



MFH-RAPTOR

High Feed Milling Series



Stable Machining with Greater Chatter Resistance

Reduce Cycle Time During Roughing Applications

Multi-Functional for Various Applications

MFH Mini / Micro High Feed Mills for Small Machining Centers

PR18 Series Inserts with MEGACOAT NANO EX Coating Technology for Extended Tool Life

MFH-RAPTOR



Large Diameter

Ø1.000"~Ø6.000" | Ø25mm~Ø160mm

MFH-MAX



Small Diameter/
Larger Depth of Cut

Ø1.000"~Ø3.000" | Ø22mm~Ø80mm

MFH-RAPTOR_{mini}



Small Diameter/
Fine Pitch Type

Ø0.625"~Ø2.000" | Ø16mm~Ø50mm

MFH-RAPTOR_{micro}



Micro Diameter

Ø0.375"~Ø0.625" | Ø8mm~Ø16mm

MFH Series



Convex Cutting Edge Design Reduces Chatter for High-Efficiency Rough Machining
Large Tooling Lineup to Cover a Wide Application Range for Multiple Metalworking Processes

MFH-RAPTOR

➔ Page 4



Large Diameter

Ø1.000"~Ø6.000" | Ø25mm~Ø160mm

MFH-MAX

➔ Page 15



Small Diameter/
Larger Depth of Cut

Ø1.000"~Ø3.000" | Ø22mm~Ø80mm

MFH-RAPTOR Mini

➔ P23



Small Diameter/
Fine Pitch Type

Ø0.625"~Ø2.000" | Ø16mm~Ø50mm

MFH-RAPTOR MICRO

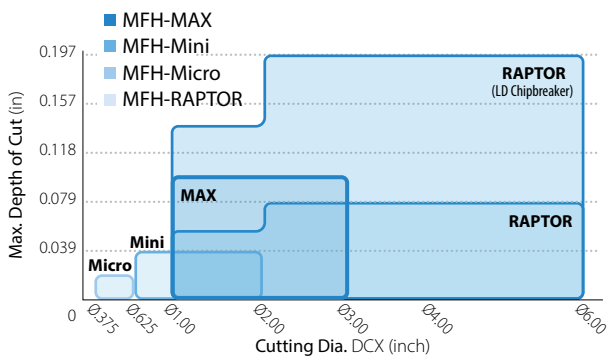
➔ P30



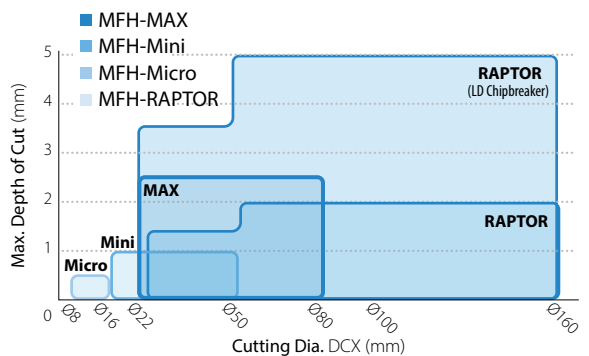
Micro Diameter

Ø0.375"~Ø0.625" | Ø8mm~Ø16mm

MFH-Series Inch Diameter Range



MFH-Series Metric Diameter Range



1 Reduced Chattering with Convex Cutting Edge Design

Reduces Cutting Forces at Initial Impact with a Convex Helical Edge Design

Cutting Force and Vibration when Approaching the Workpiece (D.O.C. = Half of Cutter Diameter)

Convex Edge Design



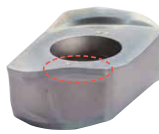
MFH Micro
LPGT Insert



MFH Mini
LOGU Insert

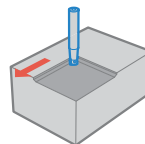


MFH
SOMT Insert

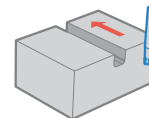


MFH-MAX
LOMU Insert

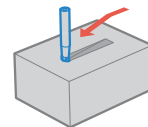
2 Wide Application Range for Multiple Metalworking Processes



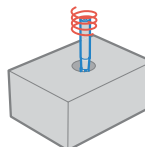
Face Milling &
Shouldering



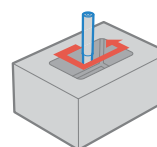
Slotting



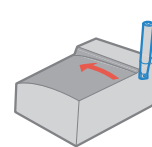
Ramping



Helical Milling



Pocketing



Contouring

For Using MFH:
GM and GH chipbreakers are available for all the above applications. LD and FL chipbreakers are not available for helical milling, plunging and contouring of rising wall. (Refer to Page 35)

PR18 Series

Kyocera's Nano Layer Coating Technology
Longer Tool Life with Next-generation Coating for Milling



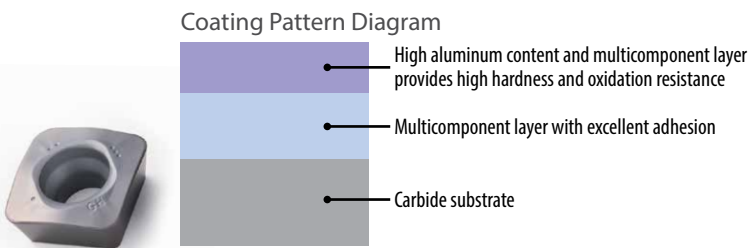
Extensive lineup of insert grades

Workpiece material	P Steel					M Stainless steel					K Cast iron				
ISO	01	10	20	30	40	01	10	20	30	40	01	10	20	30	40
Lineup	1st recommendation					1st recommendation					1st recommendation				
	PR1825					PR1835					PR1810				
	Wet					High-speed machining									
	PR1835					CA6535									
H Hardened material	PR015S (GH)					S Heat-resistant alloy	CA6535 (PR1835)					Titanium alloy	PR1835		

PR015S MEGACOAT HARD

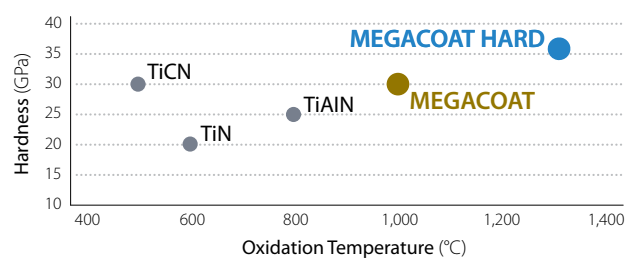
Thermal property of the substrate reduces cracks and notch wear with a high hardness and heat-resistant coating for improved wear resistance when machining in hardened materials

MEGACOAT HARD Improves Wear Resistance with High Hardness and High Heat-resistant PVD Layer



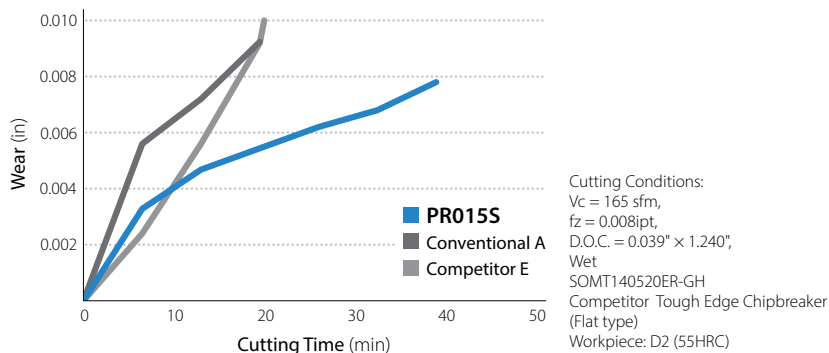
Combining GH chipbreaker and grade PR015S reduces heat cracking and improves fracture resistance for stable machining in hardened material

Coating Properties (Internal Evaluation)

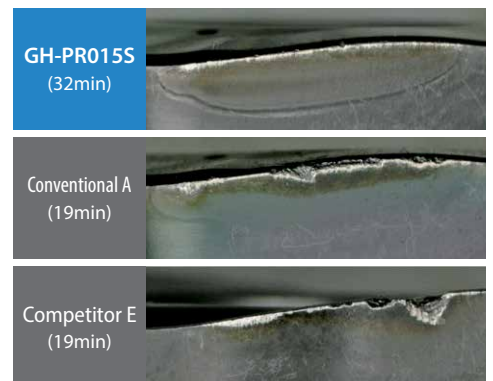


Low Oxidation Resistance High

Cutting Performance Comparison (Internal Evaluation)



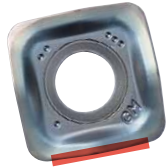
Cutting Edge



Wide Product Lineup for High Feed Milling Applications
Large Depths of Cut and Low Cutting Forces

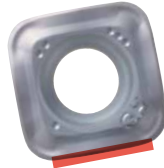
1 4 Different Insert Designs Offer a Variety of Machining Options

GM (General Milling)



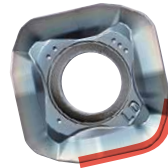
1st Choice for General Purpose
Multiple Metalworking Processes

GH (Tough Edge)



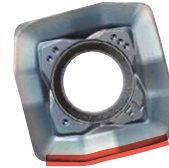
Tough Edge
Excellent Fracture Resistance

LD (Large D.O.C.)



1st Choice for Large D.O.C.
Available for Scale Removal

FL (Wiper Edge)

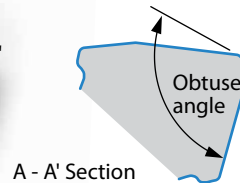
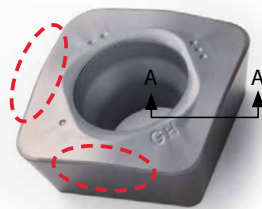


Wiper Edge
Roughing and Finishing Even in Low Horsepower Machining Centers

GH Chipbreaker
Excellent Fracture Resistance

Convex Cutting Edge Design

Reduces cutting force when entering workpiece
Suppresses chattering and fracturing



Tough Edge Design

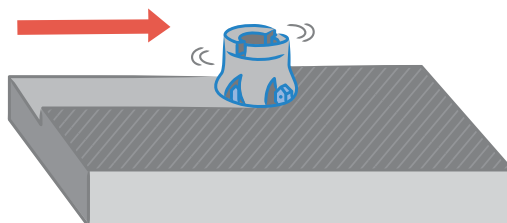
Combining with PR015S is excellent for machining hardened material with improved fracture resistance



LD Chipbreaker Can Be Used for Both Large D.O.C. and High Feed Machining

Large D.O.C. for Scale Removal

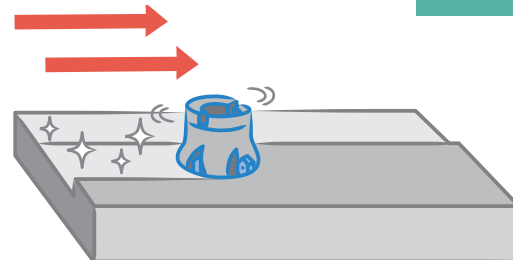
D.O.C. = 0.158"



($f_z = 0.010$ ipt, D.O.C. = 0.158")

High Feed Rates After Scale Removal

$f_z = 0.059$ ipt



($f_z = 0.059$ ipt, D.O.C. = 0.079")

MFH2500R-14-5T (Cutter Dia. 2.500", 5 Inserts)

① Roughing for Scale Removal (2 Passes): Large D.O.C.

$V_c = 660$ sfm, $f_z = 0.010$ ipt
D.O.C. $\times$ ae = 0.158" $\times$ 1.575"
 $V_f = 50$ in/min

② Roughing (2 Passes) After Scale Removal: High Feed Rate

$V_c = 660$ sfm, $f_z = 0.059$ ipt
D.O.C. $\times$ ae = 0.079" $\times$ 1.575", $V_f = 298$ in/min
Workpiece: Stainless Steel

Conventional 45° Cutter (Cutter Dia. 2.500", 5 Inserts)

Roughing (4 Passes): Constant D.O.C. and Feed Rate

$V_c = 660$ sfm, $f_z = 0.010$ ipt
D.O.C. $\times$ ae = 0.118" $\times$ 1.575", $V_f = 50$ in/min
Workpiece: Structural Steel

Chip Evacuation

MFH

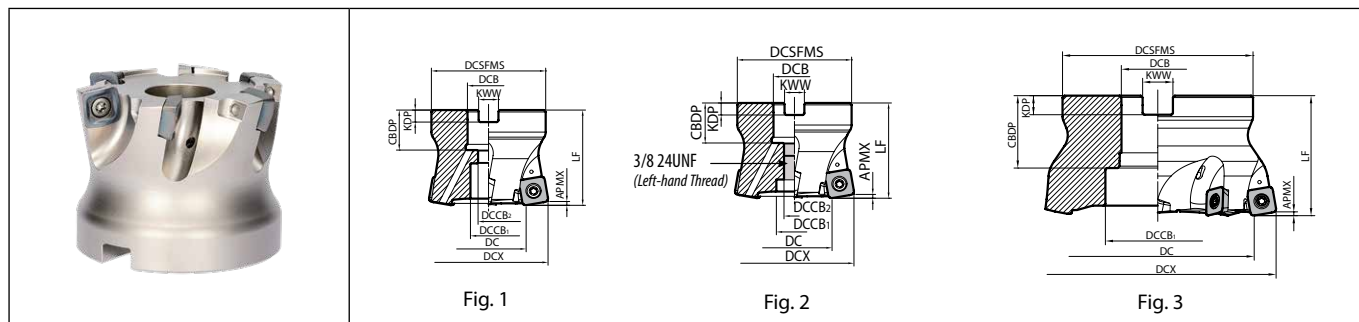
404 cc/min

Efficiency

x2.6

Conventional
Cutter

151 cc/min


Toolholder Dimensions (SOMT10 Inserts)

Unit	Part Number	Std. Item	No. of Inserts	Dimensions														A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Applicable Inserts ➡ Page 12
				DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	APMX ₂							
Inch	MFH 2000R-10-4T	● 4	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	10,000	0.4	1	SOMT1004...
	2000R-10-5T	● 5	5																					
	2500R-10-5T	● 5	5	2.500	1.831	2.010	1.969	2.250	0.750	0.669	0.433	1.969	0.75	0.187	0.313	0.059 (0.138)	0.047	+10	-4	Yes	8,800	0.7		
	2500R-10-6T	● 6	6																					
	3000R-10-7T	● 7	7	3.000	2.331	2.510	2.469	2.750	1.000	0.866	0.551	2.48	1.063	0.236	0.382							7,600		

● : Standard Item

Toolholder Dimensions (SOMT14 Inserts)

Unit	Part Number	Std. Item	No. of Inserts	Dimensions												A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Applicable Inserts ➔ Page 12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
				DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW								APMX	APMX ₂																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Inch	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	8,800	0.4	2 2	SOMT1405...																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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	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						7,400	0.6	1 1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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	2500R-14-5T-1000	● 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						7,400	0.7	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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	3000R-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				6,400	1.2	1 1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	3000R-14-6T-1250	● 6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	4000R-14-6T	● 6	5.000	4.094	4.330	4.291	4.880	2.000	2.835	-	2.480	1.496	0.394	0.626				6,400	1.3	1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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	5000R-14-7T	● 7	6.000	5.094	5.330	5.291	4.880	2.000	2.835	-	2.480	1.496	0.433	0.752				5,600	2.3	1 1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	6000R-14-8T	● 8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

● : Standard Item

 For APMX₂, refer to the figure on [Page 6](#)

 For SOMT10...-LD inserts (APMX = 0.138") and (APMX₂ = 0.047").

 For SOMT14...-LD inserts (APMX = 0.197") and (APMX₂ = 0.079").

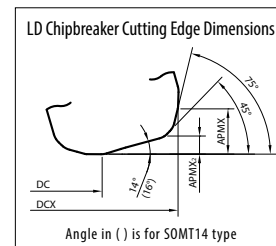
Max. Revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

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

Spare Parts (MFH-RAPTOR - Inch Face Mills)

Part Number	Spare Parts						Applicable Inserts  Page 12
	Insert Screw	Wrench		Anti-Seize Compound	Arbor Bolt	Mounting Screw	
		DTPM 	TTP 				
MFH 2000R-10-4T	SB-4090TRPN	DTPM-15 Recommended tightening torque for insert screw 3.5N•m		P-37	HH3/8-1.25(H)	-	SOMT100420ER-GM SOMT100420ER-LD SOMT100420ER-FL SOMT100420ER-GH
2000R-10-5T					HH1/2-1.25(H)	-	
2500R-10-5T							
2500R-10-6T							
3000R-10-7T							
MFH 2000R-14-4T	SB-50120TRP	TTP-20 Recommended tightening torque for insert screw 4.5N•m		P-37	-	XNS610*	SOMT140520ER-GM SOMT140520ER-LD SOMT140514ER-FL SOMT140520ER-GH
2000R-14-5T	SB-5090TRP						
2500R-14-4T	SB-50120TRP				HH3/8-1.25(H)	-	
2500R-14-5T					HH1/2-1.25(H)	-	
2500R-14-5T-1000					HH5/8-1.50(H)	-	
3000R-14-5T					HH3/4-2.3H	-	
3000R-14-6T							
3000R-14-6T-1250							
4000R-14-6T							
4000R-14-7T							
5000R-14-7T							
6000R-14-8T							

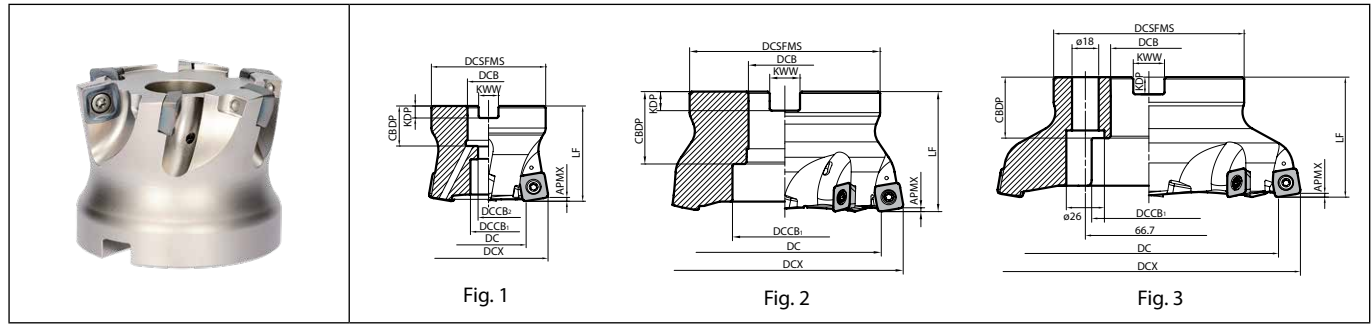
(H) Optional coolant-through bolt available.



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** thinly on portion of taper and thread prior to installation.

*Differential Screw (3/8-24UNF)



Toolholder Dimensions (SOMT10 Inserts)

Unit	Part Number			Std. Item	No. of Inserts	Dimensions												A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Applicable Inserts 🔵 Page 12				
						DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	APMX ₂									
mm	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	10,000	0.4	1	SOMT1004...				
		050R-10-5T	● 5	63	46	50.5	49.5	60		1.250"	26	17	63	1.260"	0.315"	0.500"	1.2	+10	-4	Yes	8,800	0.7						
		063R-10-5T	● 5																									
		063R-10-6T	● 6																									
		080R-10-7T	● 7																									
	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	10,000	0.4	1
		050R-10-5T-M	● 5					27	20	13	24	7		12.4														
		063R-10-5T-22M	● 5					22	19	11	21	6.3		10.4														
		063R-10-5T-27M	● 5																									
		063R-10-6T-22M	● 6	63	46	50.5	49.5	60																				
		063R-10-6T-27M	● 6																									
		080R-10-7T-M	● 7	80	63	67.5	66.5	76	27	20	13	63		24	7	12.4										7,600	1.6	

● : Standard Item

Toolholder Dimensions (SOMT14 Inserts)

Unit	Part Number		Std. Item	No. of Inserts	Dimensions												A.R. (°)		Coolant Hole	Max RPM	Weight (kg)	Fig.	Applicable Inserts ➔ Page 12					
					DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	APMX ₂										
mm	Inch Bore Dia.	MFH 050R-14-4T	● 4	4	50	27	33	32	47	0.875"	12	-	50	0.748"	0.197"	0.331"	2	(5)	2	+10	-10	Yes	8,800	0.4	1	SOMT1405...		
		063R-14-4T	● 4	4	63	40	46	45	60		19	11													7,400		0.6	1
		063R-14-5T	● 5	5	63	40	46	45	60																1			
		080R-14-5T	● 5	5	80	57	63	62	76																1			
		080R-14-6T	● 6	6	80	57	63	62	76	1.250"	26	17		1.260"	0.315"	0.500"									1			
		100R-14-6T	● 6	6	100	77	83	82	96				63												1			
		100R-14-7T	● 7	7	100	77	83	82	96																1			
		125R-14-7T	● 7	7	125	102	108	107	100	1.500"	55	-		1.496"	0.394"	0.625"									2			
		160R-14-8T	● 8	8	160	137	143	142		2.000"	72	-			0.433"	0.750"									2			
	Metric Bore Dia.	MFH 050R-14-4T-M	● 4	4	50	27	33	32	47	22	12	-	50	21	6.3	10.4	2	(5)	2	+10	-10	Yes	8,800	0.4	1	SOMT1405...		
		063R-14-4T-22M	● 4	4	63	40	46	45	60		19	11																
		063R-14-4T-27M	● 4	4						27	20	13	24	7	12.4													1
		063R-14-5T-22M	● 5	5	22	19	11	21	6.3	10.4													1					
		063R-14-5T-27M	● 5	5	27	20	13	24	7	12.4													1					
		080R-14-5T-M	● 5	5	80	57	63	62	76	27	20	13		24	7	12.4								1				
		080R-14-6T-M	● 6	6	100	77	83	82	96	32	26	17	63	28	8	14.4	33	9	16.4	-8	Yes	6,400	1.4	1				
		100R-14-6T-M	● 6	6																								
		100R-14-7T-M	● 7	7	100	77	83	82	96	32	26	17													2			
		125R-14-7T-M	● 7	7	125	102	108	107	100	40	55	-		33	9	16.4									2			
		160R-14-8T-M	● 8	8	160	137	143	142		68	-			32											2			

For APMX₂, refer to the figure on **Page 8**

For SOMT10...-LD (APMX = 3.5mm) and (APMX₂ = 1.2mm).

For SOMT14...-LD (APMX = 5mm) and (APMX₂ = 2mm).

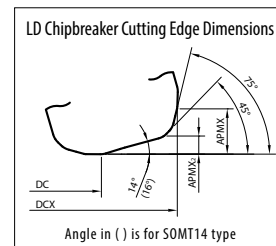
Max. Revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

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

● : Standard Item

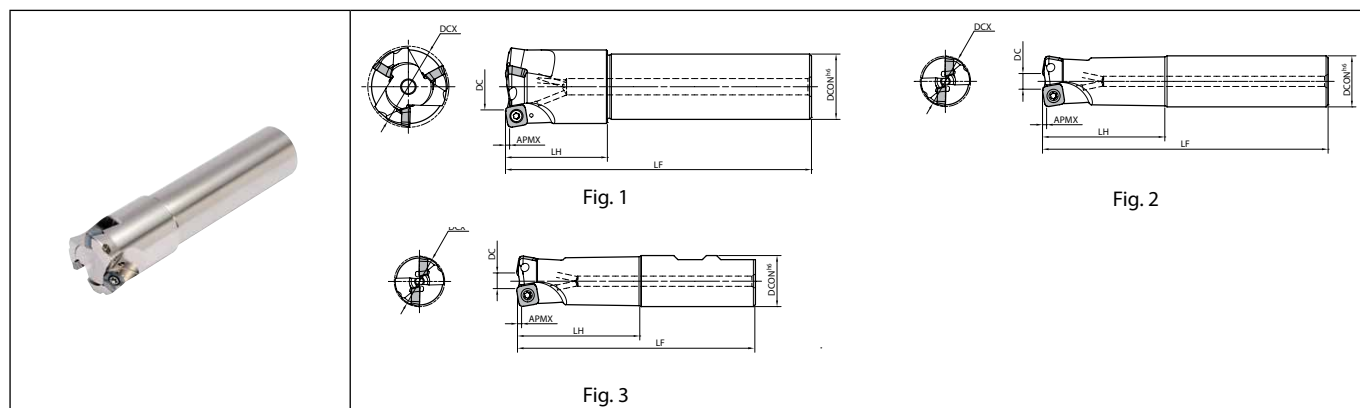
Spare Parts (MFH-RAPTOR - Metric Face Mills)

Part Number	Spare Parts						Applicable Inserts ➔ Page 12
	Insert Screw	Wrench		Anti-Seize Compound	Arbor Bolt	Mounting Screw	
							
MFH 050R-10-...	SB-4090TRPN	DTPM-15 Recommended tightening torque for insert screw 3.5N·m	P-37		HH10X30	-	SOMT100420ER-GM SOMT100420ER-LD SOMT100420ER-FL SOMT100420ER-GH
050R-10-...-M					HH12X35	-	
063R-10-...					HH16X40	-	
063R-10-...-22M					HH12X35	-	
063R-10-...-27M							
080R-10-...							
080R-10-...-M							
MFH 050R-14-...	SB-50120TRP	TTP-20 Recommended tightening torque for insert screw 4.5N·m	P-37		-	W10X31	SOMT140520ER-GM SOMT140520ER-LD SOMT140514ER-FL SOMT140520ER-GH
050R-14-...-M					HH10X30	-	
063R-14-...					HH12X35	-	
063R-14-...-22M					HH16X40	-	
063R-14-...-27M					HH12X35	-	
080R-14-...					HH16X40	-	
080R-14-...-M					-	-	
100R-14-...					-	-	
100R-14-...-M					-	-	
125R-14-...					-	-	
125R-14-...-M					-	-	
160R-14-...					-	-	
160R-14-...-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**
thinly on portion of taper and thread prior to installation.


Toolholder Dimensions (SOMT10 Inserts)

Unit	Part Number			Std. Item	No. of Inserts	Dimensions								A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Spare Parts			Applicable Inserts  Page 12									
						DCX	DCON	DC (GM/GH)	DC (LD)	DC (FL)	LF	LH	APMX							APMX ₂												
Inch	Standard Shank	Weldon	MFH 1000-W100-10-2T		2	1.000	1.000	0.331	0.508	0.469	5.500	3.173	0.059 (0.138)	0.047	+10	-5	Yes	17,000	0.4	3	P-37	SB-407STRP	DTPM-15	SOMT1004...								
			1250-W125-10-2T		2	1.250	1.250	0.581	0.758	0.719	6.000	2.750						0.047	+10	-5					Yes	14,000	0.8	3				
			1250-W125-10-3T		3	1.500	1.500	0.831	1.008	0.969		2.000														0.047	+10	-5	Yes	11,500	3	3
			1500-W150-10-3T		3																											
			1500-W150-10-4T		4																											
	Long Shank	Cylindrical	MFH 1000-S100-10-2T-8		2	1.000	1.000	0.331	0.508	0.469	8.000	4.750	0.059 (0.138)	0.047	+10	-5	Yes	17,000	0.8	2	P-37	SB-407STRP	DTPM-15	SOMT1004...								
			1250-S125-10-2T-8		2	1.250	1.250	0.581	0.758	0.719								10.000		2.000					0.047	+10	-5	Yes	14,000	1		
			1500-S125-10-4T10		4	1.500	1.250	0.831	1.008	0.969																			11,500		3	

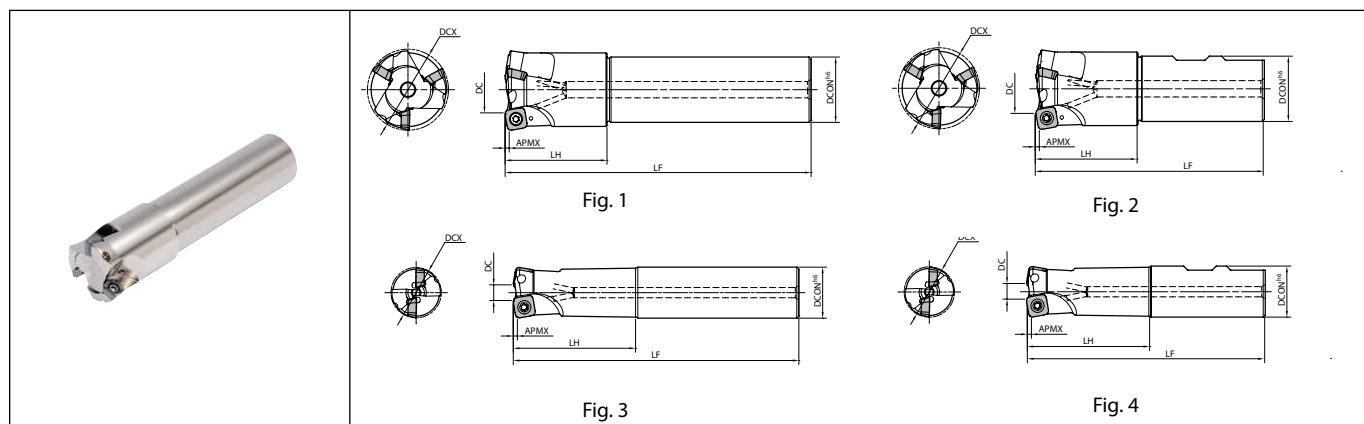
For APMX₂, refer to the figure in **Page 8**

For SOMT10...-LD inserts (APMX = 0.138") and (APMX₂ = 0.047").

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

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

● : Standard Item


Toolholder Dimensions (SOMT10 Inserts)

Unit	Part Number		Std. Item	No. of Inserts	Dimensions								A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Spare Parts			Applicable Inserts ➔ Page 12	
					DCX	DCON	DC (GM/GH)	DC (LD)	DC (FL)	LF	LH	APWX							APWX ₂	Anti-Seize Compound	Insert Screw		Wrench
mm	Standard Shank	Cylindrical	MFH 25-S25-10-2T	●	2	25	25	8	12.5	11.5	140	60	1.2	+10	-5	Yes	17,000	0.4	3	P-37	SB-4075TRP	DTPM-15	SOMT1004...
			28-S25-10-2T	●	2	28		11	15.5	14.5		40					15,500	0.5	1				
			32-S32-10-2T	●	2	32	15	19.5	18.5	70	1.5	(3.5)					14,000	0.8	3				
			32-S32-10-3T	●	3																		
			35-S32-10-2T	●	2	35	32	18	22.5	21.5	150	50					13,000	1					
			35-S32-10-3T	●	3																		
			40-S32-10-3T	●	3	40	23	27.5	26.5	11,500	0.9												
			40-S32-10-4T	●	4																		
	Weldon		MFH 25-W25-10-2T	●	2	25	25	8	12.5	11.5	117	60	1.2	+10	-5	Yes	17,000	0.4	4	P-37	SB-4075TRP	DTPM-15	SOMT1004...
			32-W32-10-3T	●	3	32	15	19.5	18.5	131	70	1.5					14,000	0.7	4				
			40-W32-10-3T	●	3	40	23	27.5	26.5	112	50	11,500					2						
			40-W32-10-4T	●	4																		
	Long Shank	Cylindrical	MFH 25-S25-10-2T-200	●	2	25	25	8	12.5	11.5	200	120	1.2	+10	-5	Yes	17,000	0.6	3	P-37	SB-4075TRP	DTPM-15	SOMT1004...
			28-S25-10-2T-200	●	2	28		11	15.5	14.5		40					15,500	0.7	1				
			32-S32-10-2T-200	●	2	32	15	19.5	18.5	120	1.5	14,000					1	3					
			35-S32-10-2T-200	●	2	35	32	18	22.5	21.5	50	13,000					1.4	1					
			40-S32-10-4T-250	●	4	40	23	27.5	26.5	250	11,500	1.5					1						
	Extra Long Shank	Cylindrical	MFH 25-S25-10-2T-300	●	2	25	25	8	12.5	11.5	180	180	1.2	+10	-5	Yes	17,000	1	3	P-37	SB-4075TRP	DTPM-15	SOMT1004...
			28-S25-10-2T-300	●	2	28		11	15.5	14.5		40					15,500	1.1	1				
			32-S32-10-2T-300	●	2	32	15	19.5	18.5	300	1.5	14,000					1.6	3					
			35-S32-10-2T-300	●	2	35	32	18	22.5	21.5	180	13,000					1.7	1					
40-S32-10-4T-300			●	4	40	23	27.5	26.5	50	11,500	1.8	1											

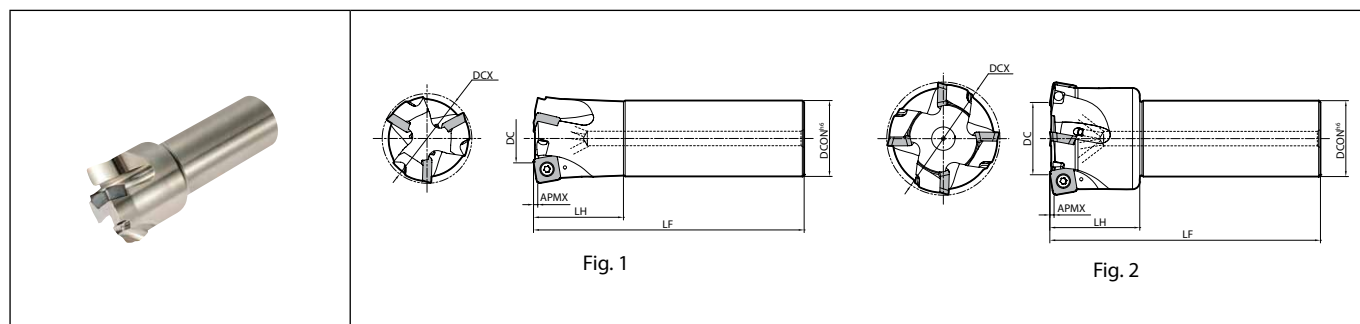
 For APMX₂, refer to the figure in **Page 8**

 For SOMT10...-LD (APMX = 3.5mm) and (APMX₂ = 1.2mm).

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

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

● : Standard Item


Toolholder Dimensions (SOMT14 Inserts)

Unit		Part Number			Std. Item	No. of Inserts	Dimensions								A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Spare Parts			Applicable Inserts ➡ Page 12
							DCX	DCON	DC (GM/GH)	DC (LD)	DC (FL)	LF	LH	APMX							APMX ₂	Anti-Seize Compound	Insert Screw	
mm	Cylindrical	MFH	50-S42-14-3T	●	3	50		27	33	32													SOMT1405...	
			63-S42-14-4T	●	4	63	42	40	46	45	150	50	2 (5)	2	+10	-10	Yes	8,800	1.4	1	P-37	SB-50120TRP		TTP-20
			80-S42-14-5T	●	5	80		57	63	62					-8			7,400	1.7	2	Recommended tightening torque for insert screw 3.5N·m			

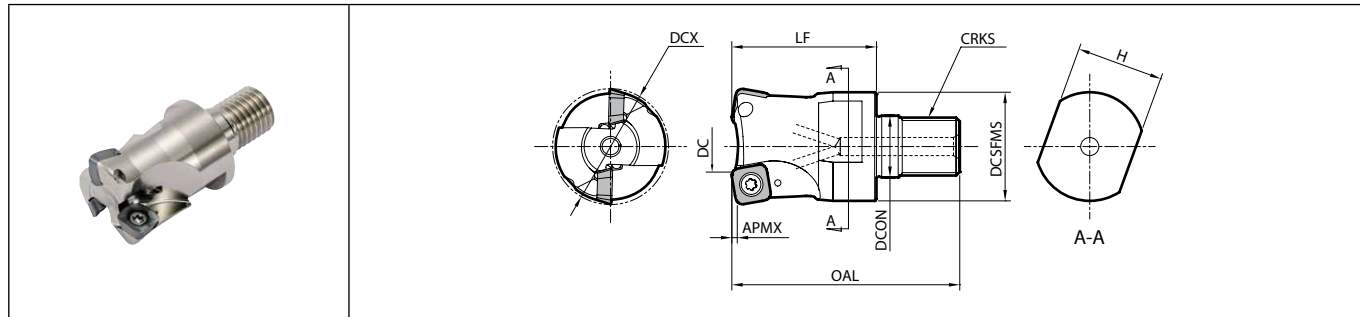
For APMX₂, refer to the figure in [Page 8](#)

For SOMT14...-LD (APMX = 5mm) and (APMX₂ = 2mm).

● : Standard Item

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

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

MFH | Modular End Mill (Metric Size)

Toolholder Dimensions (SOMT10 Inserts)

Unit	Part Number	Std. Item	No. of Inserts	Dimensions												A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Spare Parts			Applicable Inserts ➡ Page 12	
				DCX	DCON	DC (GM/GH)		DC (LD)	DC (FL)	DCSFMS	OAL	LF	APMX	APMX ₂	CRKS					H				
mm	MFH 25-M12-10-2T	●	2	25	12.5	8	12.5	11.5	23	57	35				M12×P1.75	19	+10	-5	Yes	17,000	P-37	SB-4075TRP	DTPM-15	SOMT1004...
	28-M12-10-2T	●	2	28		11	15.5	14.5												15,500				
	32-M16-10-2T	●	2	32	15	19.5	18.5	30	62	40	1.5 (3.5)	1.2	M16×P2.0	24	14,000									
	32-M16-10-3T	●	3		18	22.5	21.5								13,000									
	35-M16-10-2T	●	2	35	17	18	22.5	21.5	30	62	40	1.5 (3.5)	1.2	M16×P2.0	24	11,500								
	35-M16-10-3T	●	3													23				27.5				
	40-M16-10-3T	●	3	40	23	27.5	26.5																	
	40-M16-10-4T	●	4																					

For APMX₂, refer to the figure in [Page 8](#)

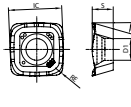
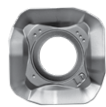
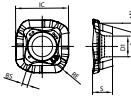
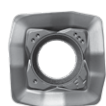
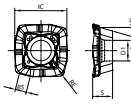
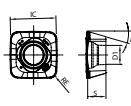
For SOMT10...-LD (APMX = 3.5mm) and (APMX₂ = 1.2mm).

● : Standard Item

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

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

See page [Page 34](#) for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Usage Classification ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (Hardness 45HRC or under)		Carbon steel / Alloy steel											☆			★	☆	P		
		Mold and die steel											☆			★	☆			
		Austenitic stainless steel												☆		☆	★	M		
		Martensitic stainless steel								★							☆			
		Precipitation hardened stainless steel												☆			★			
		Gray cast iron										☆				★			K	
		Nodular cast iron										☆				★				
		Heat-resistant alloy								★							☆	S		
		Titanium alloy													☆		★			
		Hard materials (≤ 60 HRC)									★								H	
Insert		Part Number		No. of Edges	Dimensions (mm)					Angle (°)	Carbide								Applicable Toolholder ➡ Page 5-11	
					IC	S	D1	RE	BS		AN	CVD	PVD							
													CA6535	PR0155	PR1510	PR1525	PR1535	PR1810		PR1825
	 General Purpose	SOMT 100420ER-GM	4	10.3	4.58	4.6	2	-	16	●		△	●	●	●	●	●	MFH...-10-..		
		SOMT 140520ER-GM	4	14.14	5.56	5.8	2	-	16	●		△	●	●	●	●	●	MFH...-14-..		
	 Large D.O.C.	SOMT 100420ER-LD	4	10.45	4.58	4.6	2	0.9	16	●		△	●	●	●	●	●	MFH...-10-..		
		SOMT 140520ER-LD	4	14.76	5.56	5.8	2	1.6	16	●		△	●	●	●	●	●	MFH...-14-..		
	 With Wiper Edge	SOMT 100420ER-FL	4	10.44	4.58	4.6	2	1.4	16	●		△	●	●	●	●	●	MFH...-10-..		
		SOMT 140514ER-FL	4	14.57	5.56	5.8	1.4	3.1	16	●		△	●	●	●	●	●	MFH...-14-..		
	 Tough Edge	SOMT 100420ER-GH	4	10.43	4.57	4.55	2	-	16		●	△	●	●	●	●	●	MFH...-10-..		
		SOMT 140520ER-GH	4	14.17	5.56	5.8	2	-	16		●	△	●	●	●	●	●	MFH...-14-..		

Right-hand Insert Shown

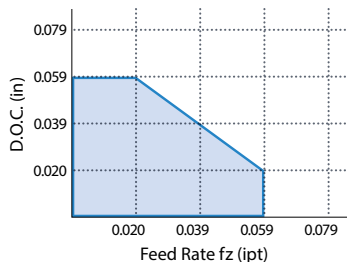
SOMT Inserts are sold in 10 piece boxes

Recommended Cutting Conditions 🔗 [Page 13](#)

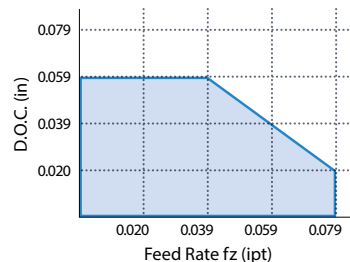
● : Standard Item △ : Phaseout Item (will be removed from next brochure)

Cutting Performance (GM / GH / FL Chipbreakers)

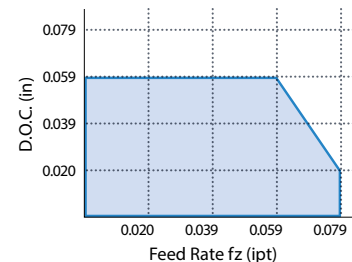
MFH1000-W100-10-2T
MFH25-S25-10-2T



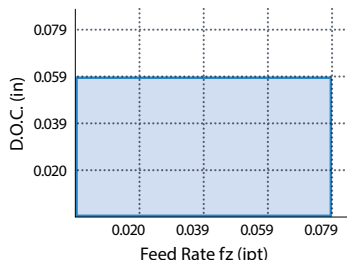
MFH1250-W125-10-○T
MFH32-S32-10-○T



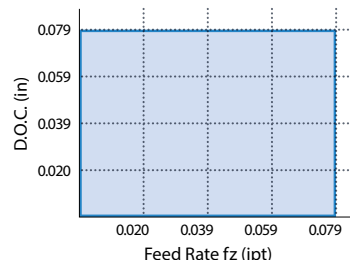
MFH1500-W150-10-○T
MFH40-S32-10-○T



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 🔗 [Page 13-14](#) for feed rate

End Mill:

Please refer to the application map above

Face Mill:

MAX feed rate (inches per tooth) fz = 0.079ipt

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 EX (MEGACOAT NANO)			MEGACOAT HARD	CVD
		MFH1000 MFH25-	MFH1250 MFH32-	MFH1500 MFH40-	MFH...R-10	MFH...-14	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR015S	CA653S
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 (~40 HRC)	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	-
	Mold Steel (40~50 HRC)	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	-	GH ★ 200~330~430	-
	Mold Steel (50~55 HRC)	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		-	☆ 160~230~330	-	GH ★ 160~230~330	-
	Mold Steel (55~60 HRC)	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 ☆ 100~160~230	-	GM ★ 130~200~260	-	-
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 (~40 HRC)	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 (40~50 HRC)	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	☆ 100~160~230	-	★ 130~200~260	-	-

- ① For D.O.C. ≤ 0.039" • Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy
 ② For D.O.C. 0.040 - 0.059" • The figure 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.
 ③ For D.O.C. 0.040 - 0.138" • Machining with CAT30 or equivalent, feed rate should be reduced to 25% of recommended cutting conditions
 ④ For D.O.C. ≤ 0.079" • Internal coolant is recommended for slotting applications
 ⑤ For D.O.C. 0.080 - 0.197" • 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

★: 1st Recommendation ☆: 2nd Recommendation

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 EX (MEGACOAT NANO)			MEGACOAT HARD	CVD
		MFH1000 MFH25-	MFH1250 MFH32-	MFH1500 MFH40-	MFH...R-10	MFH...R-14	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	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 (~40 HRC)	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 (40~50 HRC)	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		☆ 100~ 160 ~230	-	★ 130~ 200 ~260	-	-	

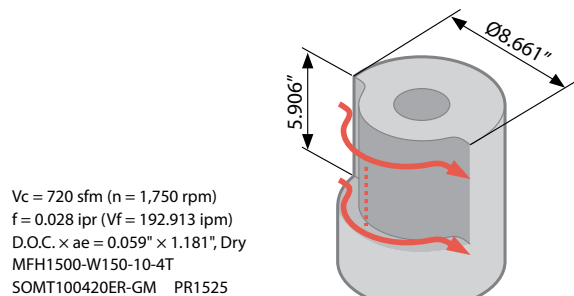
- ① For D.O.C. ≤ 0.039"
 ② For D.O.C. 0.040 - 0.059"
 ③ For D.O.C. 0.040 - 0.138"
 ④ For D.O.C. ≤ 0.079"
 ⑤ For D.O.C. 0.080 - 0.197"

- Machining with coolant is recommended for Ni-base Heat Resistant Alloy and Titanium Alloy
- The figure 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 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

★: 1st Recommendation ☆: 2nd Recommendation

Case Studies

Construction Machine Parts 1025



Cutting Time

PR1525
950 Sec

75%
Cutting Time

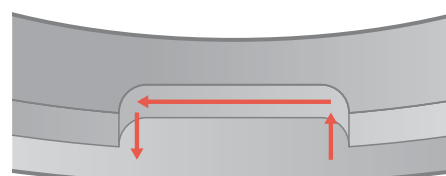
Competitor N (90° Cutter)

3,800 Sec

PR1525 features a higher number of passes compared to Competitor N, but the machining time was reduced by 75% because the feed rate can be increased by 7 times.
 (User Evaluation)

Clutch 304

Reduced Chattering



Vc = 400 sfm (n = 1,190 rpm), fz = 0.047 ipt (Vf = 112.205 ipm)
 D.O.C. × ae = 0.039" × 0.787", Dry
 MFH1250-W125-10-2T (2 Flutes), SOMT100420ER-GM (PR1535)

Cutting Time

PR1535
58 cc/min

Machining Efficiency
1.6x

Competitor M

36 cc/min

PR1535 shows stable machining while Competitor M generated chattering.
 PR1535 maintained a good cutting edge condition with stable machining.
 (User Evaluation)



MFH-MAX

(Cutter Dia. $\varnothing 1.000'' \sim \varnothing 3.000''$)
(Cutter Dia. $\varnothing 22\text{mm} \sim \varnothing 80\text{mm}$)

High Feed Milling with a Larger Depth of Cut

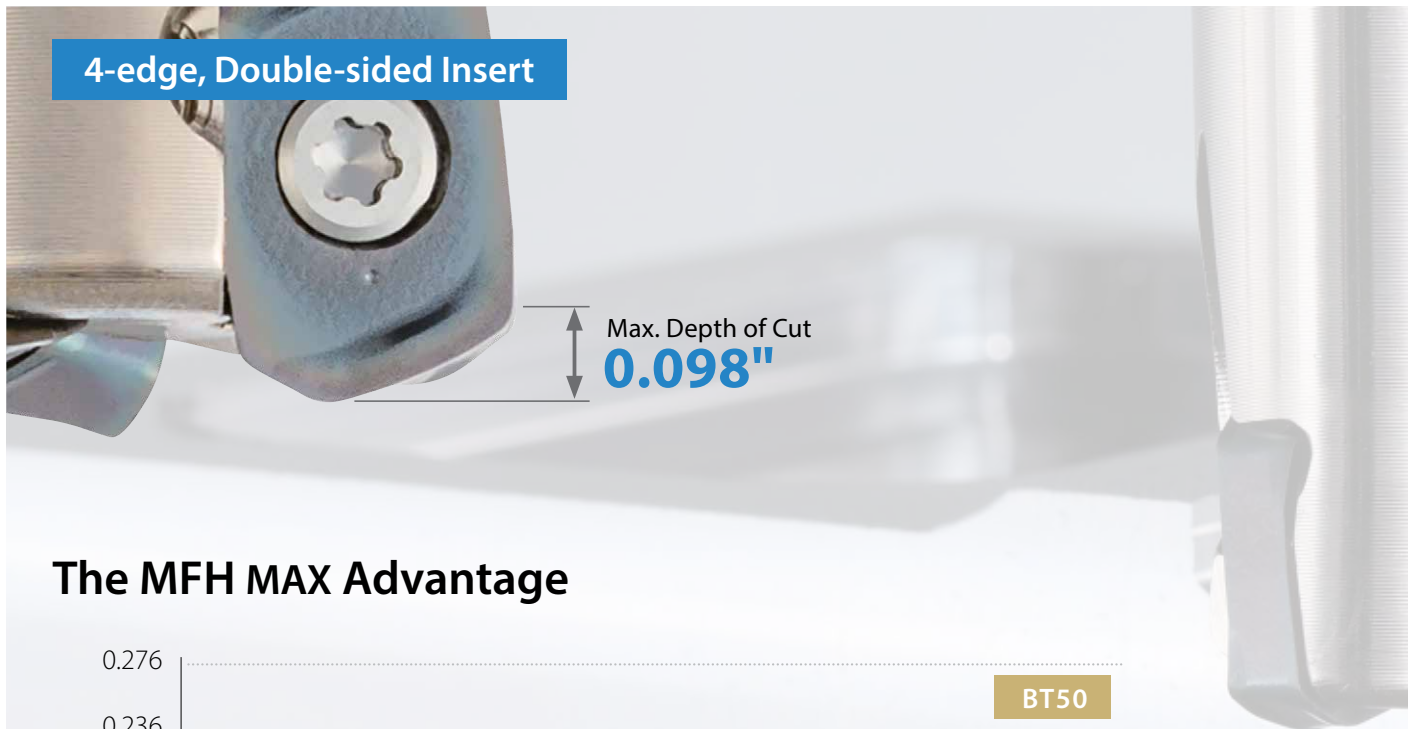
Newest Addition to the MFH High Feed Milling Family with Larger D.O.C. Capabilities

Excellent Performance in Various Applications, including Automotive Parts,
Difficult-to-cut Materials, and Mold Machining

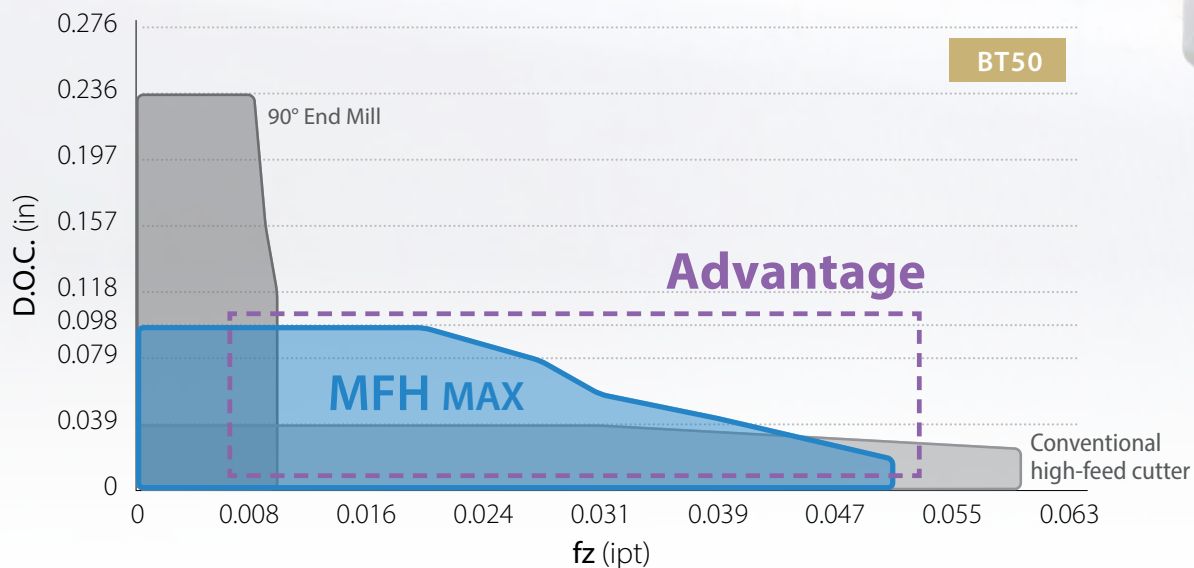
1 High Feed Milling with Large Depth of Cut Capabilities

A small 4-edge, double-sided insert supports depths of cut up to 0.098" (2.5mm) with cutting diameters available from $\varnothing 1.000''$ and $\varnothing 22\text{mm}$.

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



The MFH MAX Advantage



$V_c = 490 \text{ sfm}$, $a_e = 0.492''$ ($a_e/DCX = 50\%$), 1049 Dry $\varnothing 1.000''$ Overhang length 2.362" BT50

Higher Efficiency at 0.098" Max. Depth of Cut

1 Better Alternative to Conventional 90° End Mills (Roughing to Medium-Finishing)



Automotive Suspension Parts

Automotive Parts

General Steel Machining

- Increased productivity with large D.O.C. machining
- High reliability in unstable machining environments
Long overhang length and better clamping rigidity
Stable machining with low rigidity machines
- High-efficiency ramping
Large ramping angle (Small dia. Ø25mm: 3°)
Dramatic efficiency improvement when ramping in pockets
- Longer tool life

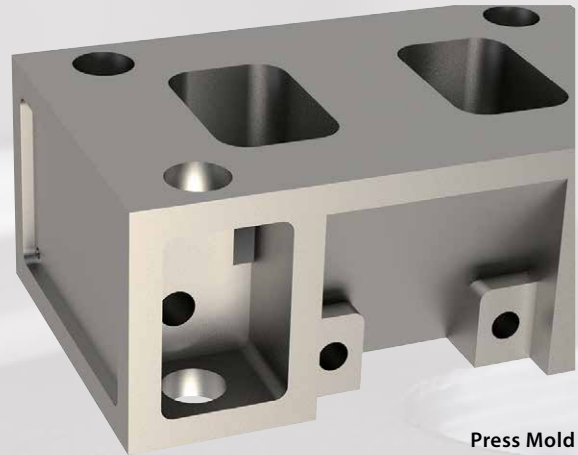
2 More Capabilities than Conventional High Feed Cutters

General Parts/Molds (Roughing/Facing)

General Parts, Pressing and Die Casting

- Higher productivity with larger D.O.C.
- Long tool life and improved efficiency through the reduction of tool paths
Reduced machining time when machining workpieces with large variations in machining margins
- Longer tool life with high-efficiency machining

*MFH-Mini/RAPTOR recommended for contouring with small depth of cut and high feed



Press Mold

3 Excellent Solution for Machining Difficult-to-cut Materials



Aircraft Landing Gear Parts

Aircraft/Energy Industry Parts

Difficult-to-cut materials such as titanium alloy and stainless steel machining

- High feed rates increase productivity
- Long tool life through the reduction of tool paths
- Heat-resistant grade PR1535 provides long tool life and stable machining

Improve Productivity and Reduce Machining Costs

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, $a_e = 0.492''$

MFH MAX
Ø1.000" (3 Flute)

100 cc/min

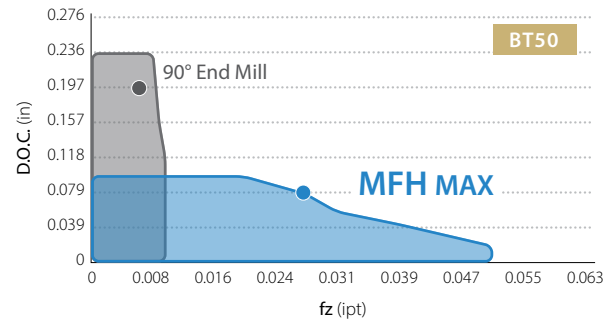
D.O.C. = 0.079", $f_z = 0.028$ ipt

Machining
Efficiency
x 1.8

Conventional
90° End Mill
Ø1.000" (3 Flute)

54 cc/min

D.O.C. = 0.197", $f_z = 0.006$ ipt



High Efficiency and Good Tool Life

Machining Efficiency and Cutting Edge Condition Comparison (Internal Evaluation)

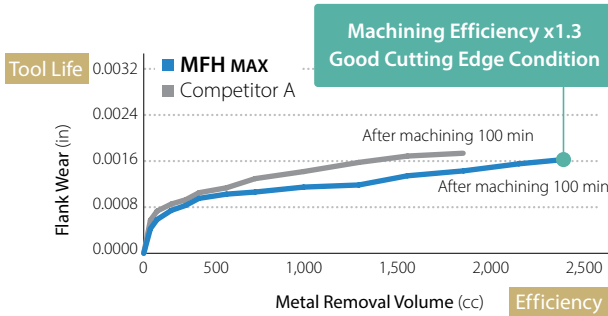
Cutting edge condition after machining 100 min

MFH MAX

D.O.C. = 0.063", $f_z = 0.024$ ipt

Competitor A 90° End Mill

D.O.C. = 0.197", $f_z = 0.006$ ipt



$V_c = 490$ sfm, $a_e = 0.492''$, Dry 4140(Ø) Ø1.000" BT50

Higher Stability in Unstable Machining Environment

Chatter Resistance Comparison (Internal evaluation)

Slotting
Ø1.000" (3 Flute)
External air
1049
BT50

Video



Machining Efficiency

MFH MAX

103 cc/min

$V_c = 390$ sfm, D.O.C. = 0.059", $f_z = 0.024$ ipt

Machining
Efficiency
x 4.5

Competitor A
90° End Mill

31 cc/min

Chattering (Machining was impossible)

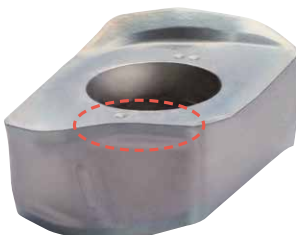
$V_c = 260$ sfm, D.O.C. = 0.079", $f_z = 0.008$ ipt

23 cc/min

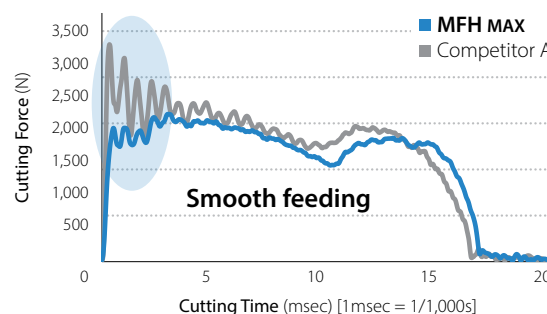
$V_c = 260$ sfm, D.O.C. = 0.079", $f_z = 0.006$ ipt

Innovative Insert Design

Convex cutting edge design reduces impact when entering workpiece



Cutting Force when Entering Workpiece (Internal Evaluation)



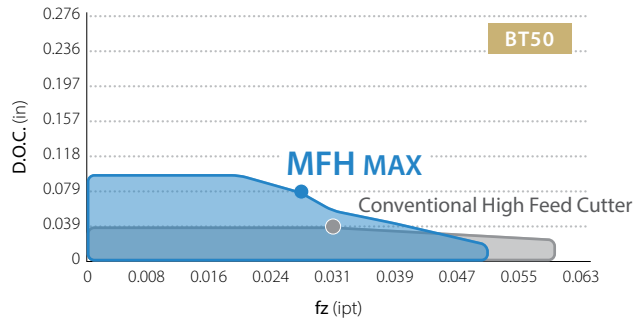
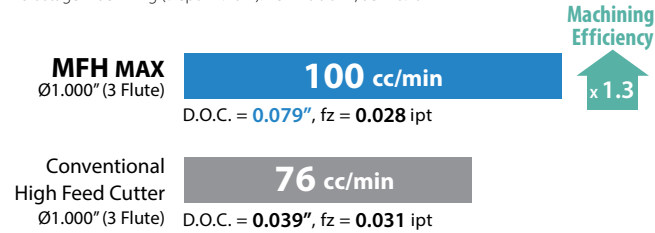
$V_c = 490$ sfm, D.O.C. = 0.079",
 $a_e = 1.000''$, $f_z = 0.028$ ipt,
Dry 1049 Ø2.000" BT50

2 When Compared to Conventional High Feed Cutters

A Larger D.O.C. Dramatically Improves Machining Efficiency

Machining Efficiency Simulation Example

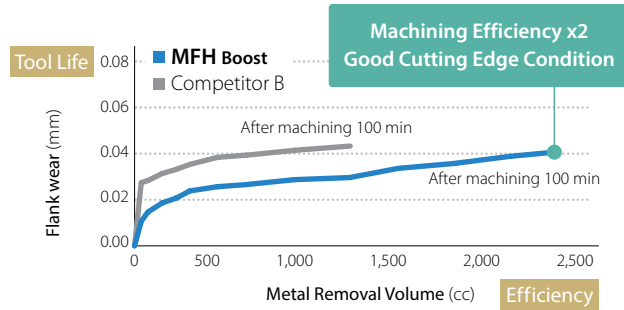
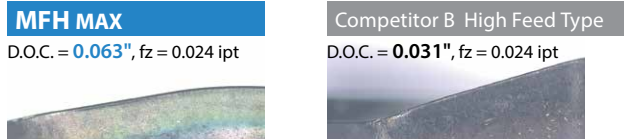
Multistage Machining (Depth 1.181"): $V_c = 490$ sfm, $a_e = 0.492$ "



High Efficiency and Good Tool Life

Machining Efficiency and Cutting Edge Condition Comparison (Internal Evaluation)

Cutting Edge Condition after 100 min machining



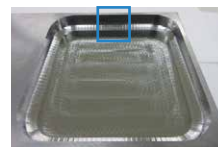
$V_c = 490$ sfm, $a_e = 0.492$ ", Dry 4140 Ø1.000" BT50

Excellent Wall Accuracy

Machining Efficiency and Wall Comparisons (Internal Evaluation)

Pocketing (Depth 0.472")

MFH MAX
Ø1.000" (3 Flute)



D.O.C. = **0.059"** × 8 Passes
 $Q = 115$ cc/min

Cutting Conditions: $V_c = 660$ sfm, $a_e = 0.492$ ", $f_z = 0.031$ ipt, Dry 1049 BT50

Competitor B High Feed Type
Ø1.000" (4 Flute)



D.O.C. = **0.031"** × 15 Passes
 $Q = 81$ cc/min

Superior Wall Accuracy



Wiper on outer periphery

reduction of wall level variation in multi-pass machining

Video

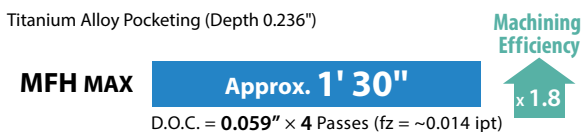


3 A Powerful Tool for Difficult-to-cut Materials

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")

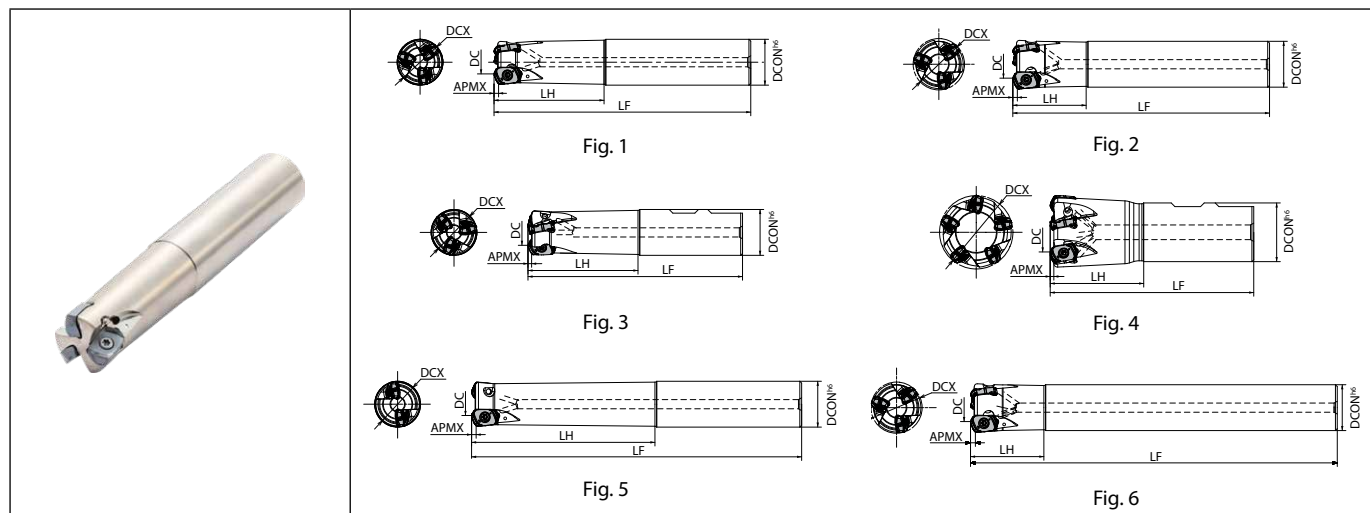


Competitor C High Feed Type
D.O.C. = **0.024"** × 10 Passes ($f_z \sim 0.016$ ipt)

$V_c = 160$ sfm, $a_e = 0.492$ " ($a_e/DCX = 50\%$), Ramping Angle 3° Ti-6Al-4V Wet Ø1.000" (3 Flute) BT50

Video

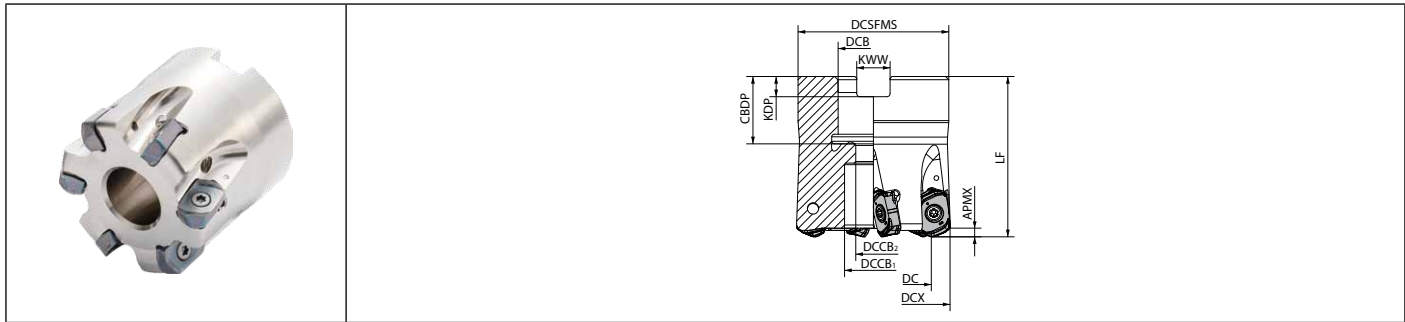



Toolholder Dimensions

Unit		Part Number				Std. Item	No. of Inserts	Dimensions							A.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Spare Parts			Applicable Inserts Page 21	
								DCX	DC	DCON	LF	LH	APMX	Anti-Seize Compound						Insert Screw	Wrench			
Inch	Cylindrical	Standard Shank	MFH 1000-S100-04-3T		3	1.000	0.567	1.000	2.500	5.500	0.098	-10	Yes	12,500	0.4	1				LOMU040410ER-GM				
		Long Shank	1250-S125-04-5T		5	1.250	0.817	1.250	2.750	6.000				11,000	0.7	1								
		MFH 1000-S100-04-3T-7		3	1.000	0.567	1.000	4.000	7.000	0.098	-10	Yes	12,500	0.7	5									
		1250-S125-04-4T-8		4	1.250	0.817	1.250	4.750	8.000				11,000	1.1	5									
Weldon	Standard Shank	MFH 1000-W100-04-3T		3	1.000	0.567	1.000	2.000	4.600	0.098	-10	Yes	12,500	0.4	3	Recommended tightening torque for insert screw 2.0N·m								
		1250-W125-04-5T		5	1.250	0.817	1.250	2.750	5.150				11,000	0.7	3									
mm	Cylindrical	Standard Shank	MFH 22-S20-04-2T		2	22	11	20	130	30	2.5	-10	Yes	13,600	0.3	2				LOMU040410ER-GM				
			25-S25-04-2T		2	25	14	25	140	60				12,700	0.5	1								
			25-S25-04-3T		3										1									
			28-S25-04-3T		3										2									
			28-S25-04-4T		4	28	17		40					12,000	0.5	2								
			32-S32-04-4T		4										1									
			32-S32-04-5T		5	32	21		70					11,200	0.8	1	Recommended tightening torque for insert screw 2.0N·m							
			35-S32-04-4T		4										2									
			35-S32-04-5T		5	35	24	32	150	50				10,700	0.8	2								
			40-S32-04-5T		5										2									
			40-S32-04-6T		6	40	29							10,000	0.9	2								
														2										
	Long Shank	Standard Shank	MFH 25-S25-04-2T-180		2	25	14	25	180	100	2.5	-10	Yes	12,700	0.6	5				LOMU040410ER-GM				
			25-S25-04-3T-180		3										5									
			28-S25-04-3T-200		3									28	17						40	12,000	0.7	6
			32-S32-04-4T-200		4	32	21		200	120				11,200	1.1	5	Recommended tightening torque for insert screw 2.0N·m							
			35-S32-04-4T-200		4	35	24	32	50	10,700					6									
			40-S32-04-4T-200		4	40	29		250															
			40-S32-04-5T-250		5									10,000	1.5	6								
						6																		
Weldon	Standard Shank	MFH 25-W25-04-2T		2	25	14	25	117	60	2.5	-10	Yes	12,700	0.4	3				LOMU040410ER-GM					
		25-W25-04-3T		3										3										
		32-W32-04-4T		4	32	21		131	70				11,200		3									
		32-W32-04-5T		5										3										
		40-W32-04-5T		5	40	29		111	50					4	Recommended tightening torque for insert screw 2.0N·m									
		40-W32-04-6T		6									10,000					4						

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat Anti-Seize Compound thinly on portion of taper and thread prior to installation.

● : Standard Item



Toolholder Dimensions

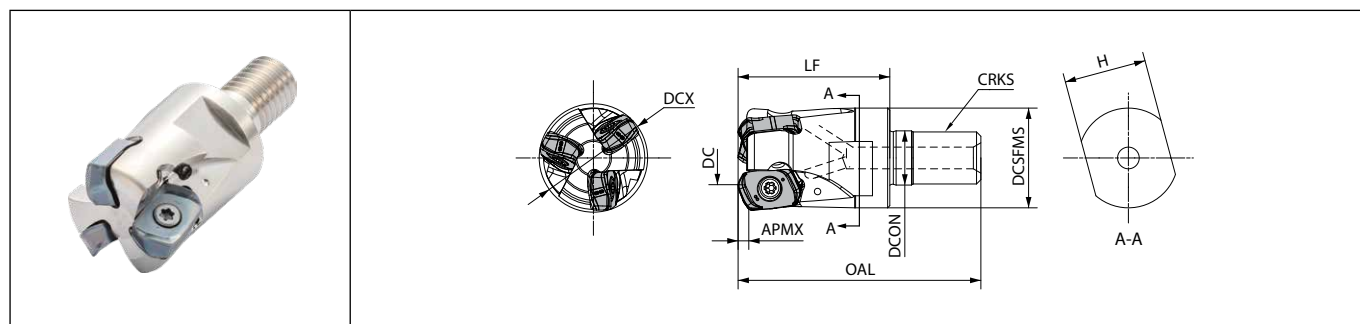
Unit	Part Number	Std. Item	No. of Inserts	Dimensions											A.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Spare Parts				Applicable Inserts ➡ Page 21	
				R	DCX	DC	DCSFM5	DCB	DCB ₁	DCB ₂	LF	CBDP	KDP	KWW					APMX	Anti-Seize Compound	Insert Screw	Wrench		Arbor Bolt
																								
Inch	Inch Bore Dia.	MFH 1500R-04-6T	● 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	10,200	0.2				HH1/4-0.75(H)	LOMU 040410ER-GM	
		2000R-04-7T	● 7	2.000	1.567	1.750	0.750	0.669	0.433	1.969	0.947	0.188	0.313				HH3/8-1.25(H)							
		2500R-04-9T	● 9	2.500	2.067	2.250											0.750	0.375				HH1/2-1.25(H)		
		3000R-04-10T	● 10	3.000	2.567	2.750																1.000		0.866
mm	Inch Bore Dia.	MFH 080R-04-8T	● 8	80	69	76	1.250"	26	17	63	1.260"	0.315"	0.500"	2.5	-10	Yes	7,100	1.6				HH16X40(H)	LOMU 040410ER-GM	
		080R-04-10T	● 10																			HH16X40(H)		
	Metric Bore Dia.	MFH 040R-04-5T-M	● 5	40	29	38	16	15	9	40	19	5.6	8.4	2.5	-10	Yes	10,000	0.2				HH8X25(H)	LOMU 040410ER-GM	
		040R-04-6T-M	● 6																			50		39
		050R-04-6T-M	● 6	52	41	22	18	11	21	6.3	10.4	HH10X30(H)												
		050R-04-7T-M	● 7									63	52									60		27
		052R-04-6T-M	● 6	27	20	13	21	6.3	10.4															
		052R-04-7T-M	● 7							27	20	13	21									6.3		12.4
		063R-04-7T-M	● 7	80	69	76	27	20	13															
		063R-04-7T-27M	● 7							27	20	13	21									6.3		10.4
		063R-04-9T-M	● 9	27	20	13	21	6.3	10.4															
		063R-04-9T-27M	● 9							27	20	13	21									6.3		10.4
		080R-04-8T-M	● 8	27	20	13	21	6.3	10.4															
		080R-04-10T-M	● 10							27	20	13	21									6.3		10.4

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

●: Standard Item

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

(H) Optional coolant-through arbor bolt available


Toolholder Dimensions

Unit	Part Number		Std. Item	No. of Inserts	Dimensions								A. R. (°)	Coolant Hole	Max RPM	Spare Parts			Applicable Inserts ➔ Page 21	
					DCX	DC	DCON	DCSFMS	OAL	LF	APMX	CRKS				H	Anti-Seize Compound	Insert Screw		Wrench
																				
Inch	MFH	1000-M12-04-3T 1250-M16-04-5T	●	3	1.000	0.567	0.492	0.900	2.205	1.380	0.098	M12×P1.75	0.748	-10	Yes	12,500	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
			●	5	1.250	0.817	0.669	1.180	2.441	1.580		M16×P2.0	0.945					11,000	Recommended tightening torque for insert screw 2.0N·m	
mm	MFH	22-M10-04-2T	●	2	22	11	10.5	18.7	48	30	2.5	M10×P1.5	15	-10	Yes	13,600	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM
		25-M12-04-2T	●	2	25	14	12.5	23	56	35		M12×P1.75	19			12,700				
		25-M12-04-3T	●	3		28										17				
		28-M12-04-3T	●	3	32						21						17	30	62	
		28-M12-04-4T	●	4		35	24	10,700												
		32-M16-04-4T	●	4	40			29	9,800											
		32-M16-04-5T	●	5		42	31			Recommended tightening torque for insert screw 2.0N·m										
		35-M16-04-4T	●	4	40			29			Recommended tightening torque for insert screw 2.0N·m									
		35-M16-04-5T	●	5		42	31		Recommended tightening torque for insert screw 2.0N·m											
		40-M16-04-5T	●	5	42			31		Recommended tightening torque for insert screw 2.0N·m										
		40-M16-04-6T	●	6		42	31				Recommended tightening torque for insert screw 2.0N·m									
		42-M16-04-5T	●	5	42			31	Recommended tightening torque for insert screw 2.0N·m											
		42-M16-04-6T	●	6		42	31			Recommended tightening torque for insert screw 2.0N·m										

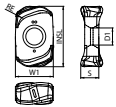
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard Item

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

See page [Page 34](#) for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

MFH-MAX | Applicable Inserts

Usage Classification ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (Hardness 45HRC or under)		Carbon steel / Alloy steel								☆			★	☆	P			
		Mold and die steel							☆				★	☆				
		Austenitic stainless steel								☆			☆	★	M			
		Martensitic stainless steel					★						☆					
		Precipitation hardened stainless steel								☆			★					
		Gray cast iron						☆				★			K			
		Nodular cast iron						☆			★							
		Heat-resistant alloy					★							☆	S			
		Titanium alloy								☆				★				
		Hard materials														H		
Insert		Part Number		No. of Edges	Dimensions (mm)					Carbide							Applicable Toolholder ➡ Page 19-21	
					S	D1	RE	W1	INSL	CVD	PVD							
											CA6535	PR1510	PR1525	PR1535	PR1810	PR1825		
	 General Purpose	LOMU 040410ER-GM	4	4.4	4.1	1	9.1	14.5	●	△	●	●	●	●	●	MFH...-04-..		

Right-hand Insert Shown

Recommended Cutting Conditions ➡ [Page 22](#)

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

LOMU Inserts are sold in 10 piece boxes

Chipbreaker	Workpiece Material	Holder Part Number and Feed Rate (fz: ipt)		Recommended Insert Grade (Vc: sfm)			
		D.O.C. (in)	MFH...04...	MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coating
				PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535
GM	Carbon Steel Alloy Steel	≤ 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				
	(~ 350HB)	≤ 0.020	0.008~ 0.030 ~0.047	-	★ 330~ 490 ~660 (Dry Machining Recommended)	☆ 330~ 490 ~660 (Dry Machining Recommended)	-
		≤ 0.039	0.008~ 0.026 ~0.039				
		≤ 0.059	0.008~ 0.022 ~0.028				
		≤ 0.079	0.008~ 0.016 ~0.022				
		≤ 0.098	0.008~ 0.010 ~0.014				
	(~ 40HRC)	≤ 0.020	0.008~ 0.024 ~0.043	-	★ 260~ 390 ~520 (Dry Machining Recommended)	☆ 260~ 390 ~520 (Dry Machining Recommended)	-
		≤ 0.039	0.008~ 0.020 ~0.035				
		≤ 0.059	0.008~ 0.016 ~0.026				
		≤ 0.079	0.008~ 0.012 ~0.022				
		≤ 0.098	0.008~ 0.010 ~0.014				
	(40 ~ 50HRC)	≤ 0.020	0.004~ 0.012 ~0.020	-	★ 200~ 330 ~430 (Dry Machining Recommended)	-	-
		≤ 0.039	0.004~ 0.010 ~0.016				
		≤ 0.059	0.004~ 0.008 ~0.012				
		≤ 0.079	-				
		≤ 0.098	-				
	(50 ~ 55HRC)	≤ 0.020	0.004~ 0.008 ~0.016	-	★ 160~ 230 ~330 (Dry Machining Recommended)	-	-
		≤ 0.039	0.004~ 0.006 ~0.010				
		≤ 0.059	-				
		≤ 0.079	-				
		≤ 0.098	-				
	Austenitic Stainless Steel	≤ 0.020	0.008~ 0.024 ~0.039	-	☆ 330~ 460 ~590	★ 330~ 460 ~590	-
		≤ 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				
	Martensitic Stainless Steel	≤ 0.020	0.008~ 0.024 ~0.039	-	-	☆ 330~ 490 ~660	★ 490~ 660 ~980
		≤ 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				
	Precipitation Hardened Stainless Steel	≤ 0.020	0.004~ 0.012 ~0.020	-	-	★ 300~ 390 ~490	-
		≤ 0.039	0.004~ 0.010 ~0.018				
		≤ 0.059	0.004~ 0.006 ~0.010				
		≤ 0.079	-				
		≤ 0.098	-				
	Gray Cast Iron	≤ 0.020	0.008~ 0.032 ~0.051	★ 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				
	Nodular Cast Iron	≤ 0.020	0.008~ 0.024 ~0.039	★ 330~ 490 ~660	-	-	-
		≤ 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				
	Ni-base Heat-Resistant Alloy	≤ 0.020	0.004~ 0.012 ~0.018	-	-	☆ 70~ 100 ~160	★ 70~ 100 ~160
		≤ 0.039	0.004~ 0.010 ~0.016				
		≤ 0.059	0.004~ 0.006 ~0.008				
		≤ 0.079	-				
		≤ 0.098	-				
	Titanium Alloy	≤ 0.020	0.004~ 0.012 ~0.020	-	-	★ 130~ 200 ~260	-
		≤ 0.039	0.004~ 0.010 ~0.018				
		≤ 0.059	0.004~ 0.006 ~0.010				
		≤ 0.079	-				
		≤ 0.098	-				

- 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. ★: 1st Recommendation ☆: 2nd Recommendation
- 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.

MFH-RAPTOR[®] Mini

(Cutter Dia. Ø0.625" ~ Ø2.000")
(Cutter Dia. Ø16mm ~ Ø50mm)

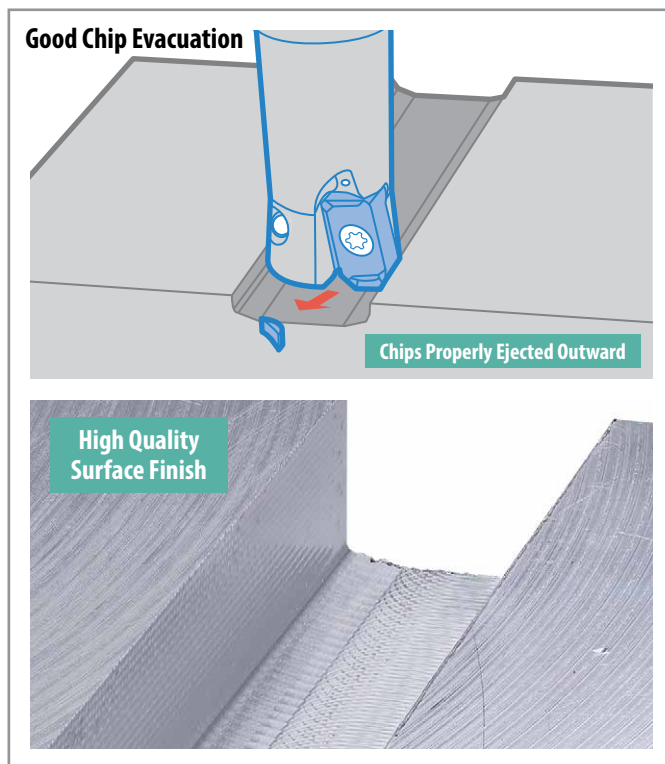
Economical Inserts with 4 Cutting Edges

High Feed Milling for Small Diameters and Small Machining Centers

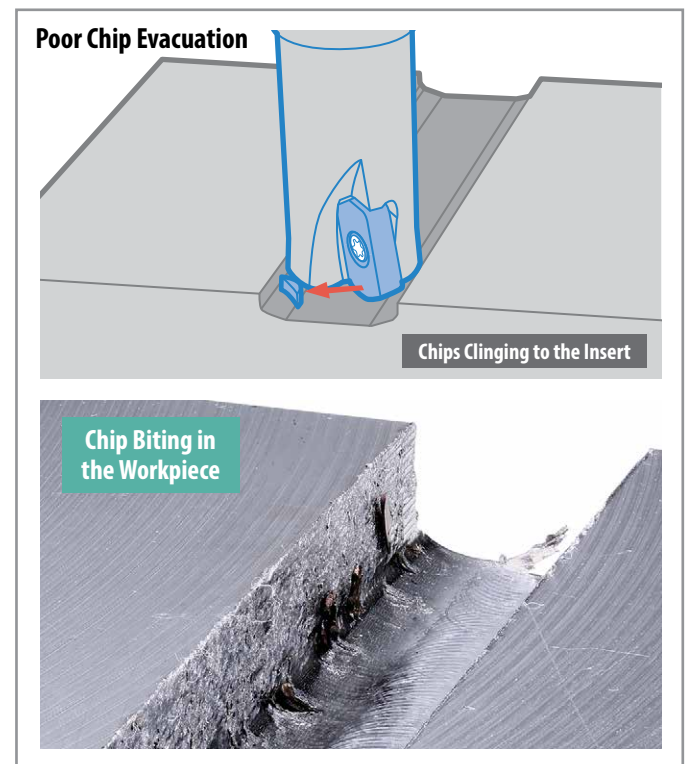
1 Good Chip Evacuation

MFH Mini Controls Chip Biting with Convex Cutting Edge

MFH Mini



Competitor High Feed Cutter

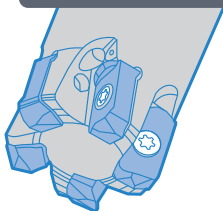


Cutting Conditions: Cutter Dia. DCX = Ø0.625", Vc = 490 sfm, fz = 0.024 ipt, D.O.C. = 0.020" (20 Passes): Total 0.394" × 0.630", Dry Workpiece: Stainless Steel

2 Fine Pitch for Efficient Machining

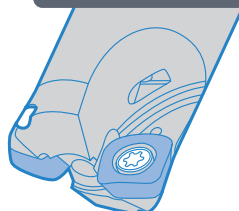
Cutter Dia. 1.000" Type

MFH Mini



MFH1000-W100-03-5T47

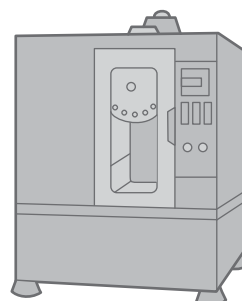
MFH

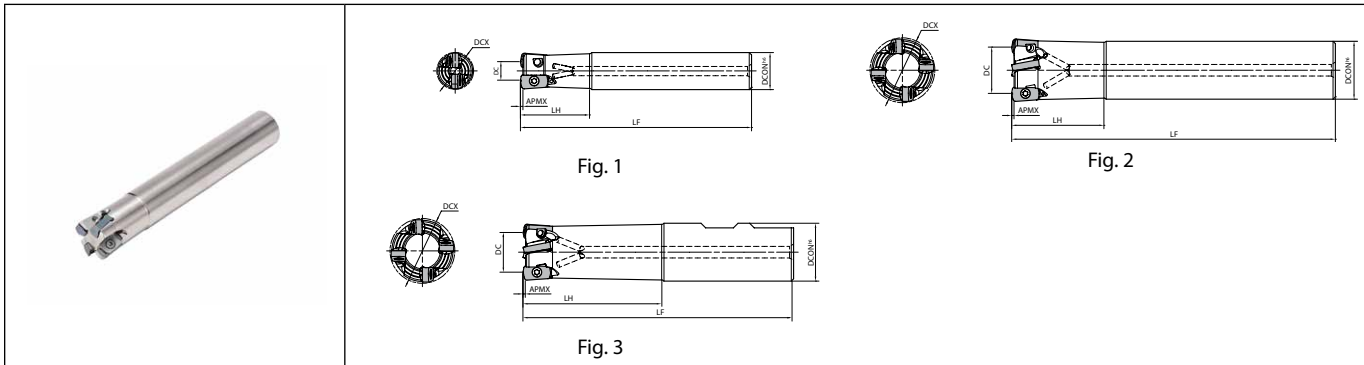


MFH1000-W100-10-2T

3 Suitable for Roughing of Molds

High Feed Machining in Small Machining Centers





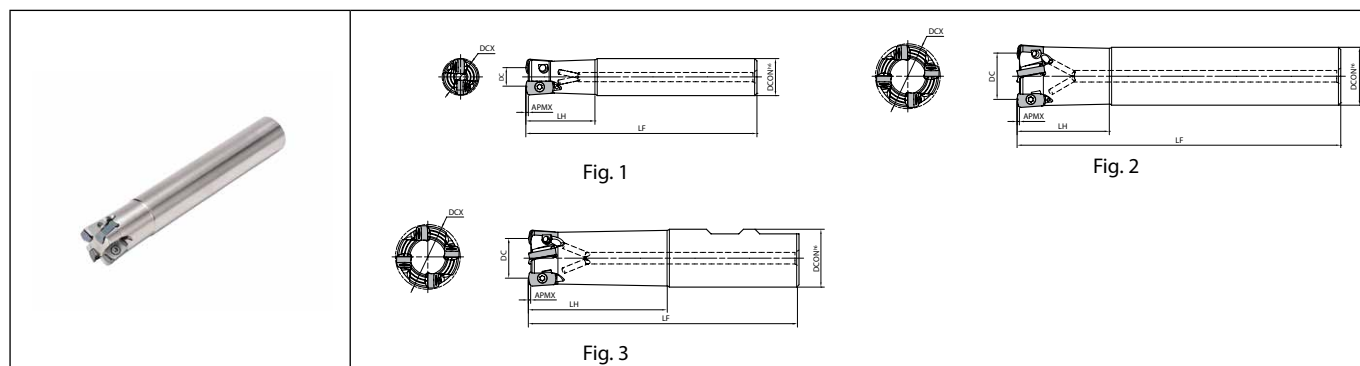
Toolholder Dimensions

Unit	Part Number			Std. Item	No. of Inserts	Dimensions						A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Spare Parts			Applicable Inserts ➔ Page 28
						DCX	DC	DCON	LF	LH	APMX										
Inch	Weldon	Standard Shank	MFH	0625-W625-03-2T-3	● 2	0.625	0.310	0.625	3.196	1.250	0.039	-10	-15	Yes	18,800	0.1	3	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
				0750-W750-03-3T-4	● 3	0.750	0.435	0.750	4.070	2.000					15,700	0.2	3				
				1000-W100-03-4T-47	● 4	1.000	0.685	1.000	4.820	2.500					13,400	0.4	3				
				1000-W100-03-5T-47	● 5										11,400	0.7	3				
				1250-W125-03-5T-5	● 5	1.250	0.935	1.250	5.070	2.750											
				1250-W125-03-6T-5	● 6																
	Cylindrical	Long Shank	MFH	0625-S625-03-2T-6	● 2	0.625	0.310	0.625	6.000	2.000	0.039	-10	-15	Yes	18,800	0.2	1	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
				0750-S750-03-3T55	● 3	0.750	0.435	0.750	5.500	2.000					15,700	0.3	1				
				0750-S750-03-3T65	● 3				6.500	3.000											
				0875-S750-03-3T55	● 3	0.875	0.560		5.500	2.000					14,700	0.3	1				
				1000-S100-03-4T55	● 4	1.000	0.685	1.000	5.500	2.500					13,400	0.5	1				
				1000-S100-03-4T-7	● 4					7.000					4.000	11,400	0.6				
				1250-S125-03-5T62	● 5				6.250	3.000						0.8	1				
				1250-S125-03-5T-8	● 5	1.250	0.935	1.250	8.000	4.750						1.1	1				

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

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

● : Standard Item



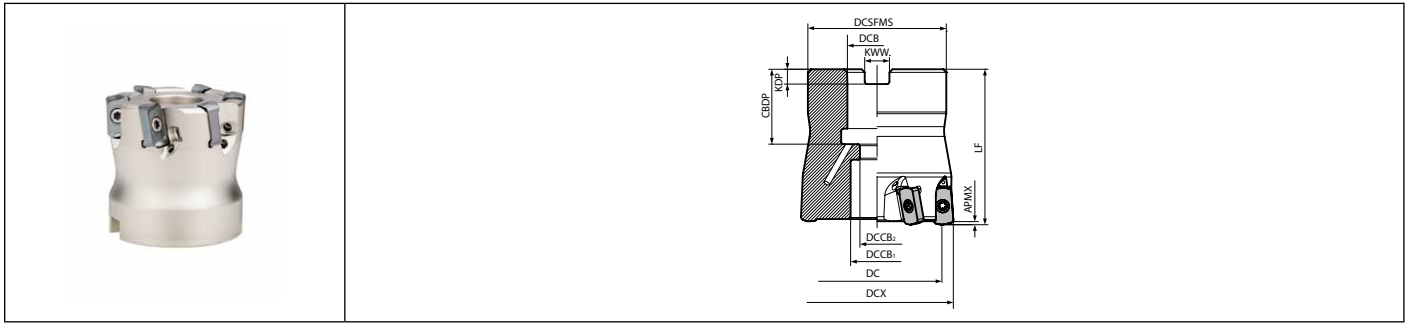
Toolholder Dimensions

Unit	Part Number			Std. Item	No. of Inserts	Dimensions							A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Spare Parts			Applicable Inserts ➡ Page 28		
						DCX	DC	DCON	LF	LH	APMX													
mm	Cylindrical	Standard Shank	MFH 16-S16-03-2T	● 2	16	8	16	100	30	1	-10	-15	Yes	18,800	1				LOGU030310ER-GM LOGU030310ER-GH					
			17-S16-03-2T	● 2	17	9			20					17,900	0.1					2				
			18-S16-03-2T	● 2	18	10			20					17,000	2									
			20-S20-03-3T	● 3	20	12	20	130	50					15,700	1									
			20-S20-03-4T	● 4					1															
			22-S20-03-3T	● 3					30					14,700	0.3					2				
			22-S20-03-4T	● 4	22	14	30	2																
			25-S25-03-4T	● 4	25	17	25	140	60					13,400	1					Recommended tightening torque for insert screw 1.2N·m				
			25-S25-03-5T	● 5					40					12,400	0.5									1
			28-S25-03-4T	● 4					28					20	40									2
			28-S25-03-5T	● 5				2																
			32-S32-03-5T	● 5	32	24	32	150	70					11,400	0.8									1
			32-S32-03-6T	● 6										1										
	Long Shank	MFH 16-S16-03-2T-150	● 2	16	8	16	150	50	1	-10	-15	Yes	18,800	0.2	1				LOGU030310ER-GM LOGU030310ER-GH					
			20-S20-03-3T-160	● 3	20	12	20	160					80	15,700	0.3					1				
			25-S25-03-4T-180	● 4	25	17	25	180					100	13,400	0.6					1				
			32-S32-03-5T-200	● 5	32	24	32	200					120	11,400	1.1					1				
	Weldon	Standard Shank	MFH 16-W16-03-2T	● 2	16	8	16	79	30	1	-10	-15	Yes	18,800	0.1	3				LOGU030310ER-GM LOGU030310ER-GH				
			20-W20-03-3T	● 3	20	12	20	101	50					15,700	0.2	3								
			20-W20-03-4T	● 4	25	17	25	117	60					3										
			25-W25-03-4T	● 4										3										
			25-W25-03-5T	● 5										3										
			32-W32-03-5T	● 5	32	24	32	131	70					11,400	0.7	3								
			32-W32-03-6T	● 6																				

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

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

● : Standard Item



Toolholder Dimensions

Unit	Part Number	Std. Item	No. of Inserts	Dimensions										A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Spare Parts				Applicable Inserts ➡ Page 28																		
				R	DCX	DC	DCSFM5	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP						KWW	APMX																					
Inch	MFH 1500R-03-ST	●	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	10,200	0.2				HH1/4-0.75(H)	LOGU030310ER-GM																	
	1500R-03-6T	●	6																												LOGU030310ER-GH										
	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										Recommended tightening torque for insert screw 1.2N·m	SB-3065TRP	DTPM-8	HH3/8-1.25(H)														
	2000R-03-9T	●	9																																						
mm	MFH 040R-03-ST-M	●	5	40	32	38	16	15	9	40	19	5.6	8.4	1	-10	-15	Yes	9,900	0.2				HH8X25(H)	LOGU030310ER-GM																	
	040R-03-6T-M	●	6																																						LOGU030310ER-GH
	050R-03-8T-M	●	8																					50	42	47	22	19	11	50	21	6.3	10.4	Recommended tightening torque for insert screw 1.2N·m	SB-3065TRP	DTPM-8	HH10X30(H)				
			●																					8																	

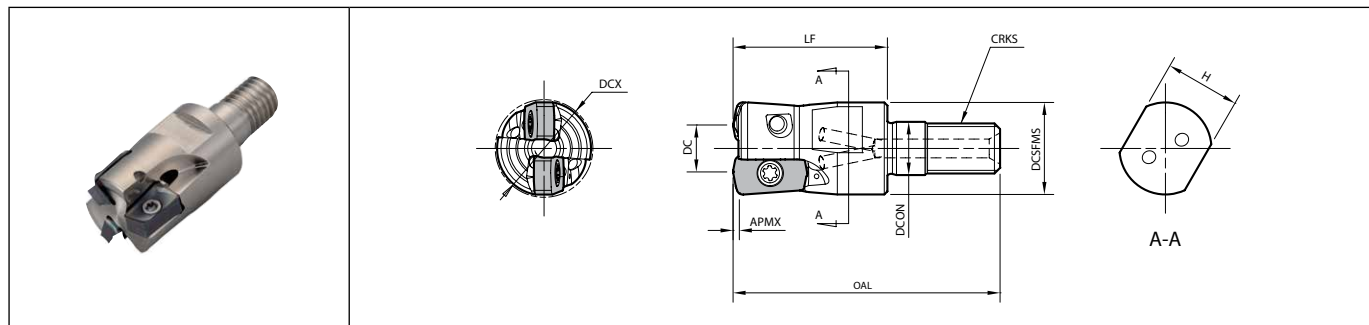
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard Item

Multiple step slot milling is NOT recommended for MFH-Mini face mill diameters above Ø1.300" due to a danger of re-cutting chips.

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

(H) Optional coolant-through arbor bolt available.



Toolholder Dimensions

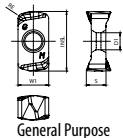
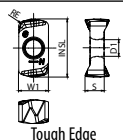
Unit	Part Number	Std. Item	No. of Inserts	Dimensions									A.R. (°)	R.R. (°)	Coolant Hole	Max RPM	Spare Parts			Applicable Inserts ➡ Page 28
				DCX	DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H					Anti-Seize Compound 	Insert Screw 	Wrench 	
Inch	MFH 0625-M08-03-2T	●	2	0.625	0.310	0.335	0.579	1.693	0.984	0.039	M8×P1.25	0.472	-10	-15	Yes	18,800	P-37 SB-3065TRP DTPM-8 Recommended tightening torque for insert screw 1.2N·m	LOGU030310ER-GM LOGU030310ER-GH		
	MFH 0750-M10-03-3T	●	3	0.750	0.435	0.413	0.728	1.929	1.181	0.039	M10×P1.5	0.591	-10	-15	Yes	15,700				
	MFH 1000-M12-03-4T	●	4	1.000	0.685	0.492	0.906	2.244	1.378	0.039	M12×P1.75	0.748	-10	-15	Yes	13,400				
	MFH 1000-M12-03-5T	●	5																	
	MFH 1250-M16-03-5T	●	5	1.250	0.935	0.669	1.181	2.480	1.575	0.039	M16×P2	0.945	-10	-15	Yes	11,400				
	MFH 1250-M16-03-6T	●	6																	
MFH 1500-M16-03-6T	●	6	1.500	1.185											10,200					
mm	MFH 16-M08-03-2T	●	2	16	8	8.5	14.7	42	25	1	M8×P1.25	12	-10	Yes	18,880	P-37 SB-3065TRP DTPM-8 Recommended tightening torque for insert screw 1.2N·m	LOGU030310ER-GM LOGU030310ER-GH			
	MFH 17-M08-03-2T	●	2	17	9															
	MFH 18-M08-03-2T	●	2	18	10															
	MFH 20-M10-03-3T	●	3	20	12	10.5	18.7	48	30	1	M10×P1.5	15	-10	Yes	15,700					
	MFH 20-M10-03-4T	●	4																	
	MFH 22-M10-03-3T	●	3																	
	MFH 22-M10-03-4T	●	4	22	14									14,700						
	MFH 25-M12-03-4T	●	4	25	17	12.5	23	56	35	1	M12×P1.75	19	-10	Yes	13,400					
	MFH 25-M12-03-5T	●	5																	
	MFH 28-M12-03-4T	●	4	28	20															
	MFH 28-M12-03-5T	●	5																	
	MFH 32-M16-03-5T	●	5	32	24	17	30	62	40	1	M16×P2	24	-10	Yes	11,400					
	MFH 32-M16-03-6T	●	6																	

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

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

See page [Page 34](#) for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

● : Standard Item

Usage Classification ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (Hardness 45HRC or under)		Carbon steel / Alloy steel					☆			★	☆	P				
		Mold and die steel					☆			★	☆					
		Austenitic stainless steel						☆		☆	★	M				
		Martensitic stainless steel		★							☆					
		Precipitation hardened stainless steel						☆			★					
		Gray cast iron				☆				★		K				
		Nodular cast iron				☆				★						
		Heat-resistant alloy		★							☆	S				
		Titanium alloy						☆			★					
Hard materials (≤ 60 HRC)			★								H					
Insert	Part Number	No. of Edges	Dimensions (mm)					Carbide								Applicable Toolholder ➡ Page 24-27
			S	D1	RE	INSL	W1	CVD	PVD							
									CA6535	PR0155	PR1510	PR1525	PR1535	PR1810	PR1825	
	 General Purpose	LOGU 030310ER-GM	4	3.96	3.45	1	11.9	6.2	●	△	●	●	●	●	●	MFH....-03-..
	 Tough Edge	LOGU 030310ER-GH	4	3.96	3.45	1	11.9	6.2	●	△	●	●	●	●	●	MFH....-03-..

Right-hand Insert Shown

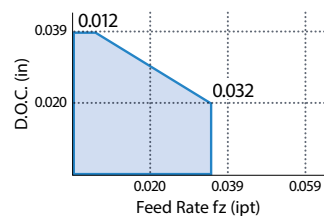
Recommended Cutting Conditions ➡ [Page 29](#)

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

LOGU Inserts are sold in 10 piece boxes

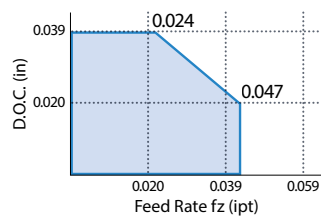
MFH Mini | Cutting Performance

Fine Pitch End Mill



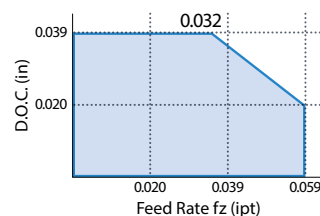
Standard Pitch End Mill

Cutting Dia. Ø0.625" - Ø0.750"
Cutting Dia. Ø16mm - Ø22mm



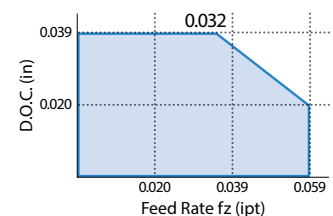
Standard Pitch End Mill

Cutting Dia. 1.000" - 1.250"
Cutting Dia. Ø25mm - Ø32mm



MFH Mini Face Mill

Cutting Dia. 1.500" - 2.000"
Cutting Dia. Ø40mm - Ø50mm



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

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 EX (MEGACOAT NANO)			MEGACOAT HARD	CVD
										PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1835)	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	-	★ 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	-	☆ 260- 460 -590	☆ 260- 460 -590	GH ★ 260- 460 -590	-	
	Mold Steel	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	-	☆ 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	-	☆ 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	-	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	★ 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	★ 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	-	-	☆ 70- 100 -160	-	★ 70- 100 -160	
	Titanium Alloy								GM ☆ 100- 160 -230	-	GM ★ 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.

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

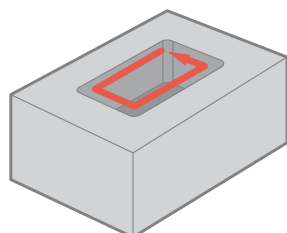
Standard Pitch End Mills Fine Pitch End Mills MFH Mini Face Mills

★: 1st Recommendation ☆: 2nd Recommendation

Case Studies

Mold Parts Pre-hardened Steel

Vc = 720 sfm (n = 3,500 rpm)
f = 0.002 ipt (Vf = 27.559 ipm)
D.O.C. x ae = 0.002" x 0.551", Dry
MFH20-S20-03-4T
LOGU030310ER-GM PR1535



Tool Life

PR1535

2.0_H

Tool Life
MAX
2x

Competitor K (4 Flutes)

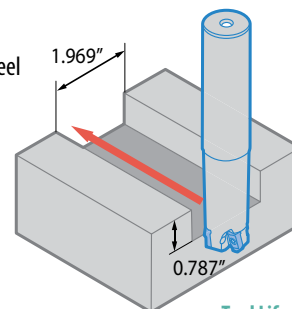
1.0~1.5_H

PR1535 shows lower cutting load compared with Competitor K making it possible to extend the machining time.

(User Evaluation)

Airplane Parts Precipitation Hardened Stainless Steel

Vc = 390 sfm (n = 1,530 rpm)
fz = 0.024 ipt (Vf = 144.488 ipm)
D.O.C. x ae = 0.028" x 0.984" Dry
MFH1000-W100-03-4T47 (4 Flutes)
LOGU030310ER-GM (PR1535)



Machining Efficiency

PR1535

100_{pcs}

Tool Life
1.8x

Competitor L (5 Inserts)

55_{pcs}

PR1535 maintains good cutting edge condition after machining 100 pcs with stable machining.

(User Evaluation)

MFH-RAPTOR MICRO

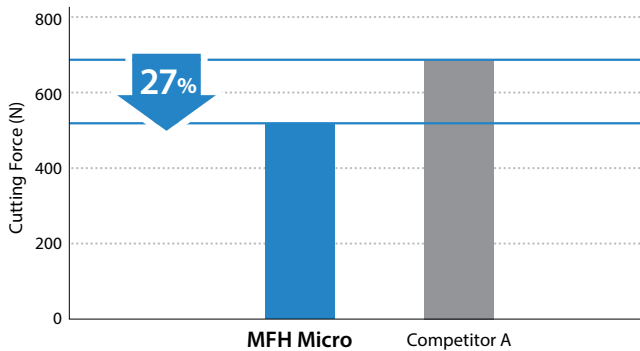
(Cutter Dia. Ø0.375" ~ Ø0.625")
(Cutter Dia. Ø8mm ~ Ø16mm)

Low Resistance and Durable Design Aids in Chatter Resistant Machining
Maximum D.O.C. 0.020" and Stable High Feed Machining on a Wide Range of Applications

1 Stable Machining with Chattering Resistance

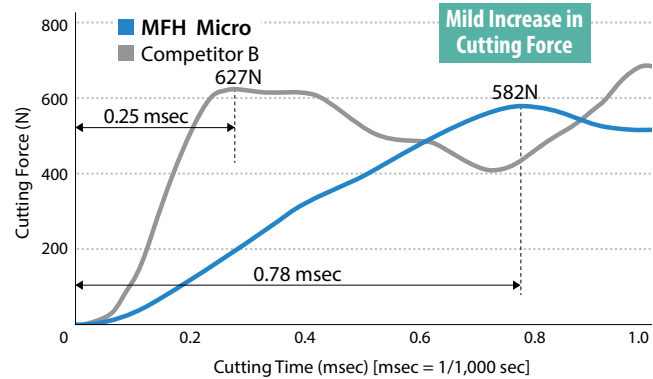
Molded Convex Cutting Edge Controls Initial Impact when Entering the Workpiece

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)



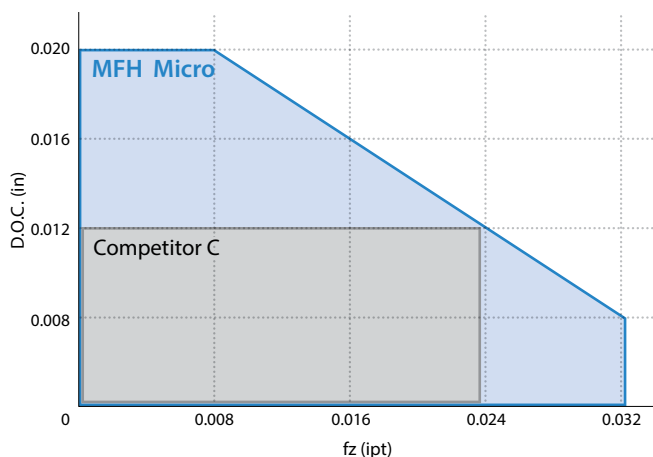
Cutting Conditions: $V_c = 390$ sfm, $f_z = 0.024$ ipt, D.O.C. $\times$ ae = 0.016" $\times$ 0.197"
Cutter Dia. Ø0.375", Dry Workpiece: 1049

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")



(Internal Evaluation)

3 Can Replace Solid End Mills to Reduce Machining Costs

Suppresses Chattering and Increases Milling Efficiency

MFH Micro Compared to Solid End Mills (Mechanical Parts Slotting 1049)

MFH Micro Q = 15.3 cc/min

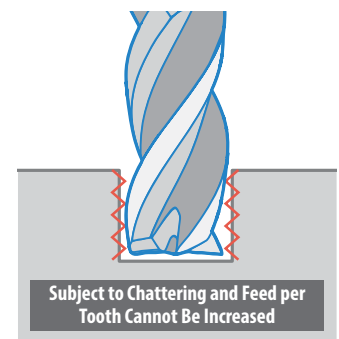
$V_c = 490$ sfm, $f_z = 0.016$ ipt
D.O.C. $\times$ ae = 0.016" $\times$ 0.394", Dry
MFH10-S10-01-2T (2 Flutes)
LPGT010210ER-GM (PR1525)

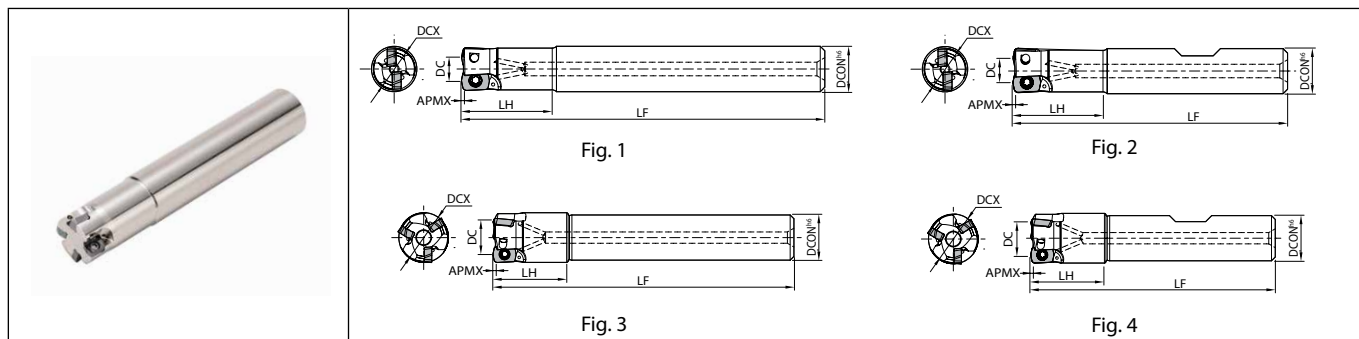
1.2x
Machining Efficiency



Solid End Mill Q = 12.2 cc/min

$V_c = 260$ sfm, $f_z = 0.002$ ipt
D.O.C. $\times$ ae = 0.012" $\times$ 0.394", Dry
Ø10mm (4 Flute)



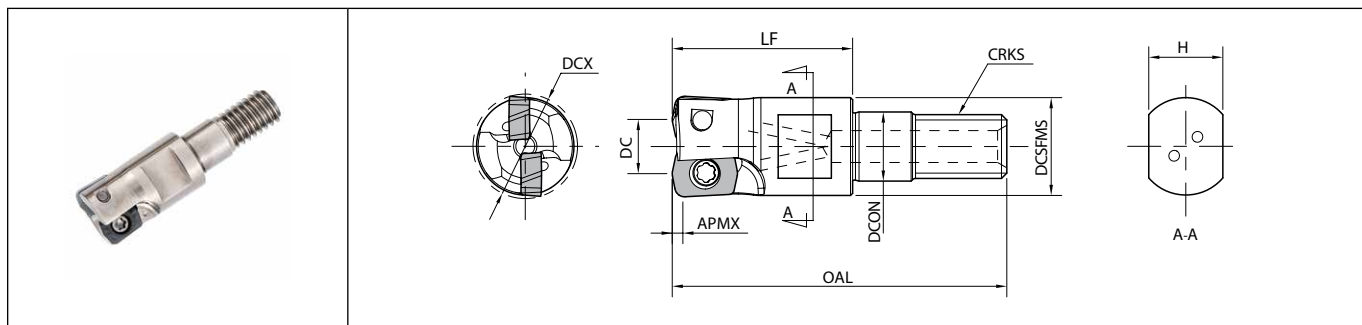

Toolholder Dimensions

Unit	Part Number		Std. Item	No. of Inserts	Dimensions							A.R. (°)	Coolant Hole	Max RPM	Weight (kg)	Fig.	Spare Parts			Applicable Inserts  Page 32
					DCX	DC	DCON	LF	LH	APMX										
Inch	Cylindrical	MFH 0375-S375-01-1T-3	● 1	1	0.375	0.225	0.375	3.000	0.750	0.020	+5	Yes	16,200	0.04	1	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
		0394-S375-01-2T-3	● 2	2	10mm	0.244														
		0500-S500-01-3T-3	● 3	3	0.500	0.350	0.500				14,000	0.07	1							
		0500-S500-01-3T-5	● 3	3				5.000			14,000	0.11	1							
		0625-S625-01-4T35	● 4	4	0.625	0.475	0.625	3.500	1.000		11,400	0.12	1							
mm	Cylindrical	MFH 08-S10-01-1T	● 1	1	8	4.2	10	75	16	0.5	+5	Yes	20,000	0.04	1	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
		10-S10-01-2T	● 2	2	10	6.2								16,200	0.04					1
		12-S12-01-3T	● 3	3	12	8.2	12	80	20				14,000	0.06	1					
		14-S12-01-3T	● 3	3	14	10.2							12,500	0.07	3					
		16-S16-01-4T	● 4	4	16	12.2	16	90	25				11,400	0.12	1					
	Weldon	MFH 08-W10-01-1T	● 1	1	8	4.2	10	58	16	0.5	+5	Yes	20,000	0.03	2	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
		10-W10-01-2T	● 2	2	10	6.2		60					16,200	0.03	2					
		12-W12-01-3T	● 3	3	12	8.2	12	65	20				14,000	0.05	2					
		14-W12-01-3T	● 3	3	14	10.2							12,500	0.05	4					
		16-W16-01-4T	● 4	4	16	12.2	16	73	25				11,400	0.1	2					

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

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

Recommended tightening torque for insert screw : 0.5N·m



Toolholder Dimensions

Unit	Part Number	Std. Item	No. of Inserts	Dimensions									A.R. (°)	Coolant Hole	Max RPM	Spare Parts			Applicable Inserts ➡ Page 32
				DCX	DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H							
Inch	MFH 0500-M06-01-3T 0625-M08-01-4T	● ●	3 4	0.500 0.625	0.350 0.475	0.256 0.335	0.441 0.579	1.240 1.575	0.669 0.866	0.020	M6xP1.0 M8xP1.25	0.276 0.472	+5	Yes	14,000 11,400	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM
mm	MFH 08-M06-01-1T 10-M06-01-2T 12-M06-01-3T 14-M06-01-3T 16-M08-01-4T	● ● ● ● ●	1 2 3 3 4	8 10 12 14 16	4.2 6.2 8.2 10.2 12.2	6.5	9.2	30.5	17	0.5	M6xP1.0	7	+5	Yes	20,000 16,200 14,000 12,500	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM
	11.2	8.5	14.7	39	22		0.5								M8xP1.25				

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

● : Standard Item

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

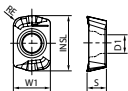
Industry standard threads for adapting to common toolholders (For Ø8mm - Ø14mm screw size: M6 x P1.0).

Check screw specifications for the shank in use.

Recommended tightening torque for insert screw : 0.5N·m

See page [Page 34](#) for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

MFH Micro | Applicable Inserts

Usage Classification ★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (Hardness 45HRC or under)		Carbon steel / Alloy steel						☆	★	☆	P			
		Mold and die steel						☆	☆	★				
		Austenitic stainless steel						☆	☆	★	M			
		Martensitic stainless steel						★	☆	☆				
		Precipitation hardened stainless steel						☆	☆	★				
		Heat-resistant alloy						★	☆	☆	S			
		Titanium alloy						☆	☆	★				
Insert	Part Number	No. of Edges	Dimensions (mm)					Carbide					Applicable Toolholder ➡ Page 31-32	
			S	D1	RE	W1	INSL	CVD	PVD					
								CA6335	PR1525	PR1535	PR1825	PR1835		
	 General Purpose	LPGT 010210ER-GM	2	2.19	2.1	1	4.19	6.26	●	●	●	●	●	MFH...-01-...

Right-hand Insert Shown

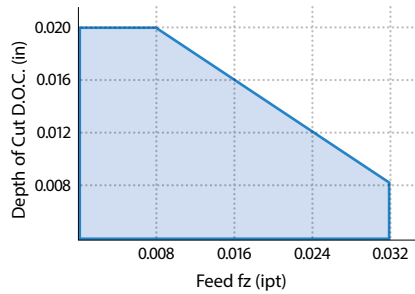
Recommended Cutting Conditions ● [Page 33](#)

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

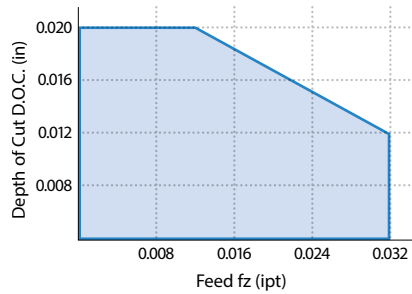
LPGT Inserts are sold in 10 piece boxes

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 ★ 1st Recommendation ☆ 2nd Recommendation

Chipbreaker	Workpiece Material	Cutter Part Number 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 EX (MEGACOAT NANO)		CVD
							PR1825 (PR1525)	PR1835 (PR1535)	CA6535
GM	Carbon Steel	0.008~ 0.016 ~0.024			0.008~ 0.020 ~0.031		★ 390~ 590 ~820	☆ 390~ 590 ~820	-
	Alloy Steel						★ 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						-	☆ 490~ 660 ~820	★ 590~ 790 ~980
	Precipitation Hardened Stainless Steel						-	★ 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						-	★ 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.

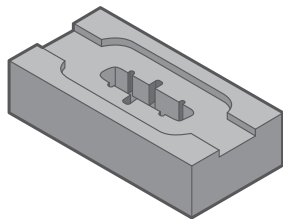
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

Internal coolant is recommended for slotting applications

Case Studies

Mold H13

Vc = 300 sfm (n = 2,400 rpm)
fz = 0.011 ipr
(Vf = 75.984 ipm)
D.O.C. x ae = 0.012" x ~0.028", Dry
MFH0500-S500-01-3T-3
LPGT010210ER-GM PR1535



Chip Evacuation

PR1535

4.5 cc/min

Efficiency
1.3x

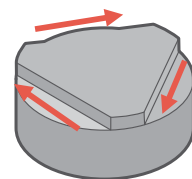
Competitor I

3.4 cc/min

PR1535 shows 1.3 times machining efficiency compared to Competitor I
Good cutting edge condition after machining almost doubling the tool life
(User Evaluation)

Industrial Machine Parts 440C

Vc = 590 sfm (n = 3,580 rpm)
fz = 0.016 ipt (Vf = 225.591 ipm)
D.O.C. = 0.016", ae = 0.315", Wet
MFH0625-S625-01-4T35
LPGT010210ER-GM PR1535



Cutting Time

PR1535

7 min

35%
Cutting Time

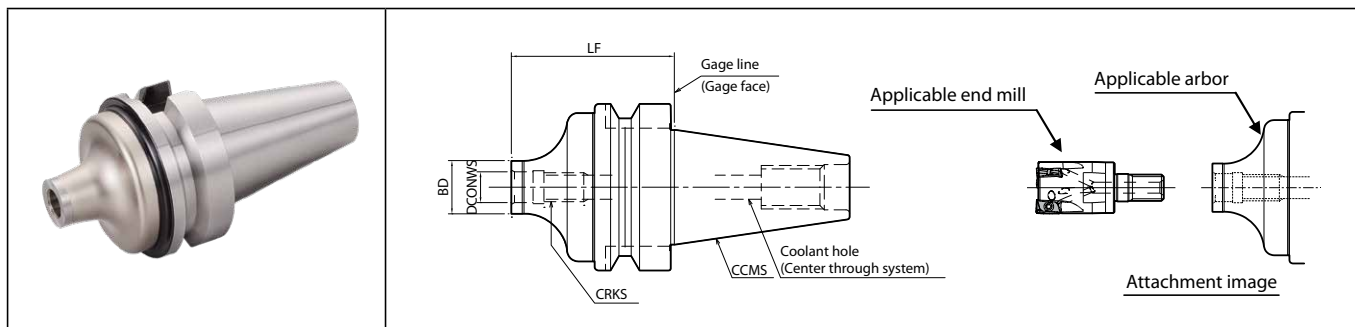
Competitor J

11 min

PR1535 shows 30% faster cycle time compared to competitor J

(User Evaluation)

BT Arbor (for Exchangeable Head / Two Face Contact)



Dimensions

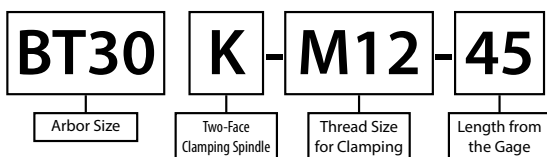
Unit	Part Number	Std. Item	Dimensions				Coolant Hole	Arbor (Double-Face Clamping)	Applicable End Mill (Head)
			LF	BD	DCONWS	CRKS			
mm	BT30K- M08-45	●	45	14.7	8.5	M8×1.25	Yes	BT30	MFH...-M08-..
	M10-45	●		18.7	10.5	M10×1.5			MFH...-M10-..
	M12-45	●		23	12.5	M12×1.75			MFH...-M12-..
	BT40K- M08-55	●	55	14.7	8.5	M8×1.25	Yes	BT40	MFH...-M08-..
	M10-60	●	60	18.7	10.5	M10×1.5			MFH...-M10-..
	M12-55	●	55	23	12.5	M12×1.75			MFH...-M12-..
	M16-65	●	65	30	17	M16×2.0			MFH...-M16-..

● : Standard Item

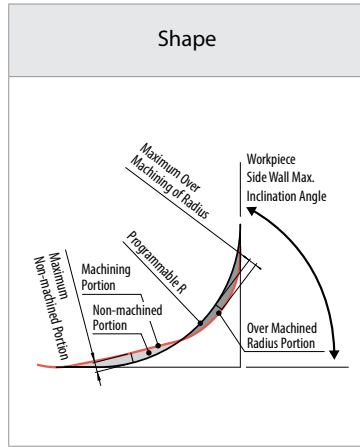
Actual End Mill Depth

	Arbor Part Number	Unit	Applicable Modular End Mill (Head)			Actual End Mill Depth
			Part Number	Cutting Dia.	Dimensions	
				DC	LF	LUX
	BT30K- M08-45	Inch	MFH0625-M08-03...	0.625	0.984	1.252
		mm	MFH16-M08-01...	16	22	28.8
		mm	MFH16-M08-03...	16	25	31.8
		mm	MFH17-M08-03...	17		33.2
		mm	MFH18-M08-03...	18		34.2
	M10-45	Inch	MFH0750-M10-03...	0.750	1.181	1.449
		mm	MFH20-M10-03...	20	30	36.8
		mm	MFH22-M10-...	22		39.2
	M12-45	Inch	MFH1000-M12-...	1.000	1.378	1.685
		mm	MFH25-M12-...	25	35	42.8
		mm	MFH28-M12-...	28		45.5
	BT40K- M08-55	mm	MFH16-M08-01...	16	22	28.7
		mm	MFH16-M08-03...	16		31.7
		mm	MFH17-M08-03...	17		33.2
		mm	MFH18-M08-03...	18	25	34.3
		mm	MFH20-M10-03...	20		38.7
		mm	MFH22-M10-...	22	30	44.5
		mm	MFH25-M12-...	25		44.6
		mm	MFH28-M12-...	28		47.6
		Inch	MFH1250-M16-...	1.250	1.575	2.016
		mm	MFH32-M16-...	32	40	51.2
		mm	MFH35-M16-10...	35		60.2
		mm	MFH40-M16-...	40		64
		mm	MFH42-M16...	42		64

Arbor Identification System



Approximate Programming Radius Adjustment



MFH Micro			MFH Mini			MFH MAX		
Programmable R (in)	Maximum Over Machining of Radius (in)	Over Machined Radius Portion (in)	Programmable R (in)	Maximum Over Machining of Radius (in)	Maximum Non-machined Portion (in)	Programmable R (in)	Maximum Over Machining of Radius (in)	Maximum Non-machined Portion (in)
R0.039	0	0.0083	R0.063 (Recommended)	0	0.0154	R0.059	0	0.0559
R0.047 (Recommended)	0	0.0067	R0.079	0.0035	0.0138	R0.079	0	0.0488
R0.059	0.0032	0.0039	R0.098	0.0102	0.0102	R0.118 (Recommended)	0	0.0343
R0.079	0.0110	0.0004	R0.118	0.0181	0.0067	0.138	0.0024	0.0272

MFH Micro / MFH Mini: Cutting Edge Angle $\gamma^\circ = 12^\circ$, Side Wall Max. Inclination Angle = 90°

MFH (GM / GH)						
Cutter	Insert	Cutting Edge Angle γ°	Programmable R (in) (Recommended)	Maximum Over Machining of Radius (in)	Maximum Non-machined Portion (in)	Workpiece Side Wall Max. Inclination Angle
MFH...-10-...	GM / GH	10°	R0.118	0	0.034	90°
	LD	14°	R0.148	0	0.027	65°
	FL	14°	R0.118	0	0.035	80°
MFH...-14-...	GM / GH	10°	R0.148	0	0.054	90°
	LD	16°	R0.197	0	0.042	65°
	FL	13°	R0.118	0	0.054	80°

Ramping Reference Data

Cutter Type	Cutter Dia. DCX (in)	-	0.375"	0.500"	-	0.625"
	Cutter Dia. DCX (mm)	8mm	10mm	12mm	14mm	16mm
MFH Micro	Max. Ramping Angle RMPX ($^\circ$)	4.0°	3.0°	2.0°	1.5°	1.2°
	tan RMPX	0.070	0.052	0.035	0.026	0.021

Cutter Type	Cutter Dia. DCX (in)	0.625"	-	-	0.750"	-	0.875"	1.000"	-	1.250"	1.500"	2.000"
	Cutter Dia. DCX (mm)	16mm	17mm	18mm	20mm	22mm	-	25mm	28mm	32mm	40mm	50mm
MFH Mini	Max. Ramping Angle RMPX ($^\circ$)	2.8°	2.5°	2.1°	1.7°	1.4°	1.3°	1.2°	1°	0.8°	0.5°	0.4°
	tan RMPX	0.049	0.042	0.037	0.030	0.024	0.023	0.021	0.017	0.014	0.009	0.007

Cutter Type	Cutter Dia. DCX (in)	1.000"	-	1.250"	-	1.500"	2.000"	2.500"	3.000"
	Cutter Dia. DCX (mm)	25mm	28mm	32mm	35mm	40mm	50mm	63mm	80mm
MFH (MFH...-10-...)	Max. Ramping Angle RMPX ($^\circ$)	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

Cutter Type	Cutter Dia. DCX (in)	2.000"	2.500"	3.000"	4.000"	5.000"	6.000"
	Cutter Dia. DCX (mm)	50mm	63mm	80mm	100mm	125mm	160mm
MFH (MFH...-14-...)	Max. Ramping Angle RMPX ($^\circ$)	2°	1.8°	1°	0.5°	0.4°	0.2°
	tan RMPX	0.035	0.031	0.017	0.009	0.007	0.003

Cutter Type	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 MAX	Max. Ramping Angle RMPX ($^\circ$)	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

Decrease Ramping Angle if Chips Become Excessively Long

Ramping angle should be under RMPX (maximum ramping angle) in the cutting conditions above

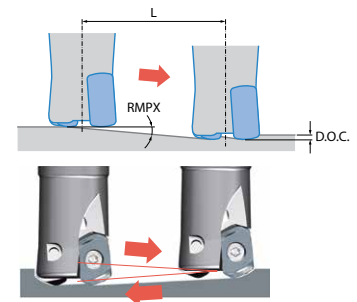
Reduce recommended feed rate in recommended cutting conditions by 70%

Multiple step slot milling is NOT recommended for MFH-Mini face mill diameters above $\varnothing 1.3"$ due to a danger of re-cutting chips

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

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

When ramping from both the front and outer periphery, set the maximum ramping angle RMPX to 50%.

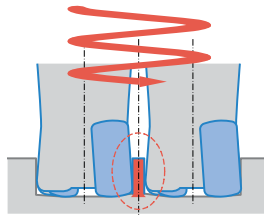


Helical Milling

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

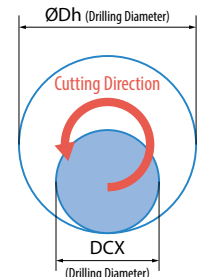
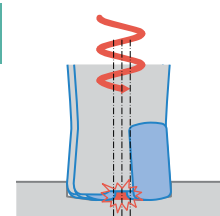
Exceeding Max. Machining Dia.

Center Core Remains After Machining



Under Min. Machining Dia.

Center Core Hits Holder Body



Cutter Type	Min. Drilling Dia.	Max. Drilling Dia.	Max. Ramping Depth per Cycle
MFH Micro	$2 \times \text{DCX} - 0.138"$	$2 \times \text{DCX} - 0.079"$	0.020"
MFH Mini	$2 \times \text{DCX} - 0.315"$	$2 \times \text{DCX} - 0.079"$	0.039"
MFH (MFH...-10-...)	$2 \times \text{DCX} - 0.709"$	$2 \times \text{DCX} - 0.079"$	$\text{GM} = 0.059"$
MFH (MFH...-14-...)	$2 \times \text{DCX} - 0.984"$	$2 \times \text{DCX} - 0.079"$	$\text{GM} = 0.079"$
MFH MAX	$2 \times \text{DCX} - 0.433"$	$2 \times \text{DCX} - 0.079"$	0.098"

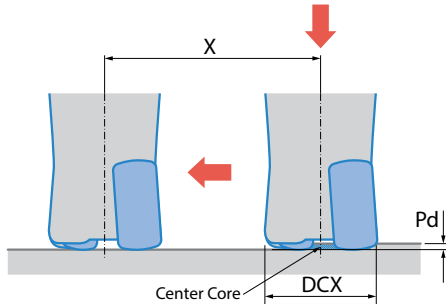
- Keep machine depth per rotation less than max D.O.C. (S) in cutter dimensions chart
- Use climb milling
- Feed rate should be reduced to 50% of the recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

Drilling

Cutter Type	Max. Drilling Depth (Pd)	Min. Cutting Length (X) for Flat Bottom Surface
MFH Micro	0.020"	DCX-0.138"
MFH Mini	0.039"	DCX-0.354"
MFH MAX	0.024"	DCX-0.472"

Unit: inch

Cutter Type	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 (MFH...-10-...)	0.059"	DCX-0.709"	0.059"	DCX-0.551"	0.059"	DCX-0.591"
MFH (MFH...-14-...)	0.079"	DCX-0.945"	0.079"	DCX-0.709"	0.079"	DCX-0.748"



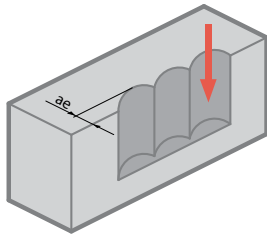
[Drilling Depth]

See Max. Drilling Depth (Pd) in the above cutting conditions

Traversing after Drilling

- It is recommended to reduce feed by 25% of recommendation until Center Core is removed
- Axial feed rate recommendation per revolution is 0.008 ipr while drilling

Plunging

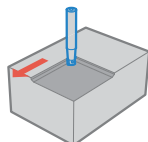


LD and FL chipbreakers are not available for plunging
Reduce feed rate to $f_z \leq 0.008 \text{ ipr}$ when plunging

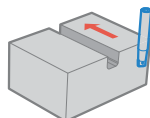
Cutter Type	Insert	Maximum Width of Cut (ae)
MFH Micro	LPGT01...	0.067"
MFH Mini	LOGU03...	0.138"
MFH (MFH...-10-...)	SOMT10...	0.315"
MFH (MFH...-14-...)	SOMT14...	0.453"
MFH MAX	LOMU04...	0.197"

3D Machining

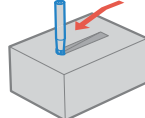
GM chipbreaker is available for all applications.



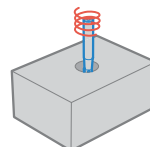
Face Milling & Shouldering



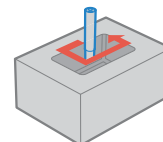
Slotting



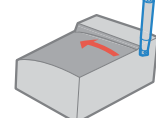
Ramping



Helical Milling



Pocketing



Contouring

Insert	Ramping	Contouring (Rising Wall Angle)	Plunging	Helical Milling	Pocketing
GM / GH	✓	✓ (90°)	✓	✓	✓
LD	✓	Limit (65°)	×	×	×
FL	✓	Limit (80°)	×	×	×

Some applications are not available depending on chipbreaker.

For FL and LD type, there is a limit of rising wall angle during contouring.



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