

FMAX

**HIGH FEED FINISH MILLING
CUTTER FOR ALUMINUM
ALLOYS AND CAST IRON**

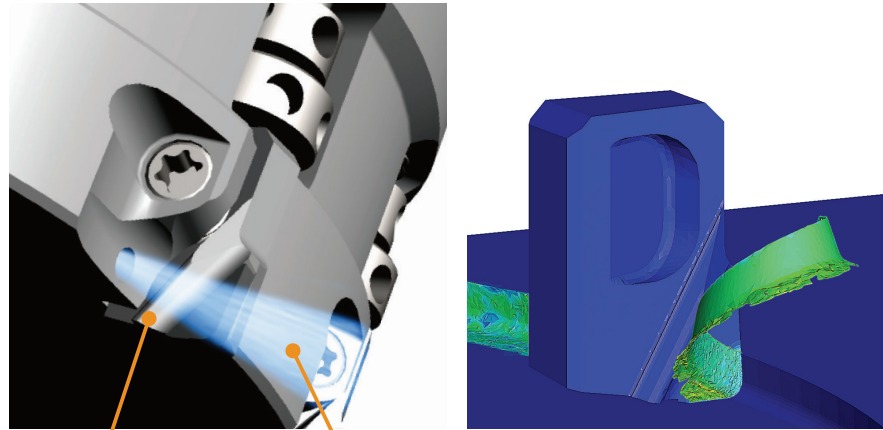


High Feed Finish Milling Cutter for Aluminum Alloys and Cast Iron

FMAX

Ultra High Efficiency Machining

The ultra fine pitch design is ideal for high efficiency machining ($v_f \geq 787$ IPM).
 (Milling for aluminum alloy)
 Internal coolant and a special chip breaker wall (body protector) provides ideal chip discharge performance.



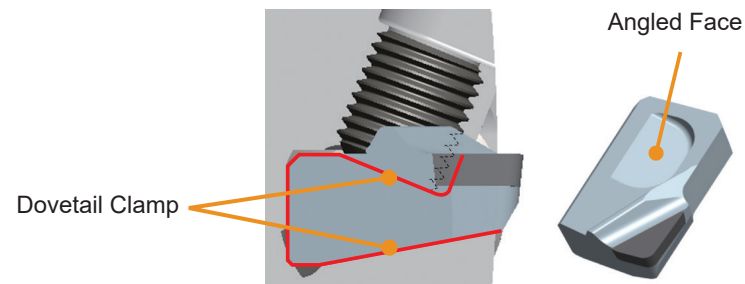
Body Protector Internal Coolant

*Graphical Representation.

The body protector on the rake face forms chip shapes ideal for disposal and disperses them away from the body. Internal coolant also aids this process. The body is compatible with all center through coolant arbors.

Designed for High Speeds

Anti fly dovetail clamping mechanism.

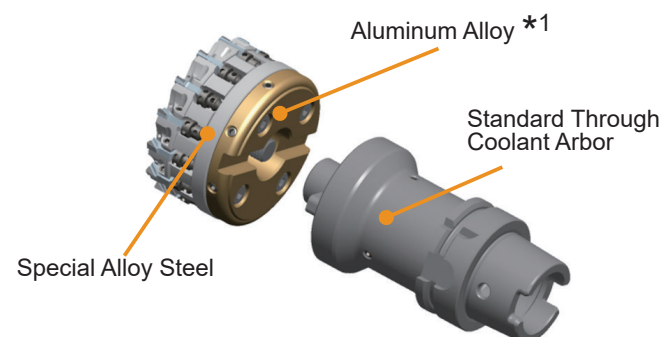


Dovetail Clamp

Angled Face

Light Weight, High Rigidity Body

A special alloy steel and aluminum body combine to provide rigidity and light weight.



Aluminum Alloy *1

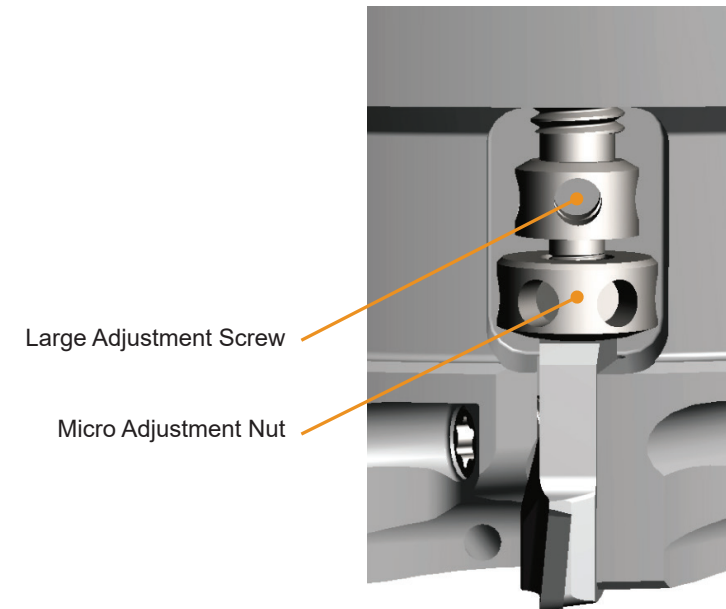
Standard Through Coolant Arbor

Special Alloy Steel

*1 Except DC=40, 50, 63mm

High Precision, Easy Setting

The combination of both a large and micro screw provides precise run-out adjustment and for adjusting new or re-ground inserts (.0002" or better).



Large Adjustment Screw

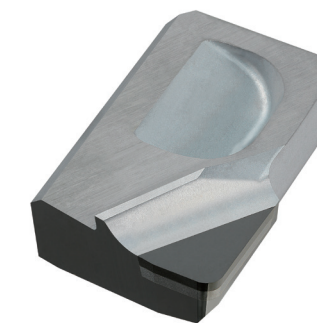
Micro Adjustment Nut

Inserts, PCD Grades and CBN Grades

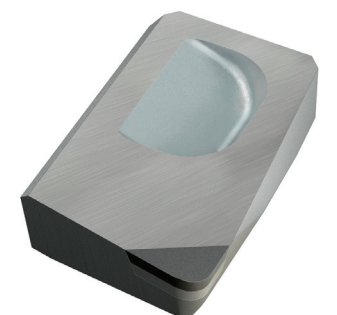
PCD grade inserts for machining Aluminum Alloys available in two grades for general purpose with focus on fracture or wear resistance.
 New CBN grade inserts available for general purpose cast iron machining provide an excellent surface finish, low cutting force and long life.



DC = 40, 50, 63mm



PCD Grades
 Milling of Aluminum Alloys
 (GAMP: +5°)



CBN Grades
 Milling of Cast Iron
 (GAMP: 0°)

High Feed Finish Milling Cutter for Aluminum Alloys and Cast Iron

FMAX

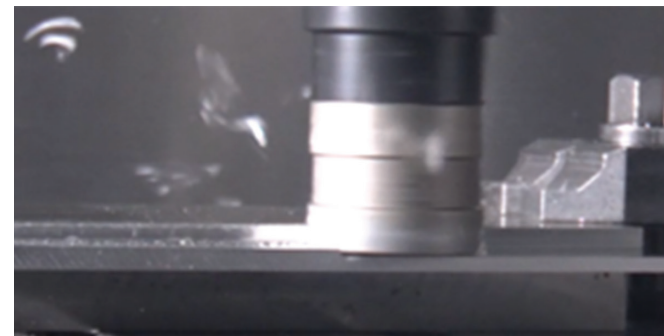
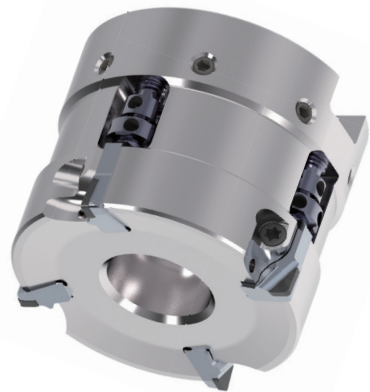
CLASSIFICATION

(inch)

Series	Use	Specifications	DCON MS	Minimum			Maximum		
				DC	Number of Teeth	WT(lbs)	DC	Number of Teeth	WT(lbs)
FMAX	High Feed Finish Millig Cutter	Light Weight, High Rigidity Body Alloy Steel and Aluminum Body	inch	3.000"	10	2.2	5.000"	16	7.6
					14	2.1		24	7.5
			mm	80mm	10	2.4	160mm	16	7.3
					14	2.4		24	7.5
			inch	80mm	14	2.4	125mm	24	7.2
			FMAX-LW	High Feed Finish Millig Cutter Compact and Smaller Machining Centers	Light Weight, High Rigidity Body Alloy Steel and Aluminum Body	inch	100mm	10	2.3
16	2.4	20						3.3	
FMAX-40/50/63	High Feed Finish Millig Cutter Small Diameter	Alloy Steel Body	mm	40mm	4	0.5	63mm	10	1.5
					6	0.5		12	1.5
NEW FMAX-MB	Low Rigidity Conditions	Alloy Steel Body Coarse Pitch Type	inch	80mm	4	2.5	125mm	6	8.4
			mm	50mm	4	0.8	125mm	6	8.4

NEW FMAX-MB

By reducing the number of teeth finishing can be easily performed even if the machine or work material is not rigid. Tool installation costs can also be reduced while maintaining the existing insert mounting and cutting edge adjustment functions.



FMAX-LW

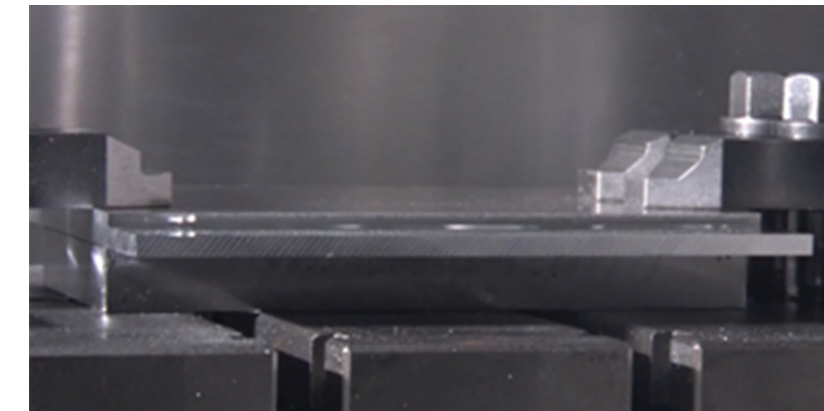
It can be used for compact and smaller machining centers while maintaining the conventional insert mounting function and cutting edge adjustment function.

Cutting Performance

Surface Finish Comparison of Thin Plate Machining ASTM 5052

The new coarse pitch type FMAX lessens chattering and vibration and is ideal for producing a good surface finish on low rigidity set ups.

Machining Condition

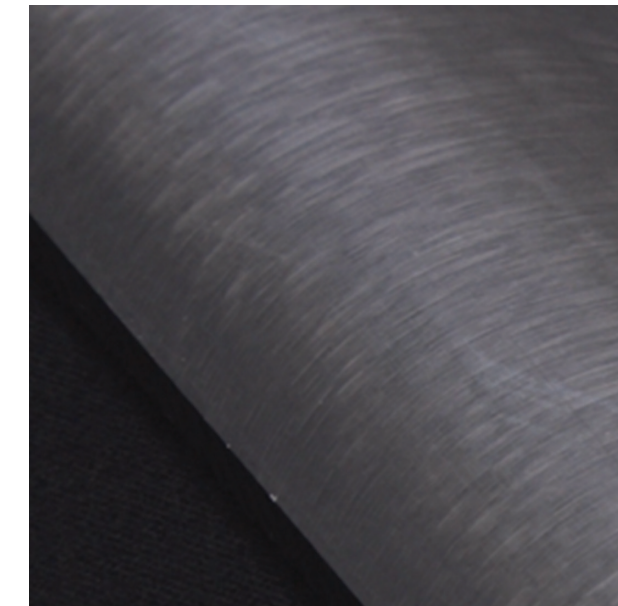


<Common Cutting Conditions>

Workpiece Material : ASTM 5052
 Diameter : DC=50mm
 Cutting Speed : vc=10300 SFM
 Feed per Tooth : fz= .004 IPT
 Depth of Cut : ap= .079 inch
 Width of Cut : ae= .575 inch
 Cutting Mode : Dry Cutting

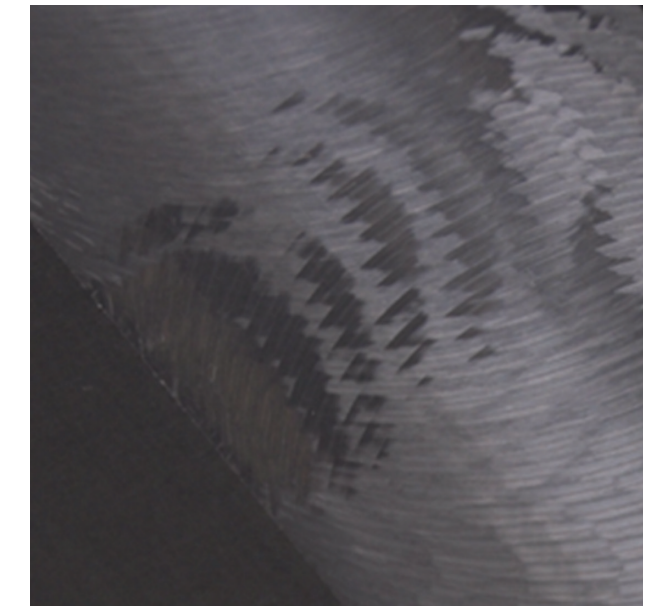
FMAX Coarse Pitch Type

<Cutting Conditions>
 Number of Teeth : 4
 Feed per Tooth : vf=315 IPM



FMAX Standard Type

<Cutting Conditions>
 Number of Teeth : 10
 Feed per Tooth : vf=787 IPM

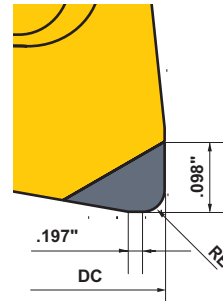


Inserts for Specific Applications

CBN Grades for Milling of Gray Cast Iron

General Purpose Inserts

CBN inserts for gray cast iron reduce the length of the wiper edge and provide excellent surface finish with low cutting forces. CBN grade insert for cast iron is an economical and disposable insert that does not require re-grinding.

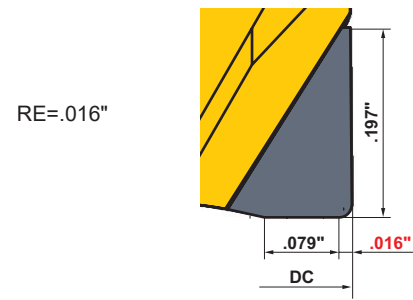
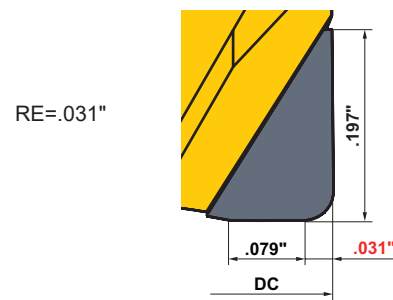


PCD Grades for Milling of Aluminum Alloys

General Purpose Inserts

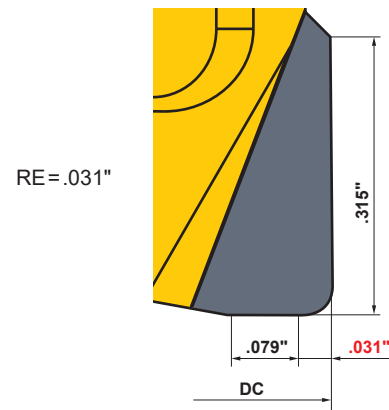
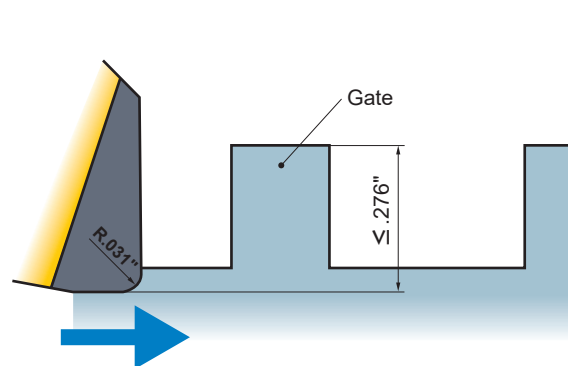
Inserts with corner R(RE) = .031 inch are excellent for general applications, and can be used in a wide variety of cutting areas. They are able to exhibit outstanding cutting edge stability, particularly under high-load conditions such as heavy interrupted cutting.

The sharpness of inserts with corner R(RE) = .016 inch is one of their most notable features. Its effectiveness can be demonstrated by the ability to suppress chatter and maintain finished surfaces.



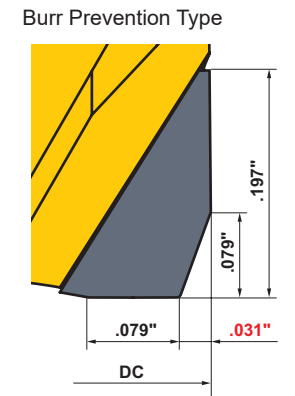
Long Edge Inserts

The long edge insert is capable of finish cutting of castings with a gate. Therefore, it is possible to reduce the number of cutting passes and to shorten the machining time as well.



Burr Prevention Inserts

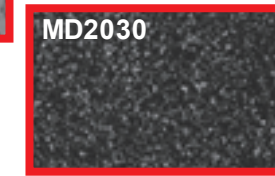
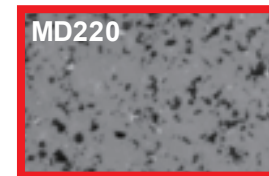
The tool cutting edge angle is effective at reducing the thickness of chips, with minimal burrs generated in comparison to conventional products. The finely-detailed R shape of the corner portion prevents chipping and enhances both stability and tool life.



Features of the Grades

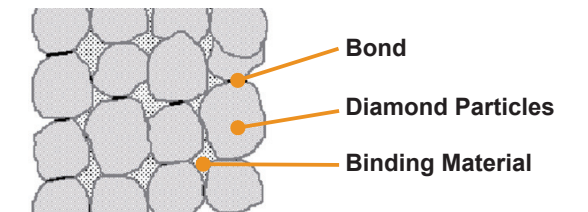
PCD Grade Diamond Sintered Segment Containing Ultra Microparticle Diamond

↑ Wear Resistance



→ Fracture Resistance

Bond of Diamond Particles



Diamond Particles : Give a highly stable cutting edge performance because of the strong bonding.

Features of MD2030

Intended for milling. Improved fracture resistance when used in unstable applications. The stability of the cutting edge can meet a wide variety of workpiece material and cutting conditions.

Features of MD220

Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. MD220 can prevent burr formation and achieve long tool life.

CBN Grade High Fracture Resistance

Features of MB4120

Fine CBN particles increase cutting edge toughness. The high fracture resistance allows stable performance even during interrupted machining. Optimized grade prevents fracture, edge chipping and thermal cracks under both dry cutting conditions and when cutting workpiece following wet cut process.

High Feed Finish Milling Cutter for Aluminum Alloys and Cast Iron

FACE MILLING
 <HIGH FEED FINISHING>



FMAX

P M **K** N S H



Fig.1
 ø3.000"
 ø4.000"

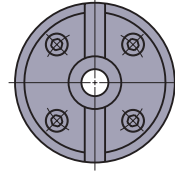
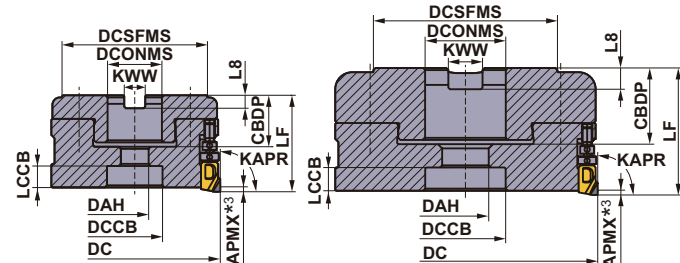
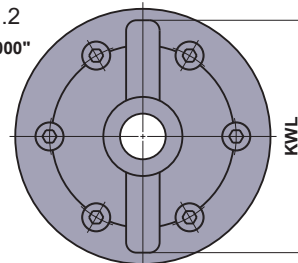


Fig.2
 ø5.000"



Right hand tool holder only. (inch)

Arbor Type

DC=Inch, DCONMS=Inch

DC	Order Number	Stock	Coolant Thru *1	No.T *2	LF	DCONMS	WT (lbs)	RPMX (min ⁻¹)	Fig.
3.000	FMAXUR0310C	●	Y	10	1.772	1.000	2.2	24500	1
3.000	FMAXUR0314C	●	Y	14	1.772	1.000	2.1	24500	1
4.000	FMAXUR0412D	●	Y	12	1.969	1.250	4.2	22000	1
4.000	FMAXUR0418D	●	Y	18	1.969	1.250	4.1	22000	1
5.000	FMAXUR0516E	●	Y	16	2.362	1.500	7.6	19600	2
5.000	FMAXUR0524E	●	Y	24	2.362	1.500	7.5	19600	2

*1 Y=Yes

*2 Number of Teeth

*3 For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be .079 inch or less for ultra high efficiency machining with table feed (vf ≥ 787 IPM).

Mounting Dimensions

DCONMS	DC	Tool Holder Type	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
1.000	3.000	FMAXUR03	.945	.539	1.024	.433	2.677	.375	.219	—	1
1.250	4.000	FMAXUR04	1.260	.669	1.260	.394	3.465	.500	.281	—	1
1.500	5.000	FMAXUR05	1.417	.787	1.496	.472	3.465	.625	.375	4.409	2

Spare Parts

DC	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø.098"
3.000	FMAXUR03	TSS04505S	KSN3	KSS2	HSCXU50012H	TKY10T	RKY25S
4.000	FMAXUR04	TSS04505S	KSN3	KSS2	HSCXU62514H	TKY10T	RKY25S
5.000	FMAXUR05	TSS04505S	KSN3	KSS2	HSCXU75017H	TKY10T	RKY25S

* Clamp Torque (lbf-in) : TSS04505S=31

Note 1) Refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out.

Note 2) The cutter body includes a set bolt for an arbor.

● : USA Stock ★ : Stocked in Japan

FACE MILLING
 <HIGH FEED FINISHING>



FMAX

P M **K** N S H



Fig.1
 ø80

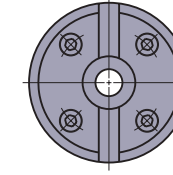
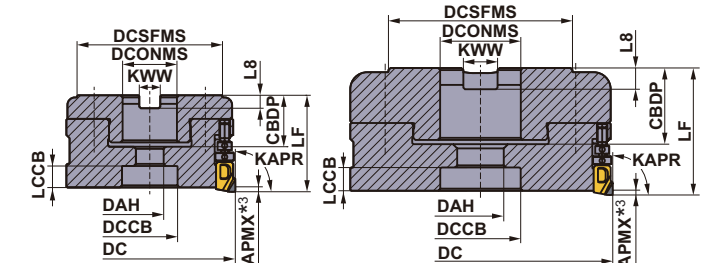
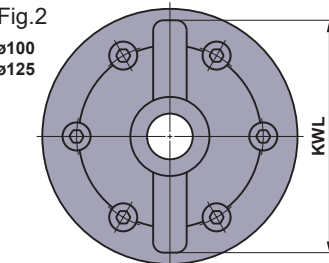


Fig.2
 ø100
 ø125



Right hand tool holder only. (mm)

Metric Standard

For Inch Arbors

Arbor Type

DC=mm, DCONMS=Inch

DC	Order Number	Stock	Coolant Thru *1	No.T *2	LF	DCONMS	WT (kg)	RPMX (min ⁻¹)	Fig.
80	FMAXR08010C	★	Y	10	45	25.4	1.11	24500	1
80	FMAXR08014C	★	Y	14	45	25.4	1.09	24500	1
100	FMAXR10012D	★	Y	12	50	31.75	1.85	22000	2
100	FMAXR10018D	★	Y	18	50	31.75	1.81	22000	2
125	FMAXR12516E	★	Y	16	60	38.1	3.33	19600	2
125	FMAXR12524E	★	Y	24	60	38.1	3.27	19600	2
160	FMAXR16016D	★	Y	16	63	31.75	3.30	10000	1
160	FMAXR16024D	★	Y	24	63	31.75	3.39	10000	1

*1 Y=Yes

*2 Number of Teeth

*3 For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
25.4	80	FMAXR08010C	24	13	26	11	68	9.5	6	—	1
25.4	80	FMAXR08014C	24	13	26	11	68	9.5	6	—	1
31.75	100	FMAXR10012D	32	17	32	10	79	12.7	8	90	2
31.75	100	FMAXR10018D	32	17	32	10	79	12.7	8	90	2
38.1	125	FMAXR12516E	36	22	38	12	88	15.9	10	112	2
38.1	125	FMAXR12524E	36	22	38	12	88	15.9	10	112	2
31.75	160	FMAXR16016D	38	17	53	10	75	12.7	8	—	1
31.75	160	FMAXR16024D	38	17	53	10	75	12.7	8	—	1

High Feed Finish Milling Cutter for Aluminum Alloys and Cast Iron

Spare Parts

DC	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench $\phi 2.5$
80	FMAXR080	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	FMAXR100	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	FMAXR125	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S
160	FMAXR160	TSS04505S	KSN3	KSS2	HSCX16045H	TKY10T	RKY25S

* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out.

Note 2) The cutter body includes a set bolt for an arbor.

FACE MILLING <HIGH FEED FINISHING>



FMAX-LW

Compact and Smaller Machining Centers



Metric Standard

For Inch Arbors

Arbor Type

DC=mm, DCONMS=Inch

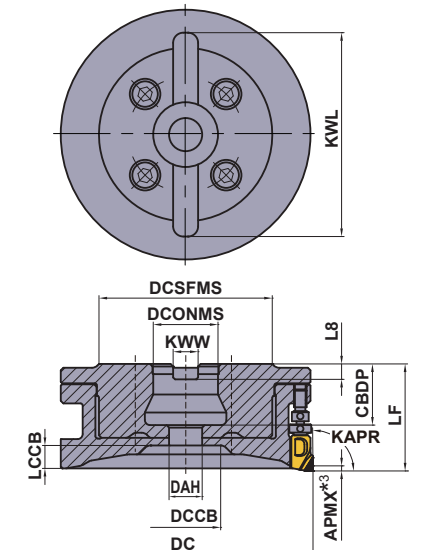
DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCONMS	WT (kg)	RPMX (min ⁻¹)	Fig.
100	FMAXR10010CLW	★	Y	10	42	25.4	1.06	22000	1
100	FMAXR10016CLW	★	Y	16	42	25.4	1.11	22000	1
125	FMAXR12514CLW	★	Y	14	42	25.4	1.44	19600	1
125	FMAXR12520CLW	★	Y	20	42	25.4	1.48	19600	1

*1 Y=Yes

*2 Number of Teeth

*3 For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).



Right hand tool holder only.

(mm)

Mounting Dimensions

(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
25.4	100	FMAXR10010CLW	24	13	27	9	68	9.5	6	80	1
25.4	100	FMAXR10016CLW	24	13	27	9	68	9.5	6	80	1
25.4	125	FMAXR12514CLW	24	13	52	9	68	9.5	6	80	1
25.4	125	FMAXR12520CLW	24	13	52	9	68	9.5	6	80	1

Spare Parts

(mm)

Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench $\phi 2.5$
TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S

* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out.

Note 2) The cutter body includes a set bolt for an arbor.

★ : Stocked in Japan

High Feed Finish Milling Cutter for Aluminum Alloys and Cast Iron

FACE MILLING
 <HIGH FEED FINISHING>



FMAX-40/50/63

P M **K** N S H



Metric Standard

For Metric Arbors

Arbor Type

DC=mm, DCONMS=mm

DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCONMS	WT (kg)	RPMX (min ⁻¹)	Fig.
40	FMAX-040A04R	★	Y	4	40	16	0.24	30000	1
40	FMAX-040A06R	★	Y	6	40	16	0.23	30000	1
50	FMAX-050A08R	★	Y	8	40	22	0.37	30000	1
50	FMAX-050A10R	★	Y	10	40	22	0.35	30000	1
63	FMAX-063A10R	★	Y	10	40	22	0.67	27000	1
63	FMAX-063A12R	★	Y	12	40	22	0.66	27000	1

*1 Y=Yes

*2 Number of Teeth

*3 For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCONMS	DC	Tool Holder Type	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
16	40	FMAX-040	18	9	14	10	37	8.4	5.6	—	1
22	50	FMAX-050	20	11	17	12	47	10.4	6.3	—	1
22	63	FMAX-063	20	11	17	12	60	10.4	6.3	—	1

Spare Parts

DC	Tool Holder Type	Insert Clamp Screw*	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
40	FMAX-040	TSS04505S	KSN3	KSS2	HSC08030H	TKY10T	RKY25S
50	FMAX-050	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
63	FMAX-063	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S

* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out.

Note 2) The cutter body includes a set bolt for an arbor.

★ : Stocked in Japan

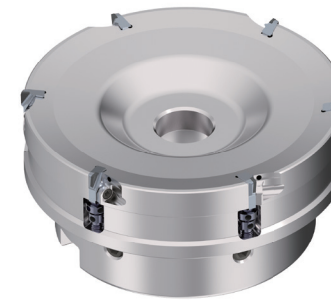
FACE MILLING
 <For Low Rigidity Conditions>



FMAX-MB Coarse Pitch Type

NEW

P M **K** N S H



Metric Standard

For Inch Arbors

Arbor Type

DC=mm, DCONMS=Inch

DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCONMS	WT (kg)	RPMX (min ⁻¹)	Fig.
80	FMAXR08004CMB	★	Y	4	45	25.4	1.14	24500	1
100	FMAXR10004DMB	★	Y	4	50	31.75	2.01	22000	1
125	FMAXR12506EMB	★	Y	6	60	38.1	3.82	19600	1

*1 Y=Yes

*2 Number of Teeth

*3 For the maximum depth of cut (APMX), please refer to the recommended cutting conditions (ap).

Mounting Dimensions

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	FMAXR08004CMB	24	13	30	11	55	9.5	6	1
31.75	100	FMAXR10004DMB	32	17	39	10	75	12.7	8	1
38.1	125	FMAXR12506EMB	36	22	45	12	100	15.9	10	1

Spare Parts

DC	Tool Holder Type	Insert Clamp Screw*	Micro Adjustment Screw	Large Adjustment Screw	Cuter Set Bolt	Wrench T10	Wrench ø2.5
80	FMAXR080	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	FMAXR100	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	FMAXR125	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S

* Clamp Torque (N · m) : TSS04505S=3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.

High Feed Finish Milling Cutter for Aluminum Alloys and Cast Iron

FACE MILLING <For Low Rigidity Conditions>



FMAX-MB Coarse Pitch Type NEW

P M **K** N S H

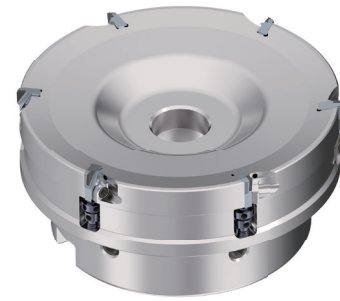


Fig.1
ø50
ø63

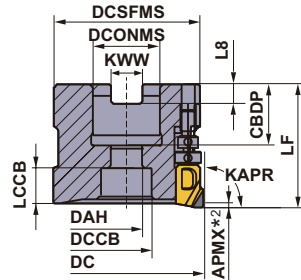
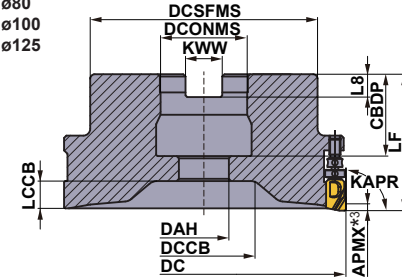


Fig.2
ø80
ø100
ø125



Right hand tool holder only.

Metric Standard

For Metric Arbors

Arbor Type

DC=mm, DCONMS=mm

DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCONMS	WT (kg)	RPMX (min ⁻¹)	Fig.
50	FMAX-050A04R	★	Y	4	40	22	0.38	30000	1
63	FMAX-063A04R	★	Y	4	40	22	0.70	30000	1
80	FMAX-080B04RMB	★	Y	4	45	27	1.12	24500	2
100	FMAX-100B04RMB	★	Y	4	50	32	2.00	22000	2
125	FMAX-125B06RMB	★	Y	6	60	40	3.81	19600	2

*1 Y=Yes

*2 Number of Teeth

*3 For the maximum depth of cut (APMX), please refer to the recommended cutting conditions (ap).

Mounting Dimensions

DCONMS	DC	Order Number	CBDB	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
22	50	FMAX-050A04R	20	11	17	12	47	10.4	6.3	1
22	63	FMAX-063A04R	20	11	17	12	60	10.4	6.3	1
27	80	FMAX-080B04RMB	24	13	30	11	55	12.4	7	2
32	100	FMAX-100B04RMB	32	17	39	10	75	14.4	8	2
40	125	FMAX-125B06RMB	36	22	45	12	100	16.4	9	2

Spare Parts

DC	Tool Holder Type	Insert Clamp Screw	Micro Adjustment Screw	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
50	FMAX-050	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
63	FMAX-063	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
80	FMAX-080	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	FMAX-100	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	FMAX-125	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S

* Clamp Torque (N • m) : TSS04505S=3.5

Note 1) Please refer to the instruction manual included with the cutter body for how to locate the insert and adjust the run-out and the balance.

● : USA Stock ★ : Stocked in Japan (PCD and CBN inserts are available with 1 piece in one case.)

Inserts

Shape	Order Number	MD220	MD2030	MB4120	L	LE	W1	S	BS	RE	Geometry
For Aluminum Alloys	GOER1404PXFR2	●	●		.551	.197	.354	.165	.079	.016	
	GOER1408PXFR2	●	●		.551	.197	.354	.165	.079	.031	
General Purpose											
For Gray Cast Iron	NP-GOEN1404PXSRO5			●	.551	.098	.354	.165	.020	.016	
	NP-GOEN1408PXSRO5			●	.551	.098	.354	.165	.020	.031	
General Purpose											
For Aluminum Alloys	GOER1408PXFR2-8	●			.551	.315	.354	.165	.079	.031	
Long Edge											
For Aluminum Alloys	GOER1401ZXFR2	●			.551	.197	.354	.165	.079	.004	
Burr Prevention											

For Aluminum Alloys : Sharp Edge

For Gray Cast Iron : Chamferd and Rounded (0.13mmx15°+R0.01)

Note 1) If general purpose inserts (RE = .016", .031"), burr prevention inserts and long edge inserts are used together, they will not be able to sufficiently display their full performance. Inserts of the same shape should be used according to the application.

Note 2) The cutting diameter will change depending on the shape. Refer to page 4 for details.

Be particularly careful when cutting near vertical walls, since there is a possibility of interference with the holder.

Note 3) The long edge inserts corresponds to the gate remainder and can not be used for constant depth cutting.

Note 4) Rake angle Axial GAMP varies depending on the insert grade. For aluminum alloy = 5°, For gray cast iron = 0°

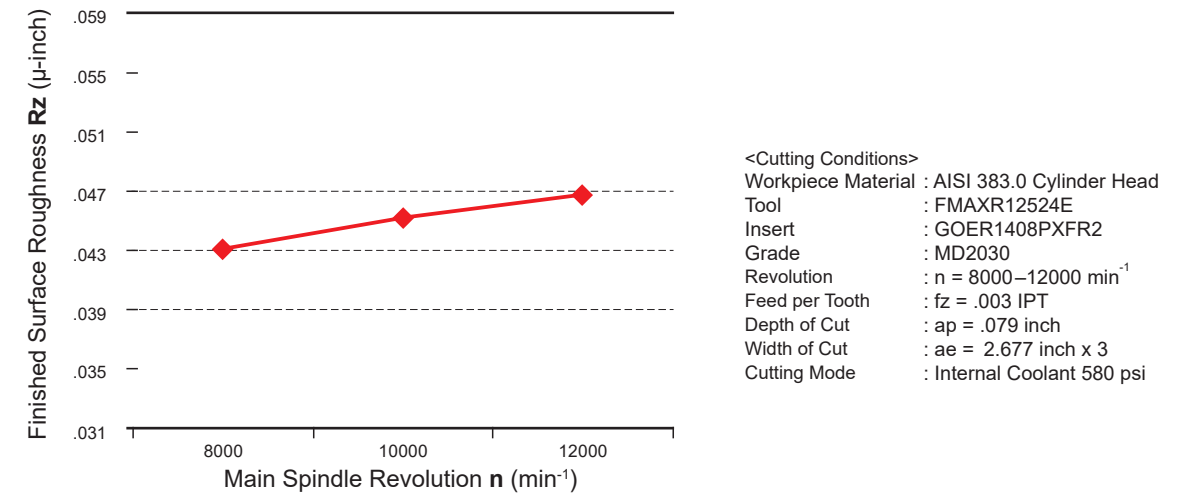
Recommended Cutting Conditions (inch)

Workpiece Material	Properties	Grade	Cutting Speed vc (SFM)	Depth of Cut		Feed per Tooth fz (IPT)	Cutting Mode
				ae	ap		
Aluminum Alloys	Tensile Strength ≤350MPa	MB4120	3280 (2295-4265)	≤ .8 DC	≤ .020	.003 (.002-.006)	Dry Cutting
				≤ .2 DC	≤ .118 (.020-.118)		
				≤ .5 DC	≤ .098 (.020-.098)		
	Content Si < 5%	MD2030 MD220	8200 (6560-9840)	≤ .8 DC	≤ .079 (.020-.079)	.003 (.002-.008)	Wet Cutting
				≤ .5 DC	≤ .098 (.020-.098)		
				≤ .2 DC	≤ .118 (.020-.118)		
	Content 5% ≤ Si ≤ 10%	MD2030 MD220	8200 (6560-9840)	≤ .8 DC	≤ .079 (.020-.079)	.003 (.002-.008)	Wet Cutting
				≤ .5 DC	≤ .098 (.020-.098)		
				≤ .2 DC	≤ .118 (.020-.118)		
	Content 10% < Si < 15%	MD220 MD2030	1970 (1310-2625)	≤ .8 DC	≤ .079 (.020-.079)	.003 (.002-.008)	Wet Cutting
≤ .5 DC				≤ .098 (.020-.098)			
≤ .2 DC				≤ .118 (.020-.118)			
Content Si ≥ 15%	MD220 MD2030	1970 (1310-2625)	≤ .8 DC	≤ .079 (.020-.079)	.003 (.002-.008)	Wet Cutting	
			≤ .5 DC	≤ .098 (.020-.098)			
			≤ .2 DC	≤ .118 (.020-.118)			

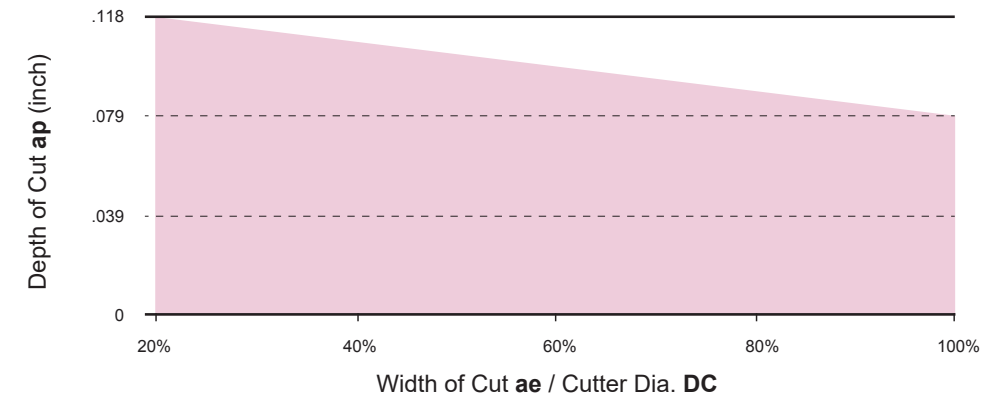
(Note 1) Please adjust the depth of cut **ap** depending on the width of cut **ae**.
 (Note 2) When using the long edge insert, please select the conditions depending on depths of cut (**ap**) excluding the length of the gate.

Cutting Performance

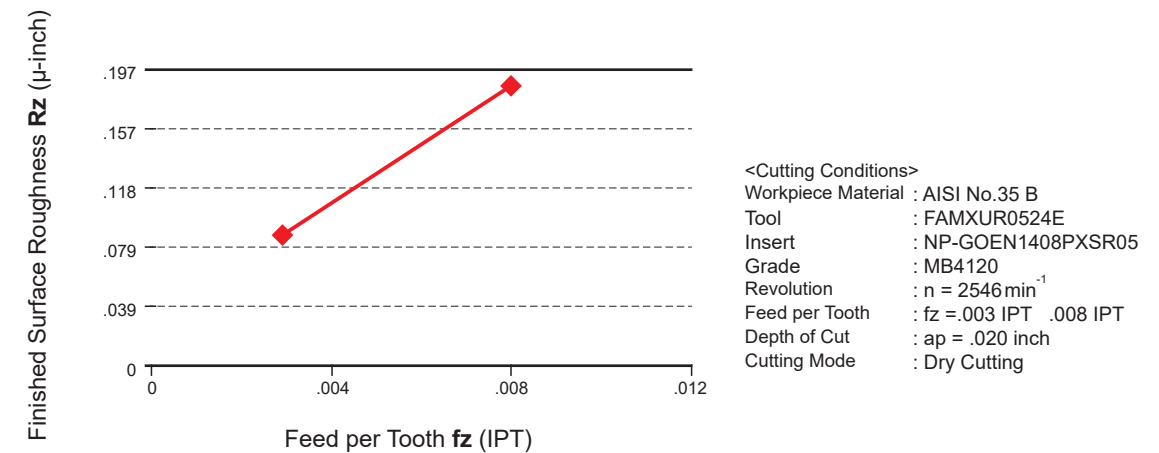
Aluminum Alloy Finished Surface Roughness (Rz) Comparison by PCD Grade



Aluminum Alloy Effective Chip Disposal Range Comparison by PCD Grade

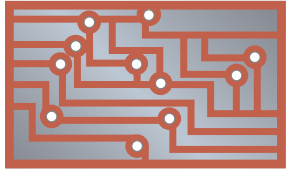
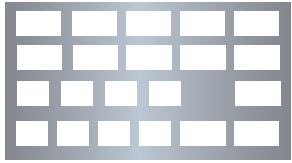


Gray Cast Iron Finished Surface Roughness (Rz) Comparison by CBN Grade

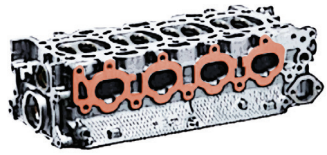
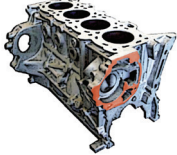


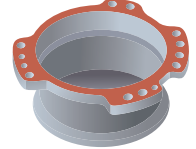
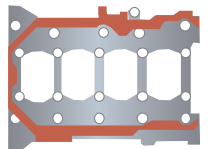
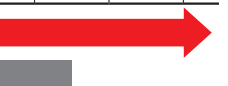

High Feed Finish Milling Cutter for Aluminum Alloys and Cast Iron

Application Examples

Cutter Body		FMAXR12520CLW	FMAXR16016D
Insert (Grade)		GOER1401ZXFR2 (MD220)	NP-GOEN1408PXSR05 (MB4120)
Workpiece		Aluminum Alloy 	AISI No.35 B 
Cutting Conditions	Cutting Speed vc (SFM)	12885(Conventional 10305)	2640(Conventional 595)
	Revolution n (min ⁻¹)	10000(Conventional 8000)	1600(Conventional 360)
	Feed per Tooth fz (IPT)	.0035	.004(Conventional .028)
	Table Feed vf (IPM)	709(Conventional 624)	100(Conventional 39)
	Depth of Cut ap (inch)	.020	.008
	Width of Cut ae (inch)	-	4.331
Cutting Mode		Wet Cutting	Dry Cutting
Machine		Vertical MC (BT30)	Double Column Type MC
Results		Compared to the conventional cutting conditions, the surface roughness is maintained and the machining efficiency is improved by 15%.	Compared to conventional cemented carbide, machining efficiency is 2.5 times and cutting length is 2.7 times. In addition was the good results for the surface finish.

The above application examples are customer's applications, so it can be different from the recommended conditions.

Cutter Body		FMAXR10018D	FMAXR08014C
Insert (Grade)		GOER1408PXFR2 (MD2030)	GOER1408PXFR2 (MD2030)
Workpiece		Aluminum Alloy 	Aluminum Alloy 
Cutting Conditions	Cutting Speed vc (SFM)	8245	6600
	Revolution n (min ⁻¹)	8000	8000
	Feed per Tooth fz (IPT)	.008	.005
	Table Feed vf (IPM)	1134	591
	Depth of Cut ap (inch)	.059	.098
	Width of Cut ae (inch)	1.969	.787
Cutting Mode		Wet Cutting	Wet Cutting
Machine		Horizontal MC	Horizontal MC
Results		Increased efficiency with a table feed increase 2.6X, FMAX achieved good surface finishes and increased machining stability.	Increased efficiency with a table feed increase 2.2X, FMAX achieved good surface finishes and increased machining stability.

Cutter Body		FMAX-050A08R	FMAXR08014C								
Insert (Grade)		GOER1401ZXFR2 (MD220)	GOER1408PXFR2-8 (MD220)								
Workpiece		AISI 383.0 	AISI 383.0 								
Cutting Conditions	Cutting Speed vc (SFM)	3605	8200								
	Revolution n (min ⁻¹)	7000	9950								
	Feed per Tooth fz (IPT)	.002	.004								
	Table Feed vf (IPM)	138	551								
	Depth of Cut ap (inch)	.012	.039, Gate .276								
	Width of Cut ae (inch)	.787 - 1.181	.984 - 1.969								
Cutting Mode		Wet Cutting	Wet Cutting (Water-soluble)								
Machine		Vertical MC (BT30)	Horizontal MC								
Results		<p>Tool Life (feet)</p> <table border="1"> <tr> <td>Conventional</td> <td>16400</td> <td>49200</td> <td>82000</td> </tr> </table> <p>FMAX  Can Continue</p> <p>Burr prevention inserts can ensure smooth finished surfaces and can maintain their effective burr prevention capabilities over long periods of use. As a result, they can achieve tool life which is over triple longer than conventional product.</p>	Conventional	16400	49200	82000	<p>Table Feed vf (IPM)</p> <table border="1"> <tr> <td>Conventional</td> <td>197</td> <td>394</td> <td>591</td> </tr> </table> <p>FMAX </p> <p>FMAX achieved 1.4 times higher efficiency than a conventional product due to its fine pitch design.</p>	Conventional	197	394	591
Conventional	16400	49200	82000								
Conventional	197	394	591								

The above application examples are customer's applications, so it can be different from the recommended conditions.

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FOR YOUR SAFETY

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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Tools specifications subject to change without notice.

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