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

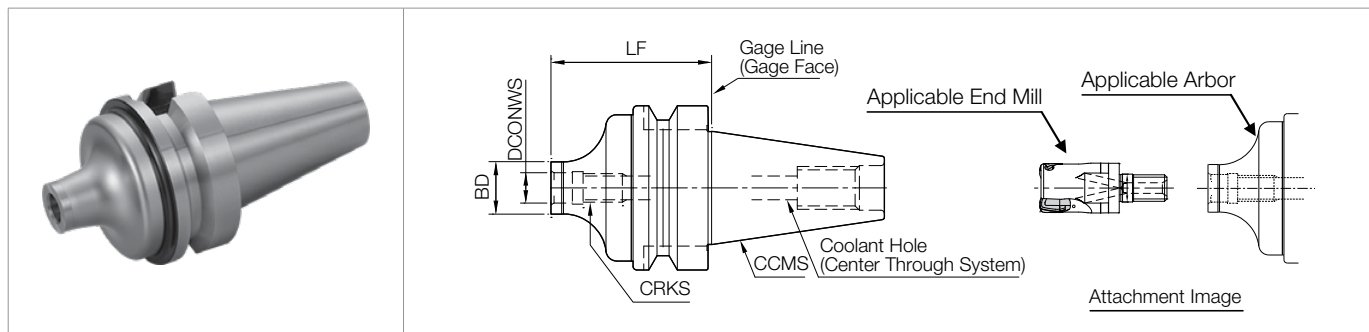
● Applicable Inserts (➡ M16)

Insert	Part Number	Dimension (in)					MEGACOAT NANO			CVD
		W1	S	D1	INSL	RE	PR1535	PR1525	PR1510	CA6535
 4-Edge Double-Sided	 LOMU 040410ER-GM	0.358	0.173	0.161	0.571	0.039	●	●	●	●

Insert Grade:

PR1535 For Steel Machining (Stability Oriented Machining), Titanium Alloy, Austenitic/Precipitation Hardened Stainless Steel, etc.**PR1525** For Steel Machining (General Use)**PR1510** For Cast Iron Machining**CA6535** For Martensitic Stainless Steel, Ni-base Heat-Resistant Alloy, etc.

BT Arbor for Exchangeable Head / Double-face Clamping Spindle



Toolholder Dimensions (Metric Sizes)

Part Number	Stock	Dimensions (mm)				Coolant Hole	Arbor (Double-face clamping spindle)	
		LF	BD	DCONWS	CRKS		CCMS	Applicable End Mill
BT30K- M10-45	●	45	18.7	10.5	M10xP1.5	Yes	BT30	MFH..-M10..
M12-45	●	45	23	12.5	M12xP1.75			MFH..-M12..
BT40K- M10-60	□	60	18.7	10.5	M10xP1.5	Yes	BT40	MFH..-M10..
M12-55	□	55	23	12.5	M12xP1.75			MFH..-M12..
M16-65	□	65	30	17	M16xP2.0			MFH..-M16..

Actual End Mill Depth

Arbor Part Number	Applicable Modular End Mill			Actual End Mill Depth LUX (mm)
	Part Number	Cutting Dia. DC (mm)	Dimensions LF (mm)	
BT30K- M10-45	MFH22-M10...	22	30	39.2
	MFH25-M12...	25	35	42.8
	MFH28-M12...	28	35	45.5
BT40K- M10-60	MFH22-M10...	22	30	44.5
	MFH25-M12...	25	35	44.6
	MFH28-M12...	28	35	47.6
	MFH32-M16...	32	40	51.2
	MFH35-M16...	35	40	60.2
	MFH40-M16...	40	40	64.0
M16-65	MFH42-M16...	42	40	64.0

MFH-Series Expansive High-Feed Lineup for Various Applications and Machining Environments

MFH-MAX
MFH-RAPTOR MICRO
MFH-RAPTOR MINI
MFH-RAPTOR

Small Diameter/
Larger Depth of Cut



MFH MAX
Ø1.000" ~ Ø3.000"
Ø22mm ~ Ø80mm

Micro Diameter



MFH Micro
Ø0.375" ~ Ø0.625"
Ø8mm ~ Ø16mm

Small Diameter/
Fine Pitch Type



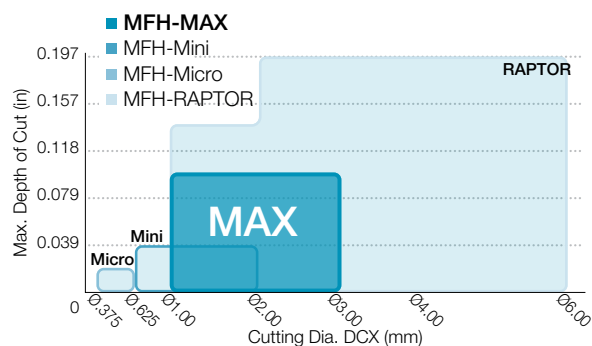
MFH Mini
Ø0.625" ~ Ø2.000"
Ø16mm ~ Ø50mm

Large Diameter

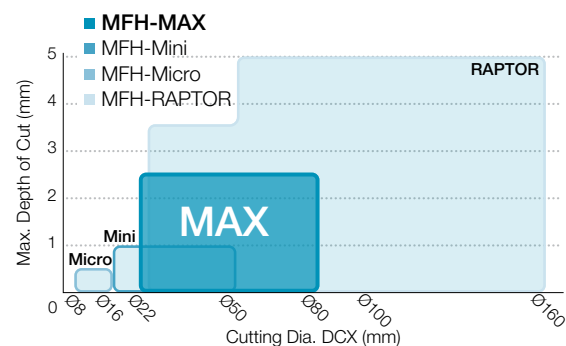


MFH RAPTOR
Ø1.000" ~ Ø6.000"
Ø25mm ~ Ø160mm

MFH-Series Inch Diameter Range



MFH-Series Metric Diameter Range



◆ Recommended Cutting Conditions

Chipbreaker	Workpiece	Feed Rate (fz: ipt)		Recommended Insert Grade (Vc: m/min)				
		D.O.C. (in)	MFH...04...	MEGACOAT NANO			CVD Coating	
				PR1535	PR1525	PR1510	CA6535	
GM	Carbon Steel Alloy Steel	(~ 280HB)	≤ 0.020	0.008 – 0.032 – 0.051	☆ 390 – 520 – 720	★ 390 – 520 – 720	-	-
			≤ 0.039	0.008 – 0.028 – 0.043				
			≤ 0.059	0.008 – 0.024 – 0.032				
			≤ 0.079	0.008 – 0.016 – 0.028				
			≤ 0.098	0.008 – 0.012 – 0.020	☆ 330 – 490 – 660 (Dry Machining Recommended)	★ 330 – 490 – 660 (Dry Machining Recommended)	-	-
			≤ 0.020	0.008 – 0.030 – 0.047				
			≤ 0.039	0.008 – 0.026 – 0.039				
			≤ 0.059	0.008 – 0.022 – 0.028				
	Mold Steel	(~ 40HRC)	≤ 0.079	0.008 – 0.016 – 0.022	☆ 260 – 390 – 520 (Dry Machining Recommended)	★ 260 – 390 – 520 (Dry Machining Recommended)	-	-
			≤ 0.098	0.008 – 0.010 – 0.014				
			≤ 0.020	0.008 – 0.024 – 0.043				
			≤ 0.039	0.008 – 0.020 – 0.035				
			≤ 0.059	0.008 – 0.016 – 0.026	-	★ 200 – 330 – 430 (Dry Machining Recommended)	-	-
			≤ 0.079	0.008 – 0.012 – 0.022				
			≤ 0.098	0.008 – 0.010 – 0.014				
			≤ 0.020	0.004 – 0.012 – 0.020				
		(40 ~ 50HRC)	≤ 0.039	0.004 – 0.010 – 0.016	-	-	-	-
			≤ 0.059	0.004 – 0.008 – 0.012				
			≤ 0.079	-				
			≤ 0.098	-				
			≤ 0.020	0.004 – 0.008 – 0.016	-	-	-	-
			≤ 0.039	0.004 – 0.012 – 0.020				
			≤ 0.059	0.004 – 0.010 – 0.016				
			≤ 0.079	0.004 – 0.006 – 0.010				
	Austenitic Stainless Steel		≤ 0.079	-	-	-	-	-
			≤ 0.098	-				
			≤ 0.020	0.004 – 0.008 – 0.016				
			≤ 0.039	0.004 – 0.006 – 0.010				
			≤ 0.059	-	-	-	-	-
			≤ 0.079	-				
			≤ 0.098	-				
			≤ 0.020	0.004 – 0.008 – 0.016				
	Martensitic StainlessSteel		≤ 0.039	0.004 – 0.010 – 0.016	-	-	-	-
			≤ 0.059	0.004 – 0.008 – 0.012				
			≤ 0.079	-				
			≤ 0.098	-				
			≤ 0.020	0.008 – 0.024 – 0.039	-	-	-	-
			≤ 0.039	0.008 – 0.020 – 0.035				
			≤ 0.059	0.008 – 0.018 – 0.024				
			≤ 0.079	0.008 – 0.012 – 0.020				
	Precipitation Hardened Stainless Steel		≤ 0.098	0.008 – 0.010 – 0.016	-	-	-	-
			≤ 0.020	0.008 – 0.024 – 0.039				
			≤ 0.039	0.008 – 0.020 – 0.035				
			≤ 0.059	0.008 – 0.018 – 0.024				
			≤ 0.079	0.008 – 0.012 – 0.020	-	-	-	-
			≤ 0.098	0.008 – 0.010 – 0.016				
			≤ 0.020	0.004 – 0.012 – 0.020				
			≤ 0.039	0.004 – 0.010 – 0.018				
	Gray Cast Iron		≤ 0.059	0.004 – 0.006 – 0.010	-	-	-	-
			≤ 0.079	-				
			≤ 0.098	-				
			≤ 0.020	0.004 – 0.012 – 0.020				
			≤ 0.039	0.004 – 0.010 – 0.018	-	-	-	-
			≤ 0.059	0.004 – 0.010 – 0.016				
			≤ 0.079	0.004 – 0.006 – 0.008				
			≤ 0.098	-				
	Nodular Cast Iron		≤ 0.020	0.004 – 0.012 – 0.018	-	-	-	-
			≤ 0.039	0.004 – 0.010 – 0.016				
			≤ 0.059	0.004 – 0.010 – 0.016				
			≤ 0.079	0.004 – 0.010 – 0.016				
			≤ 0.098	0.008 – 0.010 – 0.016	-	-	-	-
			≤ 0.020	0.008 – 0.024 – 0.039				
			≤ 0.039	0.008 – 0.020 – 0.035				
			≤ 0.059	0.008 – 0.016 – 0.028				
Ni-base Heat-Resistant Alloy		≤ 0.079	0.008 – 0.012 – 0.024	-	-	-	-	
		≤ 0.098	0.008 – 0.010 – 0.016					
		≤ 0.020	0.008 – 0.024 – 0.039					
		≤ 0.039	0.008 – 0.020 – 0.035					
		≤ 0.059	0.008 – 0.016 – 0.028	-	-	-	-	
		≤ 0.079	0.008 – 0.012 – 0.024					
		≤ 0.098	0.008 – 0.010 – 0.016					
		≤ 0.020	0.004 – 0.012 – 0.020					
Titanium Alloy		≤ 0.039	0.004 – 0.010 – 0.018	-	-	-	-	
		≤ 0.059	0.004 – 0.010 – 0.018					
		≤ 0.079	0.004 – 0.006 – 0.010					
		≤ 0.098	-					
		≤ 0.020	0.004 – 0.012 – 0.020	-	-	-	-	
		≤ 0.039	0.004 – 0.010 – 0.018					
		≤ 0.059	0.004 – 0.006 – 0.010					
		≤ 0.079	-					

- 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.
 - Machining with coolant 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 CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions. Slotting is not recommended in this situation.
 - Center through air is recommended for slotting.
 - Slotting or pocketing are not recommended for face mill types.
 - For face milling, it is recommended that width of cut should be set to 75% or less of the cutting diameter.
 - For long shank end mills, 75% or less of the recommended conditions is recommended for both D.O.C. and feed rate.
- ★: 1st Recommendation ☆: 2nd Recommendation

Approximate Programming Radius Adjustment

Shape	Programmable R (in)	Max. Over Machined Radius Portion (in)	Max. Non-machined Portion (in)
	0.059	0	0.0559
	0.079	0	0.0488
	0.118 (Recommended)	0	0.0343
	0.138	0.0024	0.0272

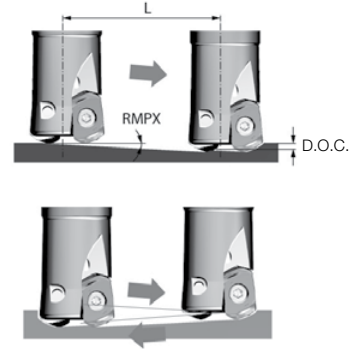
Ramping Tips

- Ramping angle should be under RMPX (maximum ramping angle) in table below
- Reduce recommended feed rate in recommended cutting conditions by 70%

Formula for Max. Cutting Length (L) at Max. Ramping Angle

$$L = \frac{D.O.C.}{\tan RMPX}$$

- When ramping from both the front and outer periphery, set the maximum ramping angle RMPX to 50%.



Ramping Reference Data

Part Number	Cutter Dia. DCX (in)	-	1.000"	-	1.250"	-	1.500"	-	2.000"	-	2.500"	3.000"
	Cutter Dia. DCX (mm)	22mm	25mm	28mm	32mm	35mm	40mm	42mm	50mm	52mm	63mm	80mm
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

Helical Milling

For Helical milling, use between Min. Drilling Dia. and Max. Drilling Dia.

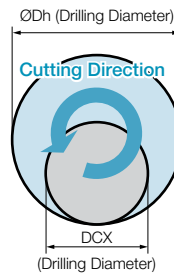
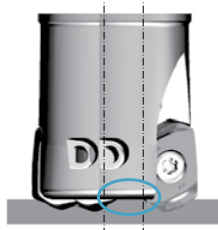
Exceeding Max. Machining Dia.

Center Core Remains After Machining



Under Min. Machining Dia.

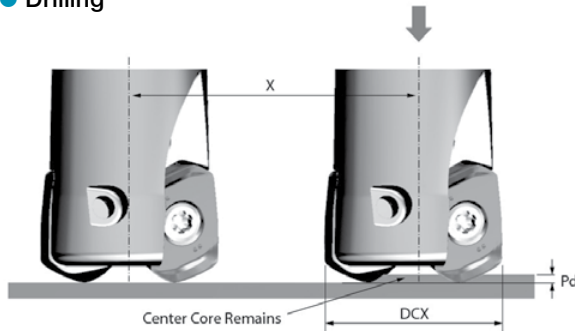
Center Core Hits Holder Body



Part Number	Min. Drilling Dia.	Max. Drilling Dia.
MFH... -04- ...	2 × DCX - 0.433"	2 × DCX - 0.079"

- Maximum ramping depth per cycle to be under maximum D.O.C. Max D.O.C. (0.098")
- 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

Drilling



Part Number	GM Chipbreaker	
	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface
MFH... -04- ...	0.024"	DCX - 0.472"

- It is recommended to reduce feed by 25% of recommendation until the center core is removed
- Axial feed rate recommendation per revolution is $f \leq 0.008$ ipr while drilling

Plunging



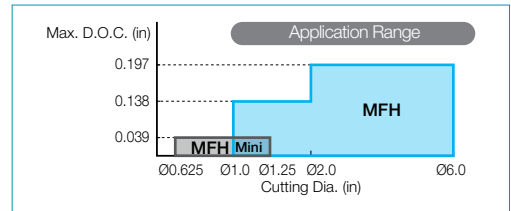
Insert Part Number	Maximum Width of Cut (ae)
LOMU04...	0.197"

- Reduce feed rate to $fz \leq 0.008$ ipt when plunging

MFH-RAPTOR

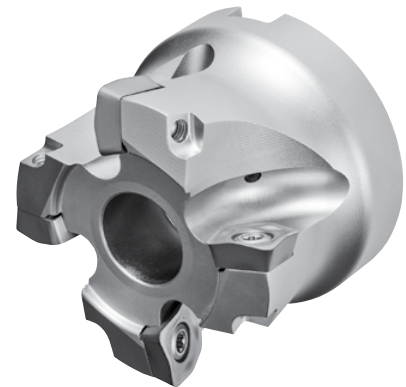
(Cutter Dia. Ø1.000" ~ Ø6.000")
(Cutter Dia. Ø25mm ~ Ø160mm)

Anti-vibration Design for Increased Chip Evacuation and Shortened Cutting Times



1 4 Different Insert Designs Offer a Variety of Machining Options

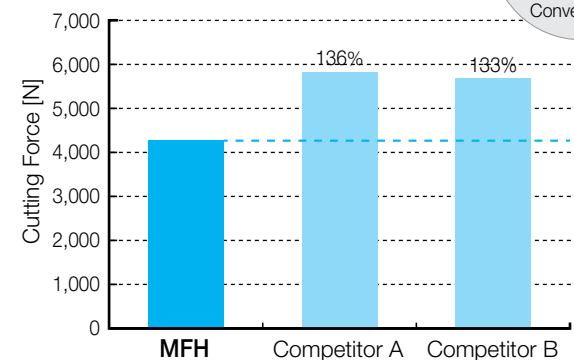
	GM (General Milling)	GH (Tough Edge)	LD (Large D.O.C.)	FL (Wiper Edge)
Shape				
Applications	1st Choice for General Purpose Multiple Metalworking Processes	Heavy Milling Excellent fracture resistance	1st Choice for Large D.O.C. MAX D.O.C. = 0.197" (SOMT14) MAX D.O.C. = 0.138" (SOMT10) Available for Scale Removal	Wiper Edge Roughing and Finishing Even in Low Horsepower Machining Centers



2 Reduced Chattering with Convex Cutting Edge Design

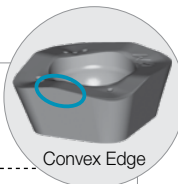
Reduces Cutting Forces at Initial Impact with a Convex Helical Edge Design

Width of cut a_e is half of cutter diameter when cutting forces at initial contact are the greatest

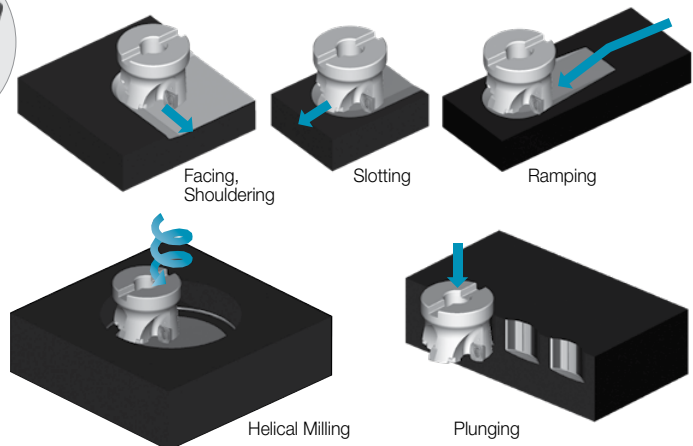


$V_c = 490 \text{ sfm}$, $f_z = 0.059 \text{ ipt}$, D.O.C. $\times a_e = 0.059" \times 1.240"$
1049, Dry, Cutter Dia. Ø2.5"

Resultant Force Shown



3 Wide Application Range for Multiple Metalworking Processes



* GM chipbreaker is available for all of the above applications.

* LD and FL chipbreakers are not available for helical milling, plunging and contouring of rising wall.
(Refer to Page [M186](#))

PR1535

MEGACOAT NANO

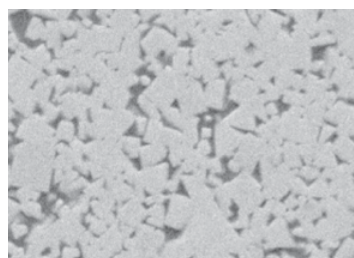
MEGACOAT NANO Grade PR1535 for stable machining of difficult-to-cut materials such as heat-resistant alloy, titanium alloy and precipitation hardened stainless steel

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

1 23% Improved Fracture Toughness

An increase in cobalt content yields a substrate with greater toughness. Fracture toughness values are improved by 23% over previous grades.

High Toughness Carbide Base Material

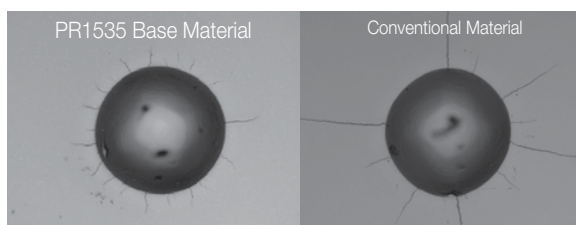


23%
Fracture
Toughness

2 Stability Improvement

The coarse grain structure and uniform particle size correspond to improved heat resistance, with conductivity values decreased by 11%. The uniform structure also reduces crack propagation.

Cracking Comparison by Diamond Indenter (In-house Evaluation)



Short Cracks
(High Impact Improvement)

Long Cracks

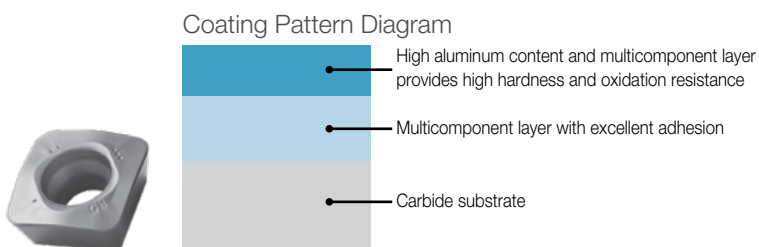
**Shock
Resistance**

PR015S

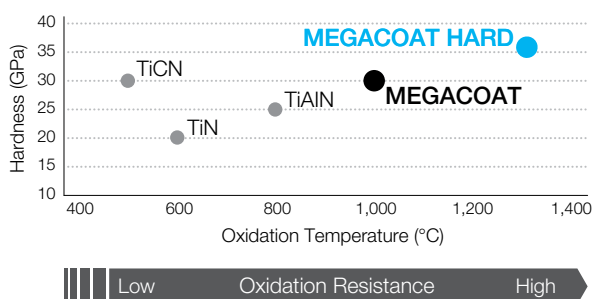
MEGACOAT HARD

Thermal property of the substrate reduces cracks and notch wear with a high hardness and heat-resistant coating for improved wear resistance when machining in hardened materials

MEGACOAT HARD Improves Wear Resistance with High Hardness and High Heat-resistant PVD Layer

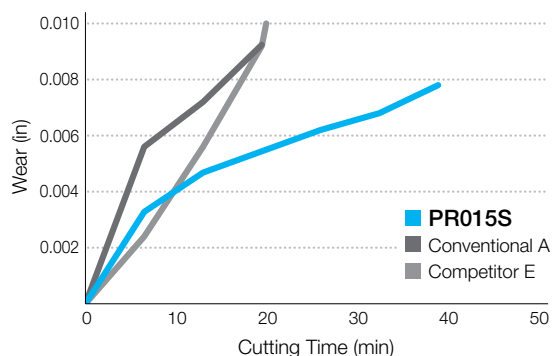


Coating Properties (Internal Evaluation)



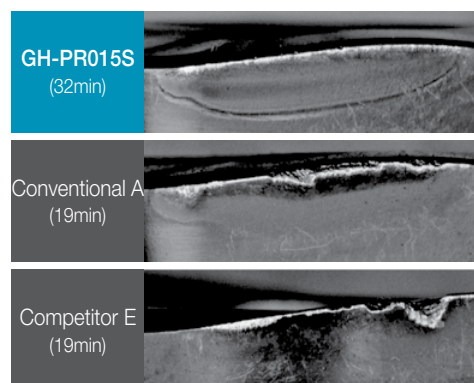
Combining GH chipbreaker and grade PR015S reduces heat cracking and improves fracture resistance for stable machining in hardened material

Cutting Performance Comparison (Internal Evaluation)

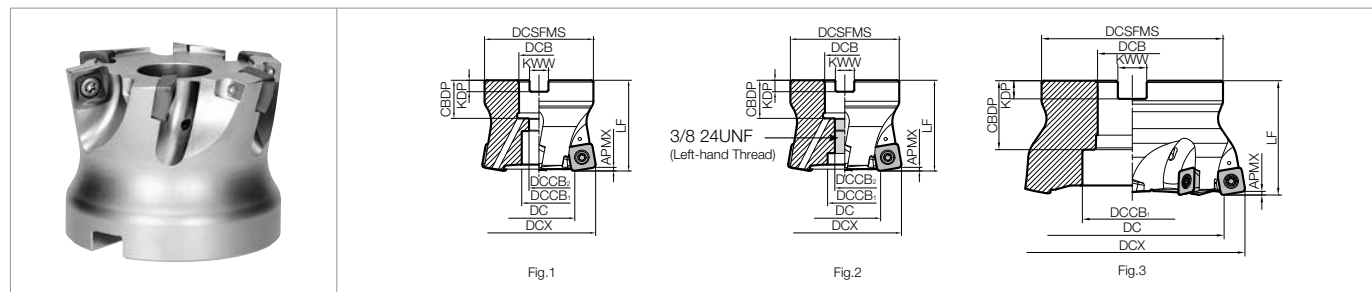


Cutting Conditions:
Vc = 165 sfm,
fz = 0.008ipt,
D.O.C. = 0.039" x 1.240",
Wet
SOMT140520ER-GH
Competitor Tough Edge Chipbreaker
(Flat type)
Workpiece: D2 (55HRC)

Cutting Edge



MFH Face Mill (Inch Size)



Toolholder Dimensions with SOMT10 Inserts (Inch Size)








Part Number	Stock	No. of Inserts	Dimensions (in)														Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM
			DCX	DC			DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	*APMX ₂	A.R.	R.R.				
MFH 2000R-10-4T	●	4	2.000	1.331	1.510	1.469	1.750	0.750	0.669	0.433	1.969	0.947	0.187	0.313	0.059 *(0.138)	0.047	+10°	-5°	Yes	Fig.1	0.4	10,000
2000R-10-5T	●	5	2.000	1.331	1.510	1.469	1.750	0.750	0.669	0.433	1.969	0.947	0.187	0.313			+10°	-5°			0.4	10,000
2500R-10-5T	●	5	2.500	1.831	2.010	1.969	2.250	0.750	0.669	0.433	1.969	0.750	0.187	0.313			+10°	-4°			0.7	8,800
2500R-10-6T	●	6	2.500	1.831	2.010	1.969	2.250	0.750	0.669	0.433	1.969	0.750	0.187	0.313			+10°	-4°			0.7	8,800
3000R-10-7T	●	7	3.000	2.331	2.510	2.469	2.750	1.000	0.866	0.551	2.480	1.063	0.236	0.382			+10°	-4°			1.3	7,600

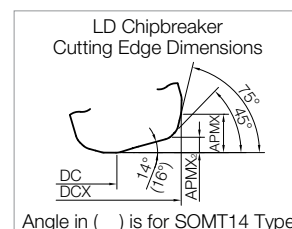
Toolholder Dimensions with SOMT14 Inserts (Inch Size)

Part Number	Stock	No. of Inserts	Dimensions (in)														Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM
			DCX	DC			DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	*APMX ₂	A.R.	R.R.				
MFH 2000R-14-4T	●	4	2.000	1.094	1.330	1.291	1.750	0.750	0.500	3/8 24UNF	1.969	0.827	0.187	0.313	0.079 *(0.197)	0.079	+10°	-10°	Yes	Fig.2	0.4	8,800
2000R-14-5T	●	5	2.000	1.094	1.330	1.291	1.750	0.750	0.500	3/8 24UNF	1.969	0.827	0.187	0.313			+10°	-10°			0.4	8,800
2500R-14-4T	●	4	2.500	1.594	1.830	1.791	2.250	0.750	0.669	0.433	1.969	0.750	0.187	0.313			+10°	-10°			0.6	7,400
2500R-14-5T	●	5	2.500	1.594	1.830	1.791	2.250	0.750	0.669	0.433	1.969	0.750	0.187	0.313			+10°	-10°			0.6	7,400
2500R-14-5T-1000	●	5	2.500	1.594	1.830	1.791	2.251	1.000	0.866	0.551	2.480	1.063	0.236	0.382			+10°	-10°			0.7	7,400
3000R-14-5T	●	5	3.000	2.094	2.330	2.291	2.750	1.000	0.866	0.551	2.480	1.063	0.236	0.382			+10°	-9°	Yes	Fig.1	1.2	6,400
3000R-14-6T	●	6	3.000	2.094	2.330	2.291	2.750	1.000	0.866	0.551	2.480	1.063	0.236	0.382			+10°	-9°			1.2	6,400
3000R-14-6T-1250	●	6	3.000	2.094	2.330	2.291	2.750	1.250	1.000	0.657	2.480	1.063	0.280	0.504			+10°	-9°			1.3	6,400
4000R-14-6T	●	6	4.000	3.094	3.330	3.291	3.750	1.500	1.299	0.866	2.480	1.181	0.394	0.626			+10°	-7°			2.3	5,600
4000R-14-7T	●	7	4.000	3.094	3.330	3.291	3.750	1.500	1.299	0.866	2.480	1.181	0.394	0.626			+10°	-7°			2.3	5,600
5000R-14-7T	●	7	5.000	4.094	4.330	4.291	3.750	1.500	2.047	-	2.480	1.496	0.394	0.626			+10°	-7°	Yes	Fig.3	2.9	4,800
6000R-14-8T	●	8	6.000	5.094	5.330	5.291	4.880	2.000	2.835	-	2.480	1.496	0.433	0.752			+10°	-6°			4.5	4,200

Spare Parts and Applicable Inserts (Inch Size)

*1 Refer to LD dimensions in figure below *2 Dimension in () is when mounting LD

Part Number	Spare Parts						Applicable Inserts  M20, M183
	Clamp Screw	Wrench		Anti-seize Compound	Mounting Bolt	Mounting Screw	
							
MFH 2000R-10-4T 2000R-10-5T 2500R-10-5T 2500R-10-6T 3000R-10-7T	SB-4090TRPN	DTPM-15 <div>Recommended Torque for Insert Clamp 3.5 N·m</div>		P-37	HH3/8-1.25(H) HH3/8-1.25(H) HH3/8-1.25(H) HH3/8-1.25(H) HH1/2-1.25(H)	-	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
MFH 2000R-14-4T 2000R-14-5T 2500R-14-4T 2500R-14-5T 2500R-14-5T-1000 3000R-14-5T 3000R-14-6T 3000R-14-6T-1250 4000R-14-6T 4000R-14-7T 5000R-14-7T 6000R-14-8T	SB-50120TRP SB-5090TRP <						



Angle in () is for SOMT14 Type

Caution with Max. Revolution
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

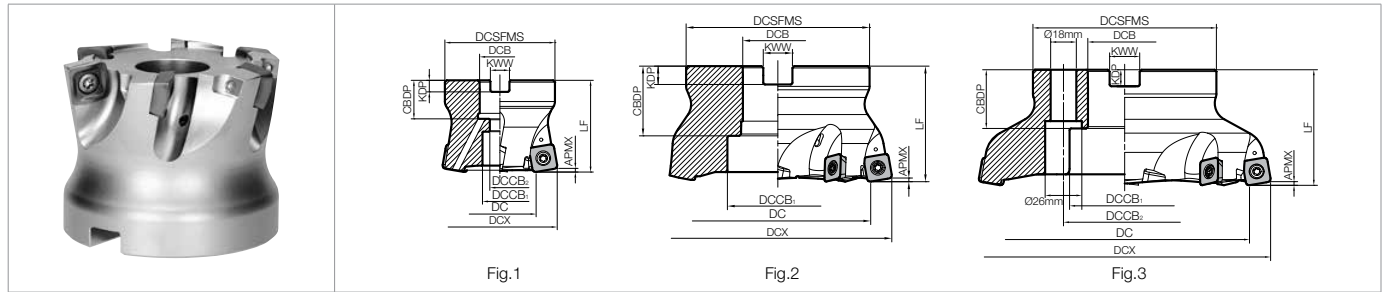
Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

*1 Differential screw (3/8-24UNF)

(H) Optional coolant thru bolt available.

Recommended Cutting Conditions **M184-M185**

MFH Face Mill (Metric Size)



Toolholder Dimensions with SOMT10 Inserts (Metric Size)

Part Number			Stock	No. of Inserts	Dimensions (mm)														Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM
					DCX	DC			DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	*APMX ₂	A.R.	R.R.				
Inch Bore Dia.	MFH 050R-10-4T	●	4	50	33	37.5	36.5	47	0.875"	19	11	50	0.748"	0.197"	0.331"	1.5 *(3.5)	1.2	+10°	-5°	Yes	Fig.1	0.4	10,000	
	050R-10-5T	●	5	50	33	37.5	36.5	47	0.875"	19	11	50	0.748"	0.197"	0.331"			+10°	-5°			0.4	10,000	
	063R-10-5T	●	5	63	46	50.5	49.5	60	0.875"	19	11	50	0.748"	0.197"	0.331"			+10°	-4°			0.7	8,800	
	063R-10-6T	●	6	63	46	50.5	49.5	60	0.875"	19	11	50	0.748"	0.197"	0.331"			+10°	-4°			0.7	8,800	
	080R-10-7T	●	7	80	63	67.5	66.5	76	1.250"	26	17	63	1.260"	0.315"	0.500"			+10°	-4°			1.3	7,600	
Metric Bore Dia.	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°	-5°	Yes	Fig.1	0.4	10,000	
	050R-10-5T-M	●	5	50	33	37.5	36.5	47	22	19	11	50	21	6.3	10.4			+10°	-5°			0.4	10,000	
	063R-10-5T-22M	●	5	63	46	50.5	49.5	60	22	19	11	50	21	6.3	10.4			+10°	-4°			0.7	8,800	
	063R-10-6T-22M	●	6	63	46	50.5	49.5	60	22	19	11	50	21	6.3	10.4			+10°	-4°			0.7	8,800	
	063R-10-5T-27M	●	5	63	46	50.5	49.5	60	27	20	13	50	24	7.0	12.4			+10°	-4°			0.7	8,800	
	063R-10-6T-27M	●	6	63	46	50.5	49.5	60	27	20	13	50	24	7.0	12.4			+10°	-4°			0.7	8,800	
	080R-10-7T-M	●	7	80	63	67.5	66.5	76	27	20	13	63	24	7.0	12.4			+10°	-4°			1.6	7,600	

Toolholder Dimensions with SOMT14 Inserts (Metric Size)






Part Number		Stock	No. of Inserts	Dimensions (mm)														Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM
				DCX	DC			DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	* ₁ APMX ₂	A.R.	R.R.				
					GM/GH	LD	FL																
Inch Bore Dia.	MFH 050R-14-4T	●	4	50	27	33	32	47	0.875"	12	-	50	0.748"	0.197"	0.331"	2 *(5)	2	+10°	-10°	Yes	Fig.1	0.4	8,800
	063R-14-4T	●	4	63	40	46	45	60	0.875"	19	11	50	0.748"	0.197"	0.331"			+10°	-10°		Fig.1	0.6	7,400
	063R-14-5T	●	5	63	40	46	45	60	0.875"	19	11	50	0.748"	0.197"	0.331"			+10°	-10°		Fig.1	0.6	7,400
	080R-14-5T	●	5	80	57	63	62	76	1.250"	26	17	63	1.260"	0.315"	0.500"			+10°	-8°		Fig.1	1.3	6,400
	080R-14-6T	●	6	80	57	63	62	76	1.250"	26	17	63	1.260"	0.315"	0.500"			+10°	-8°		Fig.1	1.3	6,400
	100R-14-6T	●	6	100	77	83	82	96	1.250"	26	17	63	1.260"	0.315"	0.500"			+10°	-7°		Fig.1	2.4	5,600
	100R-14-7T	●	7	100	77	83	82	96	1.250"	26	17	63	1.260"	0.315"	0.500"			+10°	-7°		Fig.1	2.4	5,600
	125R-14-7T	●	7	125	102	108	107	100	1.500"	55	-	63	1.496"	0.394"	0.625"			+10°	-7°		Fig.2	2.9	4,800
	160R-14-8T	●	8	160	137	143	142	100	2.000"	72	-	63	1.496"	0.433"	0.750"			+10°	-6°		No	Fig.2	3.9
Metric Bore Dia.	MFH 050R-14-4T-M	●	4	50	27	33	32	47	22	12	-	50	21	6.3	10.4	2 *(5)	2	+10°	-10°	Yes	Fig.1	0.4	8,800
	063R-14-4T-22M	●	4	63	40	46	45	60	22	19	11.0	50	21	6.3	10.4			+10°	-10°		Fig.1	0.6	7,400
	063R-14-5T-22M	●	5	63	40	46	45	60	22	19	11.0	50	21	6.3	10.4			+10°	-10°		Fig.1	0.6	7,400
	063R-14-4T-27M	●	4	63	40	46	45	60	27	20	13.0	50	24	7	12.4			+10°	-10°		Fig.1	0.6	7,400
	063R-14-5T-27M	●	5	63	40	46	45	60	27	20	13.0	50	24	7	12.4			+10°	-10°		Fig.1	0.6	7,400
	080R-14-5T-M	●	5	80	57	63	62	76	27	20	13.0	63	24	7	12.4			+10°	-8°		Fig.1	1.4	6,400
	080R-14-6T-M	●	6	80	57	63	62	76	27	20	13.0	63	24	7	12.4			+10°	-8°		Fig.1	1.4	6,400
	100R-14-6T-M	●	6	100	77	83	82	96	32	26	17.0	63	28	8	14.4			+10°	-7°		Fig.2	2.4	5,600
	100R-14-7T-M	●	7	100	77	83	82	96	32	26	17.0	63	28	8	14.4			+10°	-7°		Fig.2	2.4	5,600
	125R-14-7T-M	●	7	125	102	108	107	100	40	55	-	63	33	9	16.4			+10°	-7°		Fig.2	2.8	4,800
	160R-14-8T-M	●	8	160	137	143	142	100	40	68	66.7	63	32	9	16.4			+10°	-6°		No	Fig.3	3.7

*1 Refer to LD cutting edge dimensions in figure on page [M178](#)

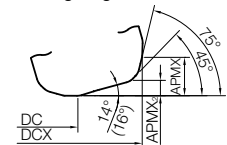
*2 Dimension in () is when mounting LD

Spare Parts and Applicable Inserts [M178](#)

● Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts					Applicable Inserts
	Clamp Screw	Wrench		Anti-seize Compound	Arbor Bolt	
						● M20, M183
MFH 050R-10-...(-M)	SB-4090TRPN	DTPM-15	-	P-37	HH10×30	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL
063R-10-...(-22M)					HH10×30	
063R-10-...-27M					HH12×35	
080R-10-...					HH16×40	
080R-10-...-M					HH12×35	
050R-14-...(-M)	SB-50120TRPN	-	TTP-20	P-37	W10×30	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL
063R-14-...(-22M)					HH10×30	
063R-14-...-27M					HH12×35	
080R-14-...					HH16×40	
080R-14-...-M					HH12×35	
100R-14-...					HH16×40	
100R-14-...-M					-	
125R-14-...					-	
160R-14-...					-	

LD Chipbreaker
Cutting Edge Dimensions



Angle in () is for SOMT14 Type

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

 **Coat Anti-Seize Compound (P-37)** thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions ● M184~M185

Holders on Page ● M177

Inserts

45°~70°
Lead Angle

75°
Lead Angle

90°/88°
Lead Angle

High Feed
Milling

Finish
Milling

Multi-
Function

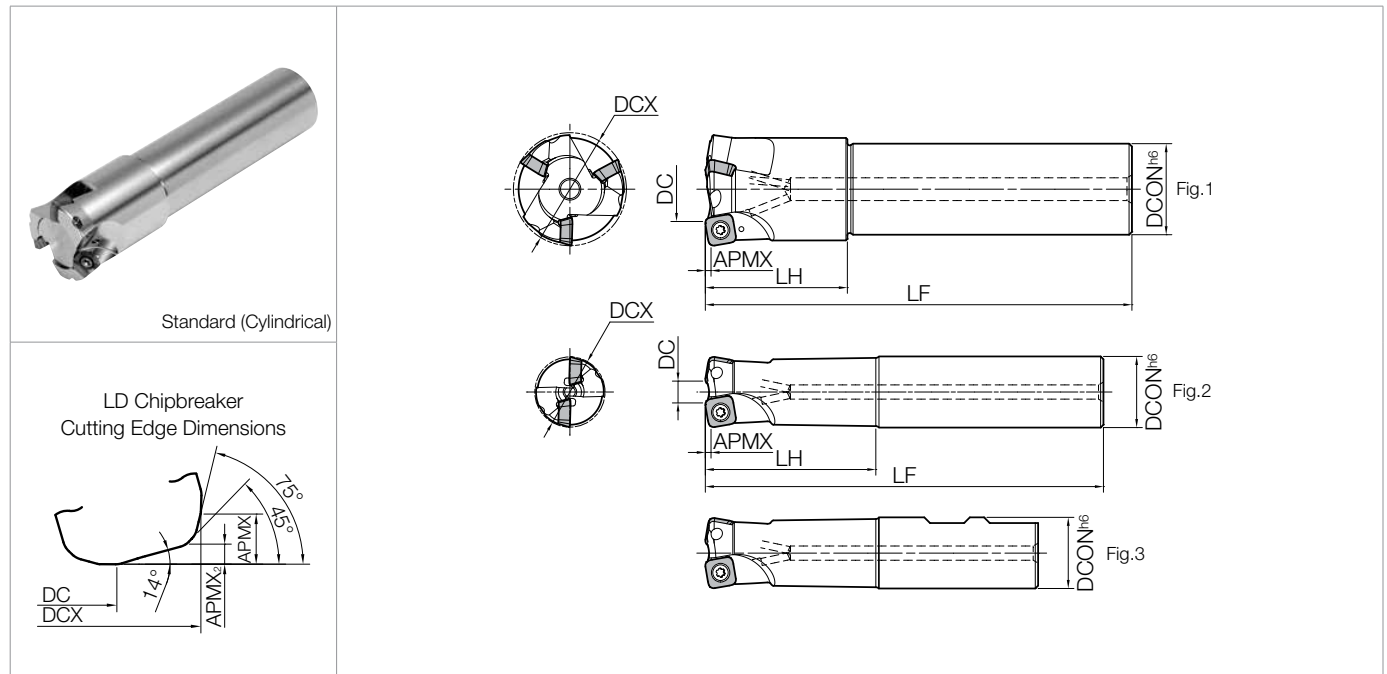
Slot Mill

Ball-Nose
Radius

Other
Applications

M
MILLING

MFH End Mill (Inch Size)






Toolholder Dimensions with SOMET10 Inserts (Inch Size)

Part Number			Stock	No. of Inserts	Dimensions (in)								Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM	
					DCX	DC			DCON	LF	LH	APMX	APMX ₂	A.R.					R.R.
Standard Shank (Weldon)	MFH	1000-W100-10-2T	●	2	1.000	0.331	0.508	0.469	1.000	5.500	3.173	0.059 *(0.138)	0.047	+10°	-5°	Yes	Fig.3	0.4	17,000
		1250-W125-10-2T	●	2	1.250	0.581	0.758	0.719	1.250	6.000	2.750			+10°	-5°			0.8	14,000
		1250-W125-10-3T	●	3	1.250	0.581	0.758	0.719	1.250	6.000	2.750			+10°	-5°			0.8	14,000
		1500-W150-10-3T	●	3	1.500	0.831	1.008	0.969	1.500	6.000	2.000			+10°	-5°			0.8	11,500
		1500-W150-10-4T	●	4	1.500	0.831	1.008	0.969	1.500	6.000	2.000			+10°	-5°			0.8	11,500
Long Shank (Cylindrical)	MFH	1000-S100-10-2T-8	●	2	1.000	0.331	0.508	0.469	1.000	8.000	4.750	0.059 *(0.138)	0.047	+10°	-5°	Yes	Fig.2	0.8	17,000
		1250-S125-10-2T-8	●	2	1.250	0.581	0.758	0.719	1.250	8.000	4.750			+10°	-5°			0.8	14,000
		1500-S125-10-4T10	●	4	1.500	0.831	1.008	0.969	1.250	10.000	2.000			+10°	-5°		Fig.1	0.8	11,500


* Dimension in () is when mounting LD

Spare Parts and Applicable Inserts (Inch Size)

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
				➔ M20, M183
MFH...-10-...	SB-4075TRP	DTPM-15	P-37	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL

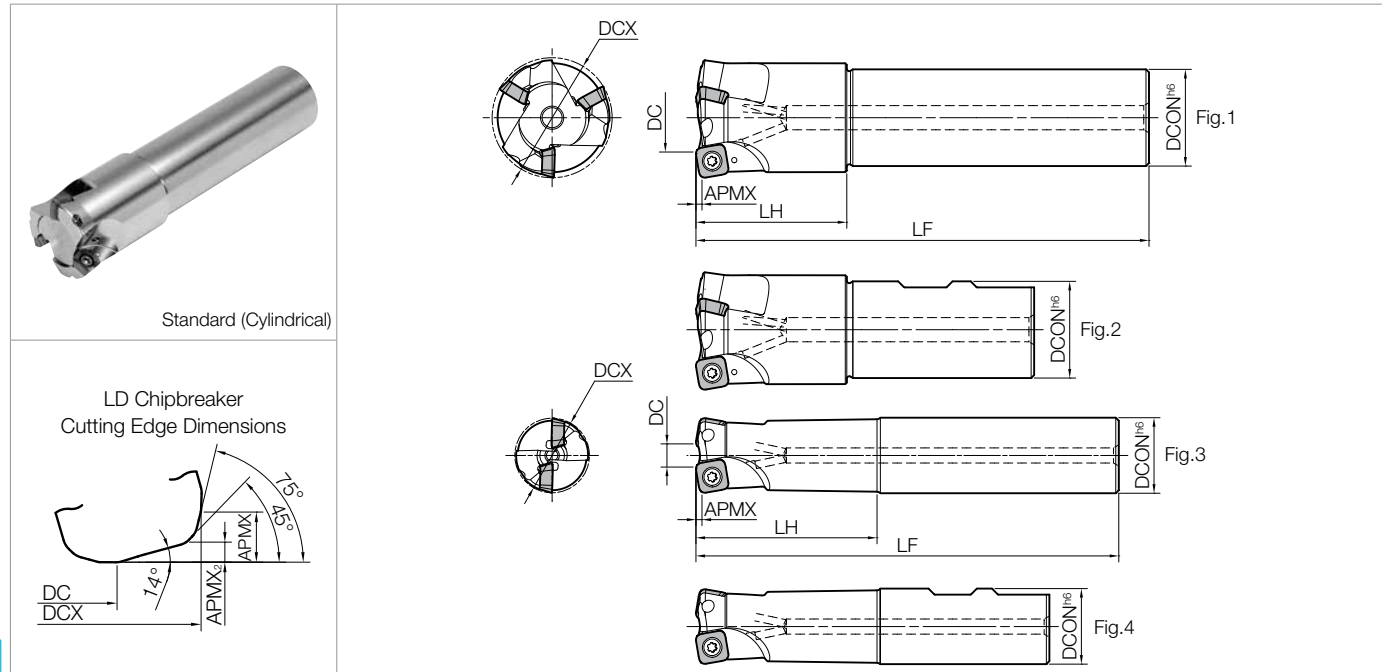
Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions ➔ **M184~M185**




MFH End Mill (Metric Size)



Toolholder Dimensions with SOMT10 Inserts (Metric Size)


Part Number			Stock	No. of Inserts	Dimensions (mm)								Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM	
					DCX	DC			DCON	LF	LH	APMX	APMX ₂	A.R.					R.R.
GM/GH	LD	FL																	
Standard Shank (Cylindrical)	MFH	25-S25-10-2T	●	2	25	8	12.5	11.5	25	140	60	1.5 *(3.5)	1.2	+10°	-5°	Yes	Fig.3	0.4	17,000
		28-S25-10-2T	●	2	28	11	15.5	14.5	25	140	40						Fig.1	0.5	15,500
		32-S32-10-2T	●	2	32	15	19.5	18.5	32	150	70						Fig.3	0.8	14,000
		32-S32-10-3T	●	3	32	15	19.5	18.5	32	150	70						Fig.3	0.8	14,000
		35-S32-10-2T	●	2	35	18	22.5	21.5	32	150	50						Fig.1	0.8	13,000
		35-S32-10-3T	●	3	35	18	22.5	21.5	32	150	50						Fig.1	0.8	13,000
		40-S32-10-3T	●	3	40	23	27.5	26.5	32	150	50						Fig.1	0.9	11,500
		40-S32-10-4T	●	4	40	23	27.5	26.5	32	150	50						Fig.1	0.9	11,500
Standard Shank (Weldon)	MFH	25-W25-10-2T	●	2	25	8	12.5	11.5	25	117	60	1.5 *(3.5)	1.2	+10°	-5°	Yes	Fig.4	0.4	17,000
		32-W32-10-3T	●	3	32	15	19.5	18.5	32	131	70						Fig.4	0.7	14,000
		40-W32-10-3T	●	3	40	23	27.5	26.5	32	112	50						Fig.2	0.7	11,500
		40-W32-10-4T	●	4	40	23	27.5	26.5	32	112	50						Fig.2	0.7	11,500
Long Shank (Cylindrical)	MFH	25-S25-10-2T-200	●	2	25	8	12.5	11.5	25	200	120	1.5 *(3.5)	1.2	+10°	-5°	Yes	Fig.3	0.6	17,000
		28-S25-10-2T-200	●	2	28	11	15.5	14.5	25	200	40						Fig.1	0.7	15,500
		32-S32-10-2T-200	●	2	32	15	19.5	18.5	32	200	120						Fig.3	1.0	14,000
		35-S32-10-2T-200	●	2	35	18	22.5	21.5	32	200	50						Fig.1	1.4	13,000
		40-S32-10-4T-250	●	4	40	23	27.5	26.5	32	250	50						Fig.1	1.5	11,500
Extra Long Shank (Cylindrical)	MFH	25-S25-10-2T-300	●	2	25	8	12.5	11.5	25	300	180	1.5 *(3.5)	1.2	+10°	-5°	Yes	Fig.3	1.0	17,000
		28-S25-10-2T-300	●	2	28	11	15.5	14.5	25	300	40						Fig.1	1.1	15,500
		32-S32-10-2T-300	●	2	32	15	19.5	18.5	32	300	180						Fig.3	1.6	14,000
		35-S32-10-2T-300	●	2	35	18	22.5	21.5	32	300	50						Fig.1	1.7	13,000
		40-S32-10-4T-300	●	4	40	23	27.5	26.5	32	300	50						Fig.1	1.8	11,500

Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
				● M20, M183
MFH...-10-...	SB-4075TRP	DTPM-15	P-37	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL

Caution with Max. Revolution

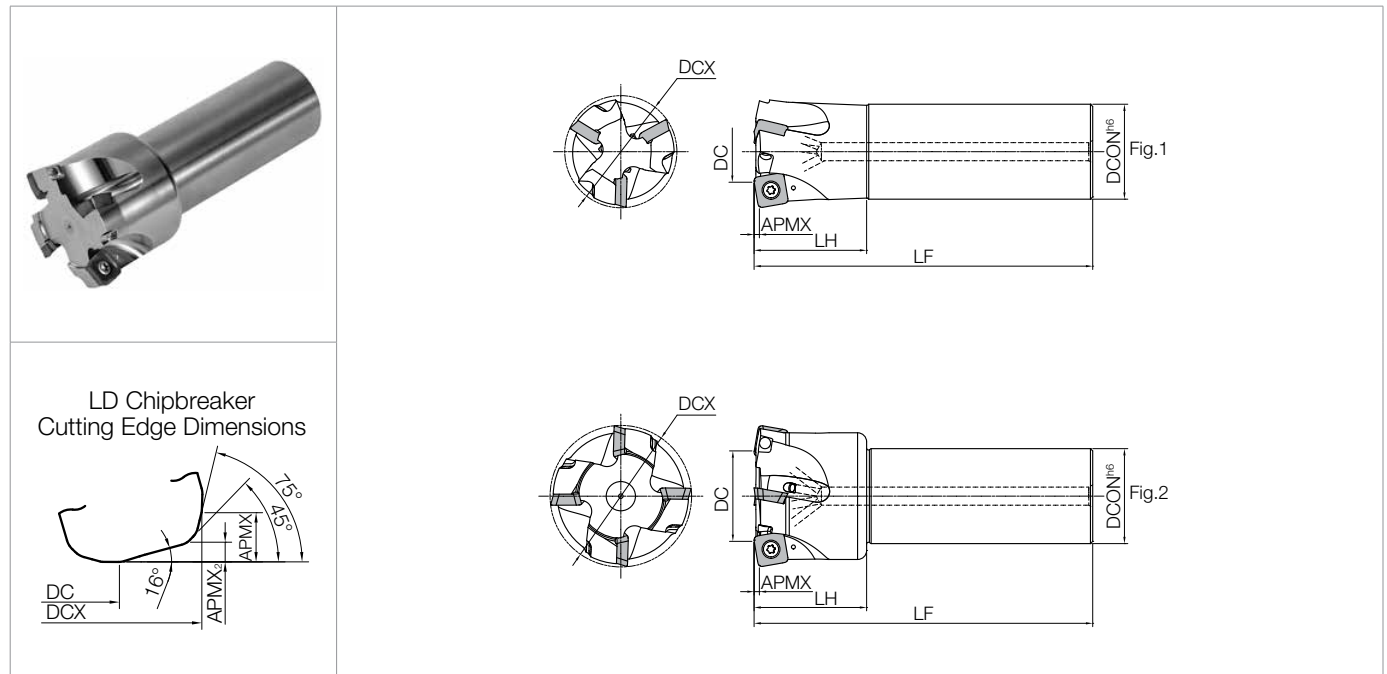
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

* Dimension in () is when mounting LD

Recommended Cutting Conditions ● M184~M185

MFH End Mill (Metric Size)



Toolholder Dimensions with SOMT14 Inserts (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)									Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM
			DCX	DC			DCON	LF	LH	APMX	APMX ₂	A.R.	R.R.				
MFH 50-S42-14-3T	●	3	50	27	33	32	42	150	50	2 *(5)	2	+10°	-10°	Yes	Fig.1	1.4	8,800
63-S42-14-4T	●	4	63	40	46	45	42	150	50			+10°	-10°		Fig.2	1.7	7,400
80-S42-14-5T	●	5	80	57	63	62	42	150	50			+10°	-8°		Fig.2	2.3	6,400

* Dimension in () is when mounting LD

Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
				➔ M20, M183
MFH...-14-...	SB-50120TRP Recommended Torque for Insert Clamp 4.5 N·m	TTP-20	P-37	SOMT140520ER-GM SOMT140520ER-GH SOMT140520ER-LD SOMT140514ER-FL

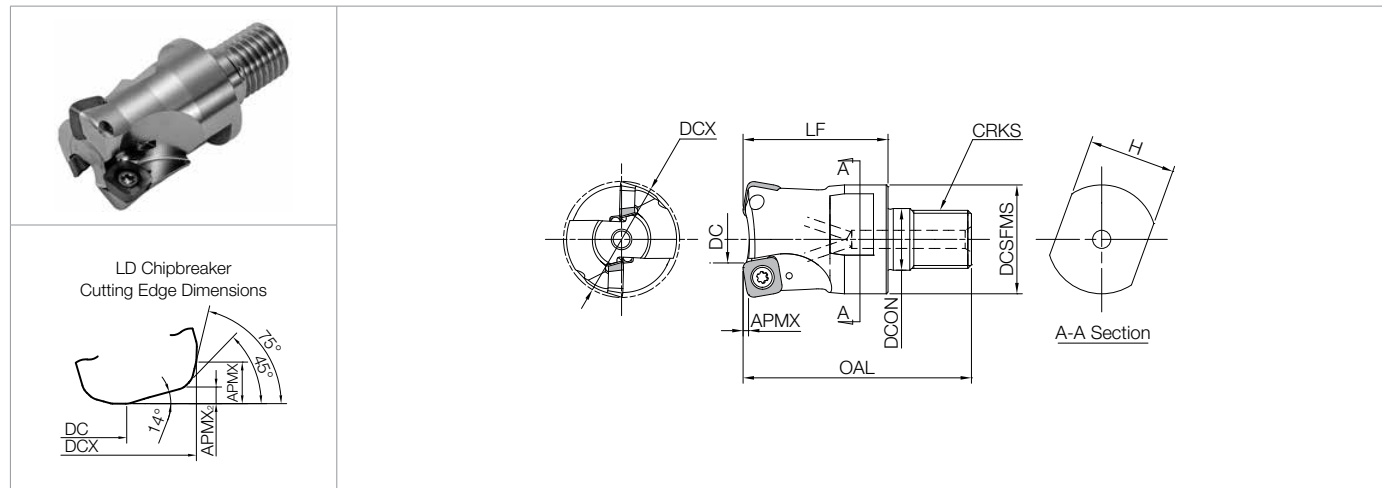
Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions ➔ **M184~M185**

MFH Modular End Mill (Metric Size)






Toolholder Dimensions (Metric Size)

Part Number		Stock	No. of Inserts	Dimensions (mm)												Rake Angle (°)		Coolant Hole	Max RPM
				DCX	DC			DCSFMS	DCON	OAL	LF	CRKS	H	APMX	APMX ₂	A.R.	R.R.		
					GM/GH	LD	FL												
MFH	25-M12-10-2T	●	2	25	8	12.5	11.5	23	12.5	57	35	M12xP1.75	19	1.5 *(3.5)	1.2	+10°	-5°	Yes	17,000
	28-M12-10-2T	●	2	28	11	15.5	14.5	23	12.5	57	35	M12xP1.75	19						15,500
	32-M16-10-2T	●	2	32	15	19.5	18.5	30	17.0	63	40	M16xP2.0	24						14,000
	32-M16-10-3T	●	3	32	15	19.5	18.5	30	17.0	63	40	M16xP2.0	24						14,000
	35-M16-10-2T	●	2	35	18	22.5	21.5	30	17.0	63	40	M16xP2.0	24						13,000
	35-M16-10-3T	●	3	35	18	22.5	21.5	30	17.0	63	40	M16xP2.0	24						13,000
	40-M16-10-3T	●	3	40	23	27.5	26.5	30	17.0	63	40	M16xP2.0	24						11,500
	40-M16-10-4T	●	4	40	23	27.5	26.5	30	17.0	63	40	M16xP2.0	24						11,500

* Dimension in () is when mounting LD

Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
				➡ M20, M183
MFH...-10-...	SB-4075TRP Recommended Torque for Insert Clamp 3.5 Nm	DTPM-15	P-37	SOMT100420ER-GM SOMT100420ER-GH SOMT100420ER-LD SOMT100420ER-FL

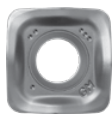
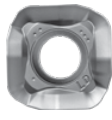
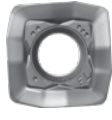

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

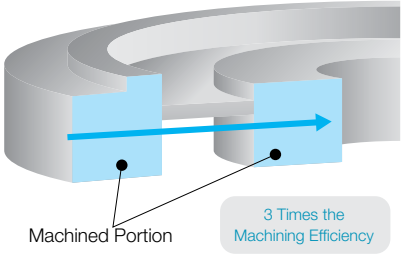
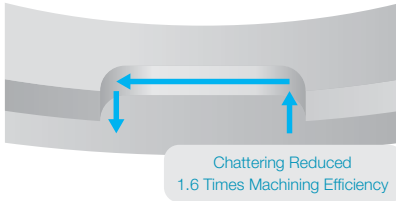
 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions ➡ **M184-M185**

● Applicable Inserts (● M20)

Insert (Right-hand Shown)	Part Number	Dimensions (in)					Angle (°)	MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide
		IC	S	D1	BS	RE		PR1535	PR1525	PR1510	PR015S	CA6535
 General Purpose	SOMT 100420ER-GM	0.406	0.180	0.181	-	0.079	16°	●	●	●		●
	140520ER-GM	0.557	0.219	0.228	-			●	●	●		●
 Large D.O.C.	SOMT 100420ER-LD	0.411	0.180	0.181	0.035	0.079	16°	●	●	●		●
	140520ER-LD	0.581	0.219	0.228	0.063			●	●	●		●
 Wiper Edge	SOMT 100420ER-FL	0.411	0.180	0.181	0.055	0.079	16°	●	●	●		●
	140514ER-FL	0.574	0.219	0.228	0.122	0.055		●	●	●		●
 Tough Edge	SOMT 100420ER-GH	0.411	0.180	0.179	-	0.079	16°	●	●	●	●	
	140520ER-GH	0.558	0.219	0.228	-			●	●	●	●	

■ Case Studies

SFVAF22B (Forged Alloy Steel)		304 (Stainless Steel)	
<ul style="list-style-type: none"> • Turbine Parts • Vc = 520 sfm • fz = 0.0461 ipt • D.O.C. x ae = 0.059" x max. 6.299" • Dry • MFH160R-14-8T (8 inserts) • SOMT140520ER-GM (PR1525) 		<ul style="list-style-type: none"> • Clutch • Vc = 390 sfm • fz = 0.0472 ipt • D.O.C. x ae = 0.039" x 0.787" • Dry • MFH32-S32-10-2T (2 inserts) • SOMT100420ER-GM (PR1535) 	
			
PR1525		PR1535	
Chip Removal = 43.94in³/min		Chip Removal = 3.54in³/min	
Competitor G		Competitor H	
Chip Removal = 14.65in³/min		Chip Removal = 2.20in³/min	
Small machining noise even at 3 times higher feed rate. Good edge condition without chipping and stable machining.		Competitor H caused chattering but MFH realized stable machining. Good edge condition and long tool life.	
(User Evaluation)		(User Evaluation)	

◆ Recommended Cutting Conditions

Chipbreaker	Workpiece	Holder Part Number and Feed Rate (fz: ipt)					Recommended Insert Grade (Vc: sfm)					
		End Mill Feed Rates			Face Mill Feed Rates		MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide	
		MFH1000 MFH25-	MFH1250 MFH32-	MFH1500 MFH40-	MFH...R-10	MFH...-14	PR1535	PR1525	PR1510	PR015S	CA6535	
GM GH	Carbon Steel	① 0.020-0.032-0.039 ② 0.008-0.016-0.020	① 0.020-0.039-0.059 ② 0.012-0.028-0.039	① 0.020-0.047-0.071 ② 0.016-0.039-0.059	0.020-0.059-0.079		☆ 390-590-820	★ 390-590-820	-	-	-	
	Alloy Steel	① 0.020-0.032-0.039 ② 0.008-0.016-0.020	① 0.020-0.039-0.059 ② 0.012-0.028-0.039	① 0.020-0.047-0.071 ② 0.016-0.039-0.059	0.020-0.059-0.079		☆ 330-520-720	★ 330-520-720	-	-	-	
	Mold Steel	~ 40HRc	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		☆ 260-460-590	☆ 260-460-590	-	GH ★ 260-460-590	-
		40~50HRc	① 0.006-0.012-0.020 ② 0.006-0.008-0.010	① 0.008-0.020-0.032 ② 0.008-0.012-0.018	① 0.008-0.024-0.035 ② 0.008-0.020-0.028	0.008-0.028-0.039		☆ 200-330-430	☆ 200-330-430	-	GH ★ 200-330-430	-
		50~55HRc	① 0.006-0.010-0.016	① 0.006-0.014-0.024	① 0.006-0.010-0.028	0.008-0.020-0.031		-	☆ 200-330-430	-	GH ★ 160-230-330	-
		55~60HRc	① 0.0004-0.0024-0.0039 (Recommended only with GH chipbreaker)					-	-	-	GH ★ 160-200-230	-
	Austenitic Stainless Steel	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		GM ☆ 330-520-660	GM ☆ 330-520-660	-	-	-	
	Martensitic Stainless Steel	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		☆ 490-660-820	-	-	-	★ 590-790-980	
	Precipitation Hardened Stainless Steel	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		★ 300-390-490	-	-	-	-	
	Gray Cast Iron	① 0.020-0.032-0.039 ② 0.008-0.016-0.020	① 0.020-0.039-0.059 ② 0.012-0.028-0.039	① 0.020-0.047-0.071 ② 0.016-0.039-0.059	0.020-0.059-0.079		-	-	★ 390-590-820	-	-	
	Nodular Cast Iron	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		-	-	★ 330-490-660	-	-	
	Ni-base Heat Resistant Alloy	① 0.008-0.016-0.024 ② 0.006-0.008-0.012	① 0.008-0.020-0.035 ② 0.008-0.016-0.024	① 0.008-0.024-0.039 ② 0.008-0.020-0.032	0.008-0.032-0.047		☆ 70-100-160	-	-	-	★ 70-100-160	
	Titanium Alloy	① 0.008-0.016-0.024 ② 0.006-0.008-0.012	① 0.008-0.020-0.035 ② 0.008-0.016-0.024	① 0.008-0.024-0.039 ② 0.008-0.020-0.032	0.008-0.032-0.047		GM ★ 130-200-260	-	GM ☆ 100-160-230	-	-	
LD	Carbon Steel	① 0.020-0.032-0.039 ③ 0.002-0.004-0.008	① 0.020-0.039-0.059 ③ 0.002-0.006-0.012	① 0.020-0.047-0.071 ③ 0.002-0.008-0.012	① 0.020-0.059-0.079 ③ 0.002-0.008-0.012	④ 0.020-0.059-0.079 ⑤ 0.002-0.008-0.016	☆ 390-590-820	★ 390-590-820	-	-	-	
	Alloy Steel	① 0.020-0.032-0.039 ③ 0.002-0.004-0.008	① 0.020-0.039-0.059 ③ 0.002-0.006-0.012	① 0.020-0.047-0.071 ③ 0.002-0.008-0.012	① 0.020-0.059-0.079 ③ 0.002-0.008-0.012	④ 0.020-0.059-0.079 ⑤ 0.002-0.008-0.016	☆ 330-520-720	★ 330-520-720	-	-	-	
	Mold Steel (~40HRc)	① 0.020-0.028-0.032 ③ 0.002-0.003-0.006	① 0.020-0.032-0.047 ③ 0.002-0.004-0.008	① 0.020-0.039-0.063 ③ 0.002-0.006-0.008	① 0.020-0.047-0.071 ③ 0.002-0.006-0.008	④ 0.020-0.047-0.071 ⑤ 0.002-0.006-0.012	☆ 260-460-590	★ 260-460-590	-	-	-	
	Mold Steel (40~50HRc)	① 0.008-0.012-0.020 ③ 0.001-0.002-0.004	① 0.008-0.020-0.032 ③ 0.001-0.003-0.006	① 0.008-0.024-0.035 ③ 0.001-0.004-0.006	① 0.008-0.028-0.039 ③ 0.001-0.004-0.006	④ 0.008-0.028-0.039 ⑤ 0.001-0.004-0.008	☆ 200-330-430	★ 200-330-430	-	-	-	
	Austenitic Stainless Steel	① 0.020-0.028-0.032 ③ 0.002-0.003-0.006	① 0.020-0.032-0.047 ③ 0.002-0.004-0.008	① 0.020-0.039-0.063 ③ 0.002-0.006-0.008	① 0.020-0.047-0.071 ③ 0.002-0.006-0.008	④ 0.020-0.047-0.071 ⑤ 0.002-0.006-0.012	★ 330-520-660	☆ 330-520-660	-	-	-	
	Martensitic Stainless Steel	① 0.020-0.028-0.032 ③ 0.002-0.003-0.006	① 0.020-0.032-0.047 ③ 0.002-0.004-0.008	① 0.020-0.039-0.063 ③ 0.002-0.006-0.008	① 0.020-0.047-0.071 ③ 0.002-0.006-0.008	④ 0.020-0.047-0.071 ⑤ 0.002-0.006-0.012	☆ 490-660-820	-	-	-	★ 590-790-980	
	Precipitation Hardened Stainless Steel	① 0.020-0.028-0.032 ③ 0.002-0.003-0.006	① 0.020-0.032-0.047 ③ 0.002-0.004-0.008	① 0.020-0.039-0.063 ③ 0.002-0.006-0.008	① 0.020-0.047-0.071 ③ 0.002-0.006-0.008	④ 0.020-0.047-0.071 ⑤ 0.002-0.006-0.012	★ 300-390-490	-	-	-	-	
	Gray Cast Iron	① 0.020-0.032-0.039 ③ 0.002-0.004-0.008	① 0.020-0.039-0.059 ③ 0.002-0.006-0.012	① 0.020-0.047-0.071 ③ 0.002-0.008-0.012	① 0.020-0.059-0.079 ③ 0.002-0.008-0.012	④ 0.020-0.059-0.079 ⑤ 0.002-0.008-0.016	-	-	★ 390-590-820	-	-	
	Nodular Cast Iron	① 0.020-0.028-0.032 ③ 0.002-0.003-0.006	① 0.020-0.032-0.047 ③ 0.002-0.004-0.008	① 0.020-0.039-0.063 ③ 0.002-0.006-0.008	① 0.020-0.047-0.071 ③ 0.002-0.006-0.008	④ 0.020-0.047-0.071 ⑤ 0.002-0.006-0.012	-	-	★ 330-490-660	-	-	
	Ni-base Heat Resistant Alloy	① 0.008-0.016-0.024 ③ 0.001-0.002-0.004	① 0.008-0.020-0.035 ③ 0.001-0.003-0.006	① 0.008-0.024-0.039 ③ 0.001-0.004-0.006	① 0.008-0.032-0.047 ③ 0.001-0.004-0.006	④ 0.008-0.032-0.047 ⑤ 0.001-0.004-0.008	☆ 70-100-160	-	-	-	★ 70-100-160	
	Titanium Alloy	① 0.008-0.016-0.024 ③ 0.001-0.002-0.004	① 0.008-0.020-0.035 ③ 0.001-0.003-0.006	① 0.008-0.024-0.039 ③ 0.001-0.004-0.006	① 0.008-0.032-0.047 ③ 0.001-0.004-0.006	④ 0.008-0.032-0.047 ⑤ 0.001-0.004-0.008	★ 130-200-260	-	☆ 100-160-230	-	-	

① For D.O.C. ≤ 0.039"

② For D.O.C. 0.040 - 0.059"

③ For D.O.C. 0.040 - 0.138"

④ For D.O.C. ≤ 0.079"

⑤ For D.O.C. 0.080 - 0.197"

• Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy

• The middle values are recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

• Machining with CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions

• Internal coolant is recommended for slotting applications

• For finishing, maximum recommended feed is f = 0.059 ipt for **SOMT14-LD** type, f = 0.035 ipt for **SOMT10-LD** type, f = 0.118 ipt for **SOMT14-FL** type, f = 0.055 ipt for **SOMT10-FL** type

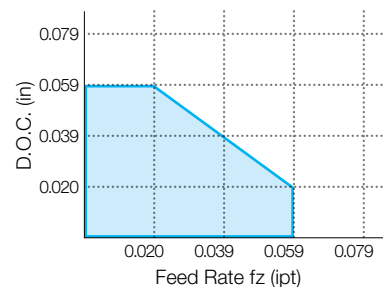
Recommended Cutting Conditions

Chipbreaker	Workpiece	Holder Part Number and Feed Rate (fz: ipt)					Recommended Insert Grade (Vc: sfm)				
		End Mill Feed Rates			Face Mill Feed Rates		MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide
		MFH1000 MFH25-	MFH1250 MFH32-	MFH1500 MFH40-	MFH...R-10	MFH...-14	PR1535	PR1525	PR1510	PR015S	CA6535
FL	Carbon Steel	① 0.020-0.032-0.039 ② 0.008-0.016-0.020	① 0.020-0.039-0.059 ② 0.012-0.028-0.039	① 0.020-0.047-0.071 ② 0.016-0.039-0.059	0.020-0.059-0.079		☆ 390-590-820	★ 390-590-820	-	-	-
	Alloy Steel	① 0.020-0.032-0.039 ② 0.008-0.016-0.020	① 0.020-0.039-0.059 ② 0.012-0.028-0.039	① 0.020-0.047-0.071 ② 0.016-0.039-0.059	0.020-0.059-0.079		☆ 330-520-720	★ 330-520-720	-	-	-
	Mold Steel (~40HRC)	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		☆ 260-460-590	★ 260-460-590	-	-	-
	Mold Steel (40~50HRC)	① 0.006-0.012-0.020 ② 0.006-0.008-0.010	① 0.008-0.020-0.032 ② 0.008-0.012-0.018	① 0.008-0.024-0.035 ② 0.008-0.020-0.028	0.008-0.028-0.039		☆ 200-330-430	★ 200-330-430	-	-	-
	Austenitic Stainless Steel	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		★ 330-520-660	☆ 330-520-660	-	-	-
	Martensitic Stainless Steel	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		☆ 490-660-820	-	-	-	★ 590-790-980
	Precipitation Hardened Stainless Steel	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		★ 300-390-490	-	-	-	-
	Gray Cast Iron	① 0.020-0.032-0.039 ② 0.008-0.016-0.020	① 0.020-0.039-0.059 ② 0.012-0.028-0.039	① 0.020-0.047-0.071 ② 0.016-0.039-0.059	0.020-0.059-0.079		-	-	★ 390-590-820	-	-
	Nodular Cast Iron	① 0.020-0.028-0.032 ② 0.008-0.012-0.016	① 0.020-0.032-0.047 ② 0.012-0.024-0.032	① 0.020-0.039-0.063 ② 0.016-0.032-0.047	0.020-0.047-0.071		-	-	★ 330-490-660	-	-
	Ni-base Heat Resistant Alloy	① 0.008-0.016-0.024 ② 0.006-0.008-0.012	① 0.008-0.020-0.035 ② 0.008-0.016-0.024	① 0.008-0.024-0.039 ② 0.008-0.020-0.032	0.008-0.032-0.047		☆ 70-100-160	-	-	-	★ 70-100-160
	Titanium Alloy	① 0.008-0.016-0.024 ② 0.006-0.008-0.012	① 0.008-0.020-0.035 ② 0.008-0.016-0.024	① 0.008-0.024-0.039 ② 0.008-0.020-0.032	0.008-0.032-0.047		★ 130-200-260	-	☆ 100-160-230	-	-

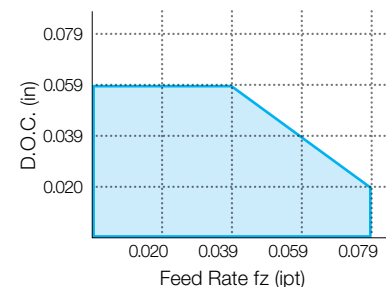
- ① For D.O.C. ≤ 0.039"
 ② For D.O.C. 0.040 - 0.059"
 ③ For D.O.C. 0.040 - 0.138"
 ④ For D.O.C. ≤ 0.079"
 ⑤ For D.O.C. 0.080 - 0.197"
- Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy
 - The middle values are recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
 - Machining with CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions
 - Internal coolant is recommended for slotting applications
 - For finishing, maximum recommended feed is f = 0.059 ipt for **SOMT14-LD** type, f = 0.035 ipt for **SOMT10-LD** type, f = 0.118 ipt for **SOMT14-FL** type, f = 0.055 ipt for **SOMT10-FL** type

MFH-RAPTOR Cutting Performance (GM, GH, FL Chipbreaker)

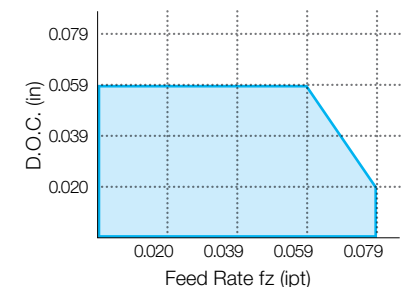
MFH1000-W100-10-2T
MFH25-S25-10-2T



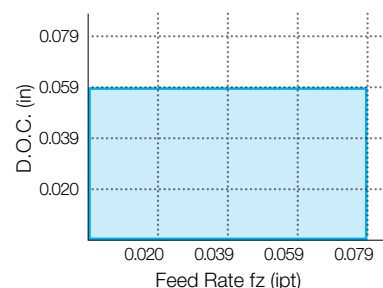
MFH1250-W125-10-○ T
MFH32-S32-10-○ T



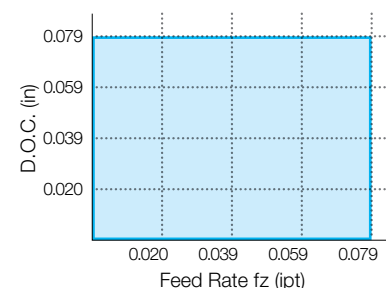
MFH1500-W150-10-○ T
MFH40-S32-10-○ T



MFH2000R ~ 3000R-10-○ T
MFH050R ~ 080R-10-○ T



MFH...-14-○ T



LD Chipbreaker:
 MAX D.O.C. for LD chipbreaker is 0.197" (0.138" for SOMT10)
 Please refer to [M184](#) for feed rate

End Mill:
 Please refer to the application map above

Face Mill:
 MAX feed rate (inches per tooth) fz = 0.079ipt

Approximate Programming Radius Adjustment

Shape	Holder	Chipbreaker	Cutting Edge Angle γ (°)	Programmable R (in)	Max. Non-machined Portion K (in)	Side Wall Max. Inclination Angle (°)
	MFH...-10-...	GM / GH	10°	0.118	0.034	90°
		LD	14°	0.148	0.027	65°
		FL	14°	0.118	0.035	80°
	MFH...-14-...	GM / GH	10°	0.148	0.054	90°
		LD	16°	0.197	0.042	65°
		FL	13°	0.118	0.054	80°

Ramping Reference Data

MFH...-10-...

Cutter Dia. DCX (in)	1.00"	-	1.25"	-	1.50"	2.00"	2.50"	3.00"
Cutter Dia. DCX (mm)	25mm	28mm	32mm	35mm	40mm	50mm	63mm	80mm
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-...

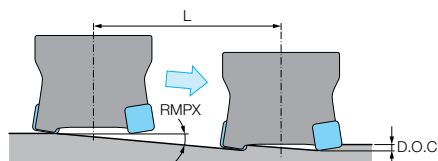
Cutter Dia. DCX (in)	2.00"	2.50"	3.00"	4.00"	5.00"	6.00"
Cutter Dia. DCX (mm)	50mm	63mm	80mm	100mm	125mm	160mm
Max. Ramping Angle RMPX (°)	2°	1.8°	1°	0.5°	0.4°	0.2°
tan RMPX	0.035	0.031	0.017	0.009	0.007	0.003

Ramping Guide

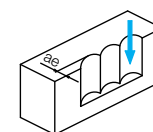
- Ramping angle should be under α max (maximum ramping angle) in the above cutting conditions
- Reduce recommended feed rate in cutting conditions above by 70%

Formula for Max. Cutting Length (L) at Max. Ramping Angle

$$L = \frac{\text{D.O.C.}}{\tan \text{RMPX}}$$



Plunging

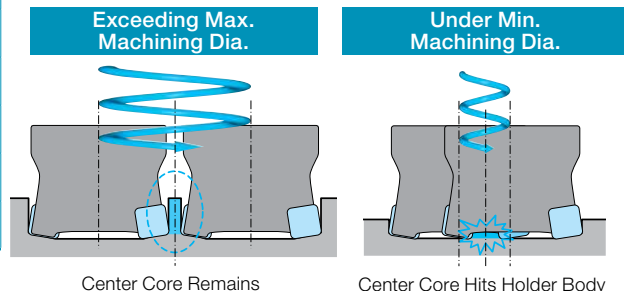


Insert Description	Maximum Width of Cut (ae)
SOMT10 Type	0.315"
SOMT14 Type	0.453"

- LD and FL chipbreakers are not available for plunging
- Reduce feed rate to $f_z \leq 0.008 \text{ ipr}$ when plunging

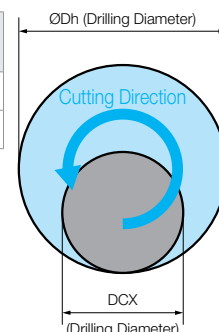
Helical Milling

- For Helical milling, use between Min. Drilling Dia. and Max. Drilling Dia.

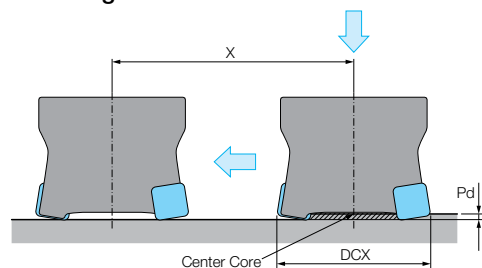


Holder	Min. Drilling Dia. $\varnothing D_h1$	Max. Drilling Dia. $\varnothing D_h2$	Max. Ramping Depth per Cycle
MFH...-10-...	$2 \times \text{DCX} - 0.709"$	$2 \times \text{DCX} - 0.079"$	GM = 0.059"
MFH...-14-...	$2 \times \text{DCX} - 0.984"$	$2 \times \text{DCX} - 0.079"$	GM = 0.079"

- Keep machine depth per rotation less than max D.O.C. (APMX) in the cutter dimensions chart
- Use climb milling. (Refer to detail on right)
- Feed rates should be reduced to 50% of recommended cutting condition (Page [M184-M185](#))
- Use caution to eliminate incidences caused by producing long chips



Drilling



3D Machining

Chipbreaker	Ramping	Contouring (Rising Wall Angle)	Plunging	Helical Milling	Pocketing
GM / GH	✓	✓ (90°)	✓	✓	✓
LD	✓	Limit (65°)	X	X	X
FL	✓	Limit (80°)	X	X	X

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

Holder	GM / GH		LD		FL	
	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface
MFH...-10-...	0.059"	$\text{DCX} - 0.709"$	0.059"	$\text{DCX} - 0.551"$	0.059"	$\text{DCX} - 0.591"$
MFH...-14-...	0.079"	$\text{DCX} - 0.945"$	0.079"	$\text{DCX} - 0.709"$	0.079"	$\text{DCX} - 0.748"$

[Drilling Depth]

See Max. Drilling Depth (Pd) in the above cutting conditions

Traversing after Drilling

- It is recommended to reduce feed by 25% of recommendation on Page [M184-M185](#) until Center Core is removed
- Axial feed rate recommendation per revolution is 0.008 ipr while drilling

MFH-RAPTOR *mini*

(Cutter Dia. $\varnothing 0.625'' \sim \varnothing 2.000''$)
(Cutter Dia. $\varnothing 16\text{mm} \sim \varnothing 32\text{mm}$)

Economical Inserts with 4 Cutting Edges High Feed Milling for Small Diameters and Small Machining Centers

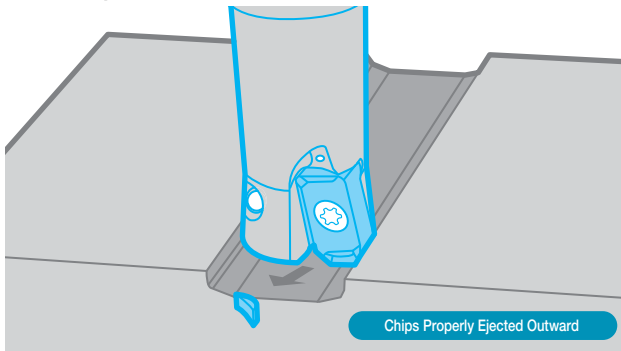
1

Good Chip Evacuation

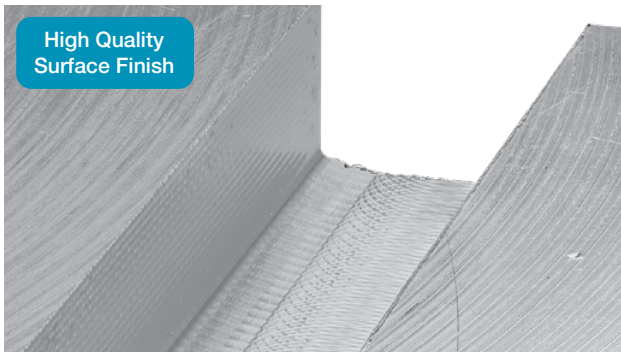
MFH Mini Controls Chip Biting with Convex Cutting Edge

MFH Mini

Good Chip Evacuation

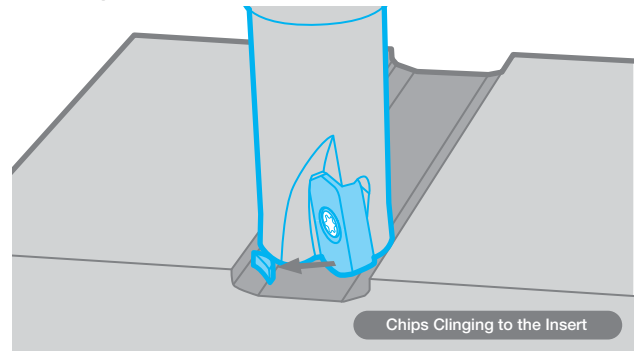


High Quality
Surface Finish

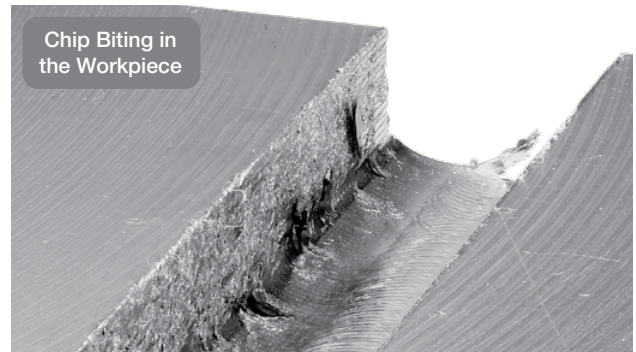


Competitor High Feed Cutter

Poor Chip Evacuation



Chip Biting in
the Workpiece



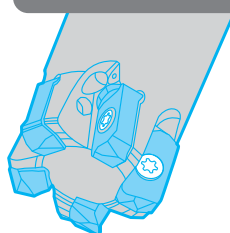
Cutting Conditions: Cutter Dia. $D_c = \varnothing 0.625''$, $V_c = 490\text{ sfm}$, $f_z = 0.024\text{ ipt}$, $D.O.C. = 0.020''$ (20 Passes): Total $0.394'' \times 0.630''$, Dry Workpiece: Stainless Steel

2

Fine Pitch for Efficient Machining

Cutter Dia. 1.000" Type

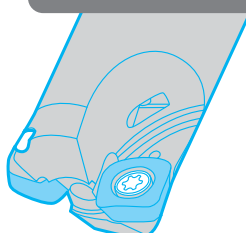
MFH Mini



5 Inserts

MFH1000-W100-03-5T47

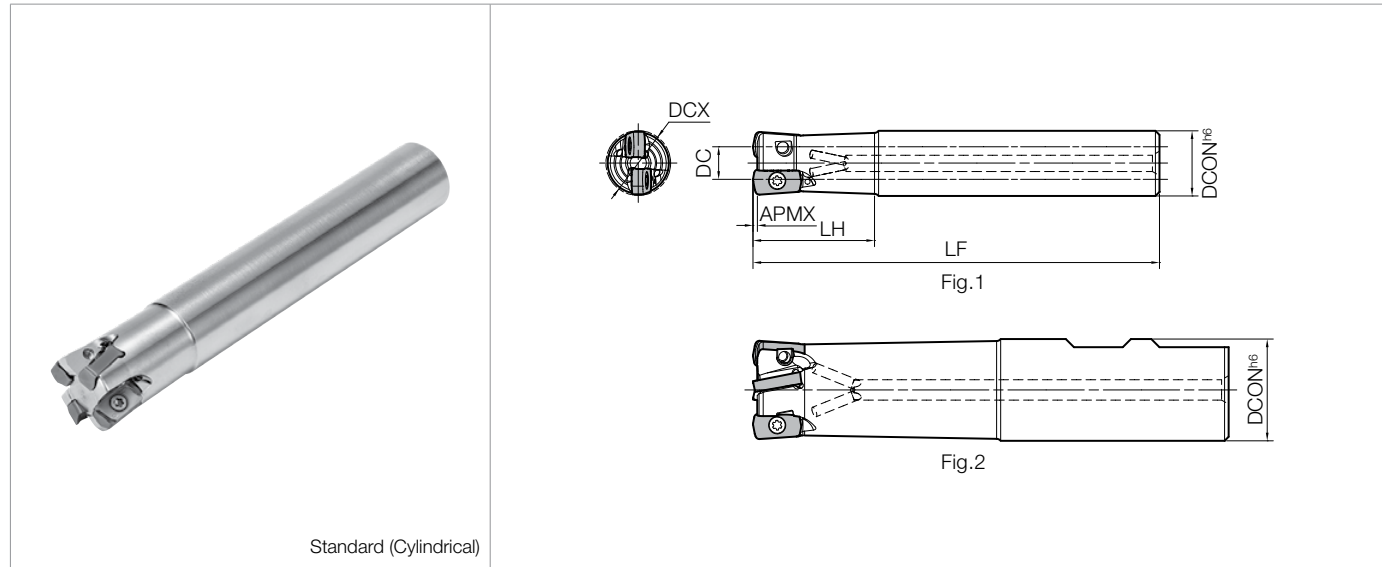
MFH



2 Inserts

MFH1000-W100-10-2T

MFH Mini End Mill (Inch Size)



Toolholder Dimensions (Inch Size)

Part Number		Stock	No. of Inserts	Dimensions (in)						Max. Ramping Angle	Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM
				DCX	DC	DCON	LF	LH	APMX		RMPX	A.R.				
Standard Shank (Weldon)	MFH 0625-W625-03-2T-3	●	2	0.625	0.310	0.625	3.196	1.250	0.039	2.8°	-10°	-15°	Yes	Fig.2	0.1	18,800
	0750-W750-03-3T-4	●	3	0.750	0.435	0.750	4.070	2.000	0.039	1.7°					0.2	15,700
	1000-W100-03-4T47	●	4	1.000	0.685	1.000	4.820	2.500	0.039	1.2°					0.4	13,400
	1000-W100-03-5T47	●	5	1.000	0.685	1.000	4.820	2.500	0.039	1.2°					0.4	13,400
	1250-W125-03-5T-5	●	5	1.250	0.935	1.250	5.070	2.750	0.039	0.8°					0.7	11,400
	1250-W125-03-6T-5	●	6	1.250	0.935	1.250	5.070	2.750	0.039	0.8°					0.7	11,400
Long Shank (Cylindrical)	MFH 0625-S625-03-2T-6	●	2	0.625	0.310	0.625	6.000	2.000	0.039	2.8°	-10°	-15°	Yes	Fig.1	0.2	18,800
	0750-S750-03-3T55	●	3	0.750	0.435	0.750	5.500	2.000	0.039	1.7°					0.3	15,700
	0750-S750-03-3T65	●	3	0.750	0.435	0.750	6.500	3.000	0.039	1.7°					0.3	15,700
	0875-S750-03-3T55	●	3	0.875	0.560	0.750	5.500	2.000	0.039	1.3°					0.3	14,700
	1000-S100-03-4T55	●	4	1.000	0.685	1.000	5.500	2.500	0.039	1.2°					0.5	13,400
	1000-S100-03-4T-7	●	4	1.000	0.685	1.000	7.000	4.000	0.039	1.2°					0.6	13,400
	1250-S125-03-5T62	●	5	1.250	0.935	1.250	6.250	3.000	0.039	0.8°					0.8	11,400
	1250-S125-03-5T-8	●	5	1.250	0.935	1.250	8.000	4.750	0.039	0.8°					1.1	11,400

Spare Parts and Applicable Inserts (Inch Size)

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
MFH...-03-...				M15, M191 LOGU030310ER-GM LOGU030310ER-GH
	SB-3065TRP	DTPM-8	P-37	
Recommended Torque for Insert Clamp 1.2 N·m				

Additional Ramping Information ➡ M193

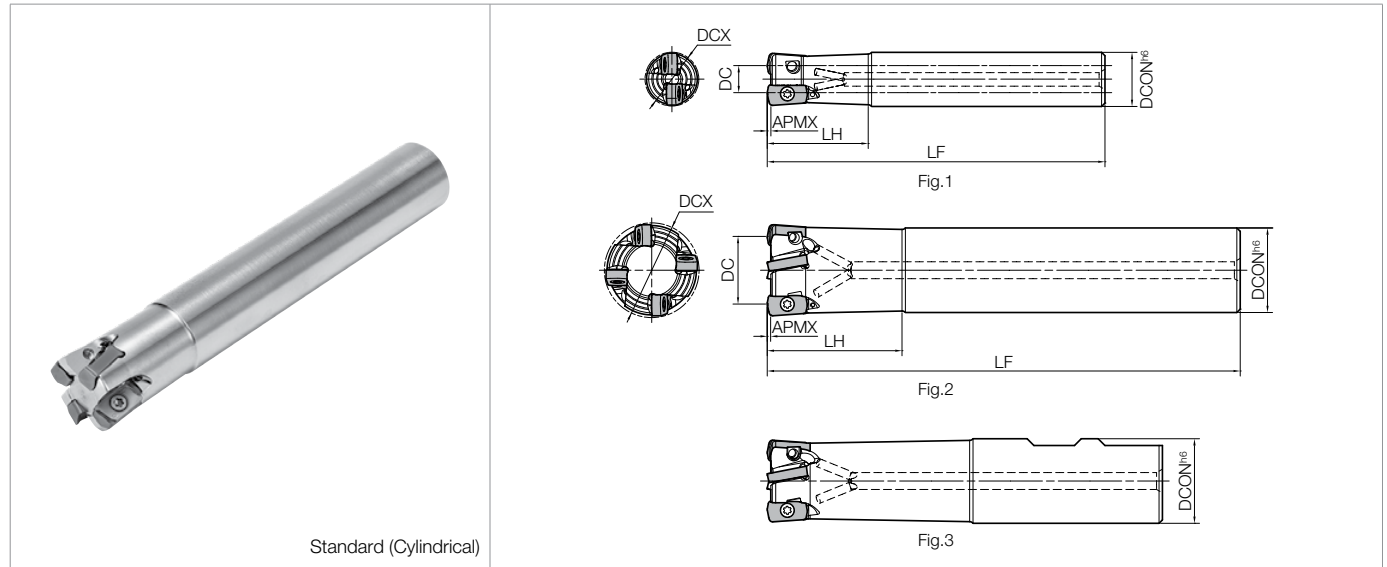
Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions ➡ M192




MFH Mini End Mill (Metric Size)



Toolholder Dimensions (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)							Max. Ramping Angle	Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max RPM
			DCX	DC	DCON	LF	LH	APMX	RMPX		A.R.	R.R.				
Standard Shank (Cylindrical)	MFH 16-S16-03-2T	●	2	16	8	16	100	30	1	2.8°	-10°	-15°	Yes	Fig.1	0.1	18,800
	17-S16-03-2T	●	2	17	9	16	100	20	1	2.5°				Fig.2	0.1	17,900
	18-S16-03-2T	●	2	18	10	16	100	20	1	2.1°					0.1	17,000
	20-S20-03-3T	●	3	20	12	20	130	50	1	1.7°				Fig.1	0.3	15,700
	20-S20-03-4T	●	4	20	12	20	130	50	1	1.7°					0.3	15,700
	22-S20-03-3T	●	3	22	14	20	130	30	1	1.4°				Fig.2	0.3	14,700
	22-S20-03-4T	●	4	22	14	20	130	30	1	1.4°					0.3	14,700
	25-S25-03-4T	●	4	25	17	25	140	60	1	1.2°				Fig.1	0.5	13,400
	25-S25-03-5T	●	5	25	17	25	140	60	1	1.2°					0.5	13,400
	28-S25-03-4T	●	4	28	20	25	140	40	1	1.0°				Fig.2	0.5	12,400
	28-S25-03-5T	●	5	28	20	25	140	40	1	1.0°					0.5	12,400
	32-S32-03-5T	●	5	32	24	32	150	70	1	0.8°				Fig.1	0.8	11,400
Standard Shank (Weldon)	MFH 16-W16-03-2T	●	2	16	8	16	79	30	1	2.8°	-10°	-15°	Yes	Fig.3	0.1	18,800
	20-W20-03-3T	●	3	20	12	20	101	50	1	1.7°					0.2	15,700
	20-W20-03-4T	●	4	20	12	20	101	50	1	1.7°					0.2	15,700
	25-W25-03-4T	●	4	25	17	25	117	60	1	1.2°					0.4	13,400
	25-W25-03-5T	●	5	25	17	25	117	60	1	1.2°					0.4	13,400
	32-W32-03-5T	●	5	32	24	32	131	70	1	0.8°					0.7	11,400
	32-W32-03-6T	●	6	32	24	32	131	70	1	0.8°					0.7	11,400
Long Shank (Cylindrical)	MFH 16-S16-03-2T-150	●	2	16	8	16	150	50	1	2.8°	-10°	-15°	Yes	Fig.1	0.2	18,800
	20-S20-03-3T-160	●	3	20	12	20	160	80	1	1.7°					0.3	15,700
	25-S25-03-4T-180	●	4	25	17	25	180	100	1	1.2°					0.6	13,400
	32-S32-03-5T-200	●	5	32	24	32	200	120	1	0.8°					1.1	11,400

Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
				M15, M191 M193
MFH...-03-...	SB-3065TRP	DTPM-8	P-37	LOGU030310ER-GM LOGU030310ER-GH

Recommended Cutting Conditions M192

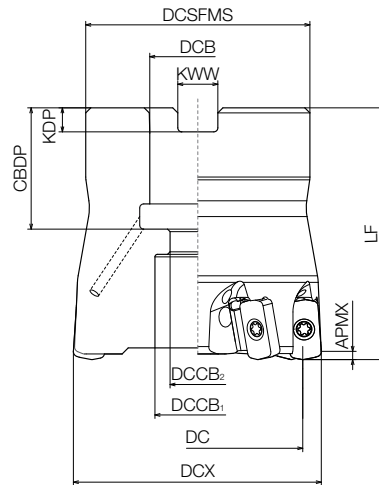
Additional Ramping Information M193

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

MFH Mini Face Mill (Inch Size)



Inserts

45°~70°
Lead Angle

75°
Lead Angle

90°/88°
Lead Angle

High Feed
Milling

Finish
Milling

Multi-
Function

Slot Mill

Ball-Nose
Radius

Other
Applications

Toolholder Dimensions (Inch Size)





Part Number	Stock	No. of Inserts	Dimensions (in)											Rake Angle (°)		Coolant Hole	Weight (kg)	Max RPM
			DCX	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R.	R.R.			
MFH 1500R-03-5T	●	5	1.500	1.185	1.400	0.500	0.433	0.276	1.575	0.709	0.156	0.250	0.039	-10°	-15°	Yes	0.2	10,200
1500R-03-6T	●	6	1.500	1.185	1.400	0.500	0.433	0.276	1.575	0.709	0.156	0.250	0.039	-10°	-15°	Yes	0.2	10,200
2000R-03-8T	●	8	2.000	1.685	1.750	0.750	0.669	0.433	1.968	0.947	0.188	0.312	0.039	-10°	-15°	Yes	0.5	8,600
2000R-03-9T	●	9	2.000	1.685	1.750	0.750	0.669	0.433	1.968	0.947	0.188	0.312	0.039	-10°	-15°	Yes	0.5	8,600

Toolholder Dimensions (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)											Rake Angle (°)		Coolant Hole	Weight (kg)	Max RPM
			DCX	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R.	R.R.			
MFH 040R-03-5T-M	●	5	40	32	38	16	15	9	40	19	5.6	8.4	1	-10°	-15°	Yes	0.2	9,900
040R-03-6T-M	●	6	40	32	38	16	15	9	40	19	5.6	8.4	1	-10°	-15°	Yes	0.2	9,900
050R-03-8T-M	●	8	50	42	47	22	19	11	50	21	6.3	10.4	1	-10°	-15°	Yes	0.5	8,600

Multiple step slot milling is NOT recommended for MFH-Mini face mill diameters above Ø1.3" due to a danger of re-cutting chips

Spare Parts and Applicable Inserts (Inch Size)

Part Number	Spare Parts				Applicable Inserts ➡ M15, M191
	Clamp Screw	Wrench	Anti-Seize Compound	Arbor Bolt	
					
MFH1500R-03-5T	SB-3065TRP	DTPM-8	P-37	HH1/4-0.75(H)	LOGU030310ER-GM LOGU030310ER-GH
MFH1500R-03-6T					
MFH2000R-03-8T					
MFH2000R-03-9T					


Recommended Torque for
Insert Clamp 1.2 N·m

(H) Optional coolant thru bolt available.

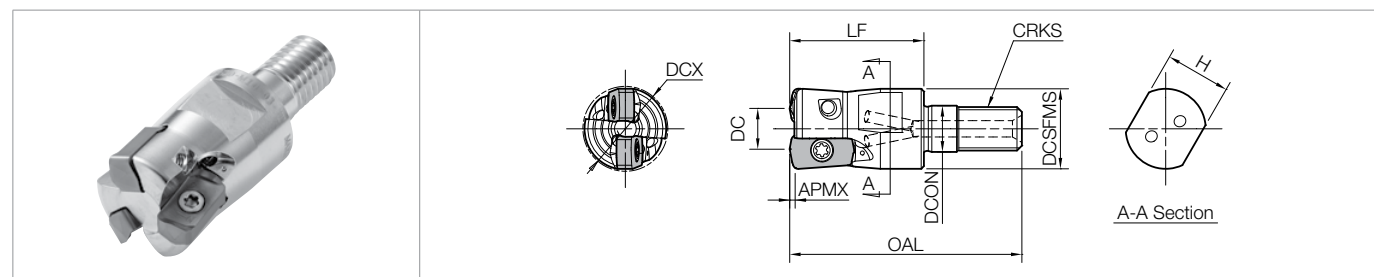
Recommended Cutting Conditions ➔ **M192**

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

MFH Mini Modular End Mill



Toolholder Dimensions

Part Number	Stock	Unit	No. of Inserts	Dimensions									Max. Ramping Angle	Rake Angle (°)		Coolant Hole	Max RPM
				DCX	DC	DCSFMS	DCON	OAL	LF	CRKS (mm)	H	APMX		RMPX	A.R.		
MFH 0625-M08-03-2T	●	inch	2	0.625	0.310	0.579	0.335	1.693	0.984	M8xP1.25	0.472	0.039	2.8°	-10°	-15°	Yes	18,800
0750-M10-03-3T	●		3	0.750	0.435	0.728	0.413	1.929	1.181	M10xP1.5	0.591	0.039	1.7°				15,700
1000-M12-03-4T	●		4	1.000	0.685	0.906	0.492	2.244	1.378	M12xP1.75	0.748	0.039	1.2°				13,400
1000-M12-03-5T	●		5	1.000	0.685	0.906	0.492	2.244	1.378	M12xP1.75	0.748	0.039	1.2°				13,400
1250-M16-03-5T	●		5	1.250	0.935	1.181	0.669	2.480	1.575	M16xP2	0.945	0.039	0.8°				11,400
1250-M16-03-6T	●		6	1.250	0.935	1.181	0.669	2.480	1.575	M16xP2	0.945	0.039	0.8°				11,400
1500-M16-03-6T	●		6	1.500	1.185	1.181	0.669	2.480	1.575	M16xP2	0.945	0.039	0.5°				10,200
MFH 16-M08-03-2T	●	mm	2	16	8	14.7	8.5	43	25	M8xP1.25	12	1	2.8°	-10°	-15°	Yes	18,880
17-M08-03-2T	●		2	17	9	14.7	8.5	43	25	M8xP1.25	12	1	2.5°				17,900
18-M08-03-2T	●		2	18	10	14.7	8.5	43	25	M8xP1.25	12	1	2.1°				17,000
20-M10-03-3T	●		3	20	12	18.7	10.5	49	30	M10xP1.5	15	1	1.7°				15,700
20-M10-03-4T	●		4	20	12	18.7	10.5	49	30	M10xP1.5	15	1	1.7°				15,700
22-M10-03-3T	●		3	22	14	18.7	10.5	49	30	M10xP1.5	15	1	1.4°				14,700
22-M10-03-4T	●		4	22	14	18.7	10.5	49	30	M10xP1.5	15	1	1.4°				14,700
25-M12-03-4T	●		4	25	17	23.0	12.5	57	35	M12xP1.75	19	1	1.2°				13,400
25-M12-03-5T	●		5	25	17	23.0	12.5	57	35	M12xP1.75	19	1	1.2°				13,400
28-M12-03-4T	●		4	28	20	23.0	12.5	57	35	M12xP1.75	19	1	1.0°				12,400
28-M12-03-5T	●		5	28	20	23.0	12.5	57	35	M12xP1.75	19	1	1.0°				12,400
32-M16-03-5T	●		5	32	24	30.0	17.0	63	40	M16xP2	24	1	0.8°				11,400
32-M16-03-6T	●		6	32	24	30.0	17.0	63	40	M16xP2	24	1	0.8°				11,400

Spare Parts and Applicable Inserts

Part Number	Spare Parts			Applicable Inserts Below
	Clamp Screw	Wrench	Anti-Seize Compound	
MFH...-03-...	SB-3065TRP Recommended Torque for Insert Clamp 1.2 N·m	DTPM-8	P-37	LOGU030310ER-GM LOGU030310ER-GH

Additional Ramping Information **M193**

* Dimension in () is when mounting LD

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

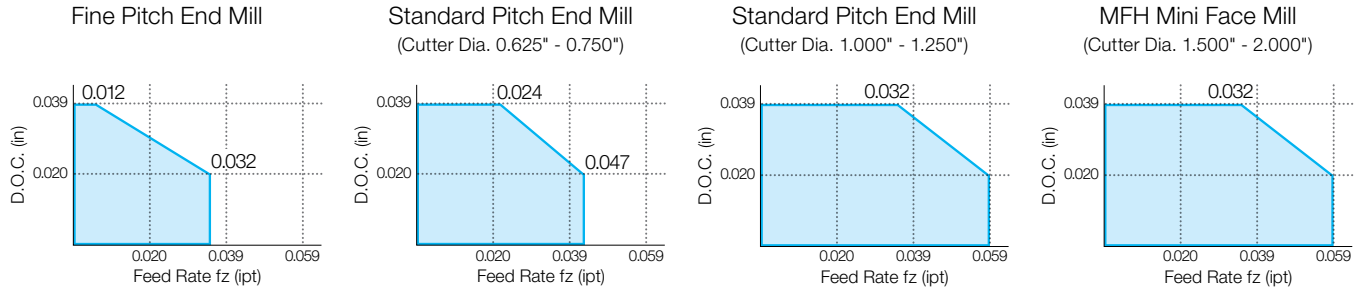
Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Applicable Inserts (M15)

Recommended Cutting Conditions **M192**

Insert	Part Number	Dimension (in)					MEGACOAT NANO			MEGACOAT HARD	CVD
		W1	S	D1	INSL	RE	PR1535	PR1525	PR1510	PR015S	CA6535
General Purpose	LOGU 030310ER-GM	0.244	0.156	0.136	0.469	0.039	●	●	●		●
Tough Edge	LOGU 030310ER-GH	0.244	0.156	0.136	0.469	0.039	●	●	●	●	

MFH Mini Cutting Performance (GM / GH Chipbreaker)



Recommended Cutting Conditions

Chipbreaker	Workpiece Material	Holder Part Number and Feed Rate (fz: ipt) *Recommended D.O.C. = 0.020" Reference Value								Recommended Insert Grade (Vc: sfm)				
		MFH0625...2T (MFH16...2T)	MFH0750...3T (MFH20...3T)	(MFH20...4T)	MFH1000...4T (MFH25...4T)	MFH1000...5T (MFH25...5T)	MFH1250...5T (MFH32...5T)	MFH1250...6T (MFH32...6T)	MFH1500...5T/6T MFH2000...8T	MEGACOAT NANO			MEGACOAT HARD	CVD Coated Carbide
										PR1535	PR1525	PR1510	PR015S	CA6535
GM GH	Carbon Steel	0.008-0.028-0.047	0.008-0.020-0.031	0.008-0.031-0.059	0.008-0.020-0.031	0.008-0.031-0.059	0.008-0.020-0.031	0.008-0.031-0.059	0.008-0.031-0.059	☆ 390-590-820	★ 390-590-820	-	-	-
	Alloy Steel									☆ 330-520-720	★ 330-520-720	-	-	-
	~40 HRC	0.008-0.020-0.035	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.024-0.047	☆ 260-460-590	☆ 260-460-590	-	GH ★ 260-460-590	-
	40-50 HRC	0.008-0.012-0.020	0.008-0.010-0.012	0.008-0.012-0.024	0.008-0.010-0.012	0.009-0.012-0.024	0.008-0.010-0.012	0.008-0.012-0.024	0.008-0.012-0.024	-	☆ 200-330-430	-	GH ★ 200-330-430	-
	50-55 HRC	0.004-0.012-0.020	0.004-0.008-0.012	0.004-0.012-0.020	0.004-0.008-0.012	0.004-0.012-0.020	0.004-0.008-0.012	0.004-0.008-0.012	0.004-0.008-0.012	-	☆ 160-230-330	-	GH ★ 160-230-330	-
	55-60 HRC	0.0004-0.0024-0.0039 (Recommended only with GH chipbreaker)								-	-	-	GH ★ 160-200-230	-
	Austenitic Stainless Steel	0.008-0.020-0.035	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.024-0.047	GM ★ 330-520-660	GM ☆ 330-520-660	-	-	-
	Martensitic Stainless Steel									☆ 490-660-820	-	-	-	★ 590-790-980
	Precipitation Hardened Stainless Steel									★ 300-390-490	-	-	-	-
	Gray Cast Iron	0.008-0.028-0.047	0.008-0.020-0.031	0.008-0.031-0.059	0.008-0.020-0.031	0.008-0.031-0.059	0.008-0.020-0.031	0.008-0.031-0.059	0.008-0.031-0.059	-	-	★ 390-590-820	-	-
	Nodular Cast Iron	0.008-0.020-0.035	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.016-0.024	0.008-0.024-0.047	0.008-0.024-0.047	-	-	★ 330-490-660	-	-
	Ni-base Heat-Resistant Alloy	0.008-0.012-0.024	0.008-0.010-0.016	0.008-0.016-0.031	0.008-0.010-0.016	0.008-0.016-0.031	0.008-0.010-0.016	0.008-0.016-0.031	0.008-0.016-0.031	☆ 70-100-160	-	-	-	★ 70-100-160
	Titanium Alloy									GM ★ 130-200-260	-	GM ☆ 100-160-230	-	-

Standard Pitch End Mills Fine Pitch End Mills MFH Mini Face Mills ★: 1st Recommendation ☆: 2nd Recommendation

- Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy
- The middle values are recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
- Machining with CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions
- Internal coolant is recommended for slotting applications
- Slotting and pocketing are not recommended for face mill types

Approximate Programming Radius Adjustment

Shape	Cutter	Chipbreaker	Cutting Edge Angle γ (°)	Programmable R (in)	Maximum Over Machining of Radius (in)	Max. Non-machined Portion K (in)	Side Wall Max. Inclination Angle
	MFH...-03-...	GM / GH	12°	R0.063 (Recommended)	0	0.0154	90°
				R0.079	0.0035	0.0138	
				R0.098	0.0102	0.0102	
				R0.118	0.0181	0.0067	

Ramping

Inch Size Standard and Modular End Mills and Mini Face Mills

Holder	Cutter Dia. DCX	0.625"	0.750"	0.875"	1.000"	1.250"	1.500"	2.000"
MFH...-03-...	Max. Ramping Angle (°) RMPX	2.8°	1.7°	1.3°	1.2°	0.8°	0.5°	0.4°
	tan RMPX max	0.049	0.030	0.023	0.021	0.014	0.009	0.007

Metric Size Standard & Modular End Mills and Face Mills

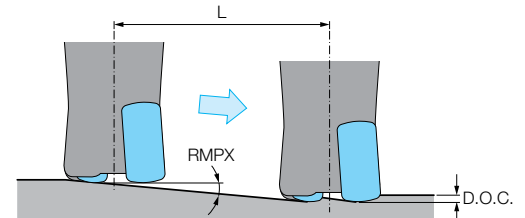
Holder	Cutter Dia. DCX	16mm	17mm	18mm	20mm	22mm	25mm	28mm	32mm	40mm	50mm
MFH...-03-...	Max. Ramping Angle (°)	2.8°	2.5°	2.1°	1.7°	1.4°	1.2°	1.0°	0.8°	0.5°	0.4°
	tan RMPX max	0.049	0.042	0.037	0.030	0.024	0.021	0.017	0.014	0.009	0.007

- Decrease ramping angle if chips become excessively long
- Recommended ramping angle is \leq RMPX (see chart above for recommended ramp angle)
- Reduce recommended feed rate by 70%

Multiple step slot milling is NOT recommended for MFH-Mini face mill diameters above Ø1.3" due to a danger of re-cutting chips

Formula for Max. Cutting Length (L) at Max. Ramping Angle

$$L = \frac{D.O.C.}{\tan RMPX \max}$$

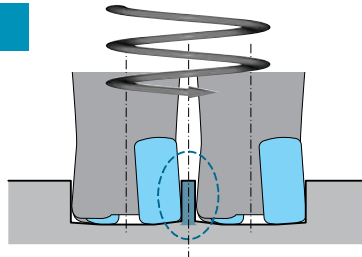


Helical Milling

- For Helical milling, use between Min. Drilling Dia. and Max. Drilling Dia.

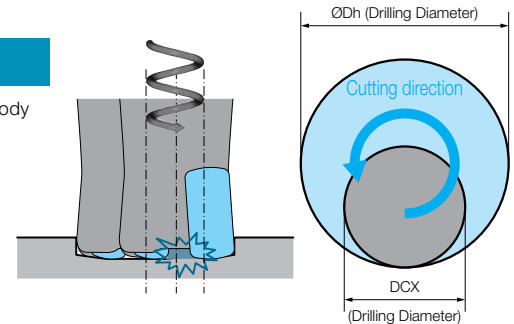
Exceeding Max. Machining Dia.

Center Core Remains



Under Min. Machining Dia.

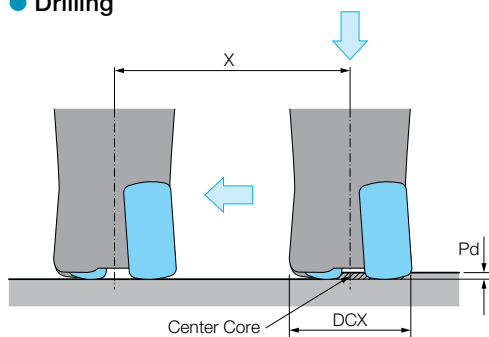
Center Core Hits Holder Body



Holder	Min. Drilling Dia.	Max. Drilling Dia.	Max. Ramping Depth per Cycle
MFH...-03-...	2xDCX-0.315"	2xDCX-0.079"	0.039"

- Keep machine depth per rotation less than max D.O.C. (0.039")
- Use climb milling. (Refer to detail on right)
- Feed rate should be reduced to 50% of recommended cutting condition (Page [M180](#))
- Use caution to eliminate incidences caused by producing long chips

Drilling

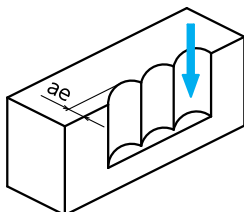


Holder	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface
MFH...-03-...	0.039"	DCX-0.354"

Plunging After Drilling

- It is recommended to reduce feed by 25% of recommendation on Page [M180](#) until Center Core is removed
- Axial feed rate recommendation per revolution is 0.008ipr while drilling

Plunging



Insert Description	Maximum Width of Cut (ae)
LOGU03...	0.138"

- Reduce feed rate to $fz \leq 0.008$ ipt when plunging

MFH-RAPTOR MICRO

(Cutter Dia. Ø0.375" ~ Ø0.625")

(Cutter Dia. Ø8mm ~ Ø16mm)

Durable Design Aids in Chatter Resistance

Maximum D.O.C. 0.020". Stable High Feed Machining on a Wide Range of Applications

1 Stable Machining with Chattering Resistance

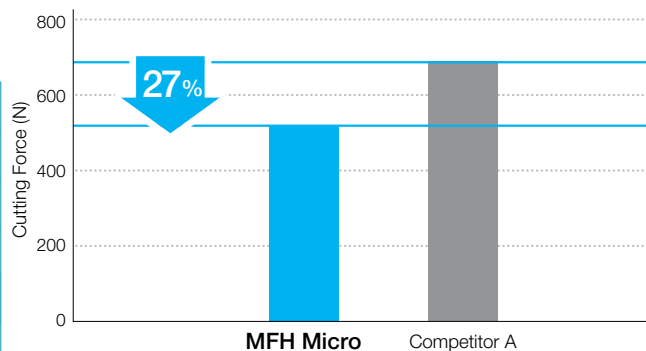
Molded Convex Cutting Edge Controls Initial Impact when Entering the Workpiece

Molded Convex Cutting Edge



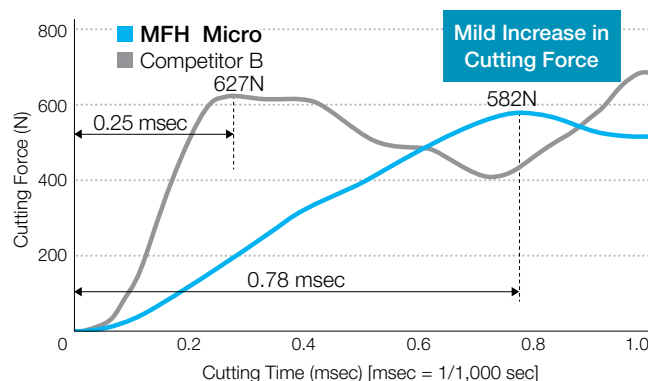
High Precision G Class Insert

Cutting Force Comparison (In-house Evaluation)



Cutting Conditions: $V_c = 390$ sfm, $f_z = 0.024$ ipt, D.O.C. = 0.016"
 Cutter Dia. Ø0.375", Slotting, Dry Workpiece: 1049

Increase in Cutting Force when Entering Work Piece (In-house Evaluation)



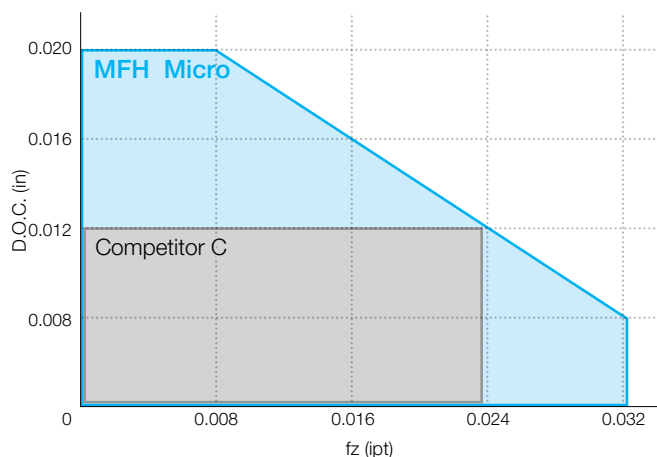
Cutting Conditions: $V_c = 390$ sfm, $f_z = 0.024$ ipt, D.O.C. \times ae = 0.016" \times 0.197"
 Cutter Dia. Ø0.375", Dry Workpiece: 1049

2 Wide Range of Machining Applications

Wide Range of Machining Applications at a Maximum Depth of Cut of 0.020"

Stable Machining Even with Small Machining Centers

Cutting Performance Map (Cutter Dia. Ø0.375")



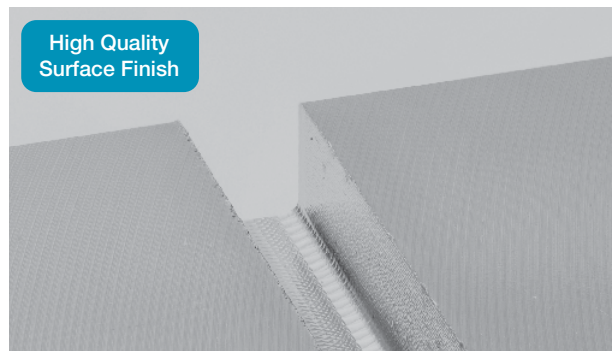
(In-house Evaluation)

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

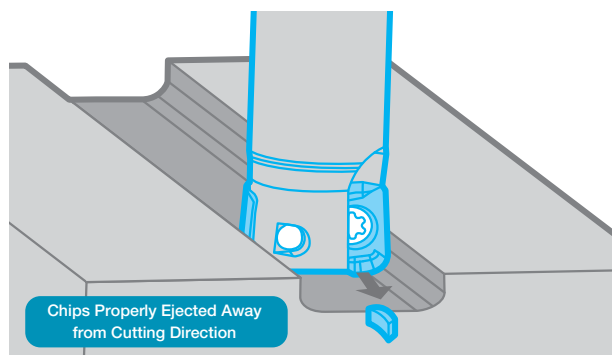
3 Good Chip Evacuation

Controls Chip Biting with Convex Cutting Edge

MFH Micro

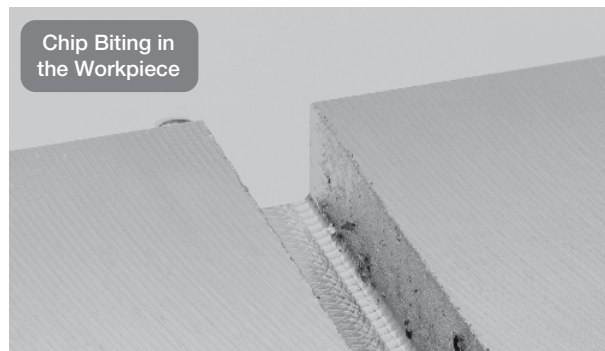


Good Chip Evacuation

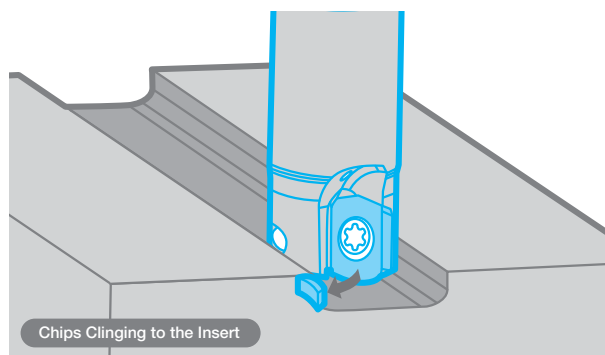


Cutting Conditions: Cutter Dia. $D_c = \varnothing 0.375"$, $V_c = 390$ sfm, $f_z = 0.024$ ipt, D.O.C. = $0.016"$ (25 Passes) Total $0.394"$, Dry Workpiece: Structural Steel

Competitor F



Poor Chip Evacuation



(Internal Evaluation)

4 Replaces Solid End Mills to Reduce Machining Costs

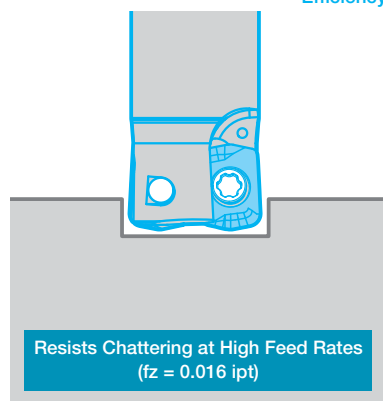
Suppresses Chattering and Increases Milling Efficiency

MFH Micro Compared to Solid End Mills

MFH Micro $Q = 0.93\text{in}^3/\text{min}$

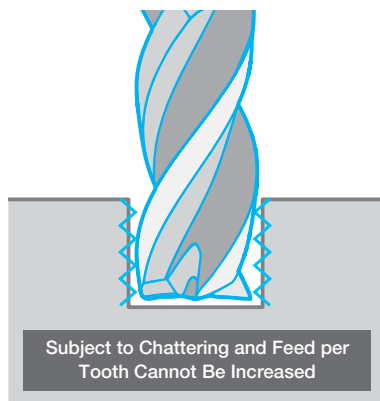
$V_c = 490$ sfm, $f_z = 0.016$ ipt
D.O.C. $\times a_e = 0.016" \times 0.394"$, Dry
MFH10-S10-01-2T (2 Inserts)
LPGT010210ER-GM (PR1525)

1.2x
Machining
Efficiency



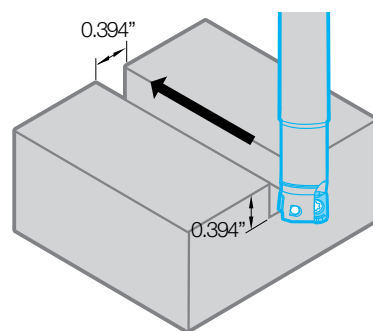
Solid End Mill $Q = 0.74\text{in}^3/\text{min}$

$V_c = 260$ sfm, $f_z = 0.002$ ipt
D.O.C. $\times a_e = 0.012" \times 0.394"$, Dry
 $\varnothing 10\text{mm}$ (4 Flute)



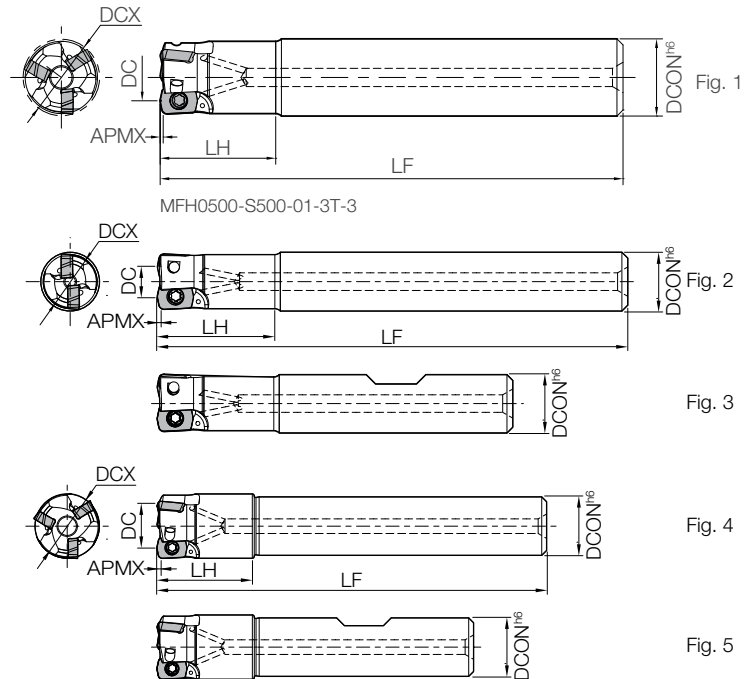
Mechanical Parts Slotting

Workpiece: 1049



(User Evaluation)

MFH Micro End Mill



Toolholder Dimensions (Inch Size)

Part Number		Stock	No. of Inserts	Dimensions (in)						Max. Ramping Angle	Rake Angle (°)	Coolant Hole	Drawing	Weight (kg)	Max RPM
				DCX	DC	DCON	LF	LH	APMX	RMPX	A.R.				
Standard Shank (Cylindrical)	MFH 0375-S375-01-1T-3	●	1	0.375	0.225	0.375	3.000	0.750	0.020	3.0°	+5°	Yes	Fig. 1	0.04	16,200
	0394-S375-01-2T-3	●	2	10mm	0.244	0.375	3.000	0.750	0.020	3.0°				0.04	16,200
	0500-S500-01-3T-3	●	3	0.500	0.350	0.500	3.000	0.750	0.020	2.0°				0.07	14,000
	0500-S500-01-3T-5	●	3	0.500	0.350	0.500	5.000	0.750	0.020	2.0°				0.04	16,200
	0625-S625-01-4T35	●	4	0.625	0.475	0.625	3.500	1.000	0.020	1.2°				0.12	11,400

Toolholder Dimensions (Metric Size)

Part Number		Stock	No. of Inserts	Dimensions (mm)						Max. Ramping Angle	Rake Angle (°)	Coolant Hole	Drawing	Weight (kg)	Max RPM
				DCX	DC	DCON	LF	LH	APMX	RMPX	A.R.				
Standard Shank (Cylindrical)	MFH 08-S10-01-1T	●	1	8	4.2	10	75	16	0.5	4.0°	5°	Yes	Fig. 2	0.04	20,000
	10-S10-01-2T	●	2	10	6.2	10	80	20	0.5	3.0°				0.04	16,200
	12-S12-01-3T	●	3	12	8.2	12	80	20	0.5	2.0°				0.06	14,000
	16-S16-01-4T	●	4	16	12.2	16	90	25	0.5	1.2°				0.12	11,400
Oversize Shank (Cylindrical)	MFH 14-S12-01-3T	●	3	14	10.2	12	80	20	0.5	1.5°	5°	Yes	Fig. 4	0.07	12,500
Standard Shank (Weldon)	MFH 08-W10-01-1T	●	1	8	4.2	10	58	16	0.5	4.0°	5°	Yes	Fig. 3	0.03	20,000
	10-W10-01-2T	●	2	10	6.2	10	60	20	0.5	3.0°				0.03	16,200
	12-W12-01-3T	●	3	12	8.2	12	65	20	0.5	2.0°				0.05	14,000
	16-W16-01-4T	●	4	16	12.2	16	73	25	0.5	1.2°				0.10	11,400
Oversize (Weldon)	MFH 14-W12-01-3T	●	3	14	10.2	12	65	20	0.5	1.5°	5°	Yes	Fig. 5	0.05	12,500

Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
MFH...-01-...	SB-1840TRP	FTP-6	P-37	LPGT010210ER-GM

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

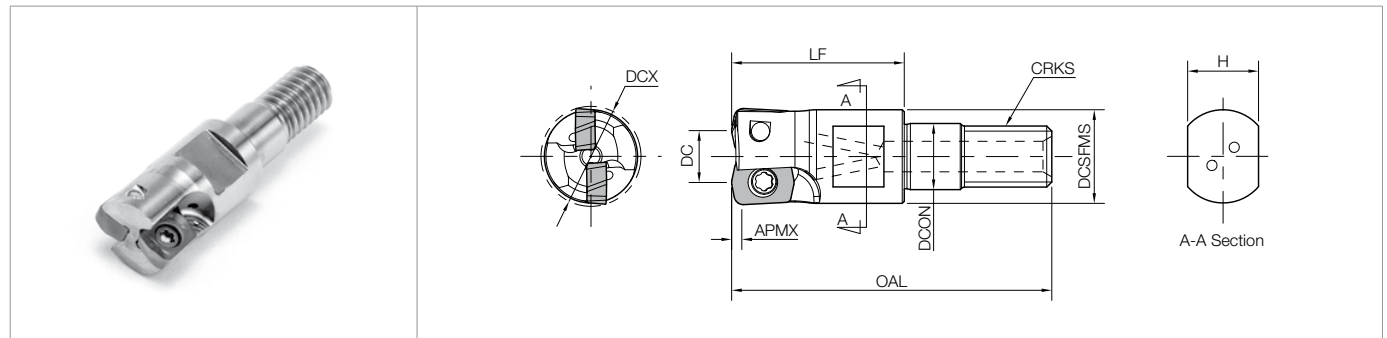
*Recommended tightening torque for insert screw is 0.5 Nm

Recommended Cutting Conditions M198

(Customer Service) 800.823.7284 - Option 1
(Technical Support) 800.823.7284 - Option 2
Visit us online at KyoceraPrecisionTools.com

● : Standard Item △ : Phaseout Item (will be removed from next catalog)
Contact your local Kyocera sales engineer to upgrade old products to new technology

MFH Micro Modular End Mill



Toolholder Dimensions

Part Number	Stock	Unit	No. of Inserts	Dimensions									Max. Ramping Angle	Rake Angle (°)	Coolant Hole	Max RPM						
				DCX	DC	DCSFMS	DCON	OAL	LF	CRKS (mm)	H	APMX	RMPX	A.R.								
MFH 0500-M06-01-3T	●	inch	3	0.500	0.350	0.441	0.256	1.240	0.669	M6xP1.0	0.276	0.020	2°		Yes	14,000						
0625-M08-01-4T	●		4	0.625	0.475	0.579	0.335	1.575	0.866	M8xP1.25	0.472		1.2°			11,400						
MFH 08-M06-01-1T	●	mm	1	8	4.2	9.2	6.5	31.5	17	M6xP1.0	7	0.5	4°	+5°	Yes	20,000						
10-M06-01-2T	●		2	10	6.2								3°			16,200						
12-M06-01-3T	●		3	12	8.2	11.2							2°			14,000						
14-M06-01-3T	●		3	14	10.2								1.5°			12,500						
16-M08-01-4T	●		4	16	12.2	14.7	8.5	40	22	M8xP1.25	12		1.2°			11,400						

Additional Ramping Information ➔ **M199**

Spare Parts and Applicable Inserts

Part Number	Spare Parts			Applicable Inserts
	Clamp Screw	Wrench	Anti-Seize Compound	
MFH...-01-...	SB-1840TRP	FTP-6	P-37	LPGT010210ER-GM

Caution with Max. Revolution


When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

🔧 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

*Recommended tightening torque for insert screw is 0.5 Nm

Recommended Cutting Conditions ➔ **M198**

Actual End Mill Depth (MFH16-M080-01-4T)

	Arbor Part Number	Applicable End Mill			Actual End Mill Depth (mm)
		Part Number	Cutting Dia. (mm)	Dimension (mm)	LUX
			DC	LF	
			BT30K-M08-45	MFH16-M08-01...	
BT40K-M08-55	MFH16-M08-01...	Ø16	22	28.7	

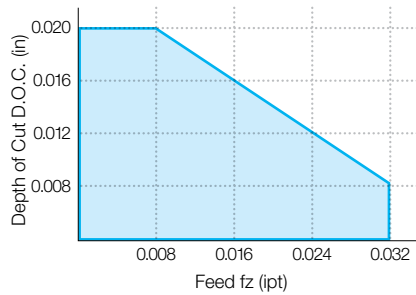
Applicable Inserts (➔ **M16**)

Insert	Part Number	Dimension (in)					MEGACOAT NANO		CVD
		W1	S	D1	INSL	RE	PR1535	PR1525	CA6535
 General Purpose	LPGT010210ER-GM	0.165	0.086	0.083	0.247	0.039	●	●	●

MFH Micro Cutting Performance

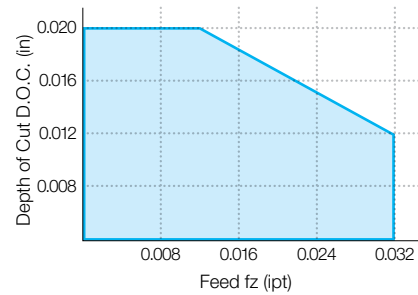
Cutter Dia: Ø0.375" ~ Ø0.500"

Cutter Dia: Ø8mm ~ Ø12mm



Cutter Dia: Ø0.625"

Cutter Dia: Ø14mm ~ Ø16mm



Recommended Cutting Conditions

Chipbreaker	Workpiece Material	Holder Description and Feed Rate (fz: ipt) *Recommended D.O.C. = 0.012" Reference Value					Recommended Insert Grade (Vc: sfm)		
		MFH08-....1T	MFH0375....1T-3 MFH0394....2T-3 MFH10-....2T	MFH0500....3T.. MFH12-....3T	MFH14-....3T	MFH0625....4T(35) MFH16-....4T	MEGACOAT NANO		CVD
							PR1535	PR1525	CA6535
GM	Carbon Steel	0.008- 0.016 -0.024			0.008- 0.020 -0.031		☆ 390- 590 -820	★ 390- 590 -820	-
	Alloy Steel	0.008- 0.016 -0.024			0.008- 0.020 -0.031		☆ 330- 520 -720	★ 330- 520 -720	-
	Mold Steel (~40 HRC)	0.008- 0.012 -0.020			0.008- 0.016 -0.024		☆ 260- 460 -590	★ 260- 460 -590	-
	Mold Steel (40~50 HRC)	0.008- 0.010 -0.012			0.008- 0.010 -0.016		☆ 200- 330 -430	★ 200- 330 -430	-
	Austenitic Stainless Steel	0.008- 0.012 -0.020			0.008- 0.016 -0.024		★ 330- 520 -660	☆ 330- 520 -660	-
	Martensitic Stainless Steel	0.008- 0.012 -0.020			0.008- 0.016 -0.024		☆ 490- 660 -820	-	★ 590- 790 -980
	Precipitation Hardened Stainless Steel	0.008- 0.012 -0.020			0.008- 0.016 -0.024		★ 300- 390 -490	-	-
	Gray Cast Iron	0.008- 0.016 -0.024			0.008- 0.020 -0.031		-	★ 390- 590 -820	-
	Nodular Cast Iron	0.008- 0.012 -0.020			0.008- 0.016 -0.024		-	★ 330- 490 -660	-
	Ni-base Heat Resistant Alloy	0.008- 0.010 -0.012			0.008- 0.010 -0.016		☆ 70- 100 -160	-	★ 70- 100 -160
	Titanium Alloy	0.008- 0.010 -0.012			0.008- 0.010 -0.016		★ 130- 200 -260	-	-

- Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy
 - 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.
 - Internal coolant is recommended for slotting applications
- ★: 1st Recommendation ☆: 2nd Recommendation

Approximate Programming Radius Adjustment

Drawing	Programmable R (in)	Maximum Over Machining of Radius (in)	Over Machined Radius Portion (in)	Maximum Unmachined Portion (in)
	0.039	0	0	0.0083
	0.047 (Recommended)	0	0	0.0067
	0.059	0.0032	0.0032	0.0039
	0.079	0.0110	0.0110	0.0004

Cutting Edge Angle: 12°

Ramping

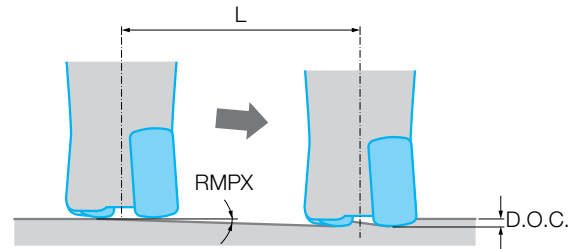
Holder	Cutter Dia. DCX	0.375"	0.500"	0.625"	8mm	10mm	12mm	14mm	16mm
MFH...-01-...	Max. Ramping Angle RMPX	3.0°	2.0°	1.2°	4.0°	3.0°	2.0°	1.5°	1.2°
	tan RMPX max	0.052	0.035	0.021	0.070	0.052	0.035	0.026	0.021

Decrease Ramping Angle if Chips Become Excessively Long

- Recommended ramping angle is \leq RMPX (see chart above for recommended ramp angle)
- Reduce recommended feed rate by 70%

Formula for Max. Cutting Length (L) at Max. Ramping Angle

$$L = \frac{\text{D.O.C.}}{\tan \text{RMPX max}}$$

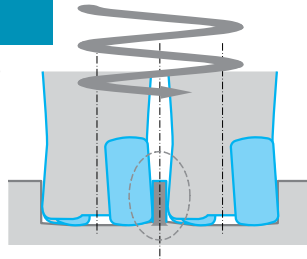


Helical Milling

- For Helical milling, use between Min. Drilling Dia. and Max. Drilling Dia.

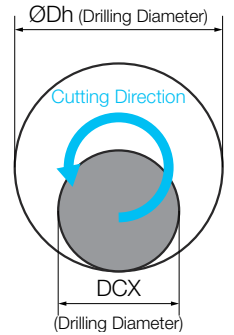
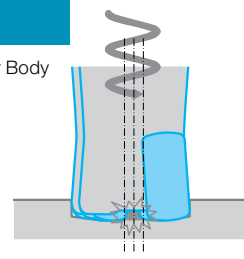
Exceeding Max. Machining Dia.

Center Core Remains



Under Min. Machining Dia.

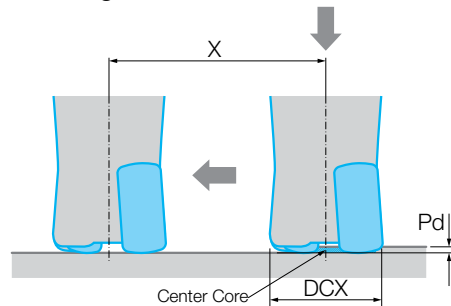
Center Core Hits Holder Body



Holder	Min. Drilling Dia.	Max. Drilling Dia.	Max. Ramping Depth per Cycle
MFH...-01-...	2xDCX-0.138"	2xDCX-0.079"	0.020"

- Keep machine depth per rotation less than max D.O.C. (0.020")
- Use climb milling. (Refer to detail on right)
- Feed rate should be reduced to 50% of recommended cutting condition (Page [M198](#))
- Use caution to eliminate incidences caused by producing long chips

Drilling

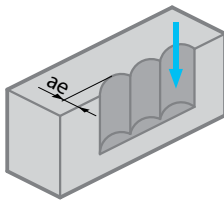


Holder	Min. Drilling Depth (Pd)	Min. Cutting Length X for Flat Bottom Surface
MFH...-01-...	0.020"	DCX-0.138"

Plunging After Drilling

- It is recommended to reduce feed by 25% of recommendation on Page [M198](#) until Center Core is removed
- Axial feed rate recommendation per revolution is 0.008ipr while drilling

Plunging



Insert Description	Maximum Width of Cut (ae)
LPGT01...	0.067"

- Reduce feed rate to $fz \leq 0.008$ ipr when plunging

MFF

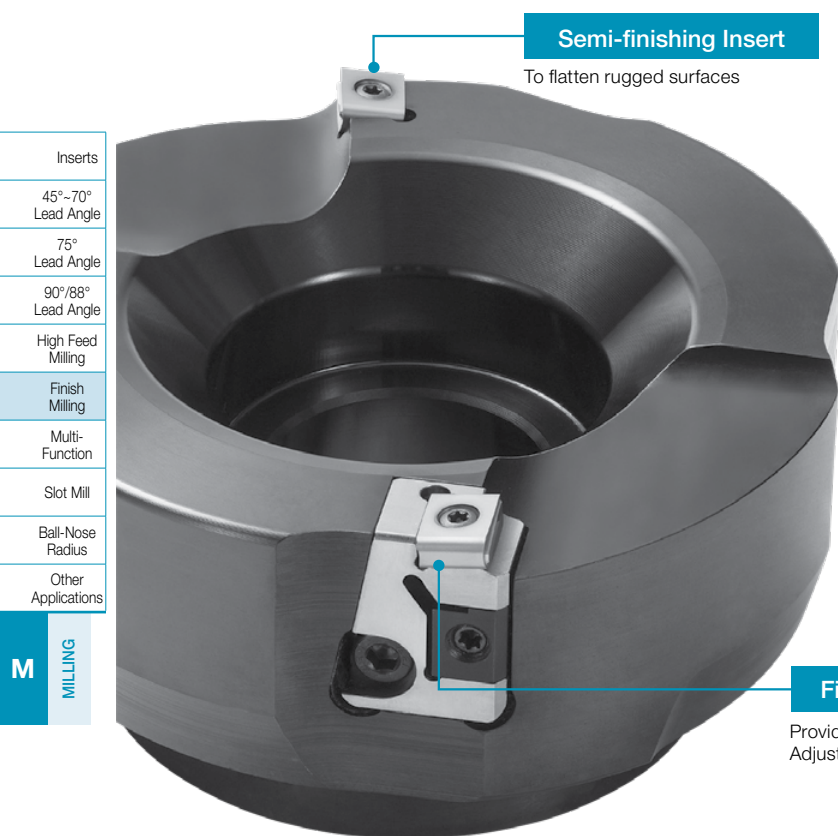
High-Precision Cutter for Finishing Applications

Cutter Body Design Provides Excellent Reliability

Molded Wiper Inserts Increase Machining Efficiency

1 Innovative Solutions for Finish Machining

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



SOLUTION

Increase feed to $f = 0.197$ ipt

Achieved $0.8 \mu\text{m Ra}$ surface finish

No grinding required

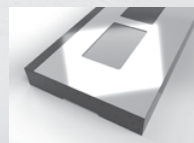
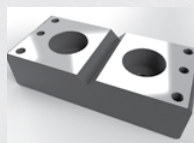
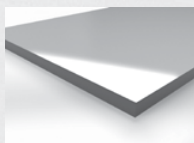
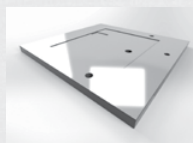
Achieved $5 \mu\text{m}$ flatness

The above is the result of a field test. Actual results will depend on machining environment, workpiece rigidity, machine, etc.
For more details, see case studies on page 4 and 5.

MFF Machining Solutions

Can be used on a wide variety of parts and workpieces

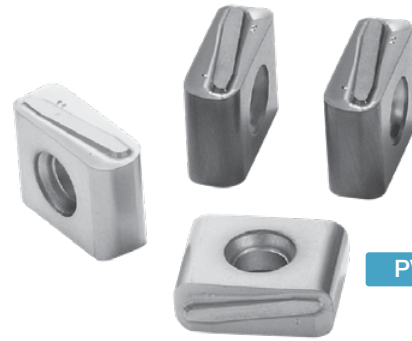
Parts	Workpieces	Industries
Plate / Frame / Case Cylinder Pump / Rail Turbine Housing Casing / Mold Base	SS400 / NO.45 / 80-60-03 Cast Iron Mold Steel Carburized and Hardened Steel (60 HRC)	Industrial Machining Machine Tools Shipbuilding / Automotive Construction Machinery Molds



2

Molded Wiper Insert for High-Quality Surface Finish

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



PR1525

PV60M

Low cutting force with special edge preparation

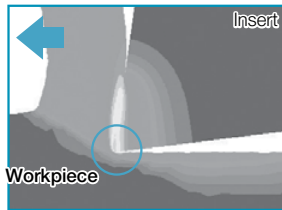
Micro-honing
Good sharpness

Wiper edge

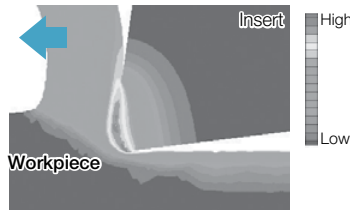
Large S-curve shape developed for higher feed rates

Edge Temperature Simulation Comparison (Internal Evaluation)

MFF

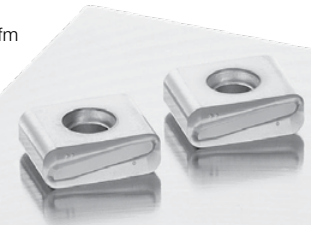


Conventional Tool After 2 sec machining



MEGACOAT NANO Cermet **PV60M**

For high-speed machining
Recommended $V_c = \sim 1,150$ sfm



High-quality surface finish

Molded **TT** Chipbreaker

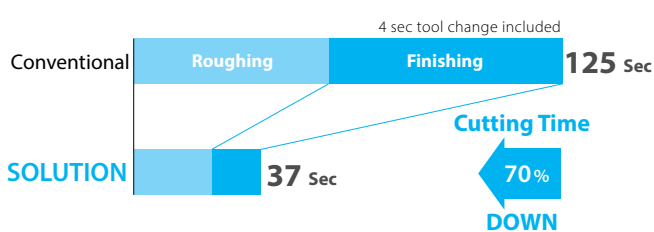
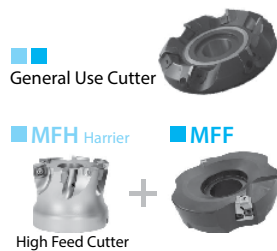
Reduces chip clogging
High feed machining



Comprehensive Machining Solutions

From Roughing to Finish Machining Improvements (Internal Evaluation)

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

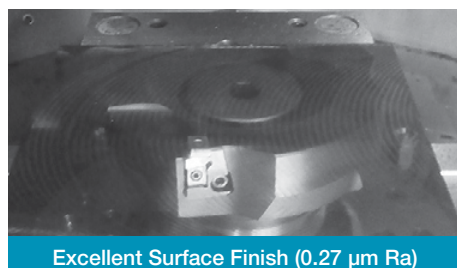


Cutting Conditions
Conventional $\varnothing 200$ mm (6 flute)
 $V_c = 660$ sfm
Roughing : $V_f = 11.26$ ipm ($f_z = 0.006$ ipt), D.O.C. = $0.047''$
Finishing : $V_f = 9.06$ ipm ($f_z = 0.005$ ipt), D.O.C. = $0.012''$

SOLUTION
Roughing: MFH-RAPTOR $\varnothing 63$ mm (6 flute)
 $V_c = 660$ sfm
 $V_f = 287.40$ ipm ($f_z = 0.047$ ipt), D.O.C. = $0.028''$
Finishing: MFF $\varnothing 200$ mm (2 flute)
 $V_c = 980$ sfm
 $V_f = 94.49$ ipm ($f = 0.197$ ipt), D.O.C. = $0.004''$

Surface Finish Quality after Machining

The MFF SOLUTION



Excellent Surface Finish ($0.27 \mu\text{m Ra}$)

Conventional Machining



Cloudy Surface Finish ($1.01 \mu\text{m Ra}$)

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

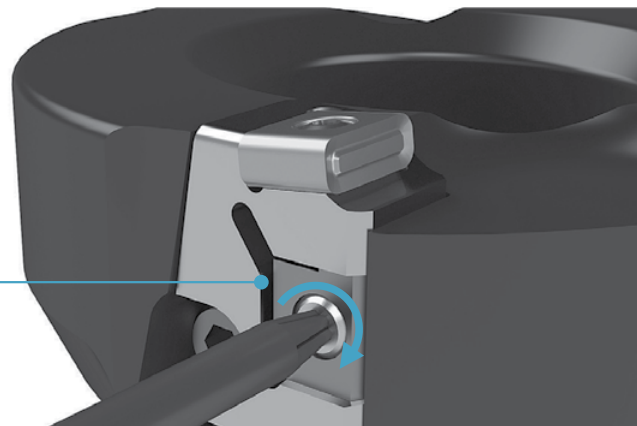
3 Adjustable Cutting Edge Height for Increased Usability

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

Adjustment is not required after replacing insert.

Easy-to-adjust Cutting Edge Height

Cutting edge height can be adjusted easily with one screw

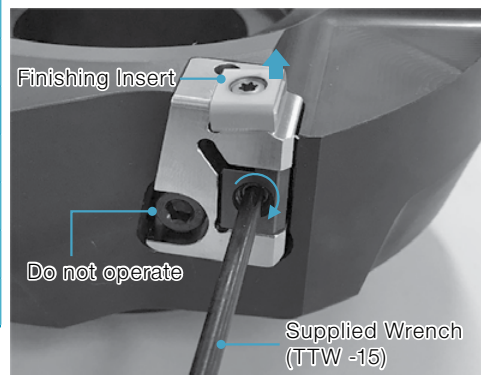


Included adjustment wrench

Edge Adjustment

If D.O.C. is 0.004" ~ 0.008" (0.1mm ~ 0.2mm), 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 0.004" (0.1mm) 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

D.O.C. = 0.0020" => protrusion against rough edge: 0.0012"

ap = 0.0039" ~ => protrusion against rough edge : 0.0024" *Pre-adjusted before shipment

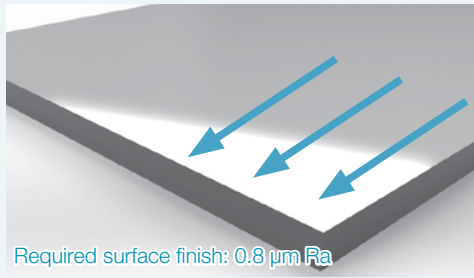
Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi- Function
Slot Mill
Ball-Nose Radius
Other Applications

M
MILLING

SOLUTION 1

1.7 times increase in efficiency at $f = 0.197$ ipt with a $0.8 \mu\text{m Ra}$ surface finish

Plate (SS400)



SOLUTION MFF

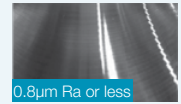
Ø200mm 2 flute



1.7 times Machining Efficiency

$V_f = 8,530$ sfm

$V_c = 1,080$ sfm, $f = 0.169$ ipt, D.O.C. = $0.004''$, Dry



Conventional

Competitor A

Ø200mm 2 flute

$V_f = 4,920$ sfm

$V_c = 720$ sfm, $f = 0.169$ ipt, D.O.C. = $0.004''$, Dry

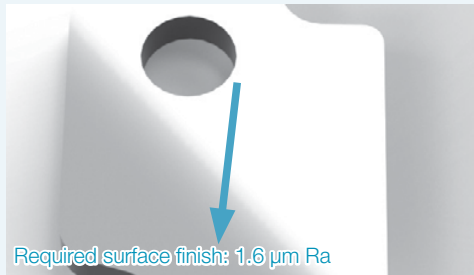
The conventional cutter was not able to feed faster than $f = 0.169$ ipt as surface finish deteriorated. The MFF showed good surface finish of $0.8 \mu\text{m Ra}$ or less even at $f = 0.197$ ipt. Increasing the cutting speed increased machining efficiency by 1.7 times.

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

SOLUTION 2

Surface finish $0.5 \mu\text{m Ra}$. No grinding required (Fewer Processes)

Valve (65-45-12)



SOLUTION MFF

Ø160mm 2 flute



No grinding required

127 sec

$V_c = 980$ sfm, $V_f = 9.84$ ipm ($f = 0.016$ ipt) D.O.C. = $0.004''$, Wet



Conventional

Competitor B

Ø200mm 10 flute

Machining 32 sec + Grinding 10 min

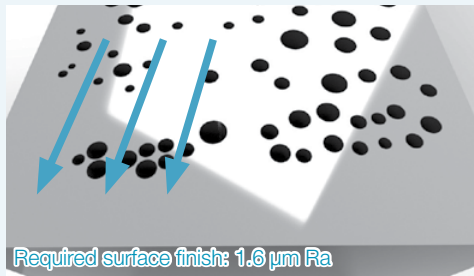
$V_c = 980$ sfm, $V_f = 31.50$ ipm ($f = 0.063$ ipt) D.O.C. = $0.004''$, Wet

Conventional cutter showed cloudy finished surface, MFF provided $0.5 \mu\text{m Ra}$ with a glossy finish. Reduced grinding process and cycle time by 80%.

SOLUTION 3

Improved flatness and machining efficiency tripled in interrupted mold steel

Mold (H13 Equivalent)



SOLUTION MFF

Ø200mm 2 flute



Machining Efficiency x 3

$V_f = 14.96$ ipm 6 Pass

$V_c = 390$ sfm, $f = 0.079$ ipt, D.O.C. = $0.002''$, Dry



Conventional

Competitor C

Ø125mm 5 flute

$V_f = 8.27$ ipm 10 Pass

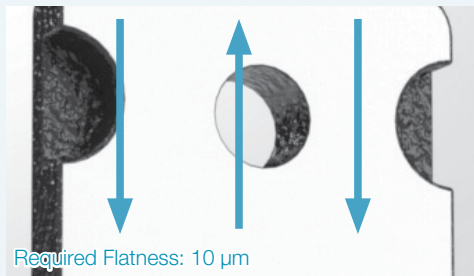
$V_c = 390$ sfm, $f = 0.026$ ipt, D.O.C. = $0.002''$, Dry

The MFF left a good finished surface with no gaps among tool path seams. Larger cutter diameter reduced the number of passes to six and improved productivity. Desirable chip shape and size were achieved.

SOLUTION 4

Flatness of $5 \mu\text{m}$ was achieved. Showed good surface finish with reduced chattering on the thin part

Case (NO.45)



SOLUTION MFF

Ø100mm 2 flute



Machining Quality Improvement

Reduced Chattering and Good Finish

$V_c = 1,080$ sfm, $V_f = 62.99$ ipm ($f = 0.059$ ipt) D.O.C. = $0.004''$, Dry



Conventional

Competitor D

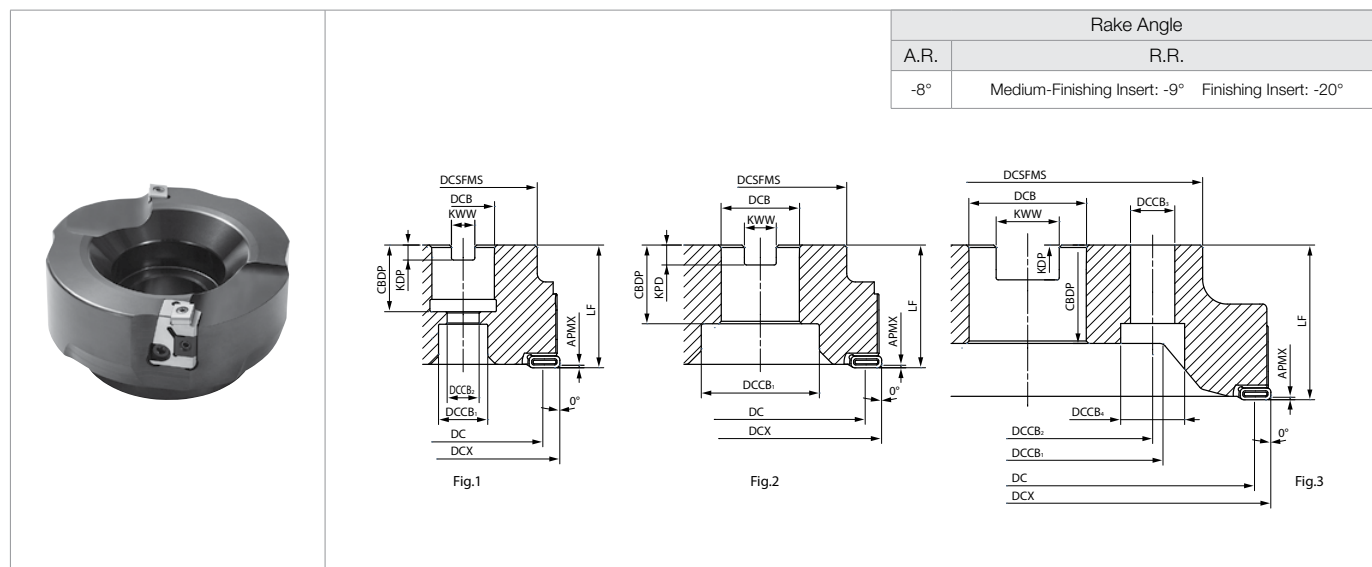
Ø100mm 8 flute (CBN)

Chattering occurred in thin wall

$V_c = 3,940$ sfm, $V_f = 96.46$ ipm ($f = 0.025$ ipt) D.O.C. = $0.004''$, Dry

Conventional cutter needed adjustment due to chattering on the thin portion. MFF prevented chattering. Finished surface is good and there is no gap in the tool path seams. Flatness of $5 \mu\text{m}$ achieved.

MFF Face Mill



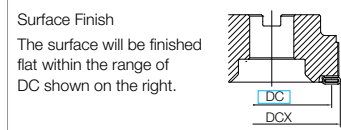
Toolholder Dimensions (Metric Size)

Inserts		Part Number	Stock	No. of Inserts	Dimensions (mm)											Coolant Hole	Drawing	Weight (kg)	Max RPM		
					DCX	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	LF	CBDP	KDP					KWW	APMX
45°~70° Lead Angle	Inch Bore Dia.	MFF 080R-SF	●	2	80	67.3	60	1.000"	20	13	-	-	50	1.063"	0.236"	0.375"	0.3	No	Fig.1	1.3	2,000
75° Lead Angle		100R-SF	●		100	87.3	70	1.250"	48	-	-	-	50	1.260"	0.315"	0.500"			Fig.2	1.8	1,600
90°/88° Lead Angle		125R-SF	●		125	112.3	87	1.500"	58	-	-	-	63	1.496"	0.394"	0.625"				3.5	1,300
High Feed Milling		160R-SF	●		160	147.3	102	2.000"	72	-	-	-	63	1.496"	0.433"	0.750"			Fig.3	5.9	1,000
Finish Milling		200R-SF	●		200	187.3	142	1.875"	110	101.6	26	18	63	1.575"	0.551"	1.000"				8.1	800
Multi-Function		250R-SF	●		250	237.3	142	1.875"	110	101.6	26	18	63	1.575"	0.551"	1.000"				10.8*	800
Slot Mill		Metric Bore Dia.	MFF 080R-M-SF	●	2	80	67.3	60	27	20	13	-	-	50	24	7	12.4	0.3	No	Fig.1	1.3
Ball-Nose Radius	100R-M-SF		●	100		87.3	70	32	48	-	-	-	50	32	8	14.4	Fig.2			1.8	1,600
Other Applications	125R-M-SF		●	125		112.3	87	40	55	-	-	-	63	33	9	16.4				3.5	1,300
	160R-M-SF		●	160		147.3	102	40	72	-	-	-	63	33	9	16.4	Fig.3			5.9	1,000
	200R-M-SF		●	200		187.3	142	60	110	101.6	26	18	63	40	14	25.7				7.7	800
			250R-M-SF	●		250	237.3	142	60	110	101.6	26	18	63	40	14				25.7	10.5*

*0250mm sizes have holes for lighter weight.

Caution with Max. Revolution

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


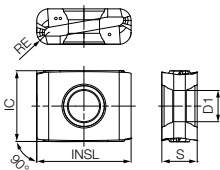

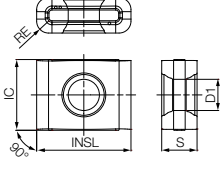


Spare Parts

Spare Parts							
Clamp Screw	Wrench	Wedge	Cartridge	Cartridge Clamp Screw	Wrench	Adjustment Screw	Anti-seize Compound
SB-3592TR	DTM-10						
Tightening Torque for Insert Screw 1.2 Nm		AD-MFF	CR-MFF	HH5X15L	TTW-15	W6X18N	P-37

MFF FINISH MILLING

● Applicable Inserts (☞ M15)

Insert		Part Number	Dimension (mm)					MEGACOAT NANO Cermet	MEGACOAT NANO
			IC	S	D1	INSL	RE	PV60M	PR1525
 Steel and Stainless Steel (Low Cutting Force)		LNGX 120916R-TT	3/8	1/4	0.165	1/2	1/16	●	●
		LNGX 120916	3/8	1/4	0.165	1/2	1/16	●	●
 Cast Iron									

◆ Recommended Cutting Conditions

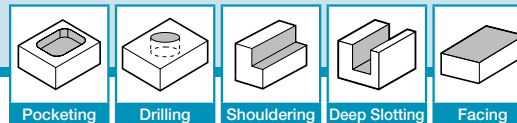
Chipbreaker	Workpiece	f (ipt)	D.O.C. (in)	Recommended Insert Grade (Cutting Speed Vc: sfm)	
				PV60M	PR1525
TT	Structural Steel	0.059 - 0.158 - 0.197	0.001 - 0.004 - 0.012	★ 750 - 920 - 1,150	☆ 750 - 920 - 1,150
	Carbon Steel	0.039 - 0.158 - 0.197		★ 660 - 820 - 1,150	☆ 660 - 820 - 1,150
	Alloy Steel	0.039 - 0.158 - 0.197		★ 660 - 820 - 1,150	☆ 660 - 820 - 1,150
	Mold Steel	0.039 - 0.079 - 0.158	0.001 - 0.004 - 0.008	☆ 390 - 660 - 820	★ 390 - 660 - 820
	Mold Steel (50 HRC~)	0.024 - 0.039 - 0.047	0.001 - 0.002 - 0.004	-	★ 160 - 230 - 260
	Austenitic Stainless Steel *	0.039 - 0.079 - 0.158	0.001 - 0.004 - 0.008	☆ 390 - 660 - 820	★ 390 - 660 - 820
	Martensitic Stainless steel *	0.039 - 0.118 - 0.158		☆ 490 - 660 - 980	★ 490 - 660 - 980
Standard	Gray Cast Iron	0.039 - 0.079 - 0.158	0.001 - 0.004 - 0.012	☆ 660 - 820 - 1,150	★ 660 - 820 - 1,150
	Nodular Cast Iron	0.059 - 0.079 - 0.158		☆ 490 - 820 - 980	★ 490 - 820 - 980

*Machining with coolant is recommended for stainless steel

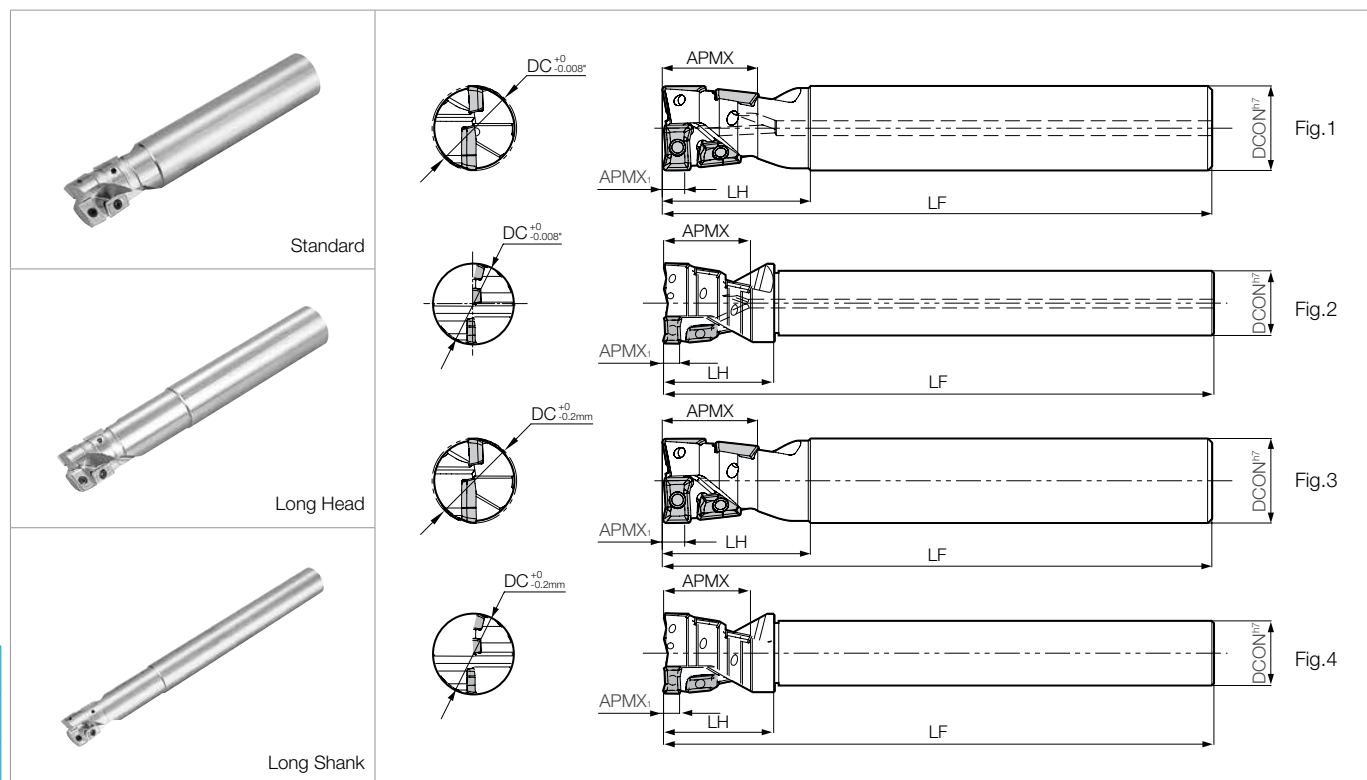
The number in **bold** is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

★: 1st Recommendation ☆: 2nd Recommendation

MEY MULTI-FUNCTION END MILL



MEY End Mill



Toolholder Dimensions

	Part Number	Stock	Unit	No. of Inserts	No. of Flutes	Dimensions						Rake Angle (°)		Coolant Hole	Drawing	Spare Parts		
						DC	DCON	LF	LH	APMX	APMX _i	A.R.	R.R.			Clamp Screw	Wrench	Anti-seize Compound
Standard	MEY 0625-S625-HG	●	inch	4	2	0.630	0.625	4.699	1.195	0.748	0.177	+11°	-11°	Yes	Fig.1	SB-2040TRG	DTM-6	P-37
	0750-S750-HG	●				0.787	0.750	5.091	1.350	0.866	0.236		-9°			SB-2555TRG	DTM-6	
	1000-S100-HG	●				1.000	1.000	5.486	1.549	1.102	0.295		-11°			SB-3070TRG	DT-10	
	1250-S125-HG	●				1.250	5.858	1.921	1.417	0.374		+13°	-9°		Fig.2	SB-4070TRG	DT-15	
	1500-S125-HG	●				1.500	6.260	2.126	1.654	0.295			-11°			SB-3070TRG	DT-10	
	2000-S150-HG	●				1.984	1.500	6.649	2.712	2.126	0.374		-9°			SB-4070TRG	DT-15	
Standard	MEY 16-S16	●	mm	4	2	16	16	120	31	19	4.5	+11°	-11°	No	Fig.3	SB-2040TRG	DTM-6	P-37
	17-S16	●				17										SB-2555TRG	DT-8	
	20-S20	●				20	20	130	35	22	6.0	+13°	-9°			SB-3070TRG	DT-10	
	21-S20	●				21										SB-4070TRG	DT-15	
	25-S25	●				25	25	140	40	28	7.5	+13°	-11°			SB-3070TRG	DT-10	
	26-S25	●				26										SB-4070TRG	DT-15	
	32-S32	●				32	32	150	50	36	9.5	+13°	-9°		Fig.4	SB-3070TRG	DT-10	
	33-S32	●				33										SB-4070TRG	DT-15	
	40-S32	●				40	32	160	55	42	7.5	+13°	-11°			SB-3070TRG	DT-10	
	50-S42	●				50	42	170	70	54	9.5	+13°	-9°			SB-4070TRG	DT-15	
																SB-2040TRG	DTM-6	
																SB-2555TRG	DT-8	
Long Head	MEY 16-S16-140H	●	mm	4	2	16	16	140	51	19	4.5	+11°	-11°	No	Fig.3	SB-2040TRG	DTM-6	P-37
	20-S20-150H	●				20	20	150	53	22	6.0		-9°			SB-2555TRG	DT-8	
	25-S25-170H	●				25	25	170	70	28	7.5	+13°	-11°			SB-3070TRG	DT-10	
	32-S32-180H	●				32	32	180	80	36	9.5		-9°			SB-4070TRG	DT-15	
																SB-2040TRG	DTM-6	
																SB-2555TRG	DT-8	
Long Shank	MEY 16-S16-190	●	mm	4	2	16	16	190	61	19	4.5	+11°	-11°	No	Fig.3	SB-2040TRG	DTM-6	P-37
	17-S16-190	●				17			31							SB-2555TRG	DT-8	
	20-S20-200	●				20	20	200	63	22	6.0	+13°	-9°			SB-3070TRG	DT-10	
	21-S20-200	●				21			35							SB-4070TRG	DT-15	
	25-S25-220	●				25	25	220	80	28	7.5	+13°	-11°			SB-3070TRG	DT-10	
	26-S25-220	●				26			40							SB-4070TRG	DT-15	
	32-S32-230	●				32	32	230	90	36	9.5	+13°	-9°		Fig.4	SB-3070TRG	DT-10	
	33-S32-230	●				33			50							SB-4070TRG	DT-15	
	40-S32-240	●				40	40	240	55	42	7.5	+13°	-11°			SB-3070TRG	DT-10	
	50-S42-250	●				50	42	250	70	54	9.5	+13°	-9°			SB-4070TRG	DT-15	
																SB-2040TRG	DTM-6	
																SB-2555TRG	DT-8	



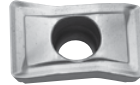
APMX_i shows the edge length of the complete 2-insert part.

Applicable Inserts M207

Coat Anti-seize Compound (P-37) thinly on portion of taper and thread when insert is fixed

MEY MULTI-FUNCTION END MILL

● Applicable Inserts

Part Number	Applicable Inserts  M23			
		No. of Inserts		No. of Inserts
	Side Edge Insert	No. of Inserts	Side Edge Insert	No. of Inserts
MEY 0625-S625-HG	JOMT08T208ER-D	3	GOMT08T208ER-D	1
0750-S750-HG	JOMT100308ER-D		GOMT100308ER-D	
1000-S100-HG	JOMT13T308ER-D		GOMT13T308ER-D	
1250-S125-HG	JOMT160408ER-D		GOMT160408ER-D	
1500-S125-HG	JOMT13T308ER-D	6	GOMT13T308ER-D	1
2000-S150-HG	JOMT160408ER-D		GOMT160408ER-D	
MEY 16-S16(-...)	JOMT08T208ER-D	3	GOMT08T208ER-D	1
17-S16(-...)	JOMT100308ER-D		GOMT100308ER-D	
20-S20(-...)	JOMT13T308ER-D		GOMT13T308ER-D	
25-S25(-...)	JOMT160408ER-D		GOMT160408ER-D	
26-S25(-...)	JOMT13T308ER-D		GOMT13T308ER-D	
32-S32(-...)	JOMT160408ER-D	6	GOMT160408ER-D	1
33-S32(-...)	JOMT13T308ER-D		GOMT13T308ER-D	
40-S32(-...)	JOMT160408ER-D		GOMT160408ER-D	
50-S42(-...)	JOMT13T308ER-D		GOMT13T308ER-D	

◆ Recommended Cutting Conditions

Workpiece Material	fz (ipt)		Recommended Insert Grade (Vc: sfm)		
	Drilling	Shouldering Slotting	MEGACOAT		PVD Coated Carbide
			PR1225	PR1210	PR830
Carbon Steel	0.003~0.006	0.002~0.010	★ 390~820	-	☆ 390~660
Alloy Steel	0.003~0.006	0.002~0.010	★ 330~720	-	☆ 330~590
Mold Steel	0.003~0.005	0.002~0.006	★ 260~590	-	☆ 260~490
Stainless Steel	0.003~0.005	0.002~0.006	★ 390~720	-	☆ 330~590
Cast Iron	0.002~0.008	0.002~0.010	-	★ 330~720	-

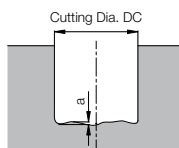
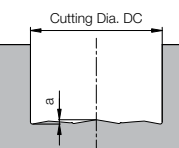
★: 1st Recommendation ☆: 2nd Recommendation

● Drilling Precautions

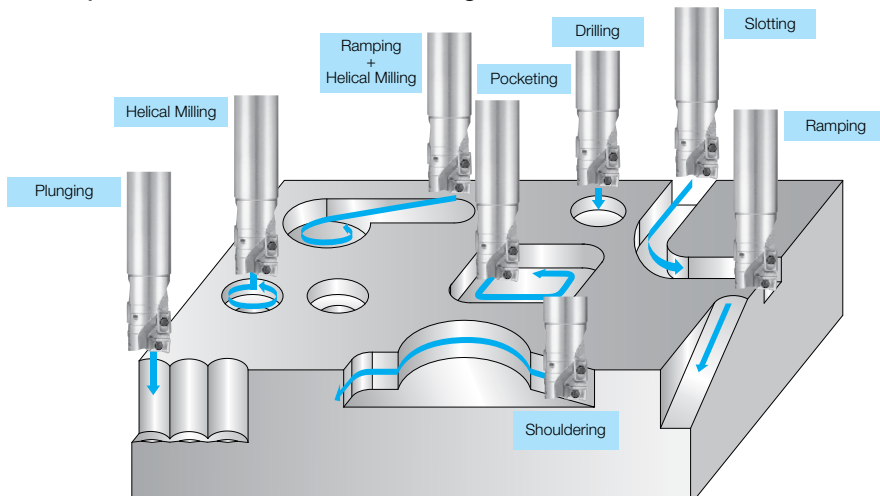
- (1) Drilling conditions should be calculated as one flute effective.
- (2) Use compressed air during drilling.
- (3) Carbon Steel other than low carbon steel can be drilled to a depth of 0.5D without step feeding. For soft steel or sticky material such as stainless steel, step feed drilling (0.020"-0.039") is recommended.
- (4) For stainless steel drilling, coolant is recommended.
- (5) Please refer to the chart for maximum hole depth.

Cutting Dia. (DC)	Max. Hole Depth
0.630" / Ø16mm	0.512" / 13mm
0.669" / Ø17mm	0.512" / 13mm
0.787" / Ø20mm	0.669" / 17mm
0.827" / Ø21mm	0.669" / 17mm
0.984" / Ø25mm	0.866" / 22mm
1.024" / Ø26mm	0.866" / 22mm
1.260" / Ø32mm	1.142" / 29mm
1.299" / Ø33mm	1.142" / 29mm
1.575" / Ø40mm	1.417" / 36mm
1.969" / Ø50mm	1.575" / 40mm

● Drilled Hole Bottom Shape

Cutting Dia.	a	Shape of the bottom
0.630" / 0.669" Ø16mm, Ø17mm	0.020" 0.50mm	
0.787" / 0.827" Ø20mm, Ø21mm	0.025" 0.64mm	
0.984" / 1.024" Ø25, Ø26	0.033" 0.85mm	
1.260" / 1.299" Ø32mm, Ø33mm	0.044" 1.12mm	
1.575" Ø40mm	0.061" 1.54mm	
1.969" Ø50mm	0.065" 1.65mm	

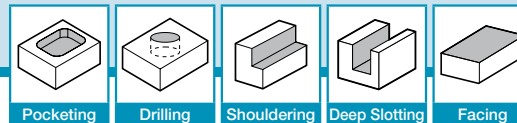
● Examples of MEY Multi-function Cutting



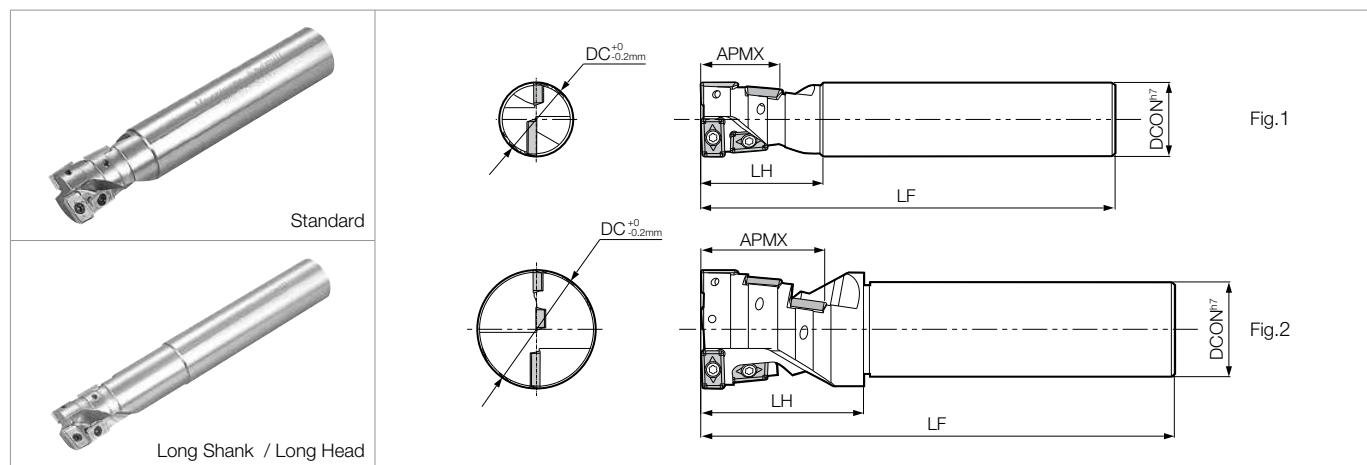
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MEZ-G MULTI-FUNCTION END MILL



MEZ-G End Mill



Toolholder Dimensions

Part Number	Stock	No. of Inserts	No. of Flutes	Dimensions					Rake Angle (°)		Drawing	Spare Parts		Applicable Inserts See Page M24
				DC	DCON	LF	LH	APMX	A.R.	R.R.		Clamp Screw	Wrench	
Standard	MEZ 16-S16G	△	4	16	16	120	31	16	+9°	-5°	Fig.1	SB-2040TRG	DTM-6	NDMT 080208ER-D□
		△		20	20	130	33	21		-4°		SB-2555TRG	DT-8	NDMT 10T208ER-D□
		△		25	25	140	40	25		-5°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		32	32	150	50	33		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		39	32	160	55	39		-3°		SB-3070TRG	DT-10	NEMT 120308ER-D□
Long Head	MEZ 16-S16-140HG	△	7	49	42	170	70	51	+9°	-2°	Fig.2	SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		16	16	140	51	16		-5°		SB-2040TRG	DTM-6	NDMT 080208ER-D□
		△		20	20	150	53	21		-4°		SB-2555TRG	DT-8	NDMT 10T208ER-D□
		△		25	25	170	70	25		-5°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		32	32	180	80	33		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
Long Shank	MEZ 16-S16-190G	△	2	16	16	190	61	16	+9°	-5°	Fig.1	SB-2040TRG	DTM-6	NDMT 080208ER-D□
		△		20	20	200	63	21		-4°		SB-2555TRG	DT-8	NDMT 10T208ER-D□
		△		25	25	220	80	25		-5°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		32	32	230	90	33		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		39	32	240	55	39		-3°		SB-3070TRG	DT-10	NEMT 120308ER-D□
Long Shank	MEZ 16-S16-200G	△	4	49	42	250	70	51	+9°	-2°	Fig.2	SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		16	16	200	63	21		-5°		SB-2040TRG	DTM-6	NDMT 080208ER-D□
		△		20	20	200	63	21		-4°		SB-2555TRG	DT-8	NDMT 10T208ER-D□
		△		25	25	220	80	25		-5°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		32	32	230	90	33		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
Long Shank	MEZ 16-S16-220G	△	7	39	32	240	55	39	+9°	-3°	Fig.2	SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		49	42	250	70	51		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		16	16	200	63	21		-5°		SB-2040TRG	DTM-6	NDMT 080208ER-D□
		△		20	20	200	63	21		-4°		SB-2555TRG	DT-8	NDMT 10T208ER-D□
		△		25	25	220	80	25		-5°		SB-3070TRG	DT-10	NEMT 120308ER-D□
Long Shank	MEZ 16-S16-230G	△	4	32	32	230	90	33	+9°	-2°	Fig.1	SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		39	32	240	55	39		-3°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		49	42	250	70	51		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		16	16	200	63	21		-5°		SB-2040TRG	DTM-6	NDMT 080208ER-D□
		△		20	20	200	63	21		-4°		SB-2555TRG	DT-8	NDMT 10T208ER-D□
Long Shank	MEZ 16-S16-240G	△	7	25	25	220	80	25	+9°	-5°	Fig.1	SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		32	32	230	90	33		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		39	32	240	55	39		-3°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		49	42	250	70	51		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		16	16	200	63	21		-5°		SB-2040TRG	DTM-6	NDMT 080208ER-D□
Long Shank	MEZ 16-S16-250G	△	4	20	20	200	63	21	+9°	-4°	Fig.1	SB-2555TRG	DT-8	NDMT 10T208ER-D□
		△		25	25	220	80	25		-5°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		32	32	230	90	33		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□
		△		39	32	240	55	39		-3°		SB-3070TRG	DT-10	NEMT 120308ER-D□
		△		49	42	250	70	51		-2°		SB-4070TRG	DT-15	NEMT 16T308ER-D□

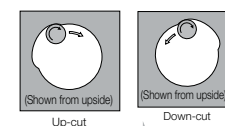
Recommended Cutting Conditions

Workpiece Material	fz (ipt)		Recommended Insert Grade (Vc: sfm)			
	Drilling	Shouldering Slotting	Cermet	MEGACOAT		Carbide
			TN100M	PR1225	PR1210	KW10
Carbon Steel	0.002~0.008	0.002~0.008	★ 390~660	★ 390~820	-	-
Alloy Steel	0.002~0.008	0.002~0.008	★ 330~590	★ 330~720	-	-
Mold Steel	0.002~0.005	0.002~0.006	★ 330~590	★ 260~590	-	-
Stainless Steel	0.002~0.005	0.002~0.006	☆ 390~660	★ 390~720	-	-
Cast Iron	0.002~0.008	0.002~0.008	-	-	★ 330~720	☆ 260~490
Non-ferrous Metals	0.002~0.008	0.002~0.008	-	-	-	★ 330~980

★: 1st Recommendation ☆: 2nd Recommendation

- Drilling conditions should be calculated as one flute line. Step feed (0.5-0.1mm) is recommended.
- Coolant is recommended when drilling stainless steel / cast iron.

- Down-Cut milling is recommended for the improvement of tool life and surface finish.
- Compressed air is recommended.



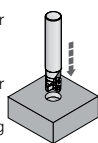
Poor galling surface, wear and chattering

Excellent surface finish, stable and long tool life, anti chattering

How to Use the Silver Drill Mill MEZ-G Effectively

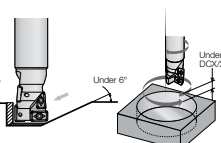
Drilling

- Step feeding is recommended for good chip control. (Depth approx. 1mm)
- Drill depth should be under 0.5DC. (DC:Drilling Dia.)
- Use compressed air when during machining.



Ramping · Helical Milling

- Ramping angle is recommended to be under 6°.
- Plunge depth per revolution when helical milling should be under 0.5DC.
- Use compressed air when during machining.



End Milling

- Tough edge insert is recommended for high load end milling. (High feed rate, large D.O.C.)
- Use a low cutting force insert to prevent chattering.



MEZ-G MULTI-FUNCTION END MILL

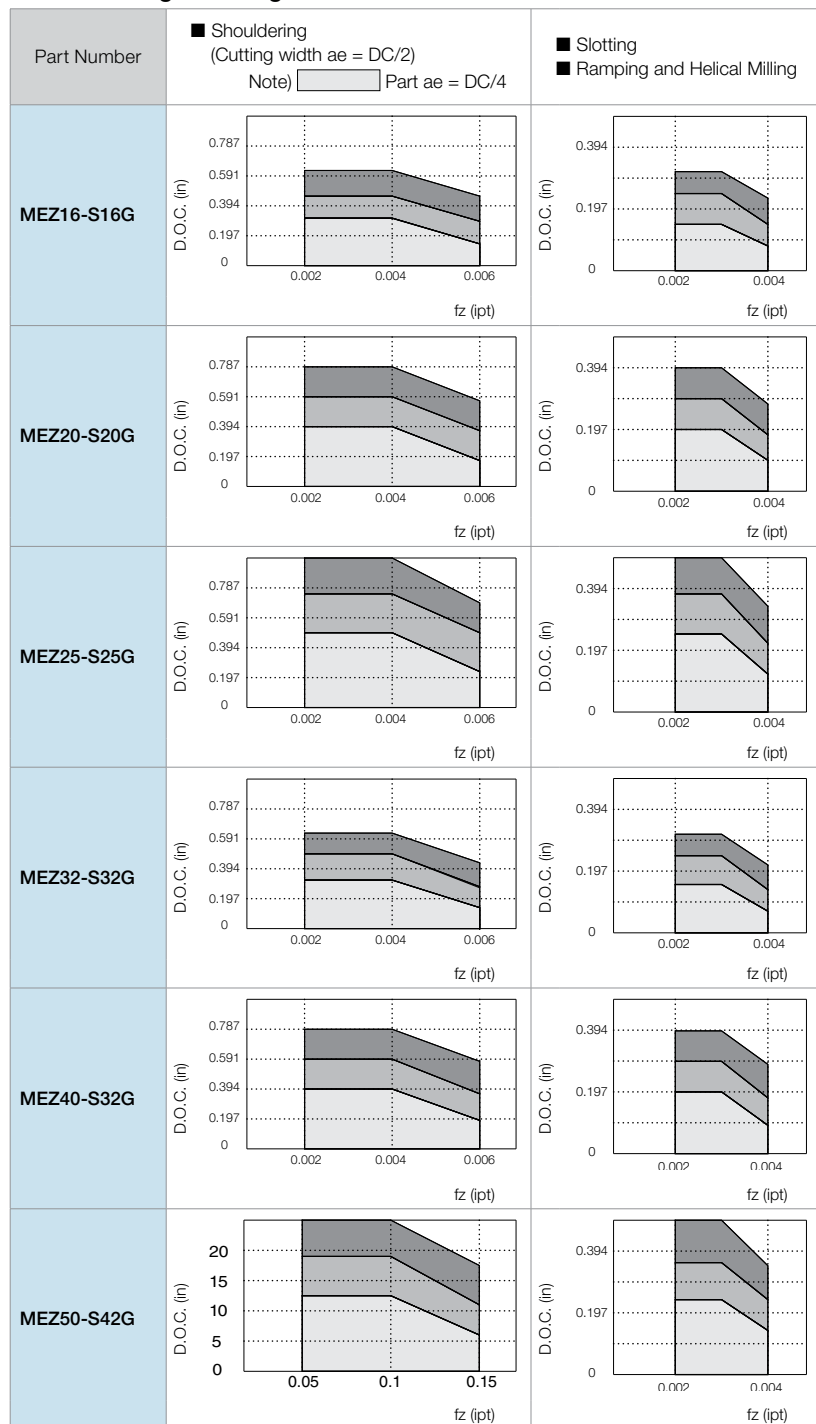
Cutting Performance of MEZ-G

[Workpiece Material: 1049]

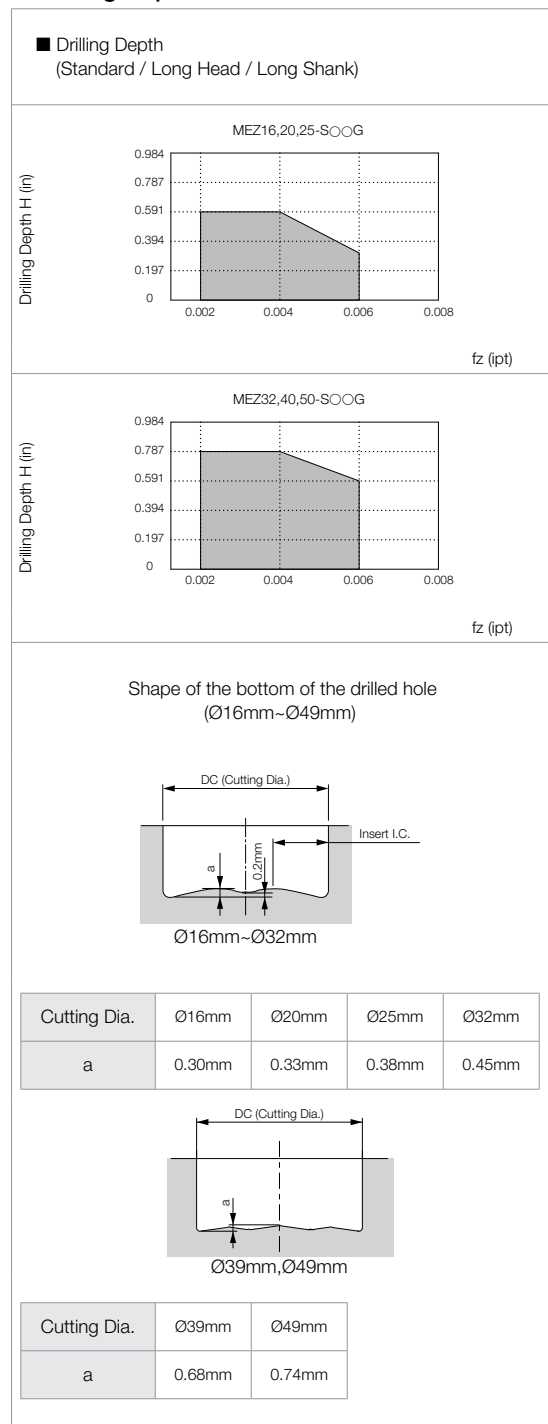
Cutting Dia.	Part Number	Overhang Length LPR (in)			Cutting Dia.	Part Number	Overhang Length LPR (in)			Shape
Ø16	MEZ16-S16G	1.220	[-2.402]	(Not Recommended)	Ø32	MEZ32-S32G	1.969	[-3.150]	(Not Recommended)	
	MEZ16-S16-140HG	-	~2.402	[-3.583]		MEZ32-S32-180HG	-	3.150	[-4.331]	
	MEZ16-S16-190G	-	2.402	~3.583		MEZ32-S32-230G	-	3.543	~4.331	
Ø20	MEZ20-S20G	1.299	[-2.480]	(Not Recommended)	Ø39	MEZ40-S32G	2.165	[-3.346]	[-4.528]	
	MEZ20-S20-150HG	-	~2.480	[-3.661]		-	-	-	-	
	MEZ20-S20-200G	-	2.480	~3.661		MEZ40-S32-240G	2.165	~3.346	~4.528	
Ø25	MEZ25-S25G	1.575	[-2.756]	(Not Recommended)	Ø49	MEZ50-S42G	2.756	[-3.937]	[-5.118]	
	MEZ25-S25-170HG	-	2.756	[-3.937]		-	-	-	-	
	MEZ25-S25-220G	-	3.150	~3.937		MEZ50-S42-250G	2.756	~3.937	~5.118	

When using dimensions in [], be careful that the chucking amount is sufficient.

Shouldering / Slotting



Drilling Depth



MST Slot Mill



MSTA
For Narrow Groove Widths
Self Clamping Type
Slot Width: 1.60 ~ 4.05mm



MSTB
For Medium Groove Widths
Semi-adjustable Width Type
Slot Width: 6.00 ~ 13.00mm



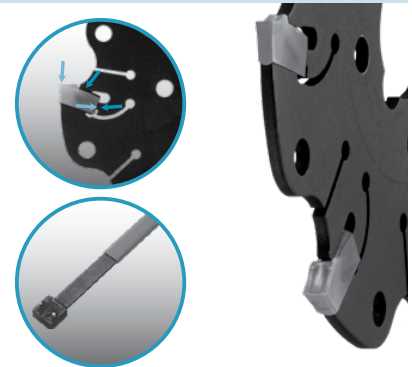
MSTC
For Wide Groove Widths
Full-adjustable Width Type
Slot Width: 14.00 ~ 23.30mm

Lineup of MST Series Slot Mills

Type	Applicable Inserts	Features	Slot Width (mm)														
			1.60	2.20 (2.25)	3.05	4.05	6.00	8.00	10.00	13.00	14.00	16.00	18.00	20.00	22.00	24.00	
MSTA	SLT..	1.60~4.05mm Fixed	●	●	●	●											
MSTB	LNEU12..	6.00~13.00mm Semi-adjustable					* Adjustable in 0.50mm increments between 6.00mm and 13.00mm depending on combination of inserts										
MSTC	SP..10T3..	14.00~18.00mm Full-adjustable									* Adjustable between 14.00mm and 18.00mm						
	SD..1204...	18.00~23.30mm Full-adjustable										* Adjustable between 18.00mm and 23.30mm					

MSTA Slot Mill [Slot Width 1.6, 2.2 (2.25), 3.05, 4.05mm]

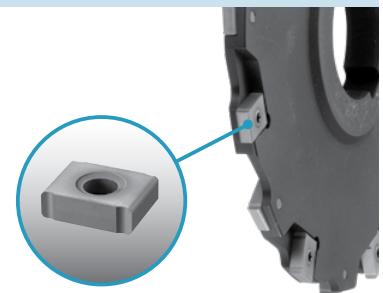
- **Self-clamping Type Slot Mill**
MSTA Slot Mills have simple self-clamping system to allow for easy attachment by just installing the insert.
- **High Rigidity Clamping System**
Owing to the highly rigid clamping system - with an end-stopper, the cutter enables high operability and stable slotting by maintaining an accurate edge position.
- **Double-Prism Clamping System**
High replacement precision due to the clamping system with two prisms.
- **Easy Replacement**
The replacement of inserts is easy and quick by using special wrench.



*Wrench Sold Separately

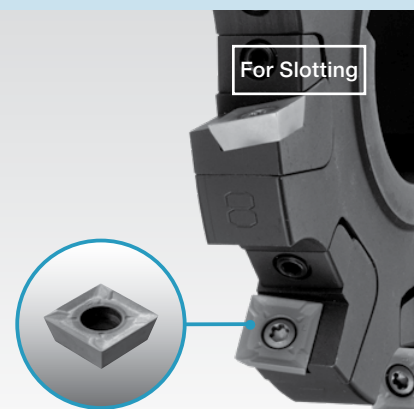
MSTB Slot Mill (Slot Width 6.0~13.0mm)

- **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.
- **Inserts have four edge and are, therefore, cost-effective**
- **Applicable to a variety of slotting by choosing different inserts**
By changing the thickness of inserts, various slotting widths are possible up to a max of 13.00mm in 0.50mm increments.



MSTC Slot Mill (Slot Width 14.0~23.3mm)

- Lay-down type inserts / fully 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 due to unique cam style adjustment mechanism
- Four-sided inserts are cost-effective
- Wide range of corner radii available
- When utilizing wiper edge insert, an excellent surface finish can be expected
- Numerous insert geometries and grades, are available for various types of workpiece machining



Insert Features

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 Nodular Cast Iron.
- For medium speed machining.

PR0735

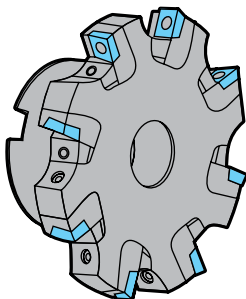
- TiN based PVD Coated Carbide
- For Stainless Steel, Heat Resistant Alloys, etc.
- For low to medium speed machining.

PR0110

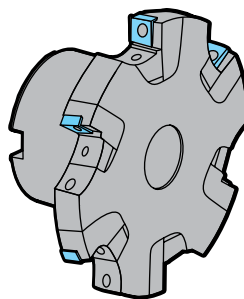
- TiB₂ based PVD Coated Carbide
- For Non-ferrous Metals such as Aluminum Alloys (Si<10%) and Titanium Alloys.
- For high speed machining.

With Boss

Right-hand



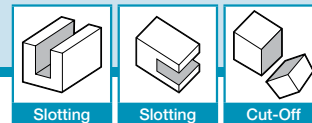
Left-hand



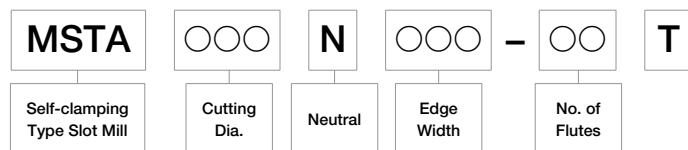
For Shouldering



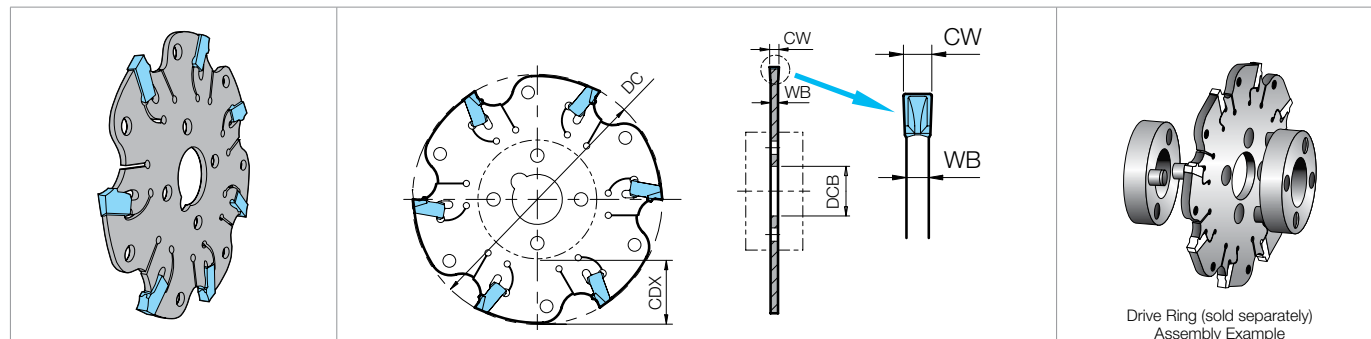
MSTA SLOT MILL (SELF-CLAMPING)






Identification System



MSTA (Inch Size)



Toolholder Dimensions (Inch Size)

Part Number	Stock	Edge Width	Slot Depth	No. of Inserts	Dimensions (in)			Weight (kg)	Max. RPM	Spare Parts	Applicable Inserts 
		CW (in)	CDX (in)		DC	DCB (H7)	WB			Wrench	
											
MSTA 02N063-5T	●	0.063	0.625	5	2.500	0.625	0.051	0.03	5,100	<div>MS-FRW1 (Wrench is not included. Please purchase it separately)</div> <div><div>How to Use Wrench Ref. to Page</div><div> M215</div></div>	SLT16...
03N063-7T	●		0.875	7	3.000	0.625		0.04	4,000		
04N063-9T	●		1.063	9	4.000	1.000		0.07	3,200		
05N063-11T	●		1.375	11	5.000	1.250		0.10	2,600		
MSTA 03N089-7T	●	0.089	0.875	7	3.000	0.625	0.071	0.05	4,000		SLT22...
04N089-9T	●		1.063	9	4.000	1.000		0.08	3,200		
06N089-14T	●		1.438	14	6.000	1.250		0.30	2,000		
MSTA 02N126-4T	●	0.120	0.625	4	2.500	0.625	0.095	0.05	5,100		SLT30...
03N126-6T	●		0.875	6	3.000	0.625		0.08	4,000		
04N126-9T	●		1.063	9	4.000	1.000		0.13	3,200		
05N126-11T	●		1.375	11	5.000	1.250		0.20	2,600		
06N126-14T	●		1.438	14	6.000	1.250		0.35	2,000		
MSTA 03N164-6T	●	0.160	0.875	6	3.000	0.625	0.134	0.10	4,000	SLT40...	
04N164-9T	●		1.063	9	4.000	1.000		0.15	3,200		
05N164-11T	●		1.375 (34.925mm)	11	5.000	1.250		0.25	2,600		

Note) 1. Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold separately.
Please purchase two drive rings per one MSTA slot mill.
2. Do not exceed the max. revolution.
3. Do not operate cutter on reverse revolution.
4. Wrench (MS-FRW1) is not included. Please purchase it separately.

Recommended Cutting Conditions M215

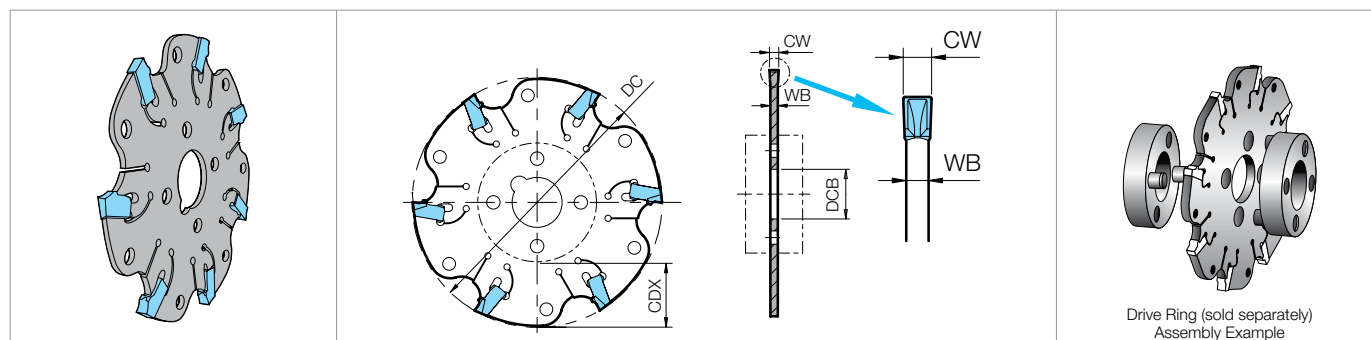
Drive Ring (Inch Size)

Shape	Part Number	Stock	Dimensions (in)					Drawing	Applicable Toolholders
			DCB	DIOUT	WB	KWW	DCON		
	DR0625-1250B	●	0.625 (15.875mm)	1.250 (31.750mm)	0.315 (8mm)	0.130 (3.3mm)	0.120 (3mm)	Fig.2	MSTA 02N063-5T
	DR1000-1875	●	1.000 (25.400mm)	1.875 (47.625mm)	0.394 (10mm)	0.256 (6.5mm)	0.200 (5mm)	Fig.3	MSTA 04N000-OT
	DR1250-2250	●	1.250 (31.750mm)	2.250 (57.150mm)	0.394 (10mm)	0.319 (8.1mm)	0.240 (6mm)	Fig.3	MSTA 05N000-OT
	DR1250-3125	●	1.250 (31.750mm)	3.125 (79.375mm)	0.472 (12mm)	0.319 (8.1mm)	0.472 (12mm)	Fig.3	MSTA 06N000-OT


Wrenches and drive rings are sold in 1 piece per box.

MSTA SLOT MILL (SELF-CLAMPING)

MSTA (Metric Size)



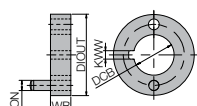
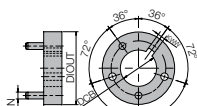
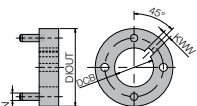
Toolholder Dimensions (Metric Size)

Part Number	Stock	Edge Width	Slot Depth	No. of Inserts	Dimensions (mm)			Weight (kg)	Max. RPM	Spare Parts	Applicable Inserts M202
		CW (mm)	CDX (mm)		DC	DCB (H7)	WB			Wrench 	
MSTA 63N16-5T	●	1.60	15	5	63	16	1.3	0.03	5,100	MS-FRW1 (Wrench is not included. Please purchase it separately) • How to use Wrench Ref. to page M215	SLT16...
80N16-7T	●		21	7	80	16		0.04	4,000		
100N16-9T	●		27	9	100	22		0.07	3,200		
125N16-11T	●		35	11	125	32		0.10	2,600		
MSTA 63N22-5T	●	2.20 (2.25)	15	5	63	16	1.8	0.03	5,100		SLT22...
80N22-7T	●		21	7	80	16		0.05	4,000		
100N22-9T	●		27	9	100	22		0.08	3,200		
125N22-11T	●		35	11	125	32		0.12	2,600		
160N22-14T	●		40	14	160	40		0.30	2,000		
MSTA 63N30-4T	●	3.00	15	4	63	16	2.4	0.05	5,100		SLT30...
80N30-6T	●		21	6	80	16		0.08	4,000		
100N30-9T	●		27	9	100	22		0.13	3,200		
125N30-11T	●		35	11	125	32		0.20	2,600		
160N30-14T	●		40	14	160	40		0.35	2,000		
MSTA 63N40-4T	●	4.00	15	4	63	16	3.4	0.06	5,100		SLT40...
80N40-6T	●		21	6	80	16		0.10	4,000		
100N40-9T	●		27	9	100	22		0.15	3,200		
125N40-11T	●		35	11	125	32		0.25	2,600		
160N40-14T	●		40	14	160	40		0.40	2,000		

Note) 1. Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold separately.
Please purchase two drive rings per one MSTA slot mill.
2. Do not exceed the max. revolution.
3. Do not operate cutter on reverse revolution.
4. Wrench (MS-FRW1) is not included. Please purchase it separately.

Recommended Cutting Conditions M215

Drive Ring (Metric Size)

Shape			Part Number	Stock	Dimensions (mm)					Drawing	Applicable Toolholders
					DCB	DIOUT	WB	KWW	DCON		
 Fig.1	 Fig.2	 Fig.3	DR16-32A	●	16	32	8	4.1	3	Fig.2	MSTA 63N16-5T 63N22-7T
			DR16-32B	●	16	32	8	4.1	4	Fig.1	MSTA 63N30-4T 63N40-4T
			DR16-38	●	16	38	8	4.1	4	Fig.3	MSTA 80N00-OT
			DR22-46	●	22	46	10	6.1	5	Fig.3	MSTA 100N00-OT
			DR32-55	●	32	55	10	8.1	6	Fig.3	MSTA 125N00-OOT
			DR40-80	●	40	80	12	10.1	12	Fig.3	MSTA 160N00-OOT

Wrenches and drive rings are sold in 1 piece per box.

Insert Identification System

SLT

1

16

2

-

15

3

S

4

KB

5

① Insert Symbol

② Edge Width

Symbol	Edge Width
16	1.60mm
22	2.20mm(2.25mm)
30	3.05mm
40	4.05mm

③ Corner-R(RE)

Symbol	Corner-R(RE)
15	0.15mm
20	0.20mm

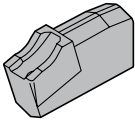
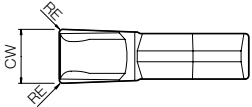
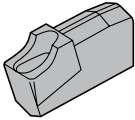
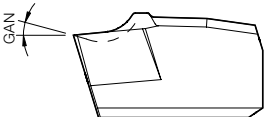
④ Edge Preparation

Symbol	Edge Preparation
S	Chamfer + R-honed

⑤ Chipbreaker Symbol

Symbol	Rake Angle
KB	5°
KD	15°

Applicable Inserts (SLT)

Applicable Inserts (SLT)		Usage Classification ● : 1st Choice ○ : 2nd Choice		P		Carbon Steel / Alloy Steel	●	○	Applicable Toolholder
				M		Stainless Steel	○	●	
				K		Cast Iron	○		
				N		Non-ferrous Metals			
				S		Heat-resistant Alloys Titanium Alloy		●	
Insert		Part Number		Dimensions (mm)		Rake Angle (°)	CVD Coated Carbide	PVD Coated Carbide	
				CW	RE	GAN	CA0835	PR0735	
		SLT 16-15SKB	1.60	+0.00 -0.10	0.15	5°	●	●	
		22-20SKB	2.20	+0.08 -0.05	0.20	5°	●	●	
		30-20SKB	3.05	+0.15 -0.00			●	●	
		40-20SKB	4.05	+0.15 -0.00			●	●	
		SLT 16-15SKD	1.60	+0.00 -0.10	0.15	15°	●	●	➡ M212 ➡ M213
		22-20SKD	2.25	+0.15 -0.00	0.20	15°	●	●	
		30-20SKD	3.05	+0.15 -0.00			●	●	
		40-20SKD	4.05	+0.15 -0.00			●	●	
Low Cutting Force									

Chipbreaker Selection

KB Chipbreaker ... General Purpose Chipbreaker for Steel and Cast Iron
 KD Chipbreaker ... Low Cutting Force Chipbreaker for Stainless Steel

Feature of Insert Grades

CA0835

- TiN+TiCN+Al₂O₃ based CVD Coated Carbide
- For Carbon Steel, Alloy Steel, Stainless Steel and Nodular Cast Iron.
- For medium to high speed machining.

PR0735

- TiN base PVD Coated Carbide
- For Stainless Steel, Heat-Resistant Alloys, etc.
- For low to medium speed machining.

Inserts are sold in 10 piece boxes.

MSTA SLOT MILL (SELF-CLAMPING)

Set up

Wrench Support Hole

Insert Removal Hole for Wrench

How to install inserts

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

How to remove inserts

- Insert one of the pins on the wrench (on OUT indicated side) into the wrench support hole, and insert other pin into the insert removal hole.
- Insert can be removed by rotating the wrench counter clock wise. (A magnet is installed on OUT indicated side.)

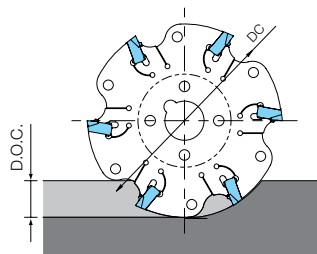
Note) Use appropriate wrench for set up.

Recommended Cutting Conditions

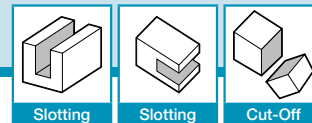
Workpiece Material		Hardness (HRC)	Recommended Insert Grade (Vc: sfm)		fz (ipt)				Notes
			CVD Coated Carbide	PVD Coated Carbide	Edge Width				
			CA0835	PR0735	0.063" 1.60mm	0.087" (0.089") 2.20mm (2.25mm)	0.118" 3.00mm	0.157" 4.00mm	
Low Carbon Steel	1010~1025	20	820~1020	660~820	0.001~0.005	0.002~0.006	0.002~0.007	0.003~0.008	Coolant
Carbon Steel	1030~1059, 1060 Annealed	29	520~620	430~520	0.001~0.005	0.002~0.006	0.002~0.007	0.003~0.008	
	1030~1059, 1060 Heat Treated	37	460~590	360~490	0.001~0.005	0.002~0.006	0.002~0.007	0.003~0.008	
Alloy Steel	Annealed	28	460~590	360~490	0.001~0.005	0.002~0.006	0.002~0.007	0.003~0.008	
	Heat Treated	41	390~520	330~430	0.001~0.004	0.002~0.005	0.002~0.006	0.003~0.007	
High Carbon Alloy	D2, H13, etc.	42	330~460	260~390	0.001~0.004	0.002~0.005	0.002~0.006	0.003~0.007	
Stainless Steel	304, 316, etc. Austenitic	33	490~620	260~390	0.001~0.004	0.002~0.005	0.002~0.006	0.003~0.007	
	403, 410, etc. Martensitic	45	460~590	200~260	0.001~0.004	0.002~0.005	0.002~0.006	0.003~0.007	
Gray Cast Iron	NO.45~NO.60	38	520~660	-	0.001~0.005	0.002~0.006	0.002~0.007	0.003~0.008	Dry
Nodular Cast Iron	60-40-18~70-50-05	25	430~520	-	0.001~0.005	0.002~0.006	0.002~0.007	0.003~0.008	
	80-60-03~120-90-02	37	360~460	-	0.001~0.005	0.002~0.006	0.002~0.007	0.003~0.008	

Note) 1. Use down-cut machining.

2. If D.O.C. is under 1/10 of Cutter Dia.(DC), it is possible to increase feed per tooth (fz) 40%.

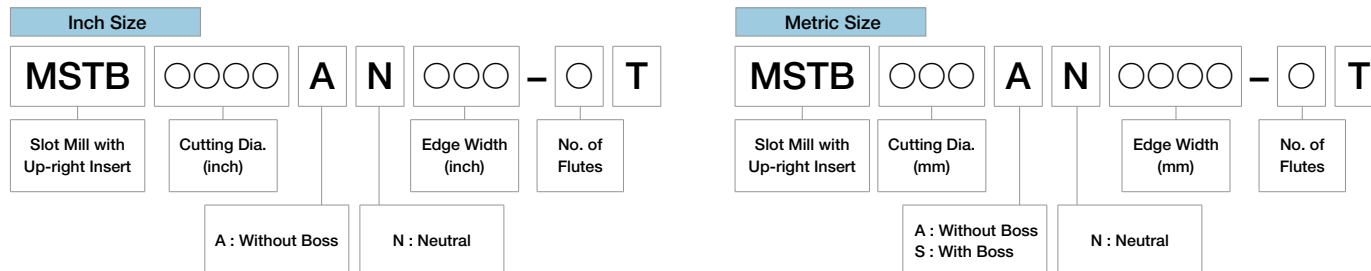


MSTB SLOT MILL (UP-RIGHT)

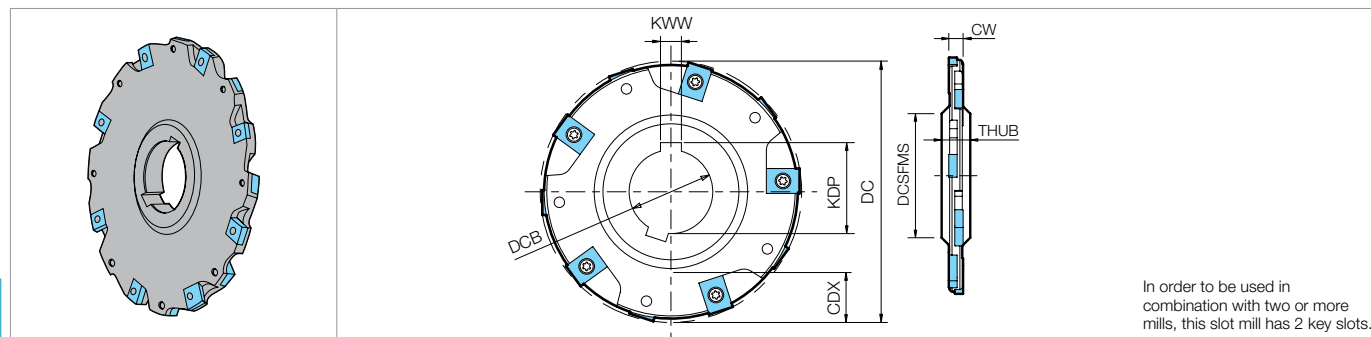


Identification System

MSTB Slot Mill



MSTB Without Boss



Toolholder Dimensions (Inch Size)

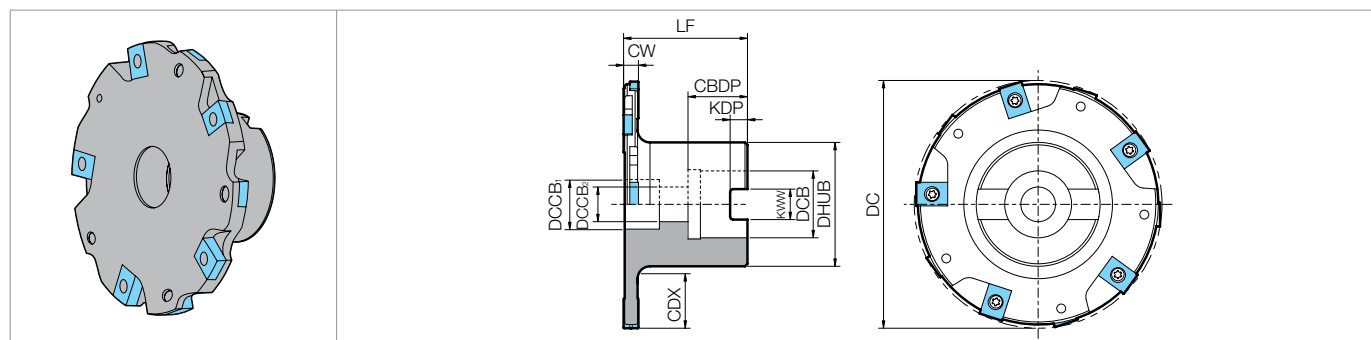
Part Number	Stock	Edge Width (inch)		Slot Depth	No. of Inserts	No. of Edge Lines M207	Dimensions (inch)						Weight (kg)	Max. RPM
		CW (Min.)	CW (Max.)				DC	DCB (H7)	DCSFMS	THUB	KDP	KWW		
MSTB 3000AN250-4T	●	0.250	0.289	0.625	8	4	3.000	1.000	1.500	0.500	1.106	0.250	0.3	9,470
4000AN250-5T	●	0.250	0.289	0.935	10	5	4.000	1.250	1.880	0.500	1.386	0.312	0.3	8,200
5000AN250-6T	●	0.250	0.289	1.435	12	6	5.000	1.250	1.880	0.500	1.386	0.312	0.7	7,300
6000AN250-8T	●	0.250	0.289	1.750	16	8	6.000	1.500	2.250	0.500	1.665	0.375	1.0	6,700
MSTB 4000AN312-5T	●	0.312	0.351	0.966	10	5	4.000	1.250	1.880	0.500	1.386	0.312	0.5	7,400
5000AN312-6T	●	0.312	0.351	1.466	12	6	5.000	1.250	1.880	0.500	1.386	0.312	0.8	6,600
6000AN312-8T	●	0.312	0.351	1.781	16	8	6.000	1.500	2.250	0.500	1.665	0.375	1.1	6,000
MSTB 4000AN375-3T	●	0.375	0.414	1.000	9	3	4.000	1.250	1.880	0.500	1.386	0.312	0.5	7,400
5000AN375-4T	●	0.375	0.414	1.500	12	4	5.000	1.250	1.880	0.500	1.386	0.312	0.8	6,600
6000AN375-5T	●	0.375	0.414	1.812	15	5	6.000	1.500	2.250	0.500	1.665	0.375	1.3	6,000
MSTB 4000AN500-3T	●	0.500	0.539	1.060	9	3	4.000	1.250	1.880	0.500	1.386	0.312	0.6	4,900
5000AN500-4T	●	0.500	0.539	1.560	12	4	5.000	1.250	1.880	0.500	1.386	0.312	1.1	4,400
6000AN500-5T	●	0.500	0.539	1.875	15	5	6.000	1.500	2.250	0.500	1.665	0.375	1.7	4,000

Toolholder Dimensions (Metric Size)

Part Number	Stock	Edge Width (mm)		Slot Depth	No. of Inserts	No. of Edge Lines M207	Dimensions (mm)						Weight (kg)	Max. RPM
		CW (Min.)	CW (Max.)				DC	DCB (H7)	DCSFMS	THUB	KDP	KWW		
MSTB 80AN0607-4T	●	6	7	15.0	8	4	80	27	44	12	29.8	7	0.3	9,240
100AN0607-5T	●	6	7	21.0	10	5	100	32	52	12	34.8	8	0.4	8,270
125AN0607-6T	●	6	7	28.0	12	6	125	40	63	12	43.5	10	0.7	7,390
160AN0607-8T	●	6	7	45.5	16	8	160	40	63	12	43.5	10	1.1	6,540
MSTB 80AN0809-4T	●	8	9	16.0	8	4	80	27	44	12	29.8	7	0.4	9,240
100AN0809-5T	●	8	9	22.0	10	5	100	32	52	12	34.8	8	0.5	8,270
160AN0809-8T	●	8	9	45.5	16	8	160	40	63	12	43.5	10	1.3	6,540
MSTB 125AN1011-4T	●	10	11	30.0	12	4	125	40	63	12	43.5	10	0.9	7,390
160AN1011-5T	●	10	11	47.5	15	5	160	40	63	12	43.5	10	1.6	6,540
MSTB 160AN1213-5T	●	12	13	48.5	15	5	160	40	63	12	43.5	10	1.6	6,540

MSTB SLOT MILL (UP-RIGHT)

MSTB With Boss



Toolholder Dimensions

Part Number		Stock	Unit	Edge Width		Slot Depth	No. of Inserts	No. of Edge Lines	Dimensions									Weight (kg)	Max. RPM
				CW (Min.)	CW (Max.)				CDX	DC	DCB (H7)	DHUB	LF (Min.)	CBDP	KDP	KWW	DCCB ₁		
MSTB	2500SN250-3T	●	inch	0.250	0.289	0.550	6	3	2.500	0.750	1.580	1.875	0.075	0.220	0.332	-	0.406	0.5	10,400
	2500SN312-3T	●		0.312	0.351	0.550	6	3	2.500	0.750	1.580	1.875	0.075	0.220	0.332	-	0.406	0.6	9,400
MSTB	80SN0607-4T	●	mm	6	7	16	8	4	80	22	40	50	23	6.3	10.4	18	12	0.7	9,240
	100SN0607-5T	●				21	10	5	100	27	50		24	7.0	12.4	20	14	1.0	8,270
	160SN0607-8T	●				41	16	8	160	40	70		28	9.0	16.4	33	22	1.9	6,540
MSTB	80SN0809-4T	●		8	9	16	8	4	80	22	40	50	23	6.3	10.4	18	12	0.8	9,240
	100SN0809-5T	●				21	10	5	100	27	50		24	7.0	12.4	20	14	1.2	8,270
	160SN0809-8T	●				41	16	8	160	40	70		28	9.0	16.4	33	22	2.2	6,540
MSTB	125SN1011-4T	●		10	11	26	12	4	125	40	70	50	28	9.0	16.4	33	22	2.0	7,390
	160SN1011-5T	●				43	15	5	160									2.5	6,540

Note) CW (Min.) dimension shows case of minimum edge width.

Spare Parts and Applicable Inserts

Part Number			Spare Parts				Applicable Inserts ➡ M218
			Clamp Screw	Wrench	Anti-seize Compound	Arbor Bolt	
Without Boss	Inch Sizes	MSTB ○○○○AN250-○T	SE-40055TR	TT-15L	P-37	-	LNEU12...
		○○○○AN312-○T	SE-40068TR	TT-15L	P-37	-	
		○○○○AN375-○T				-	
		○○○○AN500-○T	SE-40090TR	TT-15L	P-37	-	
Without Boss		MSTB ○○○○AN0607-○T	SE-40050TRN	TT-15L	P-37	-	
		○○○○AN0809-○T	SE-40068TR	TT-15L	P-37	-	
		○○○○AN1011-○T				-	
		160AN1213-5T	SE-40090TR	TT-15L	P-37	-	
With Boss	Metric Sizes	MSTB 80SN0607-4T	SE-40050TRN	TT-15L	P-37	HH10X35	
		100SN0607-5T	SE-40050TRN	TT-15L	P-37	HH12X35	
		160SN0607-8T	SE-40050TRN	TT-15L	P-37	HH20X40	
		MSTB 80SN0809-4T	SE-40068TR	TT-15L	P-37	HH10X35	
		100SN0809-5T	SE-40068TR	TT-15L	P-37	HH12X35	
		160SN0809-8T	SE-40068TR	TT-15L	P-37	HH20X40	
		MSTB ○○○○SN1011-○T	SE-40068TR	TT-15L	P-37	HH20X40	

🔧 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Recommended Cutting Conditions ➡ M220

Insert Identification System

LNEU

12

35

-

03

S

①

②

③

④

⑤

① Insert Symbol

② Insert Length

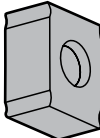
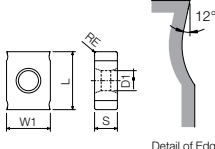
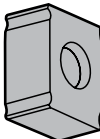
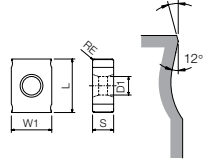
③ Edge Width

④ Corner-R(RE)

⑤ Edge Preparation

Symbol		Insert Length		Symbol		Edge Width		Symbol		Corner-R(RE)		Symbol		Edge Preparation	
12		12.70mm		35		3.50mm		03		0.30mm		S		Chamfer + R-honed	
				40		4.00mm		04		0.40mm					

Applicable Inserts (LN)

Applicable Inserts (LN)			Usage Classification		Applicable Clamp Screw		Applicable Toolholders									
(mm)			● : 1st Choice ○ : 2nd Choice													
Part Number	L	W1														
LNEU12	12.7	9.52														
Insert			Part Number		Usable Edges		Dimensions (mm)		PVD Coated Carbide							
							S		D1		RE		PR0725			
 Honed			 Detail of Edge		LNEU 1245-04		4	4.5	4.2	0.4	●	SE-40068TR				
					1245-08		4	4.5	4.2	0.8	●					
					1250-04		4	5.0	4.2	0.4	●	SE-40080TR				
					1250-08		4	5.0	4.2	0.8	●					
					1255-04		4	5.5	4.2	0.4	●	SE-40090TR				
					1255-08		4	5.5	4.2	0.8	●					
					1260-04		4	6.0	4.2	0.4	●	SE-40100TR				
 Tough Edge			 Detail of Edge		LNEU 1235-03S-4		4	3.5	4.4	0.3	●	SE-40050TRN				
					1240-03S-4		4	4.0	4.4	0.3	●					
					1245-04S		4	4.5	4.2	0.4	●					
					1245-08S		4	4.5	4.2	0.8	●					
					1250-04S		4	5.0	4.2	0.4	●	SE-40068TR				
					1250-08S		4	5.0	4.2	0.8	●	SE-40080TR				

Notes) 1. Please select the applicable clamp screw depending on each insert part number.

2. Ref. to page [M219](#) for insert description and applicable clamp screw depending on edge width.

Recommended Cutting Conditions [M220](#)

Feature of Insert Grades

PR0725

- TiN+TiCN+TiN based Multi-layer PVD Coated Carbide
- For Carbon Steel, Alloy Steel, Stainless Steel, Heat Resistant Alloys and Cast Iron.
- For medium speed machining.

Inserts are sold in 10 piece boxes.

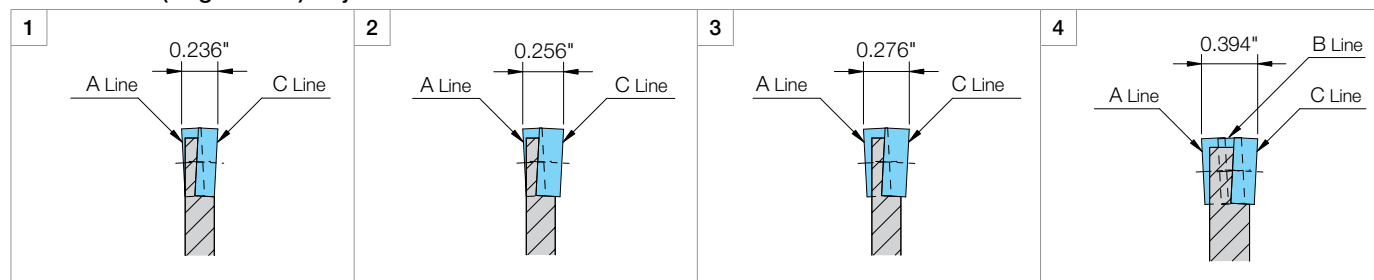
MSTB SLOT MILL (UP-RIGHT)

Combination of Applicable Inserts

Part Number		Clamp Screw (Standard attachment parts)	Edge Width		A Line		B Line		C Line		Wrench for Clamp Screw	Tightening Torque (N·m)
			mm	inch	Applicable Inserts	Clamp Screw	Applicable Inserts	Clamp Screw	Applicable Inserts	Clamp Screw		
Inch Size	MSTB ○○○AN250-○T	SE-40055TR	-	0.250	LNEU1240..	SE-40055TR	-	-	LNEU1240..	SE-40055TR	TT-15L	3
				0.270	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
				0.289	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
	MSTB ○○○AN312-○T	SE-40068TR	-	0.312	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
				0.332	LNEU1250..	SE-40080TR	-	-	LNEU1250..	SE-40080TR		
				0.351	LNEU1250..	SE-40080TR	-	-	LNEU1250..	SE-40080TR		
	MSTB ○○○AN375-○T	SE-40068TR	-	0.375	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR		
				0.395	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR		
				0.414	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR		
	MSTB ○○○AN500-○T	SE-40090TR	-	0.500	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
				0.520	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR		
				0.539	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR		
Metric Size	MSTB ○○○AN0607-○T ○○○SN0607-○T	SE-40050TRN	6.0	-	LNEU1235..	SE-40050TRN	-	-	LNEU1235..	SE-40050TRN	TT-15L	3
			6.5		LNEU1240..	SE-40055TR			LNEU1240..	SE-40055TR		
			7.0		LNEU1240..	SE-40055TR			LNEU1240..	SE-40055TR		
	MSTB ○○○AN0809-○T ○○○SN0809-○T	SE-40068TR	8.0	-	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
			8.5		LNEU1250..	SE-40080TR			LNEU1250..	SE-40080TR		
			9.0		LNEU1250..	SE-40080TR			LNEU1250..	SE-40080TR		
	MSTB ○○○AN1011-○T ○○○SN1011-○T	SE-40068TR	10.0	-	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR		
			10.5		LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR		
			11.0		LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR		
	MSTB ○○○AN1213-○T	SE-40090TR	12.0	-	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
			12.5		LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR		
			13.0		LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR		

* For clamp screw, above listed "Standard attachment parts" are included. 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 1.00mm (0.039") with the combination of inserts.

1. In the case of MSTB○○○○AN0607-○T the width (W) is 6.00mm (0.236") by installing LNEU1235 on both A line and C line.
2. By replacing C line only with LNEU1240 the width (W) is 6.50mm (0.256").
3. By replacing A line and C line with LNEU1240 the width (W) is 7.00mm (0.276").
4. If the slotting width (edge width) is 10.00mm (0.394") or more, 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 inserts.
- 2) Use proper clamp screws for applicable inserts on the basis of the above chart.
- 3) The Slot width (edge width) of MSTB Slot Mills is adjustable by a maximum of 1.00mm (0.039") with the combination of inserts.

Bottom Cutting Shape of MSTB Slot Mill

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

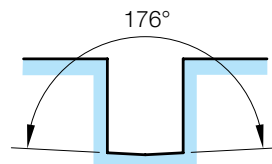


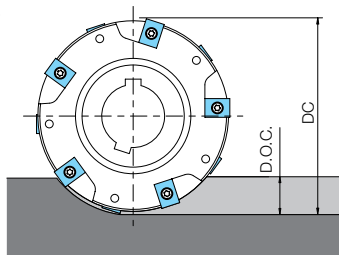
Fig.1 Convex bottom shape

MSTB SLOT MILL (UP-RIGHT)

◆ Recommended Cutting Conditions

Workpiece Material		Hardness (HRC)	Recommended Insert Grade (Vc: sfm)	fz (ipt)		Notes
			PVD Coated Carbide	Insert Thickness		
			PR0725	0.138"~0.157" 3.50mm~4.00mm	0.177"~0.236" 4.50mm~6.00mm	
Low Carbon Steel	1010~1025	20	560~690	0.003~0.008	0.004~0.009	Dry
Carbon Steel	1030~1059, 1060 Annealed	29	330~460	0.003~0.008	0.004~0.009	
	1030~1059, 1060 Heat Treated	37	300~390	0.003~0.008	0.004~0.009	
Alloy Steel	Annealed	28	300~390	0.003~0.008	0.004~0.009	
	Heat Treated	41	260~360	0.002~0.007	0.003~0.008	
High Carbon Alloy	D2, H13, etc.	41	230~300	0.002~0.007	0.003~0.008	Coolant
Stainless Steel	304, 316, etc. Austenitic	33	360~460	0.002~0.007	0.003~0.008	
	403, 410, etc. Martensitic	45	330~390	0.002~0.007	0.003~0.008	
Heat-resistant Alloys	Inconel 718, etc.	37.7	50~100	0.002~0.007	0.003~0.008	
Titanium Alloys	Ti-6Al-4V, etc.	40	70~160	0.002~0.007	0.003~0.008	
Gray Cast Iron	NO.45~NO.60	38	360~430	0.003~0.009	0.004~0.010	Dry
Nodular Cast Iron	60-40-18~70-50-05	25	260~330	0.003~0.009	0.004~0.010	
	80-60-03~120-90-02	37	230~300	0.003~0.009	0.004~0.010	

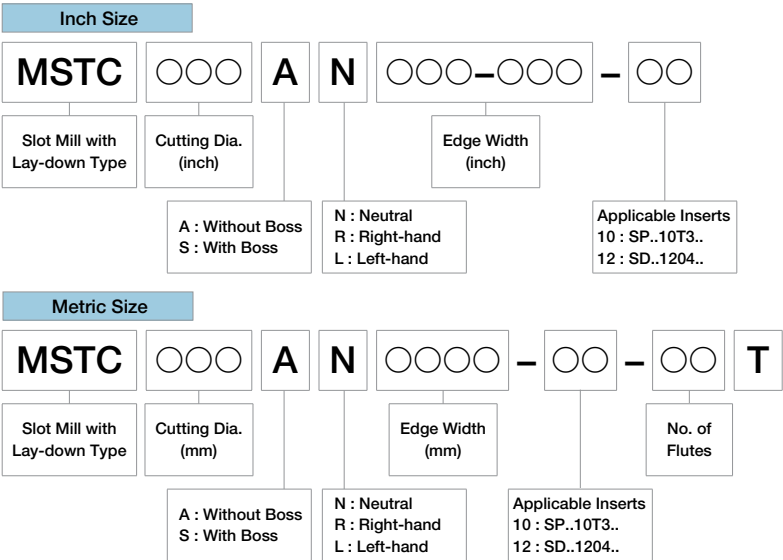
- Note) 1. Use down-cut machining.
 2. If D.O.C. is under 1/10 of Cutter Dia.(DC), it is possible to increase feed per tooth (fz) 40%.



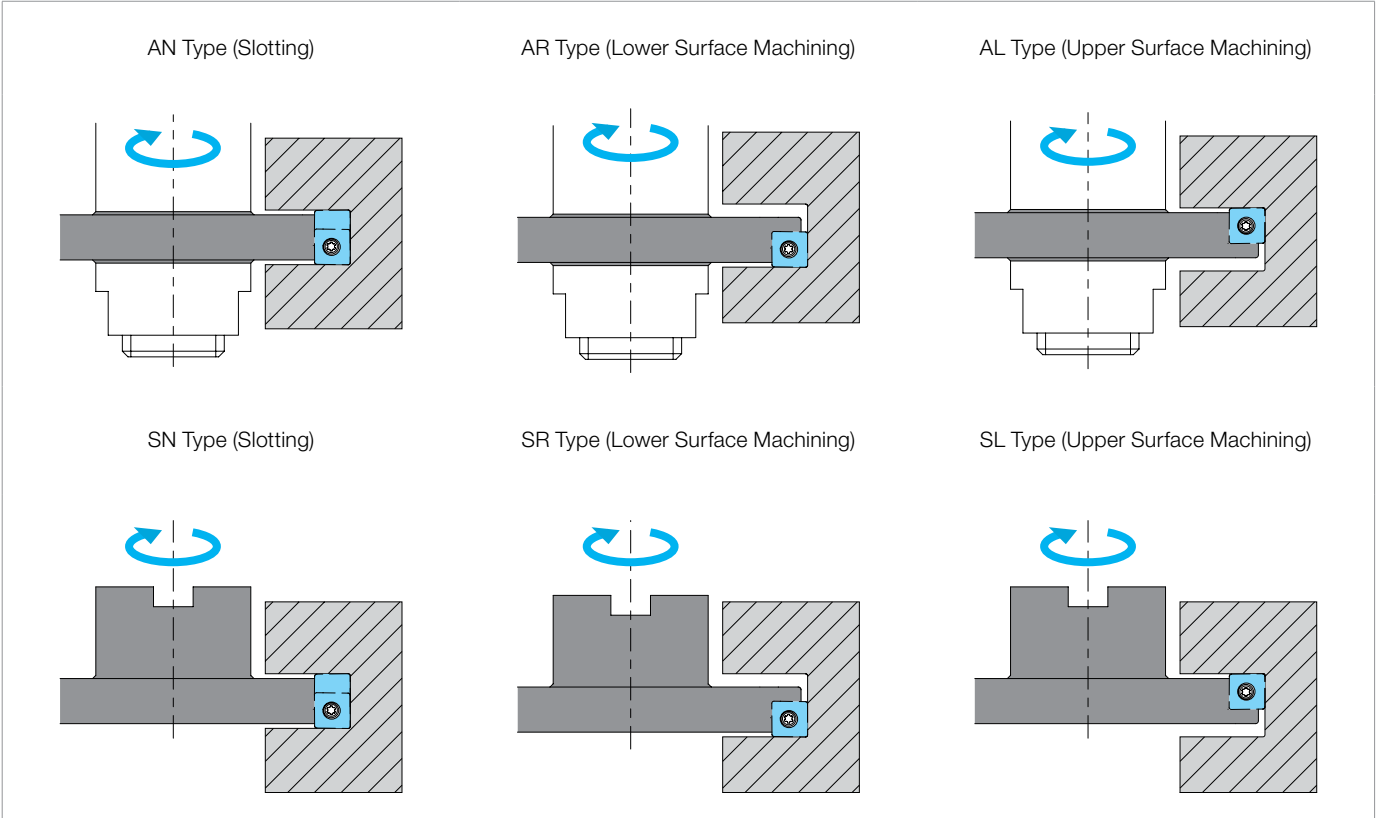
Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi- Function
Slot Mill
Ball-Nose Radius
Other Applications

■ Identification System

● MSTC Slot Mill



● Cutting Direction of MSTC Slot Mill



INSERT GRADES	A
TURNING INSERTS	B
CBN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MSTC SLOT MILL (LAY-DOWN)



Slotting

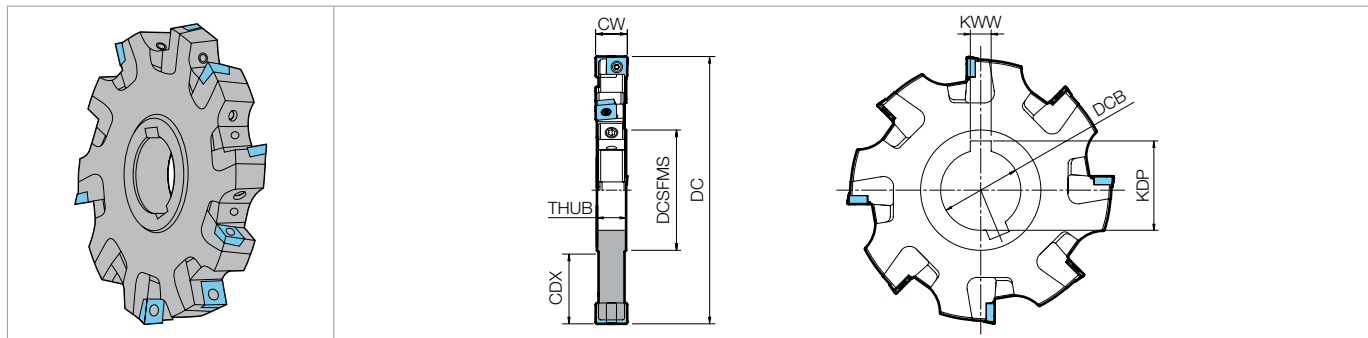


Slotting



Shouldering

MSTC Without Boss Neutral



Toolholder Dimensions (Inch Size)

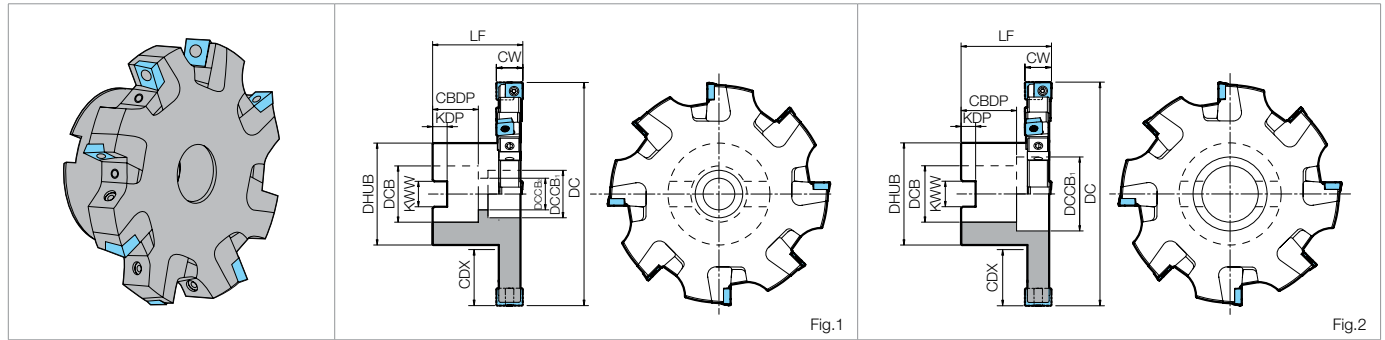
Part Number	Stock	Edge Width (inch)		Slot Depth	No. of Inserts	No. of Edge Lines	Dimensions (inch)						Weight (kg)	Max. RPM
		CW (Min.)	CW (Max.)	CDX (inch)			DC	DCB (H7)	DCSFMS	THUB	KDP	KWW		
MSTC 400AN551-630-10	●	0.551	0.630	1.030	6	3	4.000	1.250	1.880	0.545	1.386	0.312	0.6	17,100
500AN551-630-10	●	0.551	0.630	1.345	8	4	5.000	1.500	2.250	0.545	1.665	0.375	0.9	15,300
600AN551-630-10	●			1.845	10	5	6.000						1.4	14,000
MSTC 500AN630-709-10	●	0.630	0.709	1.345	8	4	5.000	1.500	2.250	0.624	1.665	0.375	1.1	15,300
600AN630-709-10	●			1.845	10	5	6.000						1.6	14,000
MSTC 500AN709-813-12	●	0.709	0.813	1.331	8	4	5.000	1.500	2.250	0.716	1.665	0.375	1.1	10,300
600AN709-813-12	●			1.831	10	5	6.000						1.7	9,400
MSTC 500AN813-917-12	●	0.813	0.917	1.331	8	4	5.000	1.500	2.250	0.820	1.665	0.375	1.3	10,300
600AN813-917-12	●			1.831	10	5	6.000						2.0	9,400

Toolholder Dimensions (Metric Size)

Part Number	Stock	Edge Width (mm)		Slot Depth	No. of Inserts	No. of Edge Lines	Dimensions (mm)						Weight (kg)	Max. RPM
		CW (Min.)	CW (Max.)	CDX (mm)			DC	DCB (H7)	DCSFMS	THUB	KDP	KWW		
MSTC 100AN1416-10-3T	●	14.0	16.0	25.9	6	3	100	32	46.8	13.9	34.8	8	0.5	17,250
125AN1416-10-4T	●	14.0	16.0	34.4	8	4	125	40	54.8	13.9	43.5	10	0.8	15,450
160AN1416-10-5T	●			51.9	10	5	160						1.5	13,650
MSTC 125AN1618-10-4T	●	16.0	18.0	34.4	8	4	125	40	54.8	15.9	43.5	10	1.0	15,450
160AN1618-10-5T	●			51.9	10	5	160						1.8	13,650
MSTC 125AN1820-12-4T	●	18.0	20.7	34.0	8	4	125	40	54.8	18.2	43.5	10	1.0	10,350
160AN1820-12-5T	●			51.5	10	5	160						1.8	9,150
MSTC 125AN2123-12-4T	●	21.0	23.3	34.0	8	4	125	40	54.8	20.8	43.5	10	1.2	10,350
160AN2123-12-5T	●			51.5	10	5	160						2.1	9,150

MSTC SLOT MILL (LAY-DOWN)

MSTC With Boss Neutral (Metric Size)



Toolholder Dimensions (Metric Size)

Part Number	Stock	Edge Width (mm)		Slot Depth	No. of Inserts	No. of Edge Lines	Dimensions (mm)									Drawing	Weight (kg)	Max. RPM
		CW (Min.)	CW (Max.)	CDX (mm)			DC	DCB (H7)	DHUB	LF (Min.)	CBDP	KDP	KWW	DCCB ₁	DCCB ₂			
MSTC 100SN1416-10-3T	●	14.0	16.0	24.4	6	3	100	27	48	50.8	24	7	12.4	20	14	Fig.1	1.0	17,250
125SN1416-10-4T	●			31.9	8	4	125	32	58		26	8	14.4	27	18	Fig.1	1.6	15,450
160SN1416-10-5T	●			43.4	10	5	160	40	70		30	9	16.4	56	-	Fig.2	2.0	13,650
MSTC 125SN1618-10-4T	●	16.0	18.0	31.9	8	4	125	32	58	50.8	26	8	14.4	27	18	Fig.1	1.7	15,450
160SN1618-10-5T	●			43.4	10	5	160	40	70		30	9	16.4	56	-	Fig.2	2.3	13,650
MSTC 125SN1820-12-4T	●	18.0	20.7	31.9	8	4	125	32	58	51.0	26	8	14.4	27	18	Fig.1	1.6	10,350
160SN1820-12-5T	●			43.4	10	5	160	40	70		30	9	16.4	56	-	Fig.2	2.3	9,150
MSTC 125SN2123-12-4T	●	20.7	23.3	31.9	8	4	125	32	58	51.0	26	8	14.4	27	18	Fig.1	1.7	10,350
160SN2123-12-5T	●			43.4	10	5	160	40	70		30	9	16.4	56	-	Fig.2	2.6	9,150

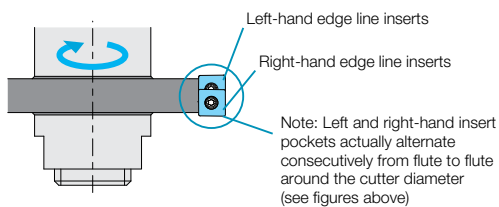
Note) LF (Min.) dimension shows case of minimum of edge width.

Recommended Cutting Conditions [M232](#)

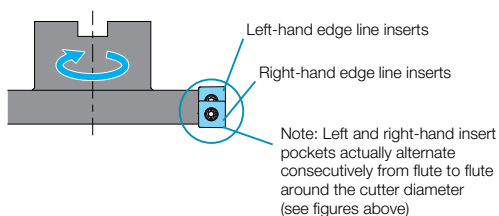
Applicable Insert Installation Method (Inch Sizes / Metric Sizes)

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. Install left-hand inserts in left edge line pockets and right-hand inserts in right edge line pockets. Note that left and right-hand edge line pockets differentiate consecutively from flute to flute around the cutter diameter.

MSTC...AN... (Without Boss)



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



Part Number	Insert Location Indication	Applicable Inserts M230-M231	
		With hand	Neutral
MSTC...AN...10...		SP..10T3...L...	SP..10T3...N...
MSTC...SN...10...		SP..10T3...R...	
MSTC...AN...12...		SD..1204...L...	SD..1204...N...
MSTC...SN...12...		SD..1204...R...	

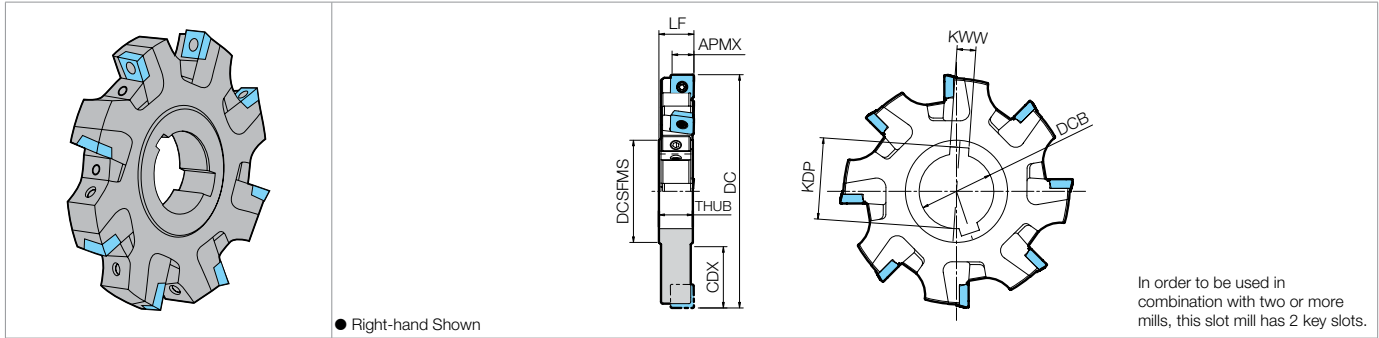
Spare Parts (Inch Sizes / Metric Sizes)

- For spare parts, ref. to page [M228](#)

Slot Width (Edge Width) Adjustment

- Ref. to page [M232-M235](#)

MSTC Without Boss Right-hand



Toolholder Dimensions (Inch Size)

Part Number	Stock	No. of Inserts	Dimensions (in)									Weight (kg)	Max. RPM	
			DC	DCB (H7)	DCSFMS	THUB	LF		CDX	APMX (Max.)	KDP			KWW
							(Min.)	(Max.)						
MSTC 500AR709-813-12	●	8	5.000	1.500	2.250	0.716	0.712	0.764	1.331	0.461	1.665	0.375	1.1	10,300
600AR709-813-12	●	10	6.000						1.831				1.7	9,400

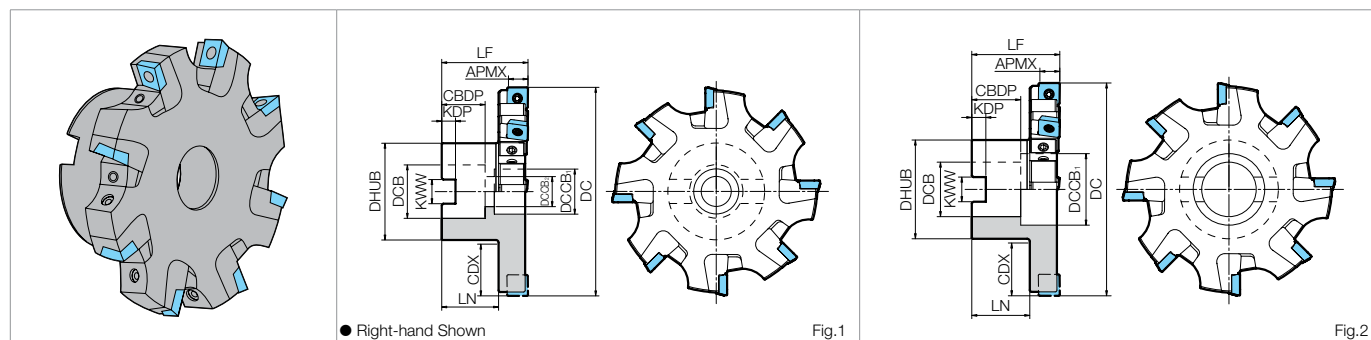
Toolholder Dimensions (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)										Weight (kg)	Max. RPM
			DC	DCB (H7)	DCSFMS	THUB	LF		CDX	APMX (Max.)	KDP	KWW		
							(Min.)	(Max.)						
MSTC 160AR1416-10-10T	●	10	160	40	54.8	13.9	13.9	14.9	51.9	9.1	43.5	10	1.5	13,650
MSTC 125AR1820-12-8T	●	8	125	40	54.8	18.2	18.1	19.4	34.0	11.7	43.5	10	1.0	10,350
160AR1820-12-10T	●	10	160						51.5				1.8	9,150

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

MSTC SLOT MILL (HALF SIDE)

MSTC With Boss Right-hand



Toolholder Dimensions (Inch Size)

Part Number	Stock	No. of Inserts	Dimensions (in)												Drawing	Weight (kg)	Max. RPM
			DC	DCB (H7)	DHUB	LF		CDX	APMX (Max.)	CBDP	KDP	KWW	DCCB ₁	DCCB ₂			
						(Min.)	(Max.)										
MSTC 500SR709-813-12	●	8	5.000	1.25	2.88	2.041	2.093	0.997	0.461	0.75	0.319	0.5	1.05	0.656	Fig.1	2.1	10,300
600SR709-813-12	●	10	6.000	1.5	3.81			1.032		0.972	0.394	0.626	2.5	-	Fig.2	2.9	9,400

Toolholder Dimensions (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)													Drawing	Weight (kg)	Max. RPM
			DC	DCB (H7)	DHUB	LN	LF		CDX	APMX (Max.)	CBDP	KDP	KWW	DCCB ₁	DCCB ₂			
							(Min.)	(Max.)										
MSTC 125SR1820-12-8T	●	8	125	32	58	34.0	51.0	52.3	31.9	11.7	26	8	14.4	27	18	Fig.1	1.6	10,350
160SR1820-12-10T	●	10	160	40	70				43.4		30	9	16.4	56	-	Fig.2	2.3	9,150

Applicable Inserts (Inch Sizes / Metric Sizes)

Part Number	Applicable Inserts M230-M231	
	With hand	Neutral
MSTC...AR...10.. MSTC...SR...10..	SP..10T3...R...	SP..10T3...N...
MSTC...AR...12.. MSTC...SR...12..	SD..1204...R...	SD..1204...N...

Recommended Cutting Conditions [M232](#)

Spare Parts (Inch Sizes / Metric Sizes)

- For spare parts, ref. to page [M229](#)

Slot Width (Edge Width) Adjustment

- Ref. to page [M232-M235](#)

MSTC SLOT MILL (HALF SIDE)

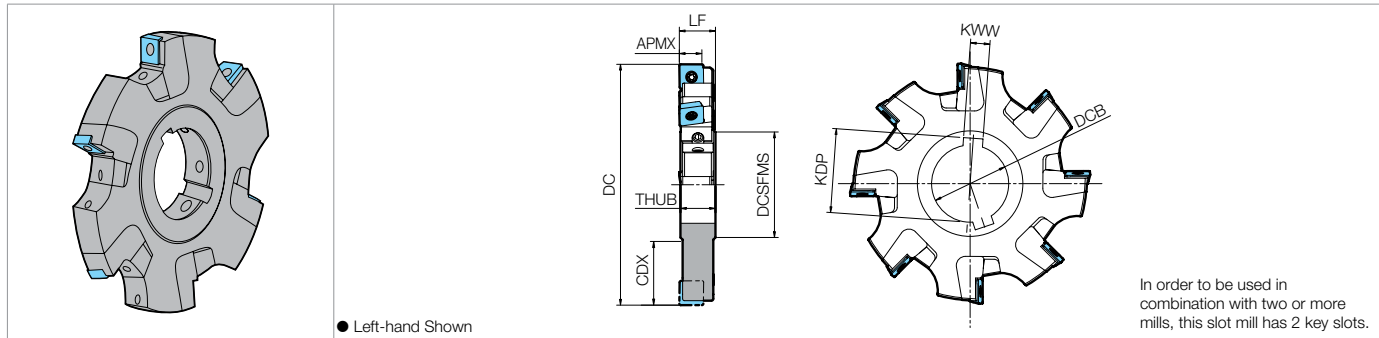


Shouldering



Back Side Milling

MSTC Without Boss Left-hand



Toolholder Dimensions (Inch Size)

Part Number	Stock	No. of Inserts	Dimensions (in)										Weight (kg)	Max. RPM
			DC	DCB (H7)	DCSFMS	THUB	LF		CDX	APMX (Max.)	KDP	KWW		
							(Min.)	(Max.)						
MSTC 500AL709-813-12	●	8	5.000	1.500	2.250	0.716	0.712	0.764	1.331	0.461	1.665	0.375	1.1	10,300
600AL709-813-12	●	10	6.000						1.831				1.7	9,400

Toolholder Dimensions (Metric Size)

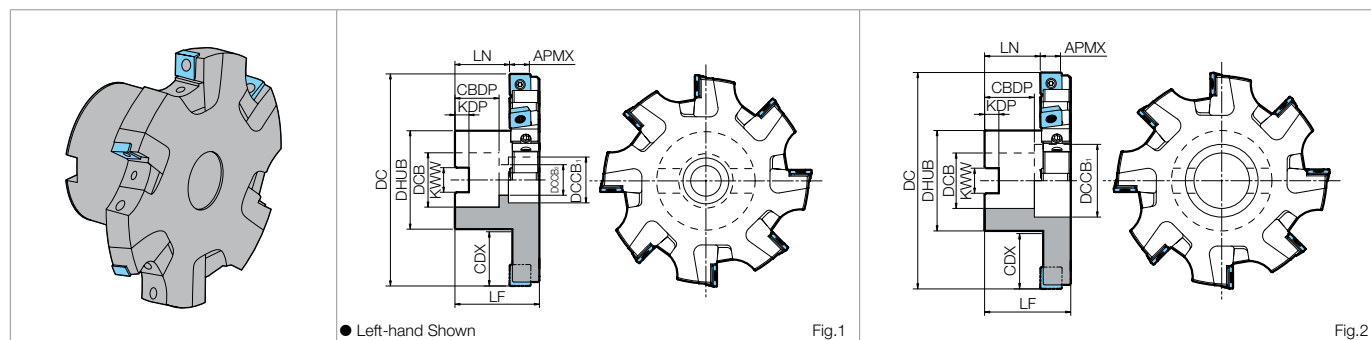
Part Number	Stock	No. of Inserts	Dimensions (mm)										Weight (kg)	Max. RPM
			DC	DCB (H7)	DCSFMS	THUB	LF		CDX	APMX (Max.)	KDP	KWW		
							(Min.)	(Max.)						
MSTC 125AL1820-12-8T	●	8	125	40	54.8	18.2	18.1	19.4	34.0	11.7	43.5	10	1.0	10,350
160AL1820-12-10T	●	10	160						51.5					

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

M
MILLING

MSTC SLOT MILL (HALF SIDE)

MSTC With Boss Left-hand



Toolholder Dimensions (Inch Size)

Part Number	Stock	No. of Inserts	Dimensions (in)												Drawing	Weight (kg)	Max. RPM
			DC	DCB (H7)	DHUB	LN		CDX	APMX (Max.)	CDBP	KDP	KWW	DCCB ₁	DCCB ₂			
MSTC 500SL709-813-12	●	8	5.000	1.250	2.880	1.280	1.332	0.997	0.461	0.750	0.319	0.500	1.050	0.656	Fig.1	2.1	10,300
600SL709-813-12	●	10	6.000	1.500	3.810			1.032		0.972	0.394	0.626	2.500	-	Fig.2	2.9	9,400

Toolholder Dimensions (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)												Drawing	Weight (kg)	Max. RPM	
			DC	DCB (H7)	DHUB	LF	LN		CDX	APMX (Max.)	CBDP	KDP	KWW	DCCB ₁				DCCB ₂
							(Min.)	(Max.)										
MSTC 125SL1820-12-8T	●	8	125	32	58	50	31.7	33.0	31.9	11.7	26	8	14.4	27	18	Fig.1	1.6	10,350
160SL1820-12-10T	●	10	160	40	70				43.4		30	9	16.4	56	-	Fig.2	2.3	9,150

Applicable Inserts (Inch Sizes / Metric Sizes)

Part Number	Applicable Inserts ➡ M230-M231	
	With hand	Neutral
MSTC...AL...10.. MSTC...SL...10..	SP..10T3...L...	SP..10T3...N...
MSTC...AL...12.. MSTC...SL...12..	SD..1204...L...	SD..1204...N...

Recommended Cutting Conditions ➡ **M232**

Spare Parts (Inch Sizes / Metric Sizes)












- For spare parts, ref. to page ➡ **M229**


Slot Width (Edge Width) Adjustment

- Ref. to page ➡ **M232-M235**



MSTC SLOT MILL (LAY-DOWN)

● Spare Parts (Inch Sizes / Metric Sizes)

Part Number			Spare Parts										
			Cartridge		Wedge	Wedge Screw	Cam Pin	Clamp Screw	Wrench			Anti-seize Compound	Arbor Bolt
			Right-hand	Left-hand					for Wedge Screw	for Cam Pin	for Clamp Screw		
													
Without Boss	Inch Size	MSTC 400AN551-630-10	C90SP1416-10R	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
		500AN551-630-10	C90SP1416-10R	C90SP1416-10L	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
		600AN551-630-10											
		MSTC 500AN630-709-10	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
		600AN630-709-10											
		MSTC 500AN709-813-12	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-
	600AN709-813-12												
	MSTC 500AN813-917-12	C90SD2023-12R	C90SD2023-12L	WC-20	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-	
	600AN813-917-12												
	Metric Size	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	C90SP1416-10R	C90SP1416-10L	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
		160AN1416-10-5T											
		MSTC 125AN1618-10-4T	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
		160AN1618-10-5T											
MSTC 125AN1820-12-4T		C90SD1820-12R	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-	
160AN1820-12-5T													
MSTC 125AN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-		
160AN2123-12-5T													
With Boss	Metric Size	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-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH16X35
		160SN1618-10-5T											-
		MSTC 125SN1820-12-4T	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		160SN1820-12-5T											-
		MSTC 125SN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		160SN2123-12-5T											-












 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

● Tightening Torque

Wrench	TH-3L	DTP-9	DTP-15
			
Tightening Torque (Nm)	5-6	1.5	4



MSTC SLOT MILL (HALF SIDE)

● Spare Parts (Inch Sizes / Metric Sizes)

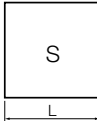

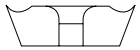




Part Number			Spare Parts										
			Cartridge		Wedge	Wedge Screw	Cam Pin	Clamp Screw	Wrench			Anti-seize Compound	Arbor Bolt
			Right-hand	Left-hand					for Wedge Screw	for Cam Pin	for Clamp Screw		
													
Without Boss	Inch Size	MSTC 500AR709-813-12	C90SD1820-12R	-	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-
		600AR709-813-12											
		MSTC 500AL709-813-12	-	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-
		600AL709-813-12											
	Metric Size	MSTC 160AR1416-10-10T	C90SP1416-10R	-	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
		MSTC 125AR1820-12-8T	C90SD1820-12R	-	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-
		160AR1820-12-10T											
		MSTC 125AL1820-12-8T	-	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	-
		160AL1820-12-10T											
With Boss	Inch Size	MSTC 500SR709-813-12	C90SD1820-12R	-	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		600SR709-813-12											-
		MSTC 500SL709-813-12	-	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		600SL709-813-12											-
	Metric Size	MSTC 125SR1820-12-8T	C90SD1820-12R	-	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		160SR1820-12-10T											-
		MSTC 125SL1820-12-8T	-	C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		160SL1820-12-10T											-

 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

● Tightening Torque

Wrench	TH-3L	DTP-9	DTP-15
			
Tightening Torque (Nm)	5-6	1.5	4

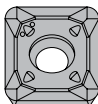
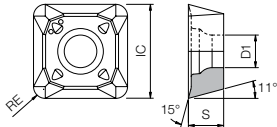
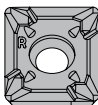
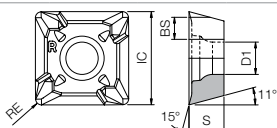
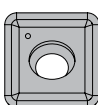
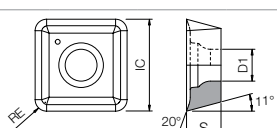

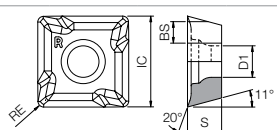

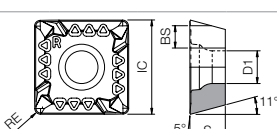
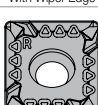
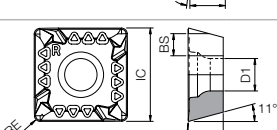
Insert Identification System

Symbol	Shape	Symbol	Class				Symbol	Corner-R(RE)	Symbol	Hand of Tool
S	Square	C	±0.013mm	±0.025mm	±0.025mm		16	1.60mm	N	Neutral
		E	±0.025mm				12	1.20mm	L	Left-hand
								08	0.80mm	R
① Shape		③ Tolerance				⑤ Edge Length	⑦ Corner-R(RE)		⑨ Hand of Tool	
S P		C T		10	T3	08	E	R - SD	⑩ Chipbreaker Symbol	
①		③		④	⑤	⑥	⑦	⑧	⑨	⑩
② Relief Angle		④ Hole / Chipbreaker			⑥ Thickness		⑧ Edge Preparation			
Symbol	Relief Angle	Symbol	Shape		Symbol	Thickness	Symbol	Edge Preparation	Symbol	Rake Angle
D	15° 	T			T3	3.97mm	E	Honed	SB	5° 
P	11° 				04	4.76mm	F	Sharp Edge	SD	15° 
							S	Chamfer + R-honed	SE	20° 

Applicable Inserts (SP..10T3)

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

M
MILLING

Applicable Inserts (SP..10T3)				Classification of Usage ● : 1st Choice ○ : 2nd Choice	P	Carbon Steel / Alloy Steel	●	●		
					M	Stainless Steel	○	●		
					K	Cast Iron	○	●		
					N	Non-ferrous Metals			●	
				S	Heat-resistant Alloys			●		
					Titanium Alloy			●	○	
Part Number				IC	S	D1				
SP..10T3							0.394	5/32	0.134	
Insert				Part Number	Usable Edges	Dimensions (in)		CVD Coated Carbide	PVD Coated Carbide	
Right-handed Insert Shown						RE	BS (Wiper Edge)	CA0835	PR0725	PR0110
		SPCT 10T316EN-SD		4	0.063	-		●		
		SPCT 10T308E $\frac{R}{L}$ -SD		4	0.031	0.098		●		
		10T312E $\frac{R}{L}$ -SD		4	0.047	0.071		●		
		SPCT 10T316FN-SE		4	0.063	-			●	
		SPCT 10T308F $\frac{R}{L}$ -SE		4	0.031	0.106			●	
		10T312F $\frac{R}{L}$ -SE		4	0.047	0.087			●	
		SPET 10T308E $\frac{R}{L}$ -SB		4	0.031	0.106	●	●		
		SPET 10T308S $\frac{R}{L}$ -SB		4	0.031	0.106	●	●		

Inserts are sold in 10 piece boxes.

(Customer Service) 800.823.7284 - Option 1
(Technical Support) 800.823.7284 - Option 2
Visit us online at KyoceraPrecisionTools.com

● : Standard Item △ : Phaseout Item (will be removed from next catalog)
Contact your local Kyocera sales engineer to upgrade old products to new technology

Applicable Inserts (SD..1204)

Applicable Inserts (SD..1204)				Usage Classification ● : 1st Choice ○ : 2nd Choice	P	Carbon Steel / Alloy Steel		●	●	
					M	Stainless Steel		○	●	
					K	Cast Iron		○	●	
					N	Non-ferrous Metals				●
					S	Heat-resistant Alloys			●	
						Titanium Alloy			●	○
Part Number				IC	S	D1	(in)			
SD..1204				1/2	3/16	0.173				
Insert Right-handed Insert Shown				Part Number	Usable Edges	Dimensions (in)		CVD Coated Carbide	PVD Coated Carbide	
						RE	BS (Wiper Edge)	CA0835	PR0725	PR0110
				SDCT 120416EN-SD	4	0.063	-		●	
				SDCT 120408E ^{R/L} -SD	4	0.031	0.098		●	
				120412E ^{R/L} -SD	4	0.047	0.071		●	
				SDCT 120416FN-SE	4	0.063	-			●
				SDCT 120408F ^{R/L} -SE	4	0.031	0.106			●
				120412F ^{R/L} -SE	4	0.047	0.075			●
				SDET 120408E ^{R/L} -SB	4	0.031	0.098	●	●	
				120412E ^{R/L} -SB	4	0.047	0.071	●	●	
				SDET 120416SN-SB	4	0.063	-	●	●	
				SDET 120408S ^{R/L} -SB	4	0.031	0.098	●	●	

Feature of Insert Grades

CA0835

- TiN+TiCN+Al₂O₃ based CVD Coated Carbide
- For Carbon Steel, Alloy Steel, Stainless Steel and Cast Iron.
- For medium 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 medium 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

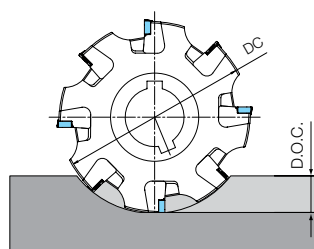
Inserts are sold in 10 piece boxes.

MSTC SLOT MILL (LAY-DOWN / HALF SIDE)

◆ Recommended Cutting Conditions (CA0835 / PR0725 / PR0110)

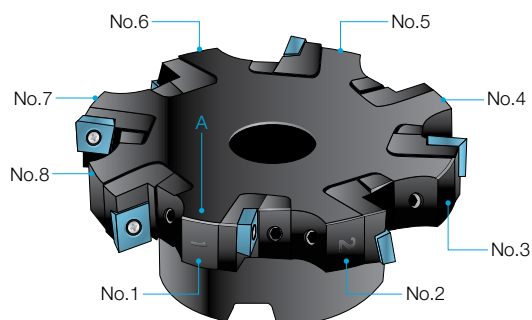
Workpiece Material		Hardness (HB)	Recommended Insert Grade (Vc: sfm)			fz (ipt)				Notes
			CVD Coated Carbide	PVD Coated Carbide		Chipbreaker				
				CA0835	PR0725	PR0110	EN-SD ER-SD EL-SD	ER-SB EL-SB	SN-SB SR-SB SL-SB	
Low Carbon Steel	1010~1025	20	820~1020	560~690	-	0.003~0.008	0.004~0.009	0.006~0.012	-	Dry
Carbon Steel	1030~1059, 1060 Annealed	29	520~620	330~460	-	0.003~0.008	0.004~0.009	0.006~0.012	-	
	1030~1059, 1060 Heat Treated	37	460~590	300~390	-	0.003~0.008	0.004~0.009	0.006~0.012	-	
Alloy Steel	Annealed	28	460~590	300~390	-	0.003~0.008	0.004~0.009	0.006~0.012	-	
	Heat Treated	41	390~520	260~360	-	0.002~0.007	0.003~0.008	0.005~0.010	-	
High Carbon Alloy	D2, H13, etc.	41	360~430	230~300	-	0.002~0.007	0.003~0.008	0.005~0.010	-	Coolant
Stainless Steel	304, 316, etc. Austenitic	33	520~660	360~460	-	0.002~0.007	0.003~0.008	0.005~0.010	-	
	403, 410, etc. Martensitic	45	490~590	330~390	-	0.002~0.007	0.003~0.008	0.005~0.010	-	
Heat-resistant Alloys	Inconel 718, etc.	37.7	-	50~100	-	0.002~0.007	0.003~0.008	0.005~0.010	-	
Titanium Alloys	Ti-6Al-4V, etc.	40	-	70~160	-	0.002~0.007	0.003~0.008	0.005~0.010	-	
Gray Cast Iron	NO.45~NO.60	38	520~660	360~430	-	0.003~0.009	0.004~0.010	0.006~0.014	-	Dry
Nodular Cast Iron	60-40-18~70-50-05	25	430~520	260~330	-	0.003~0.009	0.004~0.010	0.006~0.014	-	
	80-60-03~120-90-02	37	360~460	230~300	-	0.003~0.009	0.004~0.010	0.006~0.014	-	
Non-ferrous Metals		-	-	-	2460~3120	-	-	-	0.003~0.008	

Note) 1. Use down-cut machining.
2. If D.O.C. is under 1/10 of Cutter Dia.(DC), it is possible to increase feed per tooth (fz) 40%.

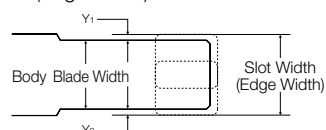


Slot Width (Edge Width) Adjustment of MSTC Slot Mills

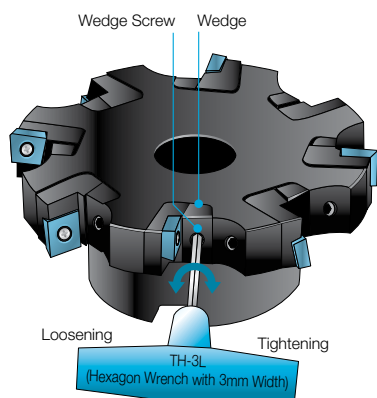
Slot Width (Edge Width) Measurement



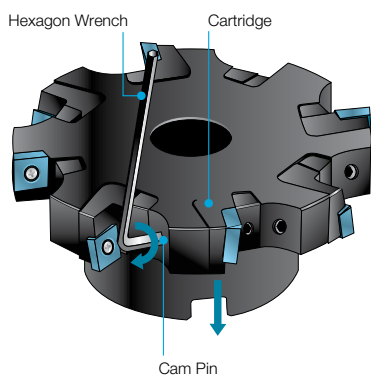
- ① Please check slot mill insert location number.
(The insert location number is marked on the slot mill body.)
- ② Set up the slot mill on length measuring equipment such as tool presettters.
- ③ Place the side A of the slot mill body near the insert position No.1 to "0 (zero)" the length measuring equipment.
- ④ Move the length measuring equipment to the insert corner and measure the step (Y₁) between side A and the corner of insert No.1.
- ⑤ Likewise, on the other side, measure the step between the slot mill body and the insert corner (Y₂), and you will obtain the slot width (edge width).



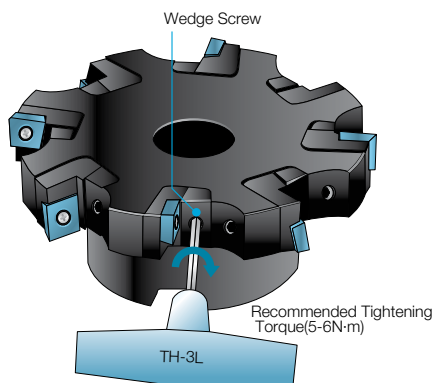
Changing the Slot Width (Edge Width)



- ① Set up the slot mill on length measuring equipment such as tool presetters.
- ② Insert a 3mm Hexagon Wrench (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.

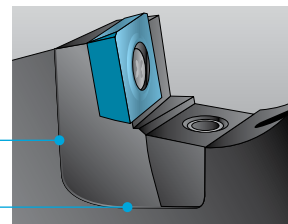


- ⑤ Insert a Hexagon Wrench (LW-2.5 or LW-3) into the Cam Pin on the back of the cartridge.
- ⑥ Turn the wrench and adjust the position of the Cartridge.
- ⑦ To secure the adjustment, back-turn the Cam Pin and make sure that it does not touch the groove surface of the back of the Cartridge.
- ⑧ Remove 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 gap between the Cartridge and the Slot Mill body.

Make sure there is no gap.



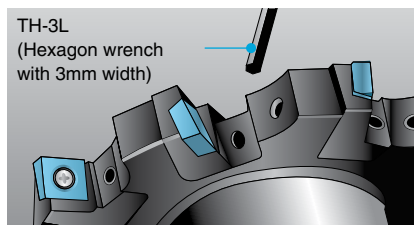
INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MSTC SLOT MILL (LAY-DOWN / HALF SIDE)

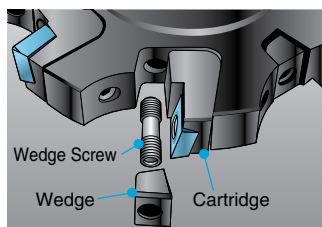
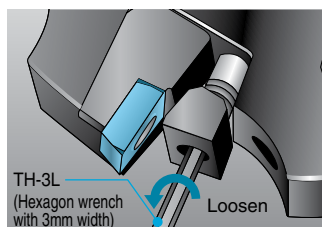
Replacement of the Cartridge

Follow the instructions below to replace the Cartridge.

- (1) Insert Hexagon wrench with 3mm width (TH-3L) into the Wedge Screw. TH-3L

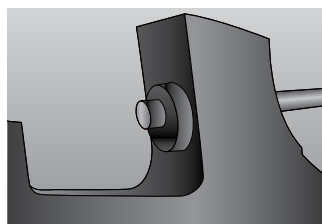
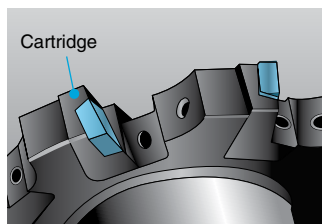


- (2) Loosen the Wedge Screw.



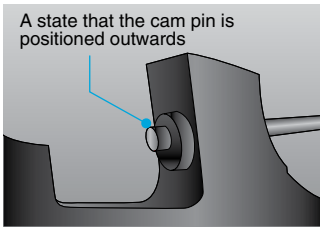
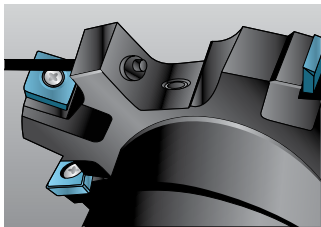
- (3) Remove the Wedge Screw and Wedge.

- (4) Remove the Cartridge.

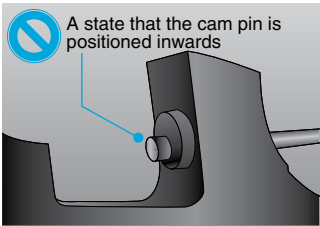


Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi- Function
Slot Mill
Ball-Nose Radius
Other Applications

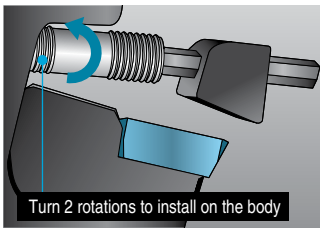
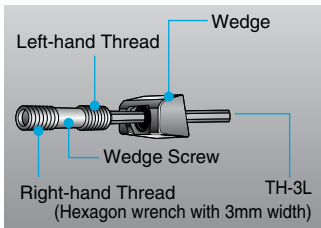
MSTC SLOT MILL (LAY-DOWN / HALF SIDE)



(5) Before replacing the Cartridge, make sure that the Cam Pin is positioned radially-outwards.



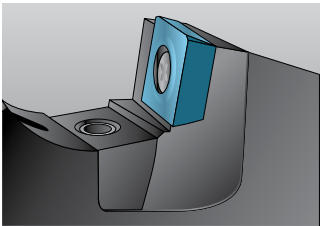
(6) If the Cam Pin is in the position shown in the left diagram, assembling the Cartridge is not possible.



(7) Place the wedge so that its larger slant surface faces toward the Cartridge.

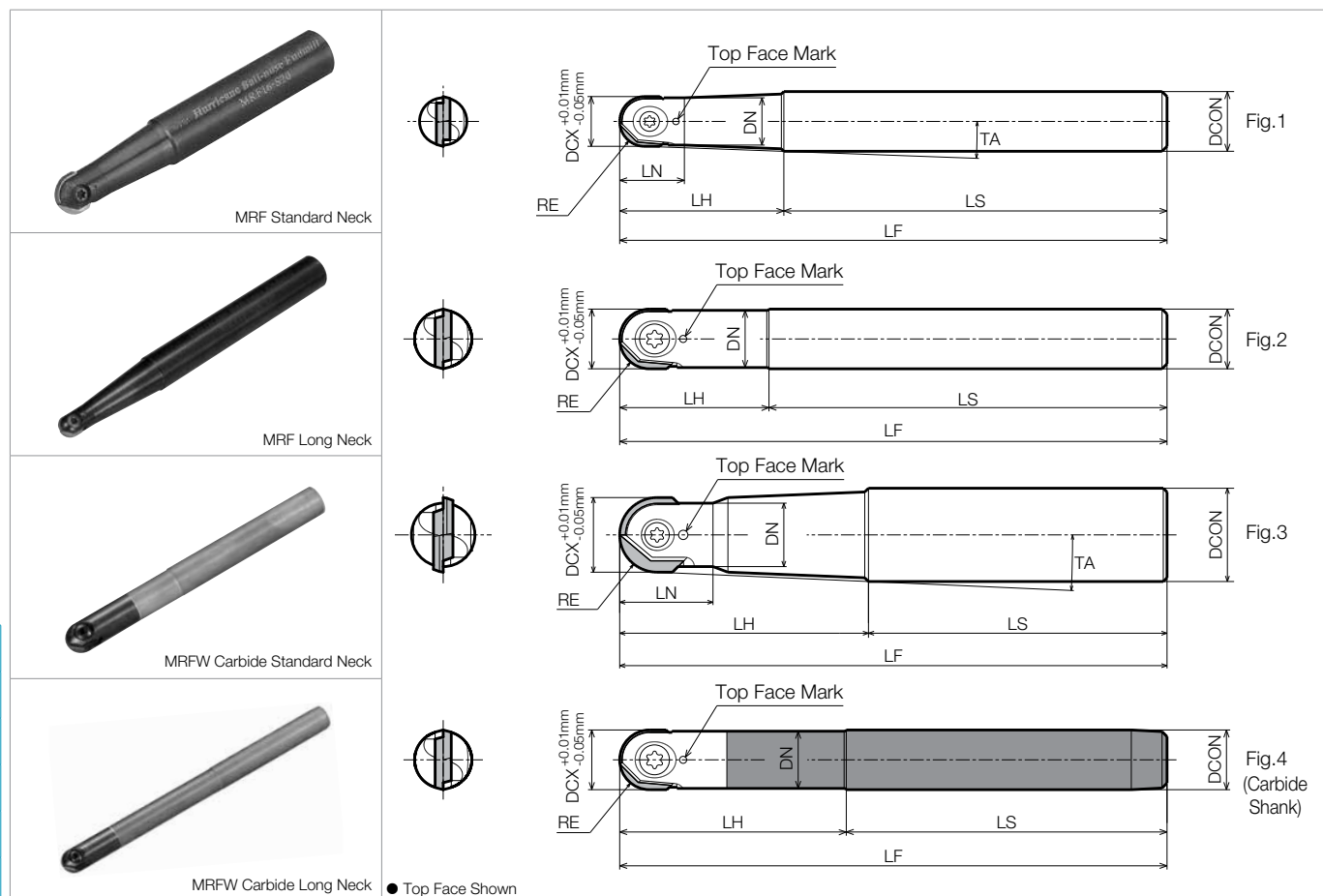
(8) Turn the Wedge Screw two times to install the Wedge to the body.























(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).

INSERT GRADES	A
TURNING INSERTS	B
CBN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DRILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

MRF (Steel Shank) / **MRFW** (Carbide Shank)

Toolholder Dimensions (Metric Size)


Part Number				Stock	No. of Inserts	Dimensions (mm)								Drawing	Spare Parts			Applicable Inserts  M25
															Clamp Screw	Wrench	Anti-seize Compound	
							 DT TT											
Standard Neck	MRF	08-S12		1	4.0	8	12	7.5	100	10	22	78	6°20'	Fig.1	SC-30067	DT-8	P-37	RDFG08FR
		10-S12		1	5.0	10	12	9.5	100	13	25	75	3°	Fig.1	SC-35085	DT-10		RDFG10FR
		12-S12		1	6.0	12	12	11.5	110	-	30	80	-	Fig.2	SC-40100	DT-15		RDFG12FR
		16-S20		1	8.0	16	20	14.0	130	20	50	80	2°50'	Fig.1	SC-50130	DT-20		RDFG16FR
		20-S25		1	10.0	20	25	17.0	140	25	60	80	3°	Fig.3	SC-60160	TT-25		RDFG20FR
		25-S32		1	12.5	25	32	22.0	150	31	70	80	3°30'	Fig.3	SC-60210	TT-30		RDFG25FR
Long Neck	MRF	08-S12-130		1	4.0	8	12	7.5	130	10	50	80	2°30'	Fig.1	SC-30067	DT-8	P-37	RDFG08FR
		10-S16-150		1	5.0	10	16	9.5	150	15	50	100	3°50'	Fig.1	SC-35085	DT-10		RDFG10FR
		12-S16-160		1	6.0	12	16	11.5	160	16	60	100	2°10'	Fig.1	SC-40100	DT-15		RDFG12FR
		16-S20-160		1	8.0	16	20	14.0	160	20	65	95	2°	Fig.1	SC-50130	DT-20		RDFG16FR
		20-S25-180		1	10.0	20	25	17.0	180	25	80	100	2°10'	Fig.3	SC-60160	TT-25		RDFG20FR
		25-S32-200		1	12.5	25	32	22.0	200	31	90	110	2°40'	Fig.3	SC-60210	TT-30		RDFG25FR
Carbide Standard Neck	MRFW	08-S08		1	4.0	8	8	7.4	100	-	30	70	-	Fig.4	SC-30067	DT-8	P-37	RDFG08FR
		10-S10		1	5.0	10	10	9.5	100	-	35	65	-	Fig.4	SC-35085	DT-10		RDFG10FR
		12-S12		1	6.0	12	12	11.5	110	-	45	65	-	Fig.4	SC-40100	DT-15		RDFG12FR
Carbide Long Neck	MRFW	08-S08-130		1	4.0	8	8	7.4	130	-	65	65	-	Fig.4	SC-30067	DT-8	P-37	RDFG08FR
		10-S10-140		1	5.0	10	10	9.5	140	-	75	65	-	Fig.4	SC-35085	DT-10		RDFG10FR
		12-S12-150		1	6.0	12	12	11.5	150	-	85	65	-	Fig.4	SC-40100	DT-15		RDFG12FR

● 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 (P-37) thinly on portion of taper and thread prior to installation.

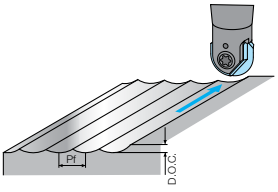
MRF / MRFW BALL-NOSE END MILL

● Applicable Inserts (● M25)

Insert	Part Number
	RDFG 08FR
	10FR
	12FR
	16FR
	20FR
	25FR

● Align the Top Face Mark of both insert and toolholder.

● Recommended Depth of Cut

Part Number	Depth of Cut (in)		Applications
	D.O.C.	Pf	
Standard Neck	MRF08-S12	0.008 (Max 0.012)	
	MRF10-S12	0.008	
	MRF12-S12	0.020	
	MRF16-S20	0.020	
	MRF20-S25	0.039	
	MRF25-S32	0.039	
Long Neck	MRF08-S12-130	0.008 (Max 0.012)	
	MRF10-S16-150	0.008	
	MRF12-S16-160	0.020	
	MRF16-S20-160	0.020	
	MRF20-S25-180	0.039	
	MRF25-S32-200	0.039	
Carbide Standard Neck	MRFW08-S08	0.008 (Max 0.012)	
	MRFW10-S10	0.008	
	MRFW12-S12	0.020	
Carbide Long Neck	MRFW08-S08-130	0.008 (Max 0.012)	
	MRFW10-S10-140	0.008	
	MRFW12-S12-150	0.020	

For Ø8mm, Holder may be broken because of overload if D.O.C. exceeds 0.012".

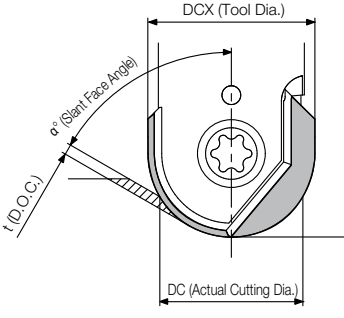
◆ Recommended Cutting Conditions (At Cutting Dia. DCX)

Workpiece Material	Insert Grades	Vc (sfm)	fz (ipt)	Ø8mm		Ø10mm		Ø12mm	
				Vc (sfm) (RPM)	fz (ipt) Vf (ipm)	Vc (sfm) (RPM)	fz (ipt) Vf (ipm)	Vc (sfm) (RPM)	fz (ipt) Vf (ipm)
Carbon Steel	PR915	330~660	0.004~0.012	490 (5,970)	0.008 (94.095)	490 (4,770)	0.008 (75.197)	490 (3,980)	0.008 (62.598)
Alloy Steel	PR915	260~590	0.004~0.012	430 (5,170)	0.008 (81.496)	430 (4,140)	0.008 (65.354)	430 (3,450)	0.008 (54.331)
Mold Steel	PR915	160~490	0.004~0.008	330 (3,980)	0.006 (46.850)	330 (3,180)	0.006 (37.402)	330 (2,650)	0.006 (31.496)
Stainless Steel	PR915	160~490	0.004~0.008	330 (3,980)	0.006 (46.850)	330 (3,180)	0.006 (37.402)	330 (2,650)	0.006 (31.496)
Cast Iron	PR915	330~660	0.008~0.016	490 (5,970)	0.012 (140.945)	490 (4,770)	0.012 (112.598)	490 (3,980)	0.012 (94.095)
Workpiece Material	Insert Grades	Vc (sfm)	fz (ipt)	Ø16mm		Ø20mm		Ø25mm	
				Vc (sfm) (RPM)	fz (ipt) Vf (ipm)	Vc (sfm) (RPM)	fz (ipt) Vf (ipm)	Vc (sfm) (RPM)	fz (ipt) Vf (ipm)
Carbon Steel	PR915	330~660	0.004~0.012	490 (2,980)	0.008 (46.850)	490 (2,390)	0.008 (37.402)	490 (1,910)	0.008 (29.921)
Alloy Steel	PR915	260~590	0.004~0.012	430 (2,590)	0.008 (40.551)	430 (2,070)	0.008 (32.677)	430 (1,660)	0.008 (25.984)
Mold Steel	PR915	160~490	0.004~0.008	330 (1,990)	0.006 (23.622)	330 (1,590)	0.006 (18.898)	330 (1,270)	0.006 (14.961)
Stainless Steel	PR915	160~490	0.004~0.008	330 (1,990)	0.006 (23.622)	330 (1,590)	0.006 (18.898)	330 (1,270)	0.006 (14.961)
Cast Iron	PR915	330~660	0.008~0.016	490 (2,980)	0.012 (70.472)	490 (2,390)	0.012 (56.299)	490 (1,910)	0.012 (45.276)

◆ Actual Cutting Speed (Vd) Conversion Coefficient Table

Vd varies depending on D.O.C. and slant face angle.

Vd can be obtained by dividing the conversion coefficient into the recommended cutting speed.

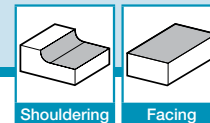
Model	Tool Dia. (DCX)	Ø8mm		Ø10mm		Ø12mm	
	D.O.C. (t: in)		0.004*	0.008*	0.004*	0.008*	0.020*
	Slant Face Angle (α°)	15°	1.00	1.00	1.00	1.00	1.00
		30°	1.05	1.02	1.05	1.03	1.01
		45°	1.18	1.12	1.20	1.14	1.07
		60°	1.47	1.34	1.51	1.38	1.24
		75°	2.15	1.82	2.24	1.92	1.60
		90°(Horizontal Plane)	4.48	3.22	5.06	3.57	2.50
	Tool Dia. (DCX)		Ø16mm	Ø20mm	Ø25mm		
	D.O.C. (t: in)		0.008*	0.020*	0.020*	0.039*	0.020*
	Slant Face Angle (α°)	15°	1.00	1.00	1.00	1.02	1.00
		30°	1.05	1.01	1.02	1.00	1.03
		45°	1.18	1.10	1.12	1.06	1.14
		60°	1.47	1.30	1.34	1.21	1.38
		75°	2.14	1.73	1.83	1.53	1.93
		90°(Horizontal Plane)	4.48	2.87	3.20	2.29	3.57

e.g.) Suppose tool dia. 8mm, D.O.C. = 0.039", slant face angle 90°: The actual cutting speed Vd for carbon steel machining, when Vc is 490sfm at the full cutter diameter, Vd can be obtained by calculating: $Vd = 490 \div 4.48 = 109.4\text{sfm}$

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KYOCERA M237



RAD-8 (MRW)

The MRW Radius Cutter Lowers Cutting Costs and Increases Efficiency

The double-faced inserts improve milling in a wide variety of materials

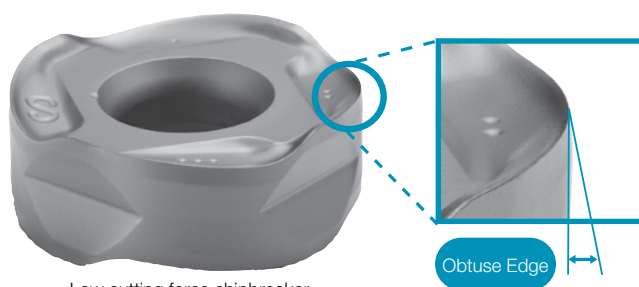
Advantages

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

Economical 8-edge Insert

Combined Sharpness & Cutting Edge Strength

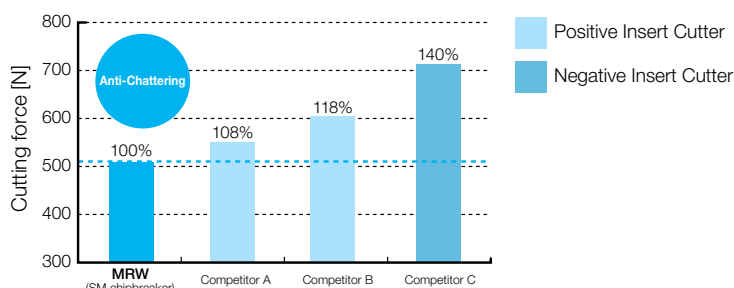
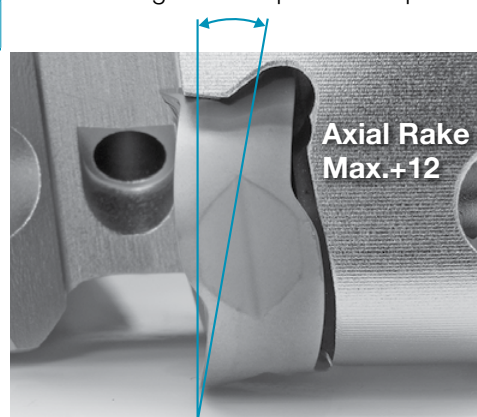
Improved edge strength due to obtuse edge



Low cutting force chipbreaker

Helical Cutting Edge Design with Maximum Axial Rake 12°

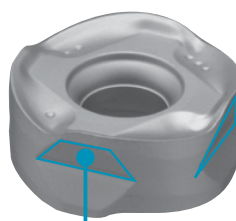
Lower cutting forces equivalent to positive inserts



< Cutting Condition >
 $V_c = 390 \text{ sfm}$, D.O.C. $\times ae = 0.039'' \times 1.575''$, $f_z = 0.008 \text{ ipt}$
 304 Stainless Steel, Cutter $\varnothing 2.000''$

Flat Lock Structure Holds Insert Firmly

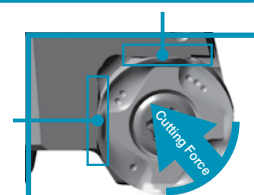
Prevents insert rotation during machining to provide stable cutting



Flat Lock Structure

Wide Flat Binding Face

- Receives even cutting forces
- Prevents insert rotation



Longer tool life with a wide insert lineup including 4 grades and 3 chipbreakers!

Available for Steel, Stainless Steels, Cast Iron, and Heat-Resistant Alloys

Workpiece Material		Applicable Insert Grade	Applicable Chipbreaker
P Carbon Steel / Alloy Steel / Die Steel		PR1525	GM/SM/GH Chipbreaker
K Gray Cast Iron / Nodular Cast Iron		PR1510	GH/GM Chipbreaker
S Ni-base Heat Resistant Alloy	M Martensitic Stainless Steel	CA6535	SM/GM Chipbreaker
S Titanium Alloy	M Austenitic Stainless Steel M Precipitation Hardened Stainless Steel	PR1535	SM/GM Chipbreaker

New Grades for Difficult-to-cut Materials

- Stable cutting prevents insert fracturing
- Good for high efficiency machining



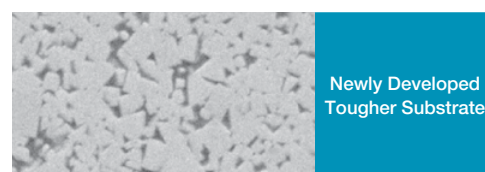
CA6535

- For Ni-base heat resistant alloys and martensitic stainless steels
- High heat resistance and wear resistance with CVD coating
- Improved stability due to thin film coating technology

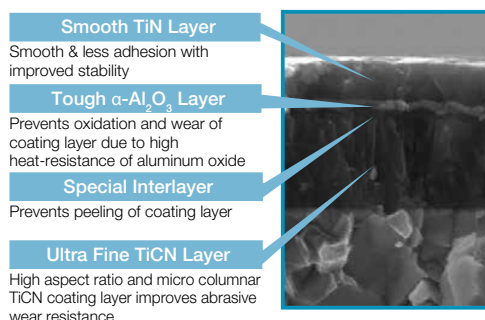


PR1535

- For titanium alloys and precipitation hardened stainless steel
- Stable milling operation and long tool life with Kyocera's MEGACOAT NANO coating technology
- Improved stability due to thin film coating technology



Newly Developed Tougher Substrate



Smooth TiN Layer

Smooth & less adhesion with improved stability

Tough α -Al₂O₃ Layer

Prevents oxidation and wear of coating layer due to high heat-resistance of aluminum oxide

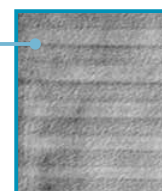
Special Interlayer

Prevents peeling of coating layer

Ultra Fine TiCN Layer

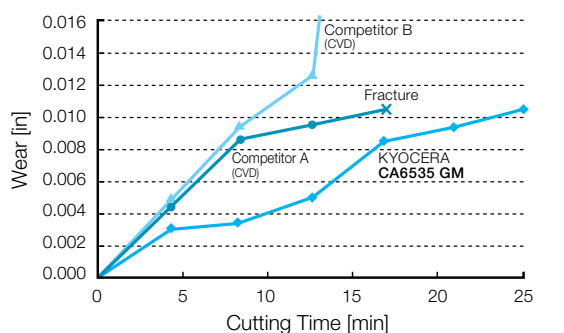
High aspect ratio and micro columnar TiCN coating layer improves abrasive wear resistance

MEGACOAT NANO Layer Structure



Tool Life Comparison

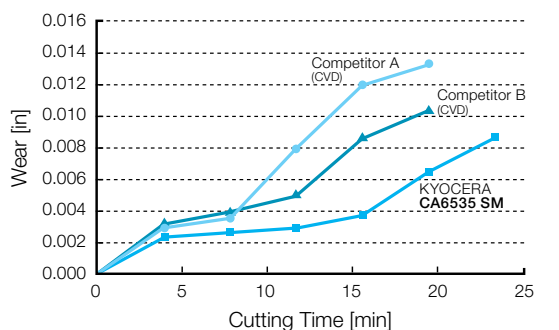
● Ni-base Heat Resistant Alloy



<Cutting Conditions> Vc = 160 sfm, D.O.C. = 0.039", fz = 0.006 ipt, WET

1st recommendation GM Chipbreaker

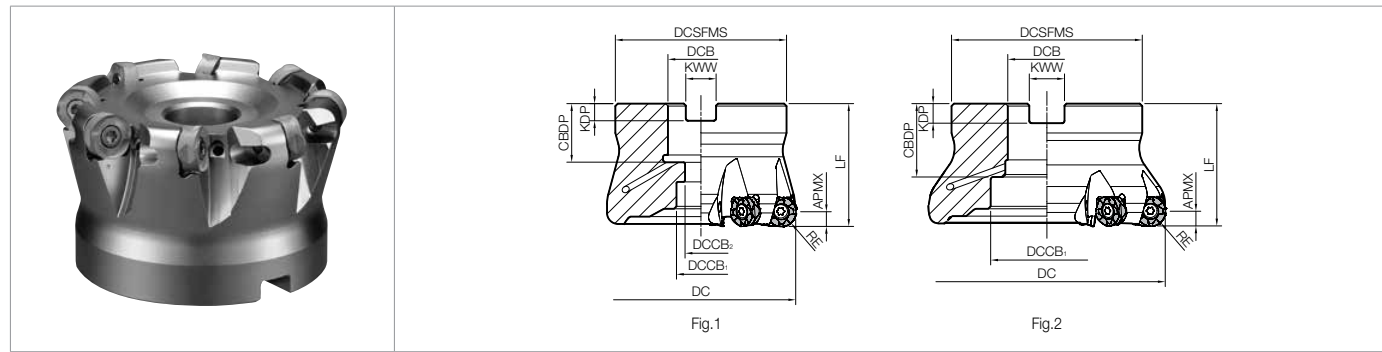
● Martensitic Stainless Steel



<Cutting Conditions> Vc = 980 sfm, D.O.C. = 0.079", fz = 0.008 ipt, WET

1st recommendation SM Chipbreaker










MRW Face Mill (Inch Size)



Toolholder Dimensions (Inch Size)

Part Number		Stock	No. of Inserts	Dimensions (in)										Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max. RPM	
				RE	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R.					R.R.
MRW	2000R-12-5T	●	5	0.236 (6mm)	2.00	1.75	0.75	0.748	0.433	1.575	0.750	0.187	0.312	0.236 (6mm)	+12°	-15.5°	Yes	Fig.1	0.3	16,000
	2000R-12-6T	●	6															0.3		
	2500R-12-6T	●	6		2.50	1.75	0.75	0.748	0.433	1.575	0.750	0.187	0.312		+12°	-15.5°	Yes	Fig.1	0.6	14,000
	2500R-12-7T	●	7															0.6		
	3000R-12-6T	●	6		3.00	2.25	1.00	0.866	0.551	1.969	1.063	0.236	0.381		+12°	-15.5°	Yes	Fig.1	1.1	12,000
	3000R-12-8T	●	8															1.1		
	4000R-12-7T	●	7		4.00	3.54	1.50	2.047	-	1.969	1.142	0.393	0.625		+12°	-15.5°	Yes	Fig.2	1.5	10,600
	4000R-12-9T	●	9															1.4		
MRW	2500R-16-5T	●	5	0.315 (8mm)	2.50	1.75	0.75	0.748	0.433	1.575	0.750	0.187	0.312	0.315 (8mm)	+11°	-16.5°	Yes	Fig.1	0.5	12,800
	2500R-16-6T	●	6															0.5		
	3000R-16-7T	●	7		3.00	2.25	1.00	0.866	0.551	1.969	1.063	0.236	0.381		+11°	-16.5°	Yes	Fig.1	1.0	11,000
	4000R-16-8T	●	8		4.00	3.54	1.50	2.047	-	1.969	1.142	0.393	0.625		+11°	-16.5°	Yes	Fig.2	1.3	9,600
	5000R-16-8T	●	8		5.00	3.54	1.50	2.047	-	2.480	1.496	0.393	0.625		+11°	-16.5°	Yes	Fig.2	2.6	8,560
	5000R-16-10T	●	10															2.5		

Spare Parts and Applicable Inserts (Inch Size)

Part Number	Spare Parts					Applicable Inserts  M19		
	Clamp Screw	Wrench		Anti-seize Compound	Arbor Bolt			
		DTPM-15 	TTP-20 			General Purpose	Low Cutting Force	Tough Edge (For Heavy Milling)
MRW 2000R-12... 2500R-12... 3000R-12... 4000R-12...	SB-4085TRP	DTPM-15	-	P-37	HH3/8-1.25 (HH3/8-1.25H)	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
Recommended Torque for Insert Clamp 3.5 N·m			HH1/2-1.25 (HH1/2-1.25H)					
			-					
MRW 2500R-16... 3000R-16... 4000R-16... 5000R-16...	SB-50140TRP	-	TTP-20	P-37	HH3/8-1.25 (HH3/8-1.25H)	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
Recommended Torque for Insert Clamp 4.5 N·m			HH1/2-1.25 (HH1/2-1.25H)					
			-					

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

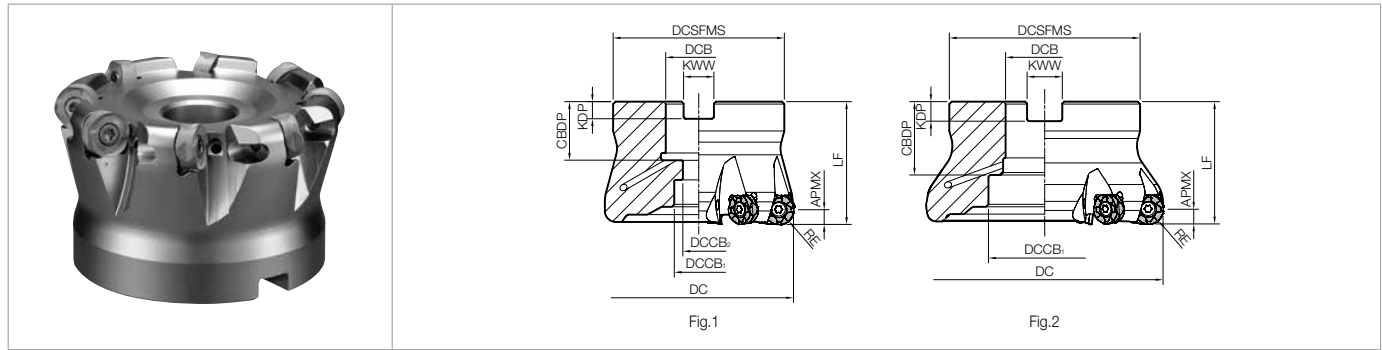
Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

APMX is Maximum D.O.C.

For more details, see Page **M244**

Recommended Cutting Conditions **M244**

MRW Face Mill (Metric Size)



Toolholder Dimensions (Metric Size)

Part Number			Stock	No. of Inserts	Dimensions (mm)										Rake Angle (°)		Coolant Hole	Drawing	Weight (kg)	Max. RPM	
					RE	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	A.R.					R.R.
Inch Bore Dia.	MRW	080R-12-6T	●	6	6	80	70	1.000"	20	13	50	1.063"	0.236"	0.375"	6.0	+12°	-15.5°	Yes	Fig.1	1.2	12,000
		080R-12-8T	●	8		Fig.1	1.1														
		100R-12-7T	●	7		Fig.2	1.5														
		100R-12-9T	●	9		Fig.2	1.4														
	MRW	080R-16-6T	●	6	8	80	70	1.000"	20	13	50	1.063"	0.236"	0.375"	8.0	+11°	-16.5°	Yes	Fig.1	1.1	11,000
		080R-16-7T	●	7		Fig.1	1.1														
		100R-16-6T	●	6		Fig.2	1.4														
		100R-16-8T	●	8		Fig.2	1.4														
Metric Bore Dia.	MRW	050R-12-5T-M	●	5	6	50	48	22	18	11	40	21	6.3	10.4	6.0	+12°	-15.5°	Yes	Fig.1	0.3	16,000
		050R-12-6T-M	●	6		Fig.1	0.3														
		063R-12-6T-M	●	6		63	60	22	19	11	40	21	6.3	10.4		+12°	-15.5°	Yes	Fig.1	0.6	
		063R-12-7T-M	●	7		Fig.1	0.6														
		080R-12-6T-M	●	6		80	70	27	20	13	50	24	7	12.4		+12°	-15.5°	Yes	Fig.1	1.1	
		080R-12-8T-M	●	8		Fig.1	1.1														
	MRW	100R-12-7T-M	●	7	8	100	78	32	46	-	50	30	8	14.4	8.0	+12°	-15.5°	Yes	Fig.2	1.5	10,600
		100R-12-9T-M	●	9		Fig.2	1.4														
063R-16-5T-M		●	5	63		60	22	19	11	40	21	6.3	10.4	+11°		-16.5°	Yes	Fig.1	0.5		
063R-16-6T-M		●	6	Fig.1		0.5															
080R-16-6T-M		●	6	80		70	27	20	13	50	24	7	12.4	+11°		-16.5°	Yes	Fig.1	1.1		
080R-16-7T-M		●	7	Fig.1		1.0															
MRW	100R-16-6T-M	●	6	8	100	78	32	46	-	50	30	8	14.4	8.0	+11°	-16.5°	Yes	Fig.2	1.4	9,600	
	100R-16-8T-M	●	8		Fig.2	1.3															
	125R-16-8T-M	●	8		125	89	40	55	-	63	33	9	16.4		+11°	-16.5°	Yes	Fig.2	2.6		
	125R-16-10T-M	●	10		Fig.2	2.5															

Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts					Applicable Inserts M19		
	Clamp Screw	Wrench		Anti-seize Compound	Arbor Bolt	General Purpose	Low Cutting Force	Tough Edge (For Heavy Milling)
		DTPM-15	TTP-20					
MRW 050R-12...	SB-4085TRP	DTPM-15	-	P-37	HH10x30	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
063R-12...					HH12x35			
080R-12...					-			
100R-12...					-			
MRW 063R-16...	SB-50140TRP	-	TTP-20	P-37	HH10x30	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
080R-16...					HH12x35			
100R-16...					-			
125R-16...					-			

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

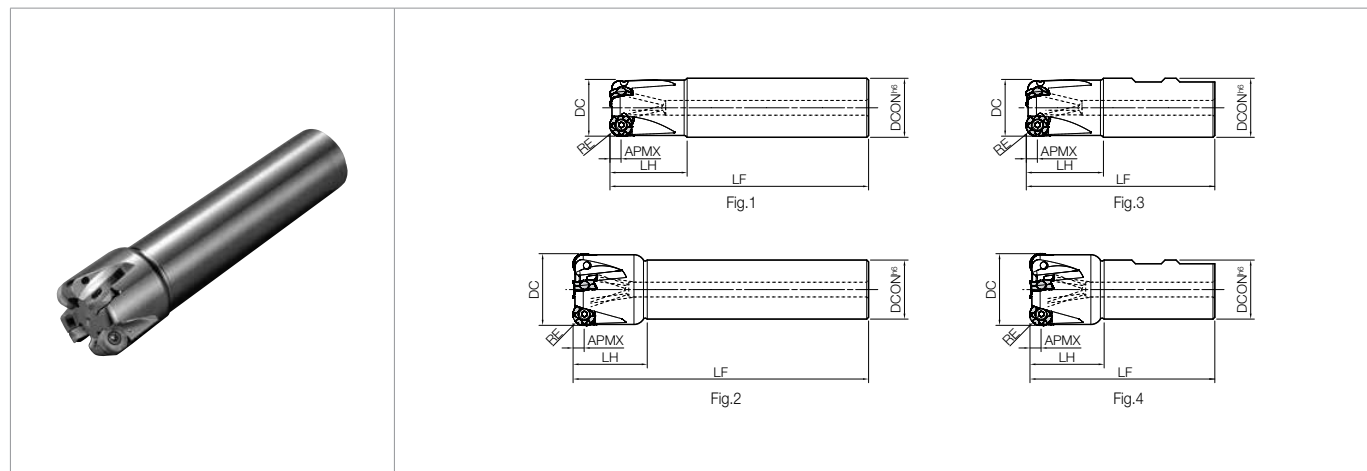
Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

APMX is Maximum D.O.C.

For more details, see Page M244

Recommended Cutting Conditions M244

MRW End Mill (Inch Size)



Toolholder Dimensions (Inch Size)

	Part Number	Stock	No. of Inserts	Dimensions (in)						Rake Angle (°)		Coolant Hole	Drawing	Max. RPM
				RE	DC	DCON	LF	LH	APMX	A.R. (Max.)	R.R.			
Standard Shank (Weldon)	MRW 1250-W125-12-3T	●	3	0.236 (6mm)	1.25	1.25	3.921	1.575	0.236 (6mm)	+12°	-20°	Yes	Fig.3	22,000
	1500-W125-12-4T	●	4		1.50	1.25	3.856	1.575			-16.5°	Yes	Fig.4	18,800
	2000-W150-12-5T	●	5		2.00	1.50	4.266	1.575			-15.5°	Yes	Fig.4	16,000
	MRW 1500-W125-16-2T	●	2	0.315 (8mm)	1.50	1.25	3.856	1.575	0.315 (8mm)	+11°	-18°	Yes	Fig.4	17,200
	2000-W150-16-4T	●	4		2.00	1.50	4.262	1.575			-16.5°			14,800
	2500-W150-16-5T	●	5		2.50	1.50	4.262	1.575			-16.5°			12,800
Long Shank (Cylindrical)	MRW 2000-S150-12-4T-12	●	4	0.236 (6mm)	2.00	1.50	12.000	1.969	0.236 (6mm)	+12°	-15.5°	Yes	Fig.2	16,000
	MRW 2000-S150-16-3T-8	●	3	0.315 (8mm)	2.00	1.50	8.000	1.575	0.315 (8mm)	+11°	-16.5°	Yes	Fig.2	14,800
	2500-S150-16-4T-12	●	4		2.50	1.50	12.000	1.969			-16.5°			12,800

Spare Parts and Applicable Inserts (Inch Size)

Part Number	Spare Parts				Applicable Inserts ➔ M19		
	Clamp Screw	Wrench		Anti-seize Compound			
		DTPM-15 	TTP-20 				
MRW ----12...	SB-4085TRP	DTPM-15	-	P-37	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
	Recommended Torque for Insert Clamp 3.5 N·m						
MRW ----16...	SB-50140TRP	-	TTP-20	P-37	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
	Recommended Torque for Insert Clamp 4.5 N·m						

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

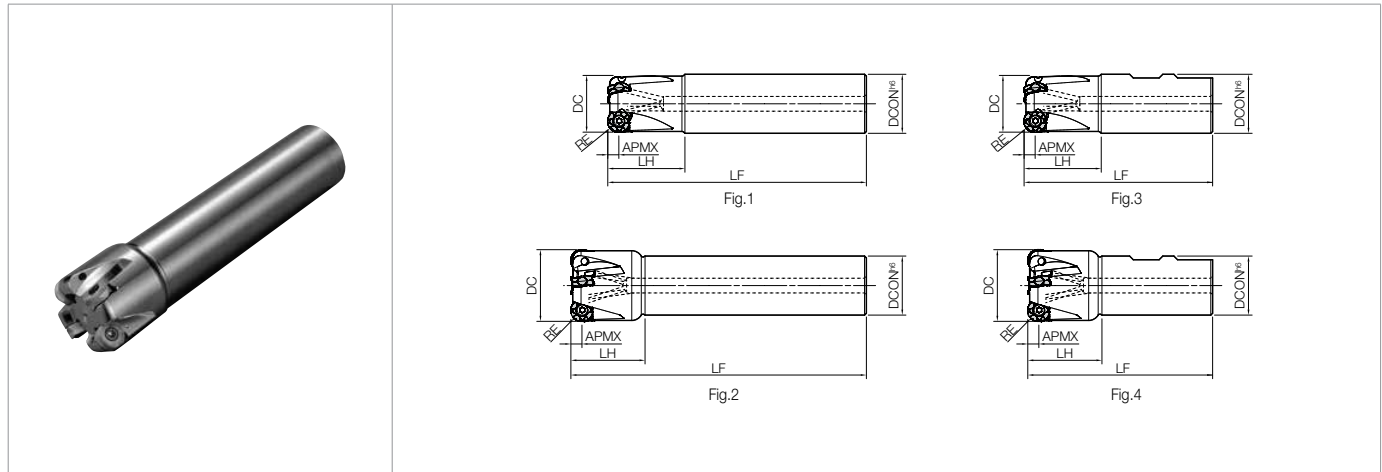
Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

APMX is Maximum D.O.C.

For more details, see Page ➔ M244

Recommended Cutting Conditions ➔ M244

MRW End Mill (Metric Size)



Toolholder Dimensions (Metric Size)

Part Number		Stock	No. of Inserts	Dimensions (mm)						Rake Angle (°)		Coolant Hole	Drawing	Max. RPM
				RE	DC	DCON	LF	LH	APMX	A.R. (Max.)	R.R.			
Standard Shank (Cylindrical)	MRW 32-S32-12-3T	●	3	6	32	32	140	40	6.0	+12°	-20°	Yes	Fig.1	22,000
	40-S32-12-4T	●	4		40	32	160	40			-16.5°	Yes	Fig.2	18,800
	50-S42-12-5T	●	5		50	42	170	40			-15.5°	Yes	Fig.2	16,000
	MRW 40-S32-16-3T	●	3	8	40	32	160	40	8.0	+11°	-18°	Yes	Fig.2	17,200
	50-S42-16-4T	●	4		50	42	170	40			-16.5°	Yes	Fig.2	14,800
	63-S42-16-5T	●	5		63	42	170	50			-16.5°	Yes	Fig.2	12,800
Long Shank (Cylindrical)	MRW 32-S32-12-2T-200	●	2	6	32	32	200	40	6.0	+12°	-20°	Yes	Fig.1	22,000
	40-S32-12-3T-200	●	3		40	32	200	40			-16.5°	Yes	Fig.2	18,800
	50-S42-12-4T-300	●	4		50	42	300	40			-15.5°	Yes	Fig.2	16,000
	MRW 40-S32-16-2T-200	●	2	8	40	32	200	40	8.0	+11°	-18°	Yes	Fig.2	17,200
	50-S42-16-3T-300	●	3		50	42	300	40			-16.5°	Yes	Fig.2	14,800
	63-S42-16-4T-300	●	4		63	42	300	50			-16.5°	Yes	Fig.2	12,800
Standard Shank (Weldon)	MRW 32-W32-12-3T	●	3	6	32	32	102	40	6.0	+12°	-20°	Yes	Fig.3	22,000
	40-W32-12-4T	●	4		40	32	100	40			-16.5°	Yes	Fig.4	18,800
	50-W40-12-5T	●	5		50	40	110	40			-15.5°	Yes	Fig.4	16,000
	MRW 40-W32-16-3T	●	3	8	40	32	100	40	8.0	+11°	-18°	Yes	Fig.4	17,200
	50-W40-16-4T	●	4		50	40	110	40			-16.5°	Yes	Fig.4	14,800
	63-W40-16-5T	●	5		63	40	120	50			-16.5°	Yes	Fig.4	12,800

Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts				Applicable Inserts ➡ M19		
	Clamp Screw	Wrench		Anti-seize Compound			
		DTPM-15	TTP-20				
MRW ---12...	SB-4085TRP	DTPM-15	-	P-37	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
Recommended Torque for Insert Clamp 3.5 N·m							
MRW ---16...	SB-50140TRP	-	TTP-20	P-37	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
Recommended Torque for Insert Clamp 4.5 N·m							

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

Recommended Cutting Conditions ➡ M244

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

APMX is Maximum D.O.C.

For more details, see Page ➡ M244

◆ Recommended Cutting Conditions

Workpiece Material	Recommended Chipbreaker fz (ipt) Recommended feed rate (standard value) ※ ROMU12 : D.O.C. = 0.118" ROMU16 : D.O.C. = 0.158"			Recommended Insert Grades (Cutting Speed Vc: sfm)			
				MEGACOAT NANO			CVD Coated Carbide
	GM	SM	GH	PR1535	PR1525	PR1510	CA6535
Carbon Steel	★ 0.004~ 0.008 ~0.012	☆ 0.002~ 0.006 ~0.008	☆ 0.006~ 0.012 ~0.014	☆ 390~ 590 ~820	★ 390~ 590 ~820	-	-
Alloy Steel	★ 0.004~ 0.008 ~0.012	☆ 0.002~ 0.006 ~0.008	☆ 0.006~ 0.012 ~0.014	☆ 330~ 520 ~720	★ 330~ 520 ~720	-	-
Mold Steel	★ 0.004~ 0.006 ~0.010	☆ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.012	☆ 260~ 460 ~590	★ 260~ 460 ~590	-	-
Austenitic Stainless Steel	☆ 0.004~ 0.006 ~0.008	★ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.010	☆ 330~ 520 ~660	☆ 330~ 520 ~660	-	-
Martensitic Stainless Steel	☆ 0.004~ 0.006 ~0.008	★ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.010	☆ 490~ 660 ~820	-	-	★ 590~ 790 ~980
Precipitation Hardened Stainless Steel	★ 0.004~ 0.006 ~0.008	☆ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.010	★ 300~ 390 ~490	-	-	-
Gray Cast Iron	★ 0.004~ 0.008 ~0.012	-	☆ 0.006~ 0.012 ~0.014	-	-	★ 390~ 590 ~820	-
Nodular Cast Iron	★ 0.004~ 0.006 ~0.010	-	☆ 0.006~ 0.008 ~0.012	-	-	★ 330~ 490 ~660	-
Ni-base Heat Resistant Alloy	★ 0.004~ 0.005 ~0.006	☆ 0.002~ 0.004 ~0.006	☆ 0.005~ 0.006 ~0.008	☆ 70~ 100 ~160	-	-	★ 70~ 100 ~160
Titanium Alloy	☆ 0.004~ 0.005 ~0.006	★ 0.002~ 0.004 ~0.006	-	★ 130~ 200 ~260	-	☆ 100~ 160 ~230	-

※ Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy

★: 1st Recommendation ☆: 2nd Recommendation

※ The figure in bold font is center value of the recommended cutting conditions. 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 D.O.C. is RE/2 (0.118" for ROMU12, 0.158" for ROMU16).

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

● Conversion Factor for Feed Per Tooth by Depth of Cut (D.O.C.)

Insert	D.O.C. (Recommended)	D.O.C. (Max.)	Conversion Factor for Feed Per Tooth				
			D.O.C. = 0.020"	D.O.C. = 0.039"	D.O.C. = 0.079"	D.O.C. = 0.118"	D.O.C. = 0.158"
ROMU12 Type	0.118" or less	0.236"	2.1	1.5	1.1	1.0 (Standard)	-
ROMU16 Type	0.158" or less	0.315"	2.4	1.7	1.3	1.1	1.0 (Standard)

Calculation Example (ROMU12, Carbon Steel, GM Chipbreaker, D.O.C. = 0.039")

$$\begin{array}{|c|} \hline \text{fz} = 0.008 \text{ ipt} \\ \hline \text{(Standard value for carbon steel and GM chipbreaker)} \\ \hline \end{array} \times \begin{array}{|c|} \hline 1.5 \\ \hline \text{(Conversion factor for ROMU12 type, D.O.C. = 0.039")} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{fz} = 0.012 \text{ ipt} \\ \hline \text{(Recommended feed rate)} \\ \hline \end{array}$$

※ Recommended D.O.C. : 0.118" or less for ROMU12, 0.158" or less for ROMU16

● Corner R Shape During Processing with MRW (See Fig.1)

Insert	D.O.C. (Max.)	X	Y
ROMU12 Type	0.236"	0.118"	0.004"
ROMU16 Type	0.315"	0.158"	0.004"

※ When machining with larger D.O.C. than recommended D.O.C. (X), there is a gap (Y) between the workpiece corner and insert corner R(RE).

※ The above figure is an estimation. There is a ±0.008" variation depending on the cutting conditions.

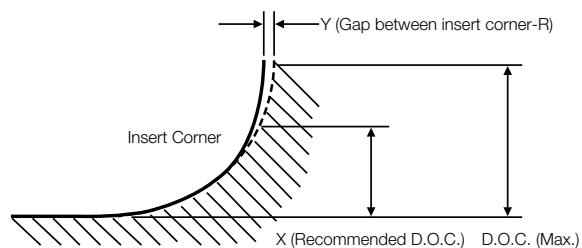
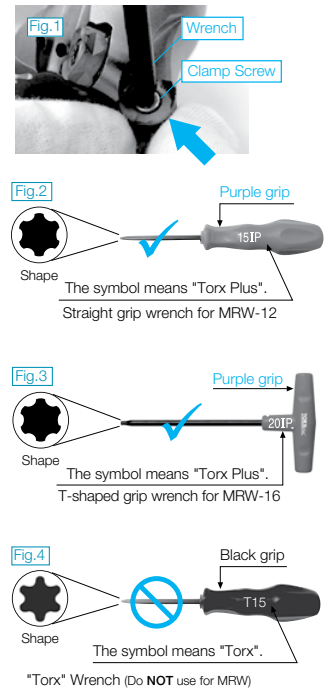


Fig.1

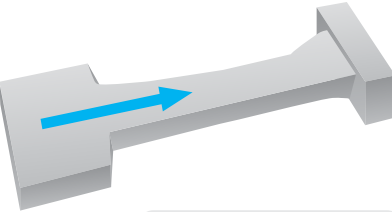
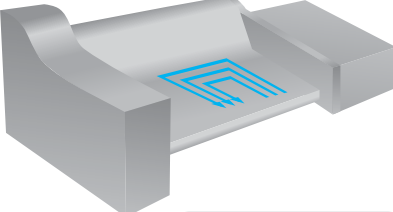
How to Mount an Insert

1. Be sure to remove dust and chips from the insert mounting pocket.
 2. Apply anti-seize compound on portion of taper and thread of clamp screw.
 - ① Attach the screw to the front end of the wrench
 - ② While lightly pressing the insert against the mating surfaces, put the screw into the hole of the insert and tighten. (See **Fig.1**)
 3. Wrenches and clamp screws are "Torx Plus".
 - ① **Fig.2** wrench is for MRW-12. (Straight grip)
 - ② **Fig.3** wrench is for MRW-16. (T-shaped grip)
 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.
4. When tightening the screw, make sure that the wrench is parallel to the screw.
For recommended torque, see **pages M240-M243**.
 5. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the holder or between the insert side surfaces and the mating surface of the holder.

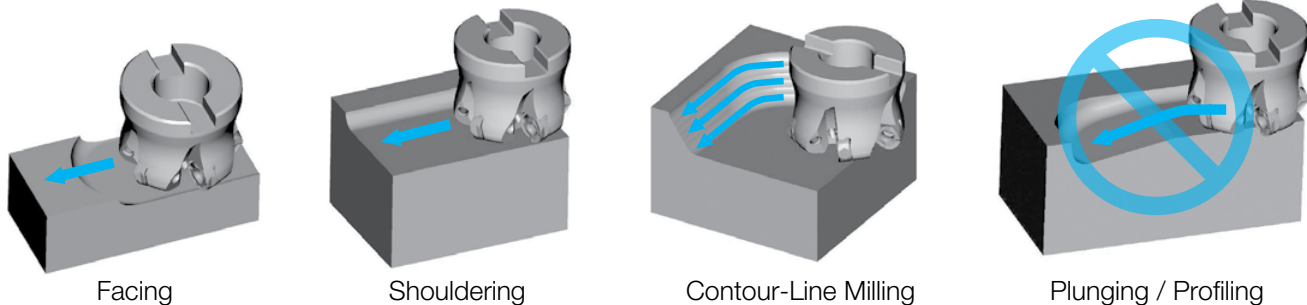
If there is any clearance, remove the insert and mount it again according to the above steps.



Case Studies

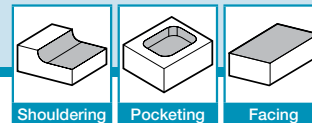
410 Stainless Steel <ul style="list-style-type: none"> • Turbine Blade • Vc = 890 sfm • fz = 0.011 ipt • D.O.C. = 0.020~0.039" • ae = Max. 1.378" • Dry • MRW050R-12-6T-M (6 Flutes) • ROMU1204M0ER-SM (CA6535) 	 <p>1.2 times the machining efficiency Economical double-faced insert</p>	410 Stainless Steel <ul style="list-style-type: none"> • Turbine Blade • Vc = 820 sfm • fz = 0.006 ipt • D.O.C. = 0.079" • ae = 0.197~1.181" • Wet • MRW050R-12-5T-M (5 Flutes) • ROMU1204M0ER-SM (CA6535) 	 <p>Same or longer tool life Economical double-faced insert</p>
CA6535	Stable Machining	CA6535	Stable, available for further machining
Competitor A (Positive Insert Cutter)	Unstable Machining	Competitor B (Positive Insert Cutter)	Unstable Machining
MRW improved machining efficiency 1.2 times with same tool life compared to Competitor A. MRW has a cost advantage due to double sided inserts.		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)		(User Evaluation)	

Application



※MRW is not available for 3D machining such as Plunging and Profiling.

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T



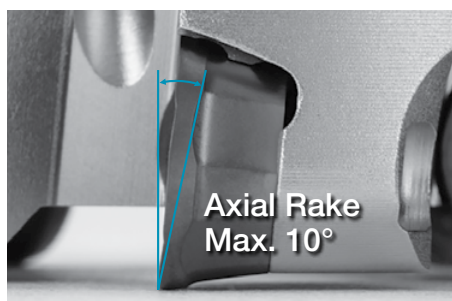
RAD-6 (MRX)

The MRX Radius Cutter
Lowers Cutting Costs and
Increases Efficiency!

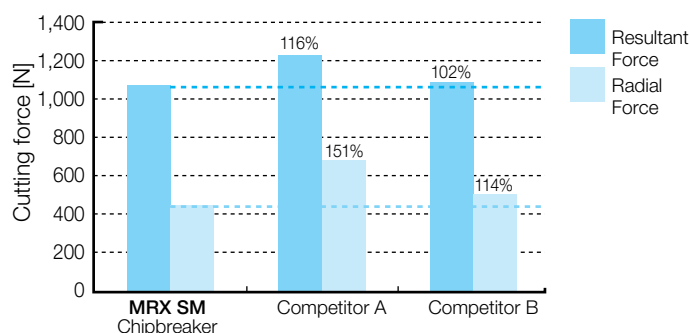
Advantages

Low Cutting Forces with Helical Cutting Edge Design

Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications



• Cutting Force Comparison



< Cutting Conditions >
Vc = 400 sfm, D.O.C. \times ae = 0.079 \times 0.984", fz = 0.008 ipt, 304 Stainless Steel, Cutter Ø50mm

Flat Lock Structure to Hold Insert Firmly in Place

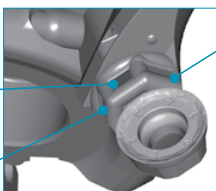
Prevents insert rotation during machining to provide stable cutting

Flat Lock Structure

Wide flat binding face
• Receives even cutting forces
• Prevents insert rotation

Support Face

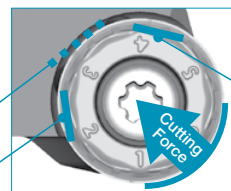
Locating Surface



Locating Surface

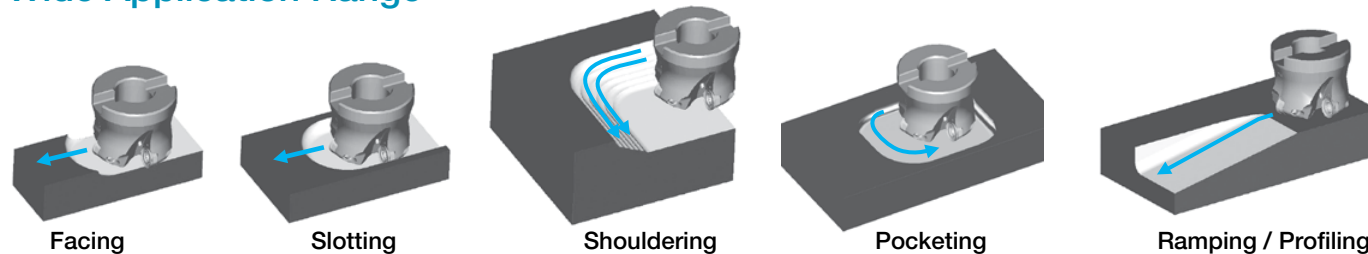
Support Face

Locating Surface



Locating Surface

Wide Application Range

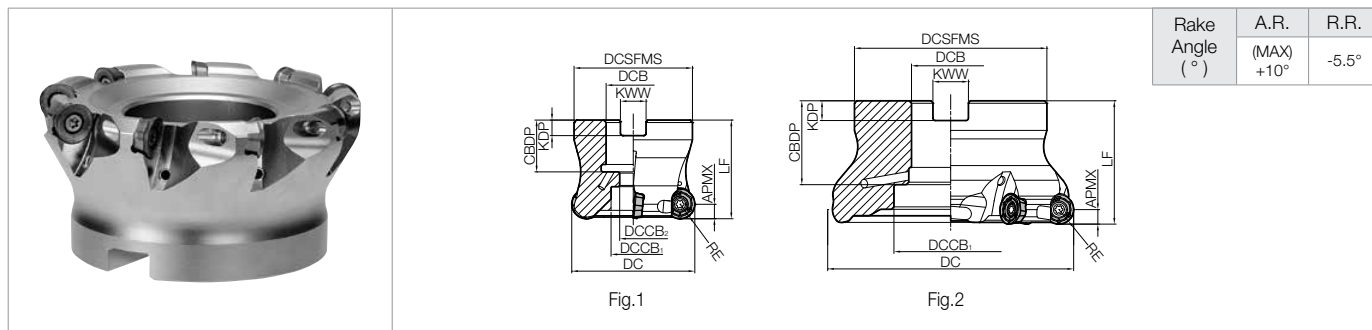


Grades for Difficult-to-cut Materials

Longer tool life with a wide lineup including 4 grades and 3 chipbreakers!
Available for steel, stainless steel, cast iron, and heat resistant alloys.

Cost-effective M-class Inserts Available.







MRX Face Mill (Inch Size)



Toolholder Dimensions (Inch Size)

Part Number	Stock	No. of Inserts	Dimensions (in)											Coolant Hole	Drawing	Weight (kg)	Max. RPM
			RE	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX				
MRX 1500R-10-5T	●	5	0.197 (5mm)	1.500	1.400	0.500	0.433	0.276	1.575	0.709	0.156	0.250	0.197 (5mm)	Yes	Fig.1	0.2	20,000
	●	6		2.000	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313				0.3	17,500
	□	7		2.500	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313				0.5	15,000
MRX 1500R-12-4T	□	4	0.236 (6mm)	1.500	1.400	0.500	0.394	0.276	1.575	0.709	0.156	0.250	0.236 (6mm)	Yes	Fig.1	0.2	21,000
	□	4		2.000	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313				0.3	18,000
	●	5		2.000	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313				0.3	18,000
	□	5		2.500	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313				0.4	15,500
	□	6		2.500	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313				0.4	15,500
	●	6		3.000	2.250	1.000	0.866	0.551	1.969	1.063	0.236	0.382				0.8	13,500
	□	7		3.000	2.250	1.000	0.866	0.551	1.969	1.063	0.236	0.382				0.8	13,500
	□	7		4.000	3.540	1.500	2.047	-	1.969	1.142	0.394	0.626		Yes	Fig.2	1.7	12,000
	□	9		4.000	3.540	1.500	2.047	-	1.969	1.142	0.394	0.626				1.6	12,000
	□	4	0.315 (8mm)	2.500	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313	0.315 (8mm)	Yes	Fig.1	0.4	13,500
MRX 2500R-16-4T	●	5		2.500	1.750	0.750	0.669	0.433	1.575	0.750	0.187	0.313				0.4	13,500
	□	5		3.000	2.250	1.000	0.866	0.551	1.969	1.063	0.236	0.382				0.8	11,500
	●	6		3.000	2.250	1.000	0.866	0.551	1.969	1.063	0.236	0.382				0.8	11,500
	□	6		4.000	3.540	1.500	2.047	-	1.969	1.142	0.394	0.626		Yes	Fig.2	1.6	10,000
	●	7		4.000	3.540	1.500	2.047	-	1.969	1.142	0.394	0.626				1.6	10,000
	□	6		5.000	3.540	1.500	2.047	-	2.480	1.496	0.394	0.626				2.9	9,000
	□	8		5.000	3.540	1.500	2.047	-	2.480	1.496	0.394	0.626				2.8	9,000

Face Mill Spare Parts and Applicable Inserts (Inch Size)

Part Number	Spare Parts					Applicable Inserts  M19			
	Clamp Screw	Wrench		Anti-seize Compound	Arbor Bolt				
		DTPM 	TTP 						
MRX 1500R-10...	SB-3070TRP	DTPM-10	-	P-37	HH1/4-0.75	RPMT10T3M0 ER-GM			
2000R-10...	Recommended Torque for Insert Clamp 2.0 N-m				HH3/8-1.25	RPGT10T3M0 ER-GM			
2500R-10...					HH3/8-1.25	RPGT10T3M0 ER-SM			
					HH3/8-1.25	RPMT10T3M0 EN-GH			
MRX 1500R-12...	SB-4090TRP	DTPM-15	-	P-37	HH1/4-0.75	RPMT1204M0 ER-GM			
2000R-12...					HH3/8-1.25	RPGT1204M0 ER-GM			
2500R-12...					Recommended Torque for Insert Clamp 3.5 N-m			HH3/8-1.25	RPGT1204M0 ER-SM
3000R-12...								HH1/2-1.25	RPMT1204M0 EN-GH
4000R-12...					-	RPMW1204M0TN			
MRX 2500R-16...	SB-50120TRP	-	TTP-20	P-37	HH3/8-1.25	RPMT1605M0 ER-GM			
3000R-16...					HH1/2-1.25	RPGT1605M0 ER-GM			
4000R-16...					Recommended Torque for Insert Clamp 4.5 N-m			-	RPGT1605M0 ER-SM
5000R-16...								-	RPMT1605M0 EN-GH
									RPMW1605M0TN

Caution with Max. Revolution
When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

🔧 Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

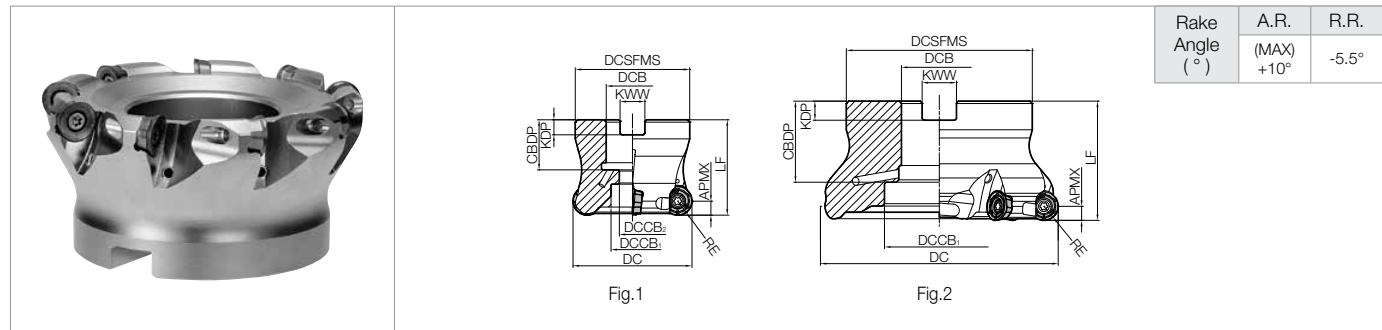
※1...Not compatible with conventional RPMT10T3M0 inserts (without ER-.. or EN-..)

※2...Not compatible with conventional RPMT1204M0 or RPMT1204M0-H inserts (without ER-.. or EN-..)

※3...Not compatible with conventional RPMT1605M0-H inserts.

Recommended Cutting Conditions ● M252

MRX Face Mill (Metric Size)



Toolholder Dimensions (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)											Coolant Hole	Drawing	Weight (kg)	Max. RPM
			RE	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX				
Inch Bore Dia.	MRX 080R-12-6T	●	6	80	70	1.000"	20.0	13	50	1.063"	0.236"	0.375"	6	Yes	Fig.1	1.2	13,500
	080R-12-8T	●	8													1.1	13,500
	100R-12-7T	●	7	100	78	1.250"	46.0	-	50	1.339"	0.315"	0.500"	6	Yes	Fig.2	1.5	12,000
	100R-12-9T	●	9													1.5	12,000
	MRX 080R-16-5T	●	5	80	70	1.000"	20.0	13	50	1.063"	0.236"	0.375"	8	Yes	Fig.1	1.1	11,500
	080R-16-6T	●	6													1.1	11,500
	100R-16-6T	●	6	100	78	1.250"	46.0	-	50	1.339"	0.315"	0.500"	8	Yes	Fig.2	1.4	10,000
	100R-16-7T	●	7													1.4	10,000
	125R-16-6T	●	6	125	89	1.500"	55.0	-	63	1.496"	0.394"	0.625"	8	Yes	Fig.2	2.7	9,000
	125R-16-8T	●	8														9,000
Metric Bore Dia.	MRX 040R-10-5T-M	●	5	40	38	16	15.0	9	40	19	5.6	8.4	5	Yes	Fig.1	0.2	20,000
	050R-10-6T-M	●	6	50	48	22	18.0	11	40	21	6.3	10.4	5	Yes	Fig.1	0.3	17,500
	063R-10-7T-M	●	7	63	60	22	18.0	11	40	21	6.3	10.4	5	Yes	Fig.1	0.6	15,000
	MRX 040R-12-4T-M	●	4	40	38	16	13.5	9	40	19	5.6	8.4	6	Yes	Fig.1	0.2	21,000
	050R-12-4T-M	●	4													0.3	18,000
	050R-12-5T-M	●	5	50	48	22	18.0	11	40	21	6.3	10.4	6	Yes	Fig.1	0.3	18,000
	063R-12-5T-M	●	5													0.6	15,500
	063R-12-6T-M	●	6	63	60	22	18.0	11	40	21	6.3	10.4	6	Yes	Fig.1	0.6	15,500
	080R-12-6T-M	●	6	80	70	27	20.0	13	50	24	7.0	12.4	8	Yes	Fig.1	1.2	13,500
	080R-12-8T-M	●	8													1.1	13,500
	100R-12-7T-M	●	7	100	78	32	46.0	-	50	30	8.0	14.4	8	Yes	Fig.2	1.4	12,000
	100R-12-9T-M	●	9													1.4	12,000
	MRX 063R-16-4T-M	●	4	63	60	22	18.0	11	40	21	6.3	10.4	8	Yes	Fig.1	0.5	13,500
	063R-16-5T-M	●	5													0.5	13,500
	080R-16-5T-M	●	5	80	70	27	20.0	13	50	24	7.0	12.4	8	Yes	Fig.1	1.1	11,500
	080R-16-6T-M	●	6													1.1	11,500
	100R-16-6T-M	●	6	100	78	32	46.0	-	50	30	8.0	14.4	8	Yes	Fig.2	1.4	10,000
	100R-16-7T-M	●	7													1.4	10,000
	125R-16-6T-M	●	6	125	89	40	55.0	-	63	33	9.0	16.4	8	Yes	Fig.2	2.6	9,000
	125R-16-8T-M	●	8													2.6	9,000

Face Mill Spare Parts and Applicable Inserts (Metric Size)

Part Number	Spare Parts					Applicable Inserts
	Clamp Screw	Wrench		Anti-seize Compound	Arbor Bolt	
		DTPM	TTP			➔ M19
MRX 040R-10...	SB-3070TRP	DTPM-10	-		HH8X25	RPMT10T3M0ER-GM
050R-10...	Recommended Torque for Insert Clamp 2.0 N·m			P-37	HH10X30	RPMT10T3M0ER-GM
063R-10...					HH10X30	RPMT10T3M0ER-SM
MRX 040R-12...	SB-4090TRP	DTPM-15	-		HH8X25	RPMT1204M0ER-GM
050R-12...	Recommended Torque for Insert Clamp 3.5 N·m			P-37	HH10X30	RPMT1204M0ER-GM
063R-12...					HH10X30	RPMT1204M0ER-SM
080R-12...					HH12X35	RPMT1204M0EN-GH
100R-12...					-	RPMT1204M0TN
MRX 063R-16...	SB-50120TRP	-	TTP-20		HH10X30	RPMT1605M0ER-GM
080R-16...	Recommended Torque for Insert Clamp 4.5 N·m			P-37	HH12X35	RPMT1605M0ER-GM
100R-16...					-	RPMT1605M0ER-SM
125R-16...					-	RPMT1605M0EN-GH
						RPMT1605M0TN

Recommended Cutting Conditions ➔ M252

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

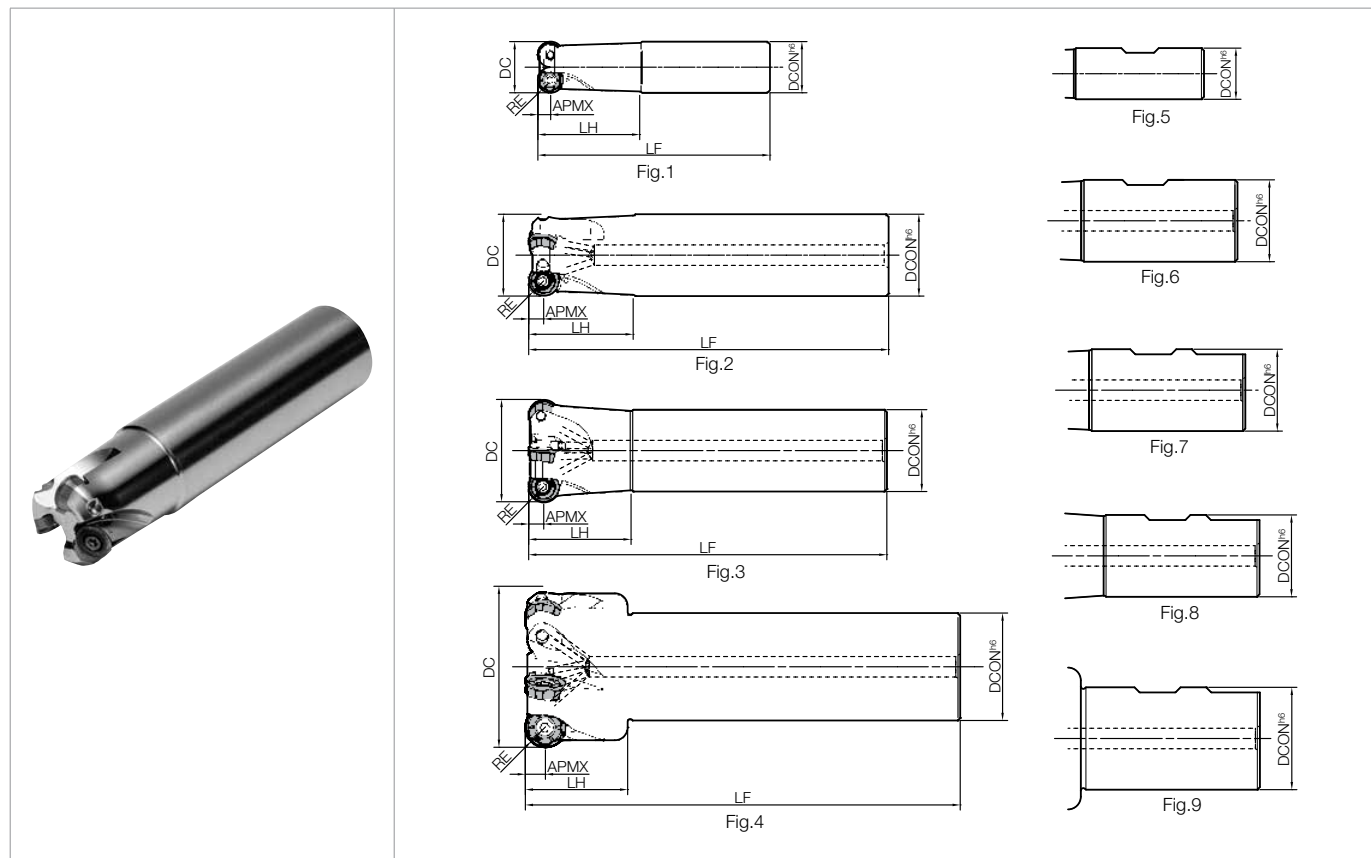
➔ Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

※1...Not compatible with conventional RPMT10T3M0 inserts (without ER-.. or EN-..)

※2...Not compatible with conventional RPMT1204M0 or RPMT1204M0-H inserts (without ER-.. or EN-..)

※3...Not compatible with conventional RPMT1605M0-H inserts.

MRX End Mill (Inch Size)

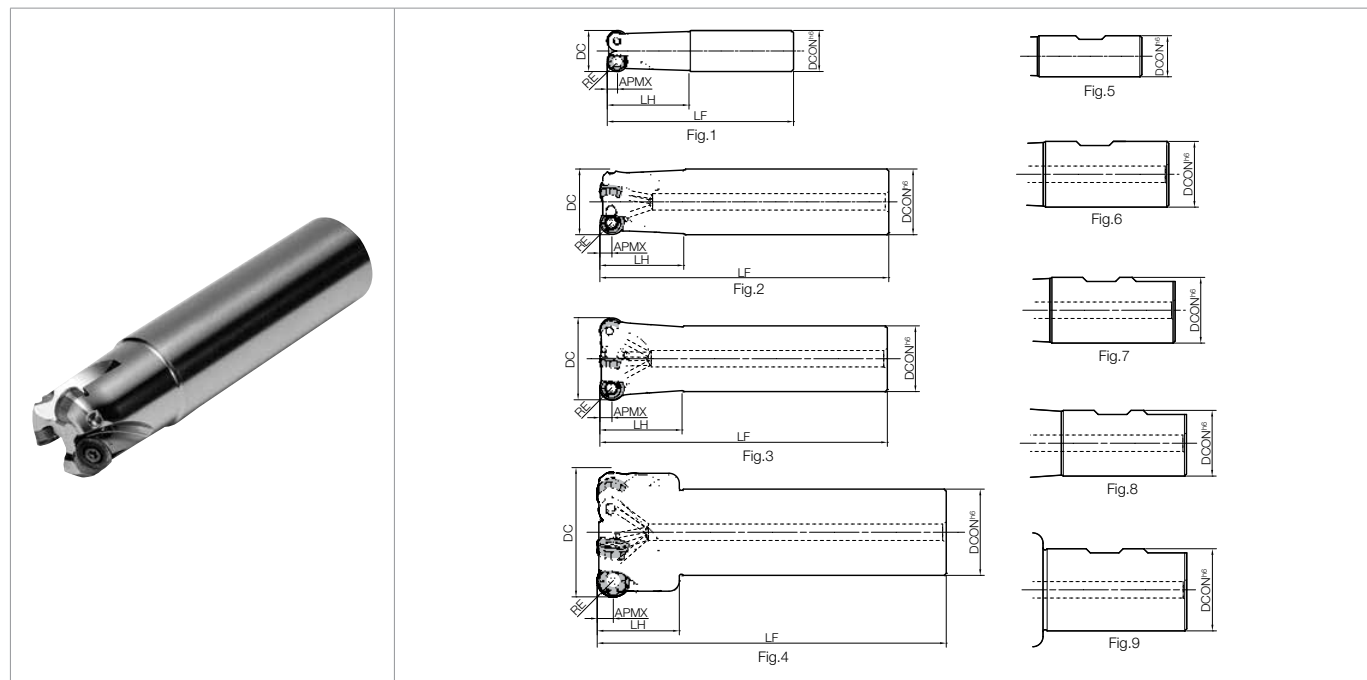


Toolholder Dimensions (Inch Size)

Part Number			Stock	No. of Inserts	Dimensions (in)					Rake Angle (°)		Coolant Hole	Drawing	Max. RPM	
					RE	DC	DCON	LF	LH	APMX	A.R. (Max.)				R.R.
Standard Shank (Weldon)	MRX	0625-W625-08-2T	●	2	0.157 (4mm)	0.625	0.625	4.331	2.386	0.157 (4mm)	+3°	-6.5°	No	Fig.5	38,000
		0750-W750-08-2T	●	2		0.750	0.750	4.724	2.654		+10°	-5.5°	Yes	Fig.6	32,000
		1000-W100-08-4T	●	4		1.000	1.000	4.724	2.406		+10°	-5.5°	Yes	Fig.7	28,000
	MRX	1000-W100-10-3T	●	3	0.197 (5mm)	1.000	1.000	4.724	2.409	0.197 (5mm)	+10°	-5.5°	Yes	Fig.7	28,000
		1250-W125-10-4T	●	4		1.250	1.250	5.512	3.197		+10°	-5.5°	Yes	Fig.7	22,500
	MRX	1250-W125-12-3T	●	3	0.236 (6mm)	1.250	1.250	5.512	3.189	0.236 (6mm)	+10°	-5.5°	Yes	Fig.7	24,500
		1500-W125-12-4T	●	4		1.500	1.250	5.512	1.575		+10°	-5.5°	Yes	Fig.8	21,000
		2000-W150-12-5T	□	5		2.000	1.500	6.693	1.575		+10°	-5.5°	Yes	Fig.8	18,000
	MRX	1500-W125-16-2T	□	2	0.315 (8mm)	1.500	1.250	5.512	1.575	0.315 (8mm)	+10°	-5.5°	Yes	Fig.8	18,000
		2000-W150-16-4T	●	4		2.000	1.500	6.693	1.575		+10°	-5.5°	Yes	Fig.8	15,500
Standard Shank (Cylindrical)	MRX	0625-S625-08-2T-6	□	2	0.157 (4mm)	0.625	0.625	6.000	3.150	0.157 (4mm)	+3°	-6.5°	No	Fig.1	38,000
		0750-S750-08-2T-7	□	2		0.750	0.750	7.000	3.150		+10°	-5.5°	Yes	Fig.2	32,000
		1000-S100-08-4T-7	□	4		1.000	1.000	7.000	3.150		+10°	-5.5°	Yes	Fig.2	28,000
	MRX	1000-S100-10-2T-7	□	2	0.197 (5mm)	1.000	1.000	7.000	3.150	0.197 (5mm)	+10°	-5.5°	Yes	Fig.2	28,000
	MRX	1250-S125-12-2T-8	□	2	0.236 (6mm)	1.250	1.250	8.000	3.150	0.236 (6mm)	+10°	-5.5°	Yes	Fig.2	24,500
		1500-S125-12-4T-8	□	4		1.500	1.250	8.000	1.575		+10°	-5.5°	Yes	Fig.3	21,000
		2000-S150-12-4T12	□	4		2.000	1.500	12.000	1.575		+10°	-5.5°	Yes	Fig.3	18,000
	MRX	1500-S125-16-2T-8	□	2	0.315 (8mm)	1.500	1.250	8.000	1.575	0.315 (8mm)	+10°	-5.5°	Yes	Fig.3	18,000
		2000-S150-16-4T12	□	4		2.000	1.500	12.000	1.575		+10°	-5.5°	Yes	Fig.3	15,500
		2500-S150-16-4T12	□	4		2.500	1.500	12.000	1.575		+10°	-5.5°	Yes	Fig.4	13,500

Recommended Cutting Conditions **M252**
End Mill Spare Parts and Applicable Inserts **M251**

MRX End Mill (Metric Size)

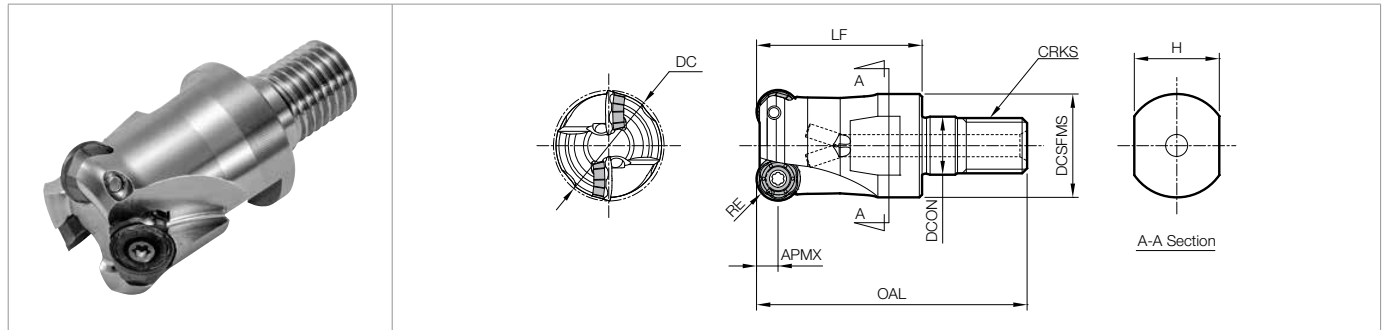


Toolholder Dimensions (Metric Size)

Inserts	Part Number	Stock	No. of Inserts	Dimensions (mm)						Rake Angle (°)		Coolant Hole	Drawing	Max. RPM
				RE	DC	DCON	LF	LH	APMX	A.R. (Max.)	R.R.			
45°~70° Lead Angle	MRX 16-S16-08-2T 20-S20-08-2T 25-S25-08-4T 20-S20-10-2T 25-S25-10-3T 32-S32-10-4T 32-S32-12-3T 40-S32-12-4T 50-S42-12-5T 40-S32-16-2T 50-S42-16-4T 63-S42-16-5T	●	2	4	16	16	110	40	4.0	+3°	-5.5°	No	Fig.1	38,000
75° Lead Angle		●	2		20	20	120	40	4.0	+10°	-5.5°	Yes	Fig.2	32,000
90°/88° Lead Angle		●	4		25	25	120	40	4.0	+10°	-5.5°	Yes	Fig.2	28,000
High Feed Milling		●	2	5	20	20	120	40	5.0	+5°	-8.0°	No	Fig.1	30,000
Finish Milling		●	3		25	25	120	40	5.0	+10°	-5.5°	Yes	Fig.2	28,000
Multi-Function		●	4		32	32	140	40	5.0	+10°	-5.5°	Yes	Fig.2	22,500
Slot Mill		●	3	6	32	32	140	40	6.0	+10°	-5.5°	Yes	Fig.2	24,500
Ball-Nose Radius		●	4		40	32	140	40	6.0	+10°	-5.5°	Yes	Fig.3	21,000
Other Applications		●	5		50	42	170	40	6.0	+10°	-5.5°	Yes	Fig.3	18,000
		●	2	8	40	32	140	40	8.0	+10°	-5.5°	Yes	Fig.3	18,000
		●	4		50	42	170	40	8.0	+10°	-5.5°	Yes	Fig.4	15,500
		●	5		63	42	170	40	8.0	+10°	-5.5°	Yes	Fig.4	13,500
Standard Shank (Weldon)	MRX 16-W16-08-2T 20-W20-08-2T 25-W25-08-4T 20-W20-10-2T 25-W25-10-3T 32-W32-10-4T 32-W32-12-3T 40-W32-12-4T 50-W40-12-5T 40-W32-16-2T 50-W40-16-4T 63-W40-16-5T	●	2	4	16	16	89	40	4.0	+3°	-5.5°	No	Fig.5	38,000
		●	2		20	20	91	40	4.0	+10°	-5.5°	Yes	Fig.6	32,000
		●	4		25	25	97	40	4.0	+10°	-5.5°	Yes	Fig.7	28,000
		●	2	5	20	20	91	40	5.0	+5°	-8.0°	No	Fig.5	30,000
		●	3		25	25	97	40	5.0	+10°	-5.5°	Yes	Fig.7	28,000
		●	4		32	32	101	40	5.0	+10°	-5.5°	Yes	Fig.7	22,500
		●	3	6	32	32	101	40	6.0	+10°	-5.5°	Yes	Fig.7	24,500
		●	4		40	32	101	40	6.0	+10°	-5.5°	Yes	Fig.8	21,000
		●	5		50	40	111	40	6.0	+10°	-5.5°	Yes	Fig.8	18,000
		●	2	8	40	32	101	40	8.0	+10°	-5.5°	Yes	Fig.8	18,000
		●	4		50	40	111	40	8.0	+10°	-5.5°	Yes	Fig.9	15,500
		●	5		63	40	112	40	8.0	+10°	-5.5°	Yes	Fig.9	13,500
Long Shank (Cylindrical)	MRX 16-S16-08-2T-160 20-S20-08-2T-180 25-S25-08-4T-180 20-S20-10-2T-180 25-S25-10-2T-180 32-S32-10-4T-200 32-S32-12-2T-200 40-S32-12-4T-200 50-S42-12-4T-300 40-S32-16-2T-200 50-S42-16-4T-300 63-S42-16-4T-300	●	2	4	16	16	160	70	4.0	+3°	-5.5°	No	Fig.1	38,000
		●	2		20	20	180	80	4.0	+10°	-5.5°	Yes	Fig.2	32,000
		●	4		25	25	180	80	4.0	+10°	-5.5°	Yes	Fig.2	28,000
		●	2	5	20	20	180	80	5.0	+5°	-8°	No	Fig.1	30,000
		●	2		25	25	180	80	5.0	+10°	-5.5°	Yes	Fig.2	28,000
		●	4		32	32	200	80	5.0	+10°	-5.5°	Yes	Fig.2	22,500
		●	2	6	32	32	200	80	6.0	+10°	-5.5°	Yes	Fig.2	24,500
		●	4		40	32	200	40	6.0	+10°	-5.5°	Yes	Fig.3	21,000
		●	4		50	42	300	40	6.0	+10°	-5.5°	Yes	Fig.3	18,000
		●	2	8	40	32	200	40	8.0	+10°	-5.5°	Yes	Fig.3	18,000
		●	4		50	42	300	40	8.0	+10°	-5.5°	Yes	Fig.3	15,500
		●	4		63	42	300	40	8.0	+10°	-5.5°	Yes	Fig.4	13,500

Recommended Cutting Conditions **M252**
End Mill Spare Parts and Applicable Inserts **M251**

MRX Modular End Mill (Metric Size)



Toolholder Dimensions (Metric Size)

Part Number	Stock	No. of Inserts	Dimensions (mm)									Rake Angle (°)		Coolant Hole	Applicable Inserts	Max. RPM
			RE	DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	A.R. (Max.)	R.R.			
MRX 16-M08-08-2T	●	2	4	16	14.7	8.5	43	25	M8xP1.25	12	4	+3°	-5.5°	No	RDMT08 RDGT08	38,000
20-M10-08-2T	●	2	4	20	18.7	10.5	49	30	M10xP1.50	15	4	+10°	-5.5°	Yes		32,000
25-M12-08-4T	●	4		25	23.0	12.5	57	35	M12xP1.75	19		28,000				
MRX 20-M10-10-2T	●	2	5	20	18.7	10.5	49	30	M10xP1.50	15	5	+5°	-8.0°	No	RPMT10 RPGT10	30,000
25-M12-10-3T	●	3	5	25	23.0	12.5	57	35	M12xP1.75	19	5	+10°	-5.5°	Yes		28,000
32-M16-10-4T	●	4		32	30.0	17.0	63	40	M16xP2.00	24		22,500				
MRX 32-M16-12-3T	●	3	6	32	30.0	17.0	63	40	M16xP2.00	24	6	+10°	-5.5°	Yes	RPMT12 RPGT12	24,500
40-M16-12-4T	●	4		40	30.0	17.0	63	40	M16xP2.00	24		RPMW12	21,000			
MRX 40-M16-16-2T	●	2	8	40	30.0	17.0	63	40	M16xP2.00	24	8	+10°	-5.5°	Yes	RPMT16 RPGT16 RPMW16	18,000

End Mill Spare Parts and Applicable Inserts (Inch / Metric Size)

Part Number	Spare Parts				Applicable Inserts
	Clamp Screw	Wrench		Anti-seize Compound	
		DTPM	TTP		
MRX ...-08...	SB-2555TRP	DTPM-8	-	P-37	RDMT0803M0ER-GM RDGT0803M0ER-GM RDGT0803M0ER-SM RDMT0803M0EN-GH
	Recommended Torque for Insert Clamp 1.2 N·m				※1
MRX ...-10...	SB-3070TRP	DTPM-10	-	P-37	RPMT10T3M0ER-GM RPGT10T3M0ER-GM RPGT10T3M0ER-SM RPMT10T3M0EN-GH
	Recommended Torque for Insert Clamp 2.0 N·m				※2
MRX ...-12...	SB-4090TRPN	DTPM-15	-	P-37	RPMT1204M0ER-GM RPGT1204M0ER-GM RPGT1204M0ER-SM RPMT1204M0EN-GH RPMW1204M0TN
	Recommended Torque for Insert Clamp 3.5 N·m				※3
MRX ...-16...	SB-50120TRP	-	TTP-20	P-37	RPMT1605M0ER-GM RPGT1605M0ER-GM RPGT1605M0ER-SM RPMT1605M0EN-GH RPMW1605M0TN
	Recommended Torque for Insert Clamp 4.5 N·m				※4

Recommended Cutting Conditions M252

Caution with Max. Revolution

When running an end mill or a cutter at the maximum revolution, the insert or cutter may be damaged by centrifugal force.

Coat Anti-Seize Compound (P-37) thinly on portion of taper and thread prior to installation.

Pre-Set Torque Wrench sold separately.

※1...Not compatible with conventional RPMT08T2M0-H inserts

※2...Not compatible with conventional RPMT10T3M0 inserts (without ER-.. or EN-..)

※3...Not compatible with conventional RPMT1204M0 or RPMT1204M0-H inserts (without ER-.. or EN-..)

※4...Not compatible with conventional RPMT1605M0-H inserts.

◆ Recommended Cutting Conditions

Workpiece Material	Recommended Chipbreaker per Material (fz: ipt)					Recommended Insert Grades (Cutting Speed Vc: sfm)			
	RD..08... : D.O.C. = 0.079" RP..10... : D.O.C. = 0.098"		RP..12... : D.O.C. = 0.118" RP..16... : D.O.C. = 0.158"			MEGACOAT NANO			CVD Coated Carbide
	RDMT-GM RPMT-GM	RDGT-GM RPGT-GM	RDGT-SM RPGT-SM	RDMT-GH RPMT-GH	RPMW	PR1535	PR1525	PR1510	CA6535
Carbon Steel	★ 0.004~ 0.008 ~0.012	☆ 0.004~ 0.008 ~0.012	☆ 0.002~ 0.006 ~0.008	☆ 0.006~ 0.012 ~0.014	☆ 0.006~ 0.012 ~0.016	☆ 390~ 590 ~820	★ 390~ 590 ~820	-	-
Alloy Steel	★ 0.004~ 0.008 ~0.012	☆ 0.004~ 0.008 ~0.012	☆ 0.002~ 0.006 ~0.008	☆ 0.006~ 0.012 ~0.014	☆ 0.006~ 0.012 ~0.016	☆ 330~ 520 ~720	★ 330~ 520 ~720	-	-
Mold Steel	★ 0.004~ 0.006 ~0.010	☆ 0.004~ 0.006 ~0.010	☆ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.012	☆ 0.006~ 0.008 ~0.012	☆ 260~ 460 ~590	★ 260~ 460 ~590	-	-
Austenitic Stainless Steel	☆ 0.004~ 0.006 ~0.008	☆ 0.004~ 0.006 ~0.008	★ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.010	☆ 0.006~ 0.008 ~0.010	★ 330~ 520 ~660	☆ 330~ 520 ~660	-	-
Martensitic Stainless Steel	☆ 0.004~ 0.006 ~0.008	☆ 0.004~ 0.006 ~0.008	★ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.010	☆ 0.006~ 0.008 ~0.010	☆ 490~ 660 ~820	-	-	★ 590~ 790 ~980
Precipitation Hardened Stainless Steel	☆ 0.004~ 0.006 ~0.008	★ 0.004~ 0.006 ~0.008	☆ 0.002~ 0.005 ~0.008	☆ 0.006~ 0.008 ~0.010	☆ 0.006~ 0.008 ~0.010	★ 300~ 390 ~490	-	-	-
Gray Cast Iron	★ 0.004~ 0.008 ~0.012	☆ 0.004~ 0.008 ~0.012	-	☆ 0.006~ 0.012 ~0.014	☆ 0.006~ 0.012 ~0.016	-	-	★ 390~ 590 ~820	-
Nodular Cast Iron	★ 0.004~ 0.006 ~0.010	☆ 0.004~ 0.006 ~0.010	-	☆ 0.006~ 0.008 ~0.012	☆ 0.006~ 0.010 ~0.014	-	-	★ 330~ 490 ~660	-
Ni-base Heat Resistant Alloy	☆ 0.004~ 0.005 ~0.006	★ 0.004~ 0.005 ~0.006	☆ 0.002~ 0.004 ~0.006	☆ 0.005~ 0.006 ~0.008	☆ 0.005~ 0.006 ~0.008	☆ 70~ 100 ~160	-	-	★ 70~ 100 ~160
Titanium Alloy	☆ 0.004~ 0.005 ~0.006	☆ 0.004~ 0.005 ~0.006	★ 0.002~ 0.004 ~0.006	-	-	★ 130~ 200 ~260	-	☆ 100~ 160 ~230	-

- Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy. ★: 1st Recommendation ☆: 2nd Recommendation
- RDGT / RPGT are recommended for Stainless Steel, Ni-base Heat Resistant Alloy, and Titanium Alloy.
- The figure in bold font is the starting value of the recommended cutting conditions. 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 D.O.C. is RE/2 (0.079" for RD..08 / 0.098" for RP..10 / 0.118" for RP..12 / 0.158" for RP..16). For other D.O.C., calculate the recommended feed rate based on the conversion factor below.
- For MRX16-S16-08-2T(-160), MRX16-W08-2T, MRX20-S20-10-2T(-180), MRX20-W20-10-2T, MRX0625-W625-08-2T, MRX0625-S625-08-2T-6 set the feed rate no higher than 50% of the recommended cutting conditions.

● Conversion Factor for Feed Per Tooth by Depth of Cut (D.O.C.)

Insert	D.O.C. (Max.)	Conversion Factor for Feed Per Tooth									
		D.O.C. = 0.020" (0.5mm)	D.O.C. = 0.039" (1.0mm)	D.O.C. = 0.059" (1.5mm)	D.O.C. = 0.079" (2.0mm)	D.O.C. = 0.098" (2.5mm)	D.O.C. = 0.118" (3.0mm)	D.O.C. = 0.158" (4.0mm)	D.O.C. = 0.197" (5.0mm)	D.O.C. = 0.236" (6.0mm)	D.O.C. = 0.315" (8.0mm)
RD..08... (GM/SM/GH Chipbreaker)	0.158" (4mm)	1.7	1.3	1.1	1.0 (Standard)	0.9	0.8	0.8	-	-	-
RP..10... (GM/SM/GH Chipbreaker)	0.197" (5mm)	1.9	1.4	1.2	1.0	1.0 (Standard)	0.9	0.8	0.8	-	-
RP..12... (GM/SM/GH Chipbreaker)	0.236" (6mm)	2.1	1.5	1.3	1.1	1.0	1.0 (Standard)	0.9	0.8	0.8	-
RP..16... (GM/SM/GH Chipbreaker)	0.315" (8mm)	2.4	1.7	1.4	1.3	1.1	1.1	1.0 (Standard)	0.9	0.8	0.8

Calculation Example (RPMT12, Carbon Steel, GM Chipbreaker, D.O.C. = 0.039")

$fz = 0.008 \text{ ipt}$ (Standard value for carbon steel and GM chipbreaker)	×	1.5 (Conversion factor for ROMU12 type, D.O.C. = 0.039")	=	$fz = 0.012 \text{ ipt}$ (Recommended feed rate)
--	---	---	---	---

● Max. D.O.C. and Usable Edges

Usable Edges	Insert Corner-R			
	R4	R5	R6	R8
3 Edges	D.O.C. = 0.079"~0.158"	D.O.C. = 0.098"~0.197"	D.O.C. = 0.118"~0.236"	D.O.C. = 0.158"~0.315"
6 Edges	Less than D.O.C. = 0.079"	Less than D.O.C. = 0.098"	Less than D.O.C. = 0.118"	Less than D.O.C. = 0.158"

Drilling Conditions

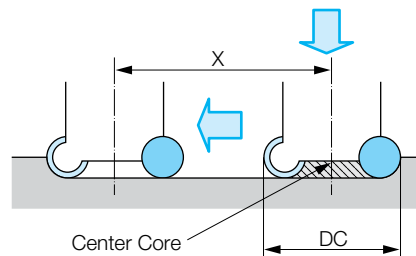
[Drilling Depth]

See Max. Cutting Depth (**Pd**) in the table below.

[Traversing After Drilling]

Caution when Traversing right after Drilling

- ① Reduce the table feed by 50% of the recommended conditions until the center core part is completely cut off. The internal cutting edge's radial rake angle is large in the negative direction.
- ② Min cutting length for flat bottom face (**X**) is in the table to the right.

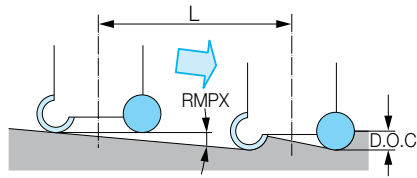


Inch					Metric				
Inch Tool Spec.		Max D.O.C.	Max. Cutting Depth (Pd)	Min. Cutting Length for flat bottom face (X)	Metric Tool Spec.		Max D.O.C.	Max. Cutting Depth (Pd)	Min. Cutting Length for flat bottom face (X)
Insert	Tool Dia.				Insert	Tool Dia. Metric			
RD..08	0.625	0.157	0.028	0.349	RD..08	16	4	0.7	9
	0.750	0.157	0.055	0.474		20	4	1.4	13
	1.000	0.157	0.055	0.724		25	4	1.4	18
RP..10	0.750	0.197	0.024	0.396	RP..10	20	5	0.6	11
	1.000	0.197	0.075	0.646		25	5	1.9	16
	1.250	0.197	0.075	0.896		32	5	1.9	23
	1.500	0.197	0.075	1.146		40	5	1.9	31
	2.000	0.197	0.075	1.646		50	5	1.9	41
	2.500	0.197	0.075	2.146		63	5	1.9	54
RP..12	1.250	0.236	0.094	0.817	RP..12	32	6	2.4	21
	1.500	0.236	0.094	1.067		40	6	2.4	29
	2.000	0.236	0.094	1.567		50	6	2.4	39
	2.500	0.236	0.094	2.067		63	6	2.4	52
	3.000	0.236	0.094	2.567		80	6	2.4	69
	4.000	0.236	0.094	3.567		100	6	2.4	89
RP..16	1.500	0.315	0.134	0.909	RP..16	40	8	3.4	25
	2.000	0.315	0.134	1.409		50	8	3.4	35
	2.500	0.315	0.134	1.909		63	8	3.4	48
	3.000	0.315	0.134	2.409		80	8	3.4	65
	4.000	0.315	0.134	3.409		100	8	3.4	85
	5.000	0.315	0.134	4.346		125	8	3.4	110

• Above value is based on the clearance of 0.039" between the tool and the workpiece.

Ramping Conditions

- Ramping angle should be under **RMPX** (maximum ramping angle) in the table below.
- Feed rate should be under 70% of the cutting conditions on [page M252](#)



Inch						Metric					
Inch Tool Spec.		Max D.O.C.	Max Ramping Angle RMPX	tan RMPX	Max. Cutting Length at Max. Ramping Angle (L)	Metric Tool Spec.		Max D.O.C.	Max Ramping Angle RMPX	tan RMPX	Max. Cutting Length at Max. Ramping Angle (L)
Insert	Tool Dia.					Insert	Tool Dia.				
RD..08	0.625	0.157	7°	0.123	1.282	RD..08	16	4	8°	0.141	28
	0.750	0.157	9°	0.158	0.994		20	4	9°	0.158	25
	1.000	0.157	5°	0.087	1.800		25	4	5°	0.087	45
RP..10	0.750	0.197	4°	0.070	2.816	RP..10	20	5	5°	0.087	57
	1.000	0.197	9°	0.158	1.243		25	5	10°	0.176	28
	1.250	0.197	6°	0.105	1.873		32	5	6°	0.105	47
	1.500	0.197	4°	0.070	2.816		40	5	4°	0.070	71
	2.000	0.197	3°	0.052	3.757		50	5	3°	0.052	95
	2.500	0.197	2°	0.035	5.640		63	5	2°	0.035	143
RP..12	1.250	0.236	9°	0.158	1.491	RP..12	32	6	9°	0.158	37
	1.500	0.236	6°	0.105	2.248		40	6	5°	0.087	68
	2.000	0.236	4°	0.070	3.379		50	6	4°	0.070	85
	2.500	0.236	2°	0.035	6.768		63	6	2°	0.035	171
	3.000	0.236	2°	0.035	6.768		80	6	2°	0.035	171
	4.000	0.236	1°	0.017	13.498		100	6	1°	0.017	343
RP..16	1.500	0.315	12°	0.213	1.481	RP..16	40	8	11°	0.194	41
	2.000	0.315	6°	0.105	2.997		50	8	7°	0.123	65
	2.500	0.315	4°	0.070	4.506		63	8	4°	0.070	114
	3.000	0.315	3°	0.052	6.011		80	8	3°	0.052	152
	4.000	0.315	2°	0.035	9.025		100	8	2°	0.035	229
	5.000	0.315	1°	0.017	17.998		125	8	1°	0.017	458

- Above value is based on the clearance of 0.039" between the tool and the workpiece.

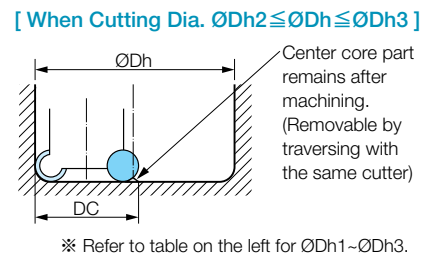
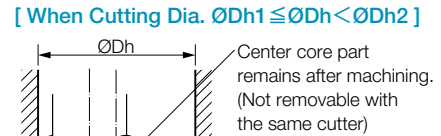
Helical Milling Conditions

- Sinking depth (**h**) when helical milling should be under **Max D.O.C.** in table below.
Sinking angle **α** (with trajectory of the center line of tool) should be under **RMPX** (maximum ramping angle) in cutting conditions on [page M254](#).
- Feed rate should be under 70% of cutting conditions on [page M252](#).
- Climb milling is recommended.

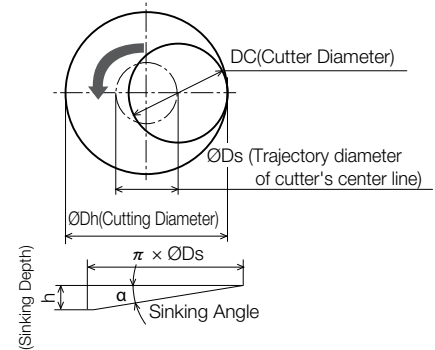
Formula for Sinking Depth (h)
 $h = \pi \times \text{ØDs} \times \text{RMPX}$
 (h should be under D.O.C.)
 (α should be under RMPX)

ØDs (Trajectory diameter of cutter's center line)
 $\text{ØDs} = \text{ØDh} - \text{DC}$

Requirements for Removing Core



Helical Milling Factors



Inch						Metric					
Inch Tool Spec.		Max D.O.C.	Min. Cutting Dia. ØDh1	Min. Cutting Dia. for flat bottom facing ØDh2	Max. Cutting Dia. ØDh3	Metric Tool Spec.		Max D.O.C.	Min. Cutting Dia. ØDh1	Min. Cutting Dia. for flat bottom facing ØDh2	Max. Cutting Dia. ØDh3
Insert	Tool Dia.					Insert	Tool Dia.				
RD..08	0.625	0.157	0.787	0.935	1.171	RD..08	16	4	20	24	30
	0.750	0.157	0.984	1.185	1.421		20	4	26	32	38
	1.000	0.157	1.457	1.685	1.921		25	4	36	42	48
RP..10	0.750	0.197	0.945	1.106	1.421	RP..10	20	5	26	30	38
	1.000	0.197	1.299	1.606	1.921		25	5	33	40	48
	1.250	0.197	1.811	2.106	2.421		32	5	47	54	62
	1.500	0.197	2.323	2.606	2.921		40	5	63	70	78
	2.000	0.197	3.307	3.606	3.921		50	5	83	90	98
	2.500	0.197	4.331	4.606	4.921		63	5	109	116	124
RP..12	1.250	0.236	1.654	2.028	2.421	RP..12	32	6	43	52	62
	1.500	0.236	2.165	2.528	2.921		40	6	59	68	78
	2.000	0.236	3.150	3.528	3.921		50	6	79	88	98
	2.500	0.236	4.173	4.528	4.921		63	6	105	114	124
	3.000	0.236	5.157	5.528	5.921		80	6	139	148	158
	4.000	0.236	7.165	7.528	7.921		100	6	179	188	198
RP..16	1.500	0.315	1.890	2.370	2.921	RP..16	40	8	51	64	78
	2.000	0.315	2.874	3.370	3.921		50	8	71	84	98
	2.500	0.315	3.858	4.370	4.921		63	8	97	110	124
	3.000	0.315	4.882	5.370	5.921		80	8	131	144	158
	4.000	0.315	6.890	7.370	7.921		100	8	171	184	198
	5.000	0.315	8.740	9.244	9.795		125	8	221	234	248

- Above value is based on the clearance of 0.039" between the tool and the workpiece.

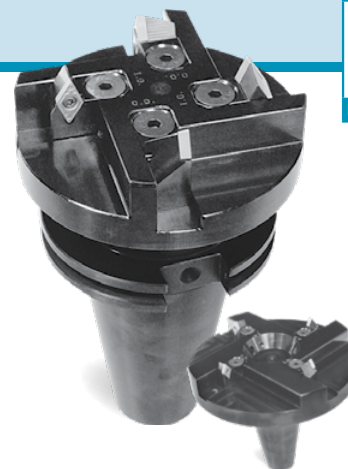
Case Studies

304 Stainless Steel	
<ul style="list-style-type: none"> Nozzle Parts Vc = 370 sfm fz = 0.006 ipt D.O.C. × ae = 0.039" × 2.559" Dry MRX100R-12-9T-M (9 Flutes) RPGT1204M0ER-SM (PR1535) 	
PR1535	450 pcs / Edge
Conventional	100 pcs / Edge
Cost savings with 4.5 times longer tool life with 1.5 times more insert edges. MRX prevented burr formation and improved surface finish. (User Evaluation)	

H13 Tool Steel (47~49HRC)	
<ul style="list-style-type: none"> Mold Parts Vc = 410 sfm fz = 0.010 ipt D.O.C. × ae = 0.039~0.079" × 0.394" Dry MRX20-S20-08-2T (2 Flutes) RDGT0803M0ER-GM (PR1525) 	
PR1525	2 pcs with Stable Machining
Conventional	1pc with Unstable Tool Life
Conventional tool only machined 1 workpiece due to unstable tool life, but the MRX doubled the tool life with stable machining. (User Evaluation)	

API Ring Groover

Kyocera is the only choice for economical ring groovers. Featuring an integral shank for maximum rigidity, Kyocera's API Ring Groovers are the most versatile ring grooving tools on the market.

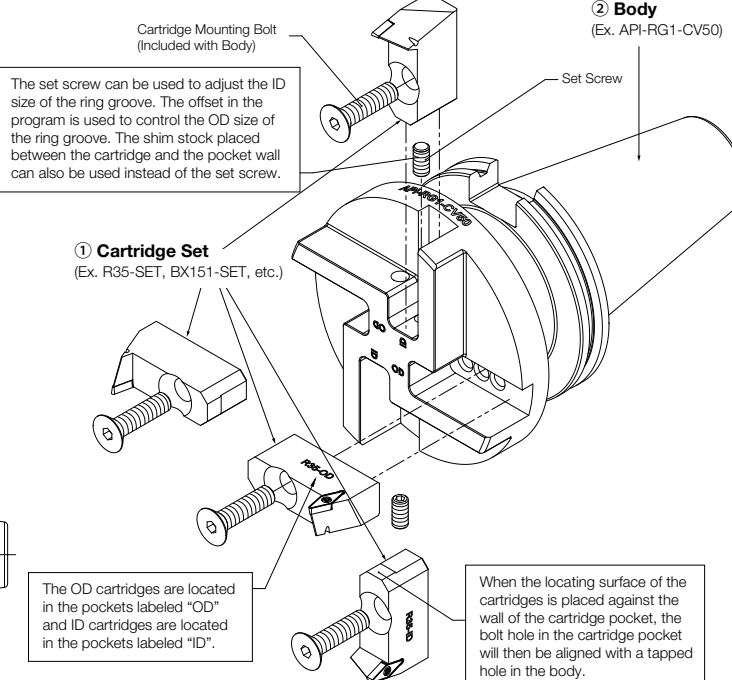
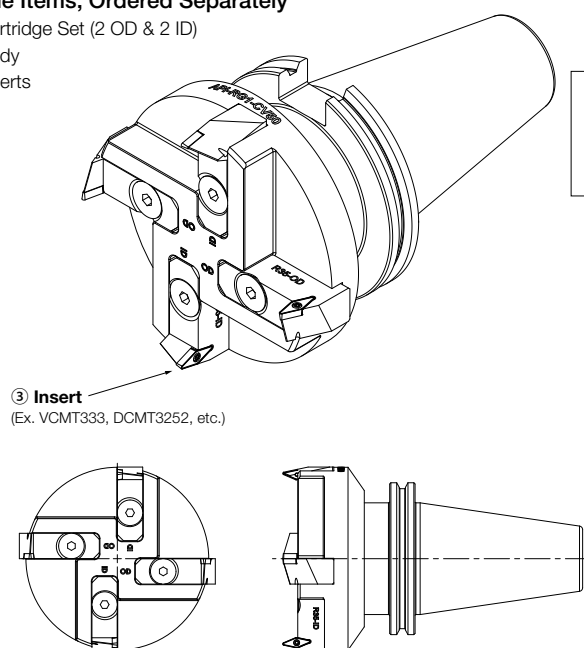


ADVANTAGES

- Create ring grooves per API Spec 6A for BX, R, and RX style grooves
- Roughout and finish of inlay of API Ring Grooves
- Replaceable cartridges allow a single cutter body to produce multiple size API grooves
- Integral shank, multiple sizes and styles available

3 Line Items, Ordered Separately

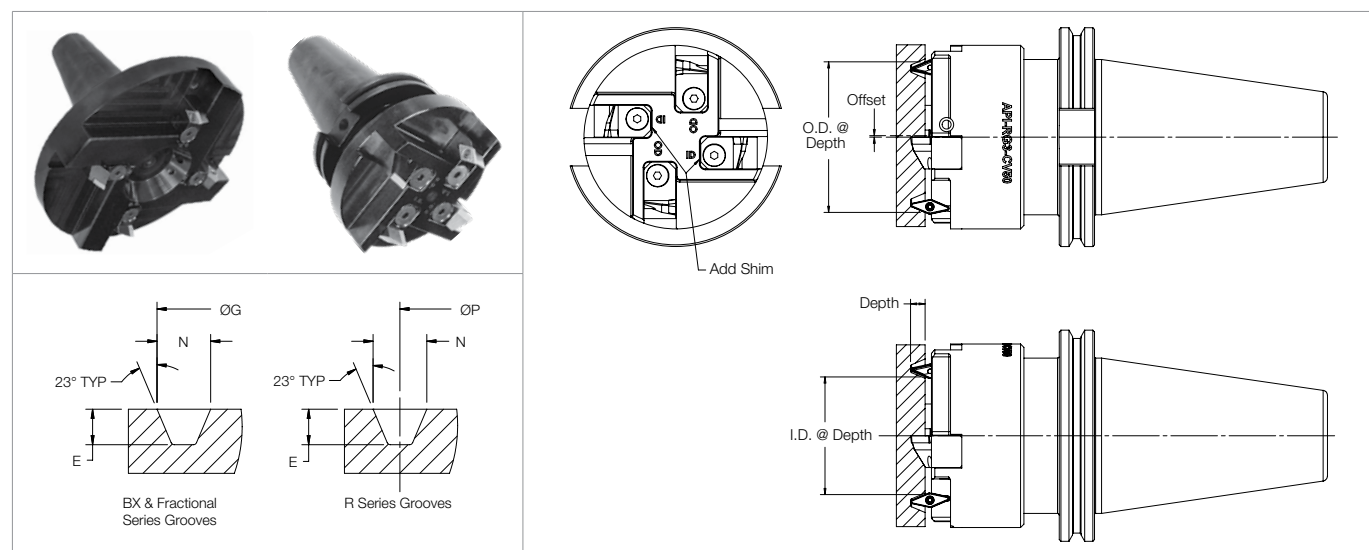
- ① Cartridge Set (2 OD & 2 ID)
- ② Body (Ex. API-RG1-CV50)
- ③ Inserts



Inserts
45°~70° Lead Angle
75° Lead Angle
90°/88° Lead Angle
High Feed Milling
Finish Milling
Multi-Function
Slot Mill
Ball-Nose Radius
Other Applications

M
MILLING

API Ring Groover Dimensions



See Dimension Table  M257

API RING GROOVER

● Ring / Cartridge Set Dimensions

Ring Specification	① Cartridge Set Part Number Choose Set	Stock	No. of Inserts	No. of Flutes	Dimensions (in)							Roughout Cartridges	Applicable Body Part Number
					Offset	Pitch	OD	Width	Depth	OD	ID		
						P	G	N	E	Depth	Depth		
BX-150	BX150-SET	●	4	2	0.061	-	2.893	0.450	0.220	2.771	2.115	-	API-RG-3-CV40 API-RG-3-CV50 API-RG-3-BT50 API-RG-3-DIN-69871
BX-150-R	BX150-R-SET	●		1	0.097	-	3.341	0.841	0.485	3.147	1.853	Yes	
BX-151	BX151-SET	●	4	2	0.065	-	3.062	0.466	0.220	2.932	2.260	-	API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871
BX-151-R	BX151-R-SET	●	4	1	0.097	-	3.496	0.846	0.485	3.302	1.998	Yes	API-RG-3-CV40 API-RG-3-CV50 API-RG-3-BT50 API-RG-3-DIN-69871
BX-152	BX152-SET	●	4	2	0.069	-	3.395	0.498	0.230	3.257	2.537	-	API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871
BX-152-R	BX152-R-SET	●		1	0.091	-	3.826	0.876	0.505	3.644	2.256	Yes	
BX-153	BX153-SET	●		2	0.077	-	4.046	0.554	0.270	3.892	3.092	-	
BX-153-R	BX153-R-SET	●		1	0.110	-	4.486	0.936	0.535	4.266	2.834	Yes	
BX-154	BX154-SET	●		2	0.083	-	4.685	0.606	0.300	4.519	3.369	-	
BX-154-R	BX154-R-SET	●		1	0.112	-	5.116	0.971	0.570	4.892	3.398	Yes	
BX-155	BX155-SET	●	4	2	0.100	-	5.930	0.698	0.330	5.730	4.734	-	API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871
BX-155-R	BX155-R-SET	●		1	0.223	-	6.366	1.076	0.595	5.920	4.660	Yes	
BX-156	BX156-SET	●	4	2	0.132	-	9.521	0.921	0.440	9.257	7.943	-	API-RG-4-CV50 API-RG-4-BT50 API-RG-4-DIN-69871
BX-156-R	BX156-R-SET	●		1	0.166	-	9.956	1.306	0.710	9.624	7.676	Yes	
BX-169	BX169-SET	●	4	2	0.081	-	6.955	0.666	0.380	6.793	5.785	-	API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871
R-16	R16-SET	●	4	2	0.026	2.000	-	0.344	0.250	2.292	1.708	-	API-RG-3-CV40 API-RG-3-CV50 API-RG-3-BT50 API-RG-3-DIN-69871
R-18	R18-SET	●				2.375				2.667	2.083	-	
R-20	R20-SET	●				2.688				2.980	2.396	-	
R-23	R23-SET	●	4	2	0.046	3.250	-	0.469	0.310	3.627	2.873	-	API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871
R-23-R	R23-R-SET	●		1	0.081	3.300				3.994	2.606	Yes	
R-24	R24-SET	●		2	0.046	3.750				4.127	3.373	-	
R-24-R	R24-R-SET	●		1	0.077	3.800				4.517	3.083	Yes	
R-26	R26-SET	●		2	0.046	4.000				4.377	3.623	-	
R-27	R27-SET	●				4.250				4.627	3.873	-	
R-31	R31-SET	●	4	2	0.044	4.875	-	0.469	0.310	5.256	4.494	-	API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871
R-31-R	R31-R-SET	●		1	0.072	4.920				5.632	4.208	Yes	
R-35	R35-SET	●		2	0.046	5.375				5.752	4.998	-	
R-35-R	R35-R-SET	●		1	0.081	5.420				6.114	4.726	Yes	
R-37	R37-SET	●		2	0.046	5.875				6.252	5.498	-	
R-39	R39-SET	●				6.375				6.752	5.998	-	
R-39-R	R39-R-SET	●		1	0.081	6.420				7.114	5.726	Yes	
R-41	R41-SET	●		2	0.046	7.125				7.502	6.748	-	
R-44	R44-SET	●				7.625				8.002	7.248	-	
R-44-R	R44-R-SET	●		1	0.071	7.670				8.384	6.956	Yes	
R-45	R45-SET	●		2	0.046	8.313				8.690	7.936	-	
R-46	R46-SET	●				0.048				8.748	7.878	-	
R-46-R	R46-R-SET	●		1	0.082	8.360				9.112	7.608	Yes	
1-13/16	1-13/16-SET	●	4	2	0.034	-	4.373	0.377	0.258	4.305	3.687	-	API-RG-1-CV40 API-RG-1-CV50 API-RG-1-BT50 API-RG-1-BT40 API-RG-1-DIN-69871
2-1/16-10K	2-1/16-10K-SET	●					4.623			4.555	3.937	-	
2-9/16-15K	2-9/16-15K-SET	□	4	2	0.034	-	5.873	0.377	0.258	5.805	5.187	-	API-RG-2-CV50 API-RG-2-BT50 API-RG-2-DIN-69871
3-1/16-10K	3-1/16-10K-SET	●				-	5.748			5.680	5.062	-	
4-1/16-10K	4-1/16-10K-SET	●				-	7.123			7.055	6.437	-	
5-1/8-10K	5-1/8-10K-SET	●				-	8.748			8.680	8.062	-	

● Applicable Body Stock

② Body Part Number Choose Body	Stock	Shank	Body Spare Parts	
			Mounting Bolt	Set Screw
API-RG-1-CV40	●	CAT40	01-05	01-08
API-RG-1-CV50	●	CAT50		
API-RG-1-BT50	●	BT50		
API-RG-1-BT40	□	BT40		
API-RG-1-DIN-69871	□	DIN69871		
API-RG-2-CV50	●	CAT50	01-05	01-08
API-RG-2-BT50	●	BT50		
API-RG-2-DIN-69871	□	DIN69871		
API-RG-3-CV40	●	CAT40	01-06	01-09
API-RG-3-CV50	●	CAT50		
API-RG-3-BT50	□	BT50		
API-RG-3-DIN-69871	□	DIN69871		
API-RG-4-CV50	●	CAT50	01-07	01-10
API-RG-4-BT50	□	BT50		
API-RG-4-DIN-69871	□	DIN69871		

● Note

The OD and ID dimensions are to set the cut diameter of a given cartridge set using a presetter. The dimensions are the cut diameter of the tool at the depth of the ring groove. By setting zero at the nose radius then moving the presetter to the depth of the API groove the OD and ID can be preset to the dimensions shown.



See illustration on page [M256](#)



Cartridge Set Spare Parts & Applicable Inserts [M258](#)

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T

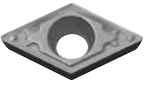

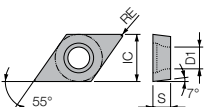

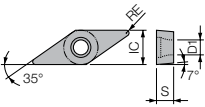
API RING GROOVER

● Cartridge Set Spare Parts & Applicable Inserts

Ring Specification	Cartridge Set Part Number	Spare Parts		③ Applicable Inserts Choose Inserts
		Clamp Screw 	Wrench 	
BX-150	BX150-SET	SCR-02	T15	DCMT3252
BX-150-R	BX150-R-SET			DCMT3253
BX-151	BX151-SET			DCMT3252
BX-151-R	BX151-R-SET			DCMT3253
BX-152	BX152-SET			DCMT3252
BX-152-R	BX152-R-SET			DCMT3253
BX-153	BX153-SET			DCMT3252
BX-153-R	BX153-R-SET			DCMT3253
BX-154	BX154-SET			DCMT3252
BX-154-R	BX154-R-SET			DCMT3253
BX-155	BX155-SET			DCMT3252
BX-155-R	BX155-R-SET			VCMT333
BX-156	BX156-SET			VCMT332
BX-156-R	BX156-R-SET			VCMT333
BX-169	BX169-SET			VCMT332
R-16	R16-SET	SCR-01	T7	VCMT222
R-18	R18-SET			
R-20	R20-SET			
R-23	R23-SET	SCR-02	T15	DCMT3252
R-23-R	R23-R-SET			VCMT333
R-24	R24-SET			DCMT3252
R-24-R	R24-R-SET			VCMT333

Ring Specification	Cartridge Set Part Number	Spare Parts		③ Applicable Inserts Choose Inserts
		Clamp Screw 	Wrench 	
R-26	R26-SET	SCR-02	T15	DCMT3252
R-27	R27-SET			
R-31	R31-SET			
R-31-R	R31-R-SET			
R-35	R35-SET			VCMT333
R-35-R	R35-R-SET			DCMT3252
R-37	R37-SET			VCMT333
R-39	R39-SET			DCMT3252
R-39-R	R39-R-SET			VCMT333
R-41	R41-SET			DCMT3252
R-44	R44-SET			
R-44-R	R44-R-SET			
R-45	R45-SET			
R-46	R46-SET			VCMT333
R-46-R	R46-R-SET			
1-13/16	1-13/16-SET	SCR-01	T7	VCMT222
2-1/16-10K	2-1/16-10K-SET			
2-9/16-15K	2-9/16-15K-SET			
3-1/16-10K	3-1/16-10K-SET			
4-1/16-10K	4-1/16-10K-SET			
5-1/8-10K	5-1/8-10K-SET			

● Applicable Inserts (Inch Size)

Insert	ANSI Part Number	ISO Part Number	Dimensions (in)				Insert Grades					
							CVD Coated Carbide			MEGACOAT Coated Carbide		PVD Coated Carbide
			IC	S	D1	RE	CA525	CA5525	CA6525	PR1225	PR1425	PR660
  Other Applications	 55°	DCMT 3252HQ	DCMT 11T308HQ	3/8	5/32	0.173	1/32	●	●	●	△	●
		DCMT 3253CQ	DCMT 11T312CQ	3/8	5/32	0.173	3/64		●	●		●
 MILLING	 35°	VCMT 222HQ	VCMT 110308HQ	1/4	1/8	0.110	1/32			●		
		VCMT 332HQ	VCMT 160408HQ	3/8	3/16	0.173	1/32	●	●	●		●
		333HQ	160412HQ	3/8	3/16	0.173	3/64			●		

● Sample CNC Program for the API Ring Groover

Sample is shown without cutter comp.

N10 (Incremental Program)

N20 G00 X (As required) Y (As required) Z.100 M03 S (As required)

N30 G01 Z0.0 F100

N40 G91 -Y (Offset) Z-.100 F (As required)

N50 G03 J (Offset) Z-.100 F (As required)

N60 G03 J (Offset) Z-.100

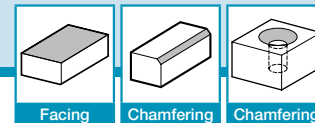
Continue to Depth

Last Pass

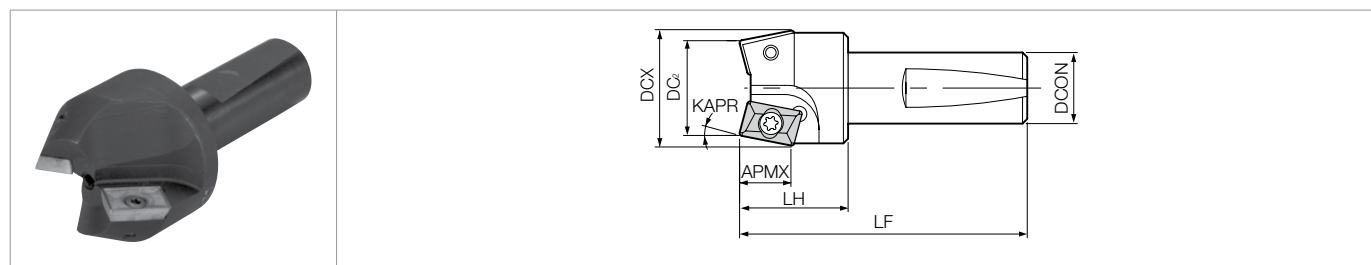
N90 G03 J (Offset) Z0.00

Use 0.03 Depth in Z for Inconel and
0.04 Depth in Z for Steel


































CM / CM-AL CHAMFERING END MILL



CM (General Purpose) / CM-AL (For Aluminum Cutting)



Toolholder Dimensions

Part Number		Stock	No. of Inserts	Dimensions (in)						Spare Parts		Applicable Inserts  M29				
										Clamp Screw	Wrench					
																
CM	0563-15-09		2	0.741	0.563	0.500	2.780	1.000	0.340	15.0°	SCR-04	T7	XPMT090208			
	0563-20-09			0.795					0.330	20.0°						
	0563-25-09			0.849					0.310	25.0°						
	0563-30-09			0.901					0.300	30.0°						
	0563-35-09			0.951	0.280	35.0°	SCR-04	T7								
	0563-45-09			1.041	0.240	45.0°										
	0563-60-09			1.165	0.160	60.0°			SCR-01	T7						
	0563-75-09			1.217	0.080	75.0°										
CM	1000-03		2	1.062	1.000	0.750	3.150	1.250	0.589	3.0°	SCR-16	T10	XPMT15T3...			
	1000-05			1.104					0.586	5.0°						
	1000-10			1.206					0.577	10.0°						
	1000-15			1.308					0.564	15.0°						
	1000-20			1.408	1.000	0.750	3.150	1.250	0.547	20.0°	SCR-30	T10				
	1000-25			1.504					0.526	25.0°						
	1000-30			1.596					0.501	30.0°						
	1000-35			1.686					0.472	35.0°						
	1000-37.5			1.744	1.000	0.750	3.150	1.250	0.456	37.5°	SCR-30	T10				
	1000-41			1.786					0.433	41.0°						
	1000-45			1.800					0.400	45.0°						
	1000-50			1.908					0.376	50.0°						
	1000-55			2.014					0.327	55.0°						
	1000-60			2.042					0.284	60.0°						
	1000-70			2.094					0.193	70.0°						
	1000-75			2.168					0.146	75.0°						
	CM	1000-15-AL			2	1.316	1.000	0.750	3.250	1.350	0.613	15.0°		SCR-02	T15	APET1604...
		1000-20-AL				1.416					0.595	20.0°				
1000-30-AL			1.608	0.544		30.0°										
0800-45-AL			1.66	0.440		45.0°	SCR-02	T15								
0800-60-AL			1.856	0.308		60.0°										
0690-75-AL			1.872	0.690		0.750			3.250	1.350	0.158	75.0°				

Recommended Cutting Conditions (EM, EM-LE, FM, FM-AL, EM-AL)

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)									
		Cermet		MEGACOAT NANO			CVD Coated Carbide	PVD Coated Carbide			Carbide
		TN100M	TC60	PR1535	PR1525	PR1510	CA6535	PR930	PR905	PR830	KW10
Low Carbon Steel	0.003~0.006	☆ 800~1400	★ 800~1400	★ 400~800	★ 400~800	-	-	☆ 350~750	-	-	-
Carbon Steel	0.003~0.006	☆ 600~1200	★ 600~1200	★ 300~700	★ 300~700	-	-	☆ 250~650	-	-	-
Mold Steel	0.003~0.006	☆ 400~700	★ 400~700	★ 250~600	★ 250~600	-	-	☆ 250~600	-	-	-
Stainless Steel	0.002~0.006	☆ 300~800	☆ 300~800	★ 300~600	☆ 300~600	-	★ 550~950	☆ 300~500	-	☆ 300~800	-
Cast Iron	0.003~0.008	☆ 400~1200	★ 400~1200	-	-	★ 400~800	-	-	★ 400~800	-	☆ 300~500
Non-ferrous Metals	0.005~0.007	☆ 1500~1800	☆ 1500~1800	-	-	-	-	-	-	-	★ 2000~4000
Heat-resistant Alloy	0.002~0.005	-	-	☆ 70~160	-	-	★ 70~160	-	-	-	-
Titanium Alloy	0.002~0.005	-	-	★ 130~260	-	☆ 100~230	-	-	-	-	-

* Apply sufficient amount of coolant

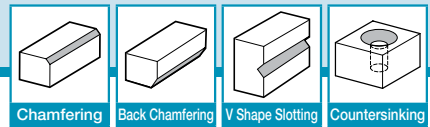
★: 1st Recommendation ☆: 2nd Recommendation

● : Standard Item △ : Phaseout Item (will be removed from next catalog)

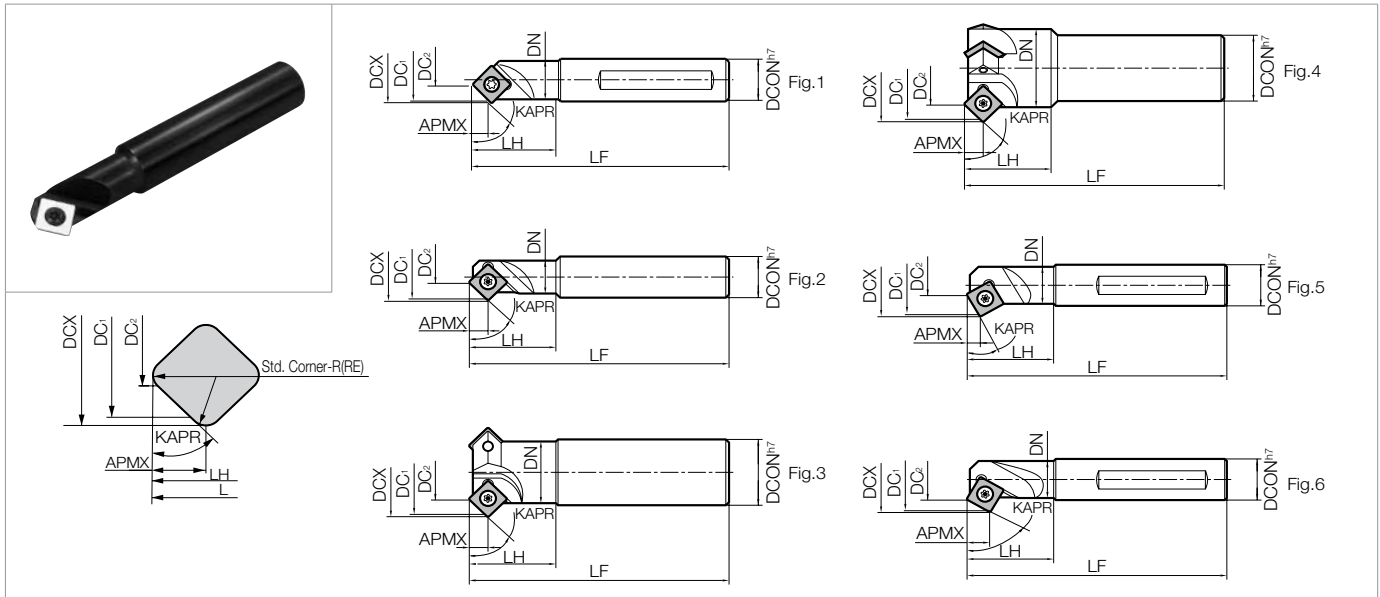
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MCSE CHAMFERING END MILL



MCSE



Toolholder Dimensions

Inserts		Part Number	Stock	No. of Inserts	Dimensions (mm)							Std. Corner-R (RE)	Angle (°)	Rake Angle (°)		Drawing	Spare Parts	
																	Clamp Screw	Wrench
					45°~70° Lead Angle	75° Lead Angle	90°/88° Lead Angle	DCX	DC ₁	DC ₂	DCON		DN	LF	LH		APMX	KAPR
High Feed Milling	MCSE 104	●	1	16.0	15	4	16	15	85	30	6.5	0.8	45°	0°	-4.5°	Fig.1	SB-3060TR	DT-10
Finish Milling	106	●	1	22.0	21	6	20	16	120	40	8.6		45°	0°	-1.0°	Fig.2	SB-5090TR	LTW-20
	115	●	1	31.0	30	15	20	18	120	40	8.6		+5.0°	SB-5090TR	LTW-20			
Multi- Function	227	●	2	43.0	42	27	32	30	120	40	8.6	0.8	45°	0°	+8.0°	Fig.3	SB-5090TR	LTW-20
Slot Mill	336	●	3	52.0	51	36	32	38	120	40	8.6	0.8	45°	0°	+10.0°	Fig.4	SB-5090TR	LTW-20
Ball-Nose Radius	MCSE 104-30D	●	1	19.0	18	4	16	15	85	30	4.7	0.8	30°	0°	-4.0°	Fig.5	SB-3060TR	DT-10
	108-30D	●	1	28.0	27	8	20	19	110	40	6.3		30°	0°	-2.5°	Fig.5	SB-5090TR	LTW-20
	110-30D	●	1	30.0	28	10	20	18	120	40	6.3				0.0°			
Other Applications	MCSE 108-60D	●	1	19.5	19	8	20	19	110	40	10.0	0.8	60°	0°	-3.5°	Fig.6	SB-5070TR	LTW-20
	120-60D	●	1	31.0	30	20	20	18	120	40	10.0				0.0°	Fig.6	SB-5090TR	LTW-20

Recommended Cutting Conditions M261

Applicable Inserts (Metric Size)

Part Number	Applicable Inserts M26		
MCSE 104	SDKW 09T204TN	SDKW 09T204FN	SDMT 31.81C
104-30D			
MCSE 106	SEKW 421TN	SEKW 421FN	SEMT 421C
115			
227			
336			
MCSE 108-30D	SEKW 422TN	SEKW 422FN	
110-30D			
MCSE 108-60D			
120-60D			

MCSE CHAMFERING END MILL

◆ Recommended Cutting Conditions

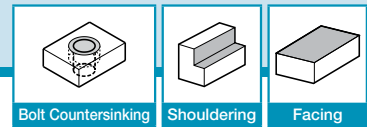
Workpiece Material	Feed Rate fz (ipt)		Recommended Insert Grades (Cutting Speed Vc: sfm)		
			Cermet	MEGACOAT	Carbide
	DC ₂ (Ø4mm~Ø20mm)	DC ₂ (Ø27mm~Ø36mm)	TN100M	PR1225	KW10
Carbon Steel	0.002~0.010	0.008~0.016	★ 330~590	★ 390~820	-
Alloy Steel	0.002~0.010	0.008~0.016	★ 330~590	★ 330~720	-
Mold Steel	0.002~0.010	0.008~0.016	★ 330~490	★ 260~590	-
Stainless Steel	0.002~0.008	0.004~0.012	☆ 330~590	★ 390~720	-
Cast Iron	0.004~0.012	0.012~0.020	-	-	☆ 260~490
Non-ferrous Metals	0.004~0.012	0.012~0.020	-	-	★ 330~980

• Use down-cut machining.

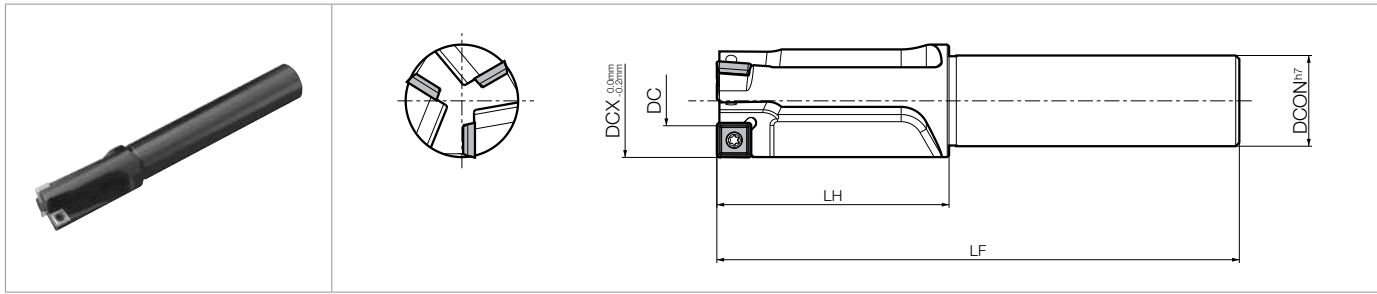
★: 1st Recommendation ☆: 2nd Recommendation

INSERT GRADES	A
TURNING INSERTS	B
GEN/PCD INSERTS	C
TURNING HOLDERS	D
SMALL TOOLS	E
BORING	F
GROOVING	G
CUT-OFF	H
THREADING	J
DILLING	K
MILLING	M
QUICK CHANGE TOOLING	N
SPARE PARTS	P
TECHNICAL	R
INDEX	T



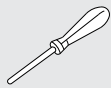




















MEF BOLT COUNTERSINKING END MILL



MEF



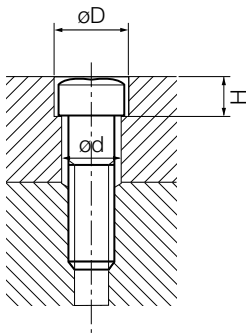
Toolholder Dimensions

Part Number	Stock	No. of Inserts	Dimensions (mm)					Std. Corner-R (RE)	Rake Angle (°)		Objective Bolt Size	Spare Parts		Applicable Inserts	
			DCX	DC	DCON	LF	LH		A.R.			R.R.	Clamp Screw	Wrench	 M28
															
MEF	11-S10		1	11.0	3.0	10	103	23	0.4	+5°	-13°	M6	SB-2250TR	DT-7	SPMT060204E-Z SPMT060208E-Z
	14-S12			14.0	4.5	12	108	28		M8	SB-2260TR				
	17-S16		2	17.5	7.3	16	115	35	0.4	+5°	-13°	M10	SB-2260TR	DT-7	
	18-S16			18.0	7.7	16	117	38		-					
	20-S16		3	20.0	9.5	16	120	40	0.4	+5°	-12°	M12	SB-2260TR	DT-7	
	22-S20			22.0	11.4	20	124	44				-			
	23-S20			23.0	12.4	20	126	46				M14			
	24-S20			24.0	13.4	20	128	48				-			
	25-S20			25.0	14.4	20	130	50				-			
	26-S25		3	26.0	9.8	25	132	52	0.8	+5°	-13°	M16	SB-3080TR	DT-10	SPMT090304E-Z SPMT090308E-Z
	27-S25			27.0	10.6	25	134	54				-			
	28-S25			28.0	11.5	25	136	56				-			
	29-S25			29.0	12.6	25	138	58				M18			
	30-S25			30.0	13.5	25	140	60				-			
	32-S25			32.0	15.5	25	144	64				M20			
	35-S32			35.0	18.4	32	150	70				M22			
39-S32		4	39.0	22.5	32	158	78	0.8	+5°	-13°	M24	SB-3080TR	DT-10		
43-S32		4	43.0	26.2	32	166	86	0.8	+5°	-12°	M27	SB-3080TR	DT-10		
48-S32			48.0	31.3	32	176	96				M30				

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

Recommended Cutting Conditions M263

Bolt Counter Sink (Hexagon Socket Head Cap Screw)



Nominal Screw Size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
øD (mm)	11.0	14.0	17.5	20.0	23.0	26.0	29.0	32.0	35.0	39.0	43.0	48.0
H (mm)	6.5	8.6	10.8	13.0	15.2	17.5	19.5	21.5	23.5	25.5	29.0	32.0
ød (mm)	6.6	9.0	11.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	30.0	33.0
Applicable End Mill	MEF11	MEF14	MEF17	MEF20	MEF23	MEF26	MEF29	MEF32	MEF35	MEF39	MEF43	MEF48

■ Inch Size Counterbores and Countersinks Available on Page K124~K125

MEF BOLT COUNTERSINKING END MILL

Recommended Cutting Conditions

Workpiece Material	fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)		
		MEGACOAT		Carbide
		PR1225	PR1210	KW10
Carbon Steel	0.004~0.006	★ 390~720	-	-
Alloy Steel	0.004~0.006	★ 390~720	-	-
Mold Steel	0.002~0.004	★ 330~590	-	-
Stainless Steel	0.002~0.004	★ 260~590	-	-
Cast Iron	0.004~0.008	-	★ 330~720	☆ 260~390
Non-ferrous Metals	0.004~0.008	-	-	★ 330~980

★: 1st Recommendation ☆: 2nd Recommendation

Points at Bolt Counter Sink Milling

① Carbon Steel

Increase the feed rate to fz = 0.004~0.006 ipt for preventing long chips at low feed rates.

Chip control is good when setting Vc = 260 sfm for MEF11~MEF25, and Vc = 390 sfm for MEF26~MEF48.

Part Number	Cutting Speed Vc (sfm)	fz (ipt)
MEF11~MEF25	260	0.004~0.006
MEF26~MEF48	390	0.004~0.006

② Sticky Materials

Step feed is recommended for good chip control

Increase the feed rate to fz = 0.004~0.006 ipt for preventing long chips at low feed rate fz = 0.002 ipt.

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

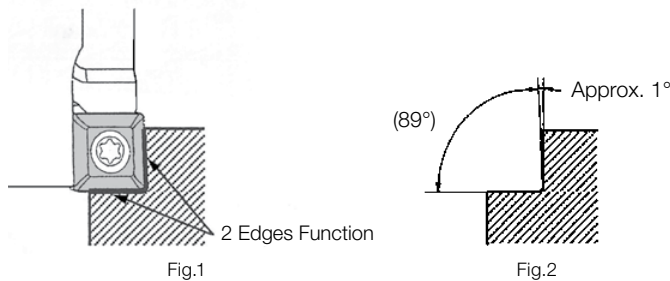
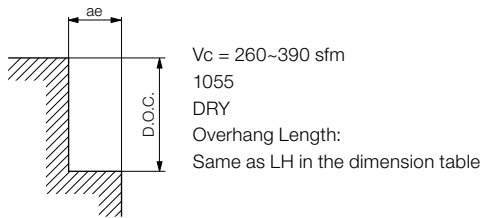
Part Number	Cutting Speed Vc (sfm)	fz (ipt)	Step Feed (inch)
MEF11~MEF48	260~490	0.004~0.006	0.020~0.059

③ Stainless Steel

Use a lower Cutting Speed. High Cutting Speeds cause chattering.

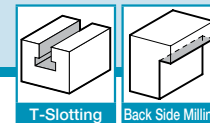
Cutting Performance when Shouldering

MEF Bolt Countersink End Mill is also recommended for shouldering.

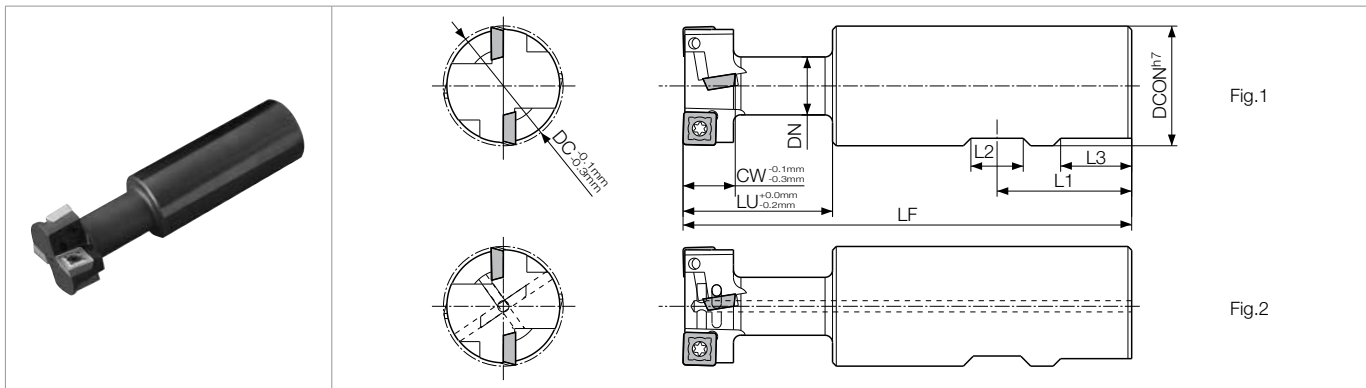


- When shouldering, both side edge and bottom edges function. Both edges wear at the same time depending on D.O.C.. The insert uses 2 edges instead of 4. (Ref. to Fig.1)
- MEF type's side edge is designed to have a slight clearance for the countersink milling. Therefore, worked side wall is approx. 1°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




Part Number	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	



METS



Toolholder Dimensions

Part Number	Stock	No. of Inserts	No. of Flutes	Dimensions (mm)									Rake Angle (°)		Drawing	Spare Parts		Applicable Inserts 
				DC	DCON	DN	CW	LF	LU	L1	L2	L3	A.R.	R.R.				
METS 21-S25	●	2	1	21	25	10.5	9	109	29	32	12	17	+9°	-10°	Fig.1	SB-2560TR	DT-8	SDMT221E-K
25-S25	●	4	2	25		12.5	11	112	32									
32-S32	●	4	2	32	32	15.5	14	120	38	36	14	19	+9°	-10°	Fig.1	SB-3060TR	DT-10	SDMT080308E-K
40-S32	●	4	2	40	32	20.5	18	130	50	36	14	19	+9°	-12°	Fig.1	SB-4085TR	DT-15	SDMT432E-K
50-S32	●			50		26.5	22	140	60									
METS 21-S25-H	●	2	1	21	25	10.5	9	109	29	32	12	17	+9°	-10°	Fig.2	SB-2560TR	DT-8	SDMT221E-K
25-S25-H	●	4	2	25		12.5	11	112	32									
32-S32-H	●	4	2	32	32	15.5	14	120	38	36	14	19	+9°	-10°	Fig.2	SB-3060TR	DT-10	SDMT080308E-K
40-S32-H	●	4	2	40	32	20.5	18	130	50	36	14	19	+9°	-12°	Fig.2	SB-4085TR	DT-15	SDMT432E-K
50-S32-H	●			50		26.5	22	140	60									

● METS---H type has air holes

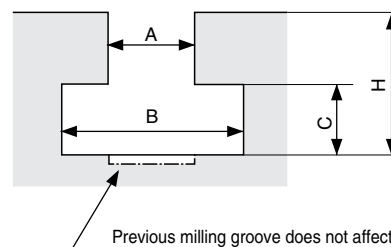
Recommended Cutting Conditions M265

Applicable Inserts

Part Number	Applicable Inserts M26	
METS 21-S25	SDMT 221E-K	
21-S25-H		
25-S25		
25-S25-H		
METS 32-S32	SDMT 080308E-K	
32-S32-H		
METS 40-S32	SDMT 432E-K	
40-S32-H		
50-S32		
50-S32-H		

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



Recommended Cutting Conditions

Workpiece Material	fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)		
		MEGACOAT		Carbide
		PR1230	PR1210	KW10
Carbon Steel	0.004~0.006	★ 330~660	-	-
Alloy Steel	0.003~0.005	★ 330~660	-	-
Mold Steel	0.002~0.004	★ 260~490	-	-
Cast Iron	0.004~0.006	-	★ 330~660	☆ 260~390
Non-ferrous Metals	0.004~0.006	-	-	★ 330~980

★: 1st Recommendation ☆: 2nd Recommendation

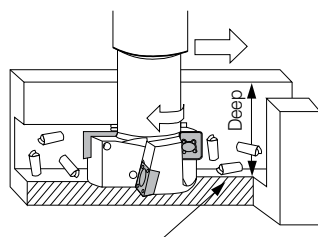
Part Number (T-Slot Nominal Size)	Steel			Cast Iron		
	Groove Shape at Pre-process	T-Slotting Conditions	Conditions to Prevent Chattering	Groove Shape at Pre-process	T-Slotting Conditions	Conditions to Prevent Chattering
METS21-S25(-H) (Nominal Size 12)	C = 0.039~0.118" 	Vc = 390 fz = 0.004 (n = 1,820) (Vf = 7.165)	Vc = 200 fz = 0.006 (n = 920) (Vf = 5.394)	C = Over 0.039" 	Vc = 390 fz = 0.005 (n = 1,820) (Vf = 8.583)	Vc = 260 fz = 0.006 (n = 1,210) (Vf = 7.165)
METS25-S25(-H) (Nominal Size 14)	C = 0.039~0.118" 	Vc = 390 fz = 0.004 (n = 1,530) (Vf = 12.047)	Vc = 200 fz = 0.006 (n = 760) (Vf = 8.976)	C = Over 0.039" 	Vc = 390 fz = 0.005 (n = 1,530) (Vf = 14.449)	Vc = 260 fz = 0.006 (n = 1,020) (Vf = 12.047)
METS32-S32(-H) (Nominal Size 18)	C = 0.039~0.118" 	Vc = 330 fz = 0.004 (n = 1,000) (Vf = 7.874)	Vc = 200 fz = 0.006 (n = 600) (Vf = 7.087)	C = Over 0.039" 	Vc = 390 fz = 0.005 (n = 1,190) (Vf = 11.260)	Vc = 260 fz = 0.006 (n = 800) (Vf = 9.449)
METS40-S32(-H) (Nominal Size 22)	C = 0.354" 	Vc = 260 fz = 0.006 Chattering is likely when set to shallower than C = 0.354".	Vc = 200 fz = 0.006 (n = 480) (Vf = 5.669)	C = Over 0.354" 	Vc = 390 fz = 0.006 (n = 960) (Vf = 8.976)	Vc = 260 fz = 0.006 (n = 640) (Vf = 7.559)
METS50-S32(-H) (Nominal Size 28)	Not recommended for steel because of chattering				Vc = 390 fz = 0.006 (n = 760) (Vf = 8.976)	Vc = 260 fz = 0.006 (n = 510) (Vf = 6.024)

[Cutting Speed : Vc (sfm), Spindle Revolution : n (min⁻¹), Feed Rate fz (ipt), Table Feed Vf (ipm)]

- Chattering is likely when fz is less than fz = 0.004 ipt. Keep feed rate between fz = 0.004~0.006 ipt.
For cast iron machining, the bigger the C-dimension becomes, the less chattering occurs.

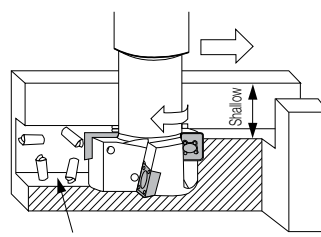
How to Prevent Damaging Chips when Steel Machining

Before Improvement (Deep Groove at Pre-Process)



Chips stay in the pre-process groove.

After Improvement (Shallow Groove at Pre-Process)



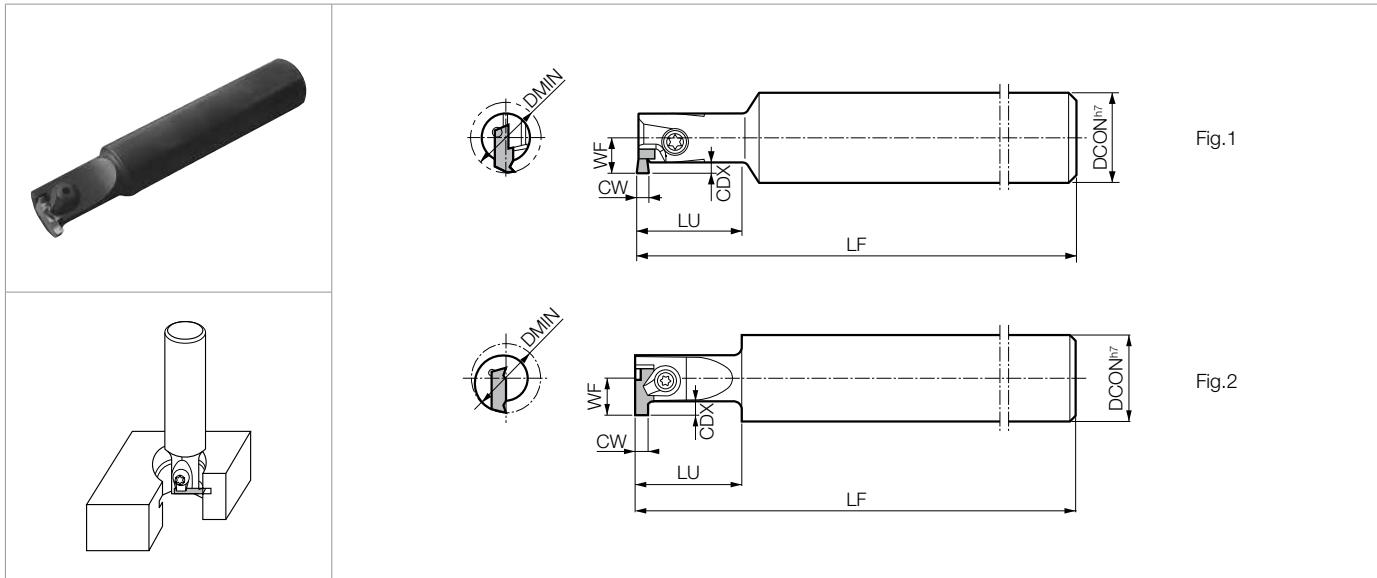
Chips are evacuated backward and chances of damaging chips are less.

Improvement
of chip biting

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

MGI GROOVING END MILL

MGI



Toolholder Dimensions

Inserts	Part Number	Stock	Min. Bore Dia.	Dimensions (mm)					Edge Width	Drawing	Spare Parts				Applicable Inserts M267
											Clamp Set		Clamp Screw	Wrench	
				DMIN	DCON	LF	LU	WF	CDX	CW	5F	6F		FT LW	
45°~70° Lead Angle	MGI 1420-1SS	●	14	20	100	20	6.8	2.2	1.0~3.0	Fig.1	-	-	SB-4065TR	FT-15	GVR...-020SS
75° Lead Angle	1620-1S	●	16	20	110	25	7.8	2.2	1.0~3.4	Fig.1	-	-	SB-4085TR	FT-15	GVR...-020S
90°/88° Lead Angle	2020-1A	●	20	20	110	30	9.8	2.2	1.0~3.4	Fig.2	CPS-5F	-	-	FT-15	GVR...-020A GVR...-...AR
High Feed Milling	2220-1B	●	22	20	110	30	11.0	2.8	1.45~4.0	Fig.2	CPS-5F	-	-	FT-15	GVR...-020B GVR...-...BR
Finish Milling	3225-1C	●	32	25	120	35	16.0	5.5 (4.5)	2.8~4.0	Fig.2	-	CPS-6F	-	LW-3	GVR...-020C
Multi-Function															
Slot Mill															
Ball-Nose Radius															
Other Applications															

- Dimension CDX shows available grooving depth.
- GVR280-020C, GVR300-020C inserts are available for groove depths up to 4.5mm.
- GVR430-020C ~ GVR500-020C inserts can be installed into MGI3225-1C and MGI4025-1C holders, but are not recommended for steel machining because of toolholder's rigidity.


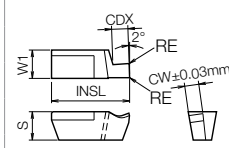

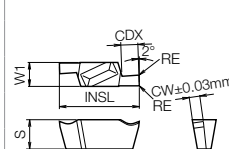
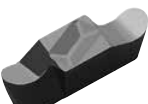
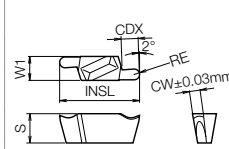
Recommended Cutting Conditions

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)					
		Cermet			MEGA COAT	PVD Coated Carbide	Carbide
		TN90	TC40	TC60	PR1225	PR930	KW10
Carbon Steel	0.002~0.006	★ 390~660	☆ 390~660	☆ 330~590	★ 260~490	☆ 260~490	-
Alloy Steel	0.002~0.006	★ 390~660	☆ 390~660	☆ 330~590	★ 260~490	☆ 260~490	-
Mold Steel	0.001~0.005	★ 330~590	☆ 330~590	☆ 260~490	★ 200~430	☆ 200~430	-
Stainless Steel	0.001~0.005	☆ 330~590	☆ 330~590	★ 260~490	★ 200~430	☆ 200~430	-
Cast Iron	0.002~0.008	★ 330~490	☆ 330~490	-	-	-	★ 260~490
Non-ferrous Metals	0.002~0.008	-	-	-	-	-	★ 330~980

- Use down-cut machining.
- ★: 1st Recommendation ☆: 2nd Recommendation

MGI GROOVING END MILL

● Applicable Inserts (Metric Size)

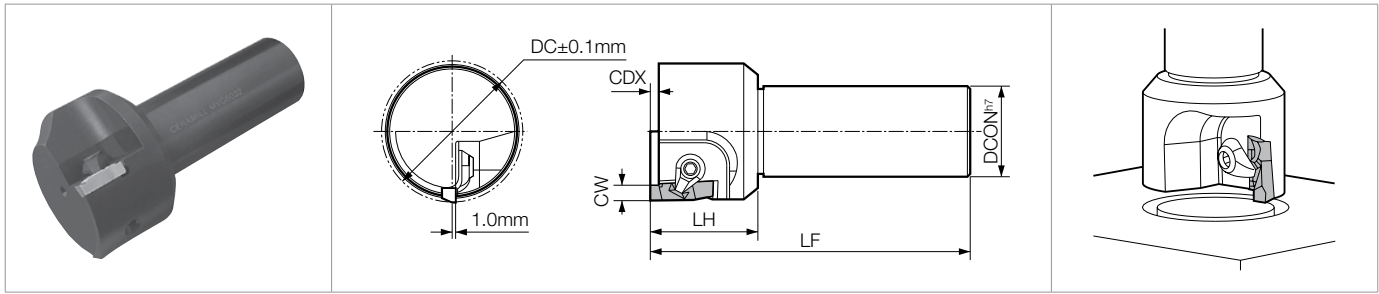
Insert Right-handed Insert Shown		Part Number	Previous Part Number	Dimensions (mm)						Insert Grades										
										Cermet			MEGA COAT	PVD	Carbide					
				CW	CDX	RE	W1	INSL	S	TN90	TC40	TC60	PR1225 COAT	PR930	KW10					
 1-Edge		GVR 100-020SS	GVR 100SS	1.00	2.3	0.2	3.6	9	3.0	△		●	●	●	●					
		125-020SS	125SS	1.25								●	●	●	●	●				
		145-020SS	145SS	1.45						△		●	●	●	●	●				
		200-020SS	200SS	2.00						△		●	●	●	●	●				
		250-020SS	250SS	2.50								●	●	●	●	●				
		300-020SS	300SS	3.00								●	●	●	●	●				
		GVR 100-020S	GVR 100S	1.00	2.3	0.2	4.0	11	4.0	△	●	●	●	●	●					
		125-020S	125S	1.25						△	●	●	●	●	●	●				
		145-020S	145S	1.45							●	●	●	●	●	●				
		185-020S	185S	1.85							●	●	●	●	●	●				
		200-020S	200S	2.00						△	●	●	●	●	●	●				
		250-020S	250S	2.50							●	●	●	●	●	●				
		340-020S	340S	3.40							●	●	●	●	●	●				
		 2-Edge		GVR 100-020A						GVR 100A	1.00	2.3	0.2	4.0	12	5.0	△	●	●	●
125-020A	125A			1.25	△	●	●	●	●	●	●									
145-020A	145A			1.45	△	●	●	●	●	●	●									
185-020A	185A			1.85		●	●	●	●	●	●									
200-020A	200A			2.00	△	●	●	●	●	●	●									
250-020A	250A			2.50	△	●	●	●	●	●	●									
300-020A	300A			3.00	△	●	●	●	●	●	●									
340-020A	340A			3.40		●	●	●	●	●	●									
GVR 145-020B	GVR 145B			1.45	2.8	0.2	4.5	15	5.5	△	●	●	●	●	●					
185-020B	185B			1.85						△	●	●	●	●	●	●				
200-020B	200B			2.00						△	●	●	●	●	●	●				
230-020B	230B			2.30						△	●	●	●	●	●	●				
250-020B	250B			2.50	3.2	0.2	4.5	15	5.5	△	●	●	●	●	●					
280-020B	280B			2.80							●	●	●	●	●	●				
300-020B	300B			3.00							●	●	●	●	●	●				
340-020B	340B			3.40						△	●	●	●	●	●	●				
400-020B	400B			4.00	4.2	0.2	4.5	15	5.5	△	●	●	●	●	●					
GVR 280-020C	GVR 280C			2.80						△	●	●	●	●	●	●				
300-020C	300C			3.00						△	●	●	●	●	●	●				
340-020C	340C			3.40						△	●	●	●	●	●	●				
400-020C	400C			4.00	5.5	0.2	5.8	21	6.5	△	●	●	●	●	●					
(430-020C)	(430C)			4.30							●	●	●	●	●	●				
(460-020C)	(460C)			4.60						6.3	0.2	5.8	21	6.5		●	●	●	●	●
(500-020C)	(500C)			5.00												●	●	●	●	●
 2-Edge Full-R		GVR 200-100AR	GVR 100AR	2.00	2.3	1.00	4.0	12	5.0			●	●	●	●					
		250-125AR	125AR	2.50								●	●	●	●	●				
		300-150AR	150AR	3.00								●	●	●	●	●				
		GVR 200-100BR	GVR 100BR	2.00	3.2	1.00	4.5	15	5.5	△		●	●	●	●					
		300-150BR	150BR	3.00						△		●	●	●	●	●				
												●	●	●	●	●				

- Only Right-hand insert is applicable.
- GVR280-020C, GVR300-020C inserts are available for groove depths up to 4.5mm.
- GVR430-020C ~ GVR500-020C inserts can be installed into MGI3225-1C and MGI4025-1C holders, but are not recommended for steel machining because of toolholder's rigidity.

MVG RING GROOVING END MILL



MVG


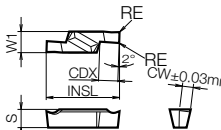


Toolholder Dimensions

Part Number	Stock	Dimensions (mm)						Edge Width	Spare Parts	
		DC	DCON	LF	LH	CDX	CW		Clamp Set	Wrench
MVG 3032	●	30	32	120	40	5.2	4.00 ~ 4.90		CPS-6V	LW-3
3532	●	35								
4032	●	40								
4532	●	45								
5032	●	50								
5532	●	55								
6032	●	60								

- Dimension CDX shows available grooving depth.

Applicable Inserts

Insert Right-handed Insert Shown		Part Number	Previous Part Number	Dimensions (mm)						Insert Grades					
										Cermet			MEGA COAT	PVD	Carbide
				CW	CDX	RE	W1	INSL	S	TN90	TC40	TC60	PR1225	PR930	KW10
		GVFR 400-020B	GVFR 400B	4.00	5.3	0.2	5.8	20	5.0	△	●	●	●	●	●
		430-020B	430B	4.30							●	●	●	△	●
		460-020B	460B	4.60							●		●	△	●
		490-020B	490B	4.90							●	●	●	●	●

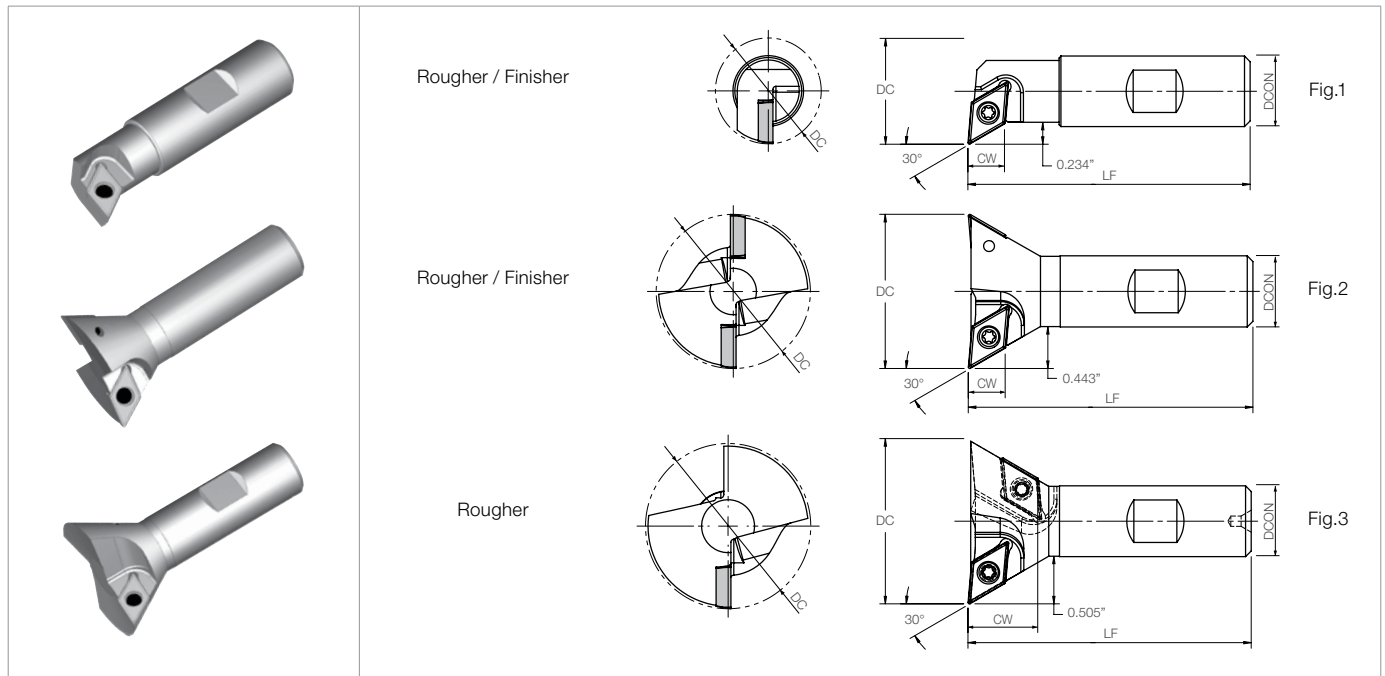
- GVFR430B-020B** inserts are applicable for sealing groove of G-series
For other ring grooving applications, **GVFR400B-020B** ~ **GVFR490B-020B** are applicable.
- Only Right-hand insert is applicable.

Recommended Cutting Conditions

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)					
		Cermet			MEGACOAT	PVD Coated Carbide	Carbide
		TN90	TC40	TC60	PR1225	PR930	KW10
Carbon Steel	0.002~0.006	-	★ 390~660	☆ 330~590	★ 260~560	☆ 260~490	-
Alloy Steel	0.002~0.006	-	★ 390~660	☆ 330~590	★ 260~560	☆ 260~490	-
Mold Steel	0.001~0.005	-	★ 330~590	☆ 260~490	★ 200~490	☆ 200~430	-
Stainless Steel	0.001~0.005	-	☆ 330~590	☆ 260~490	★ 200~490	☆ 200~430	-
Cast Iron	0.002~0.008	-	-	-	-	-	★ 260~490
Non-ferrous Metals	0.002~0.008	-	-	-	-	-	★ 330~980

★: 1st Recommendation ☆: 2nd Recommendation

DC



Toolholder Dimensions

Part Number	Stock	No. of Flutes	No. of Inserts	Dimensions (in)				Drawing	Spare Parts	
				DC*	DCON	LF	CW		Screw	Wrench
DC 1-1.13	●	1	1	1.125	0.750	3.000	0.388	Fig.1	SCR-02	T15
2-1.63	●	2	2	1.625			0.388	Fig.2		
2-1.75	●	1	2	1.750			0.739	Fig.3		

Applicable Inserts

Insert	Part Number	Dimensions (in)				Insert Grades		
		IC	S	D1	RE	CVD Coated Carbide	MEGACOAT NANO	MEGACOAT Cermet
	DCMT 3251HQ	3/8	5/32	0.173	1/64	●	●	●

Recommended Cutting Conditions

Workpiece Material	Feed Rate fz (ipt)	Recommended Insert Grades (Cutting Speed Vc: sfm)		
		CVD Coated Carbide	MEGACOAT NANO	MEGACOAT Cermet
		CA6525	PR1535	PV720
Carbon Steel	0.003 - 0.006	-	★ 300 - 650	☆ 350 - 700
Alloy Steel	0.003 - 0.005	-	★ 300 - 650	☆ 350 - 700
Mold Steel	0.002 - 0.004	-	★ 250 - 500	☆ 300 - 600
Stainless Steel	0.002 - 0.004	☆ 250 - 500	★ 200 - 450	-
Cast Iron	0.003 - 0.006	☆ 300 - 700	★ 250 - 650	☆ 300 - 700
Non-ferrous Metals	0.003 - 0.006	-	★ 350 - 900	-

★: 1st Recommendation ☆: 2nd Recommendation

