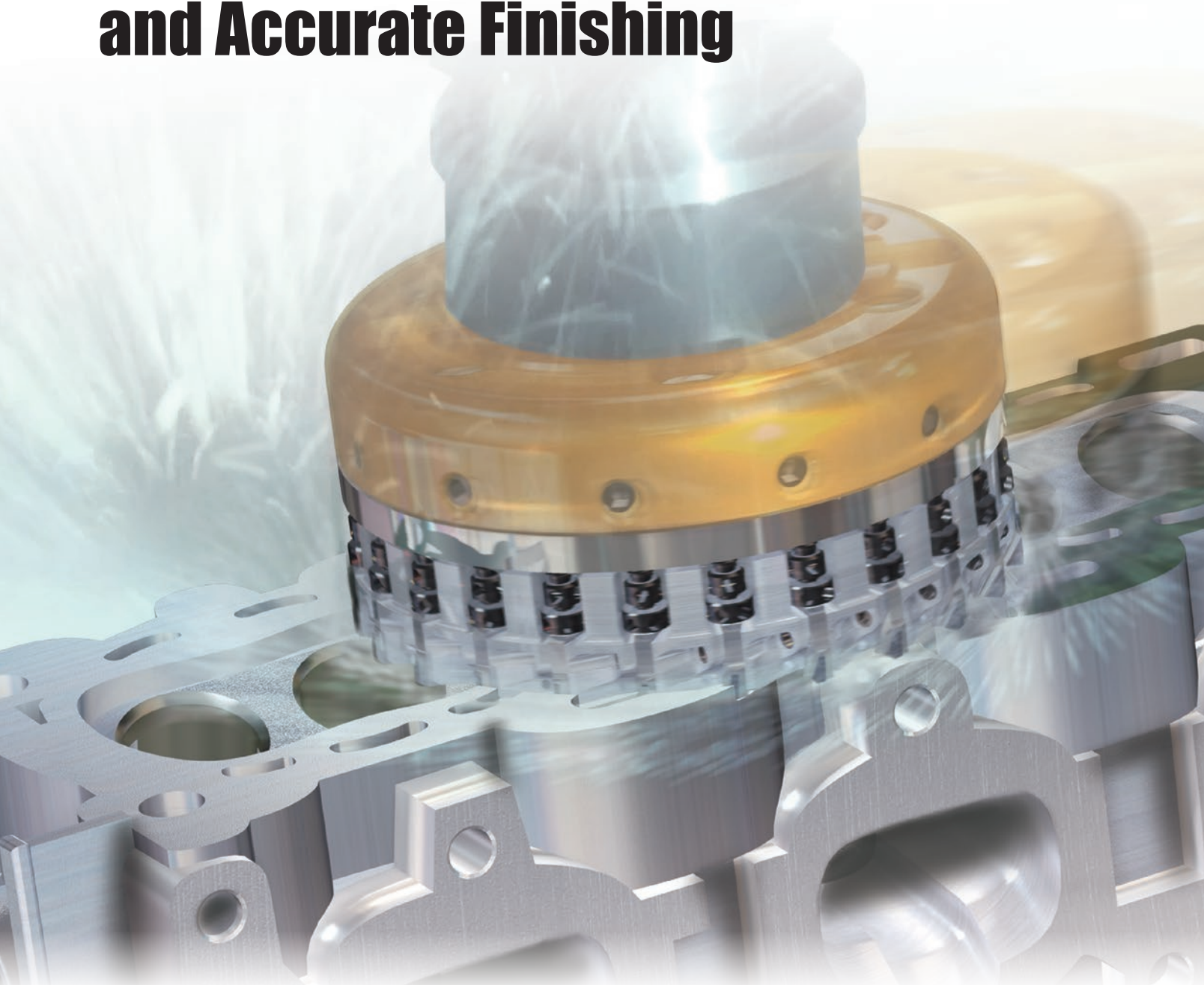


High Feed Finish Milling Cutter for Aluminum Alloys and Cast Irons

FMAX

Series
Expansion

Feed Maximum (FMAX) Milling Cutter for Ultra Efficient and Accurate Finishing



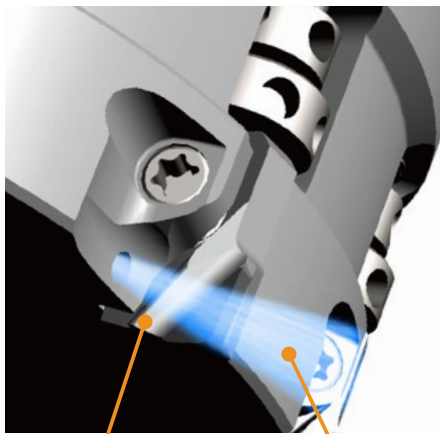
High Feed Finish Milling Cutter for Aluminum Alloys and Cast Irons

FMAX

Ultra High Efficiency Machining

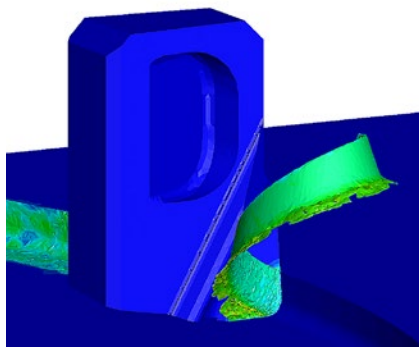
The ultra fine pitch design is ideal for high efficiency machining ($vf \geq 787$ IPM).
(Milling for aluminum alloy)

Internal coolant and a special chip breaker wall (body protector) provides ideal chip discharge performance.



Body Protector

Internal Coolant

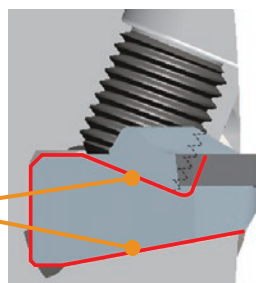


*Graphical Representation.

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.



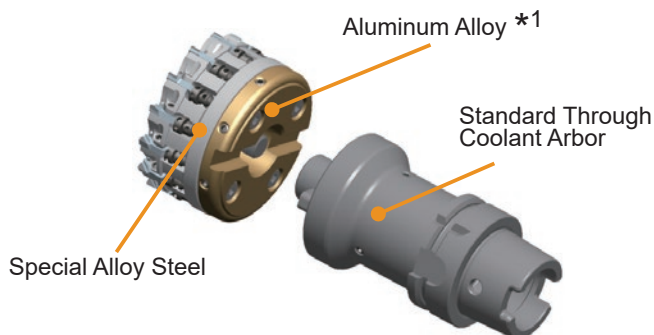
Dovetail Clamp



Angled Face

Light Weight, High Rigidity Body

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



Aluminum Alloy *1

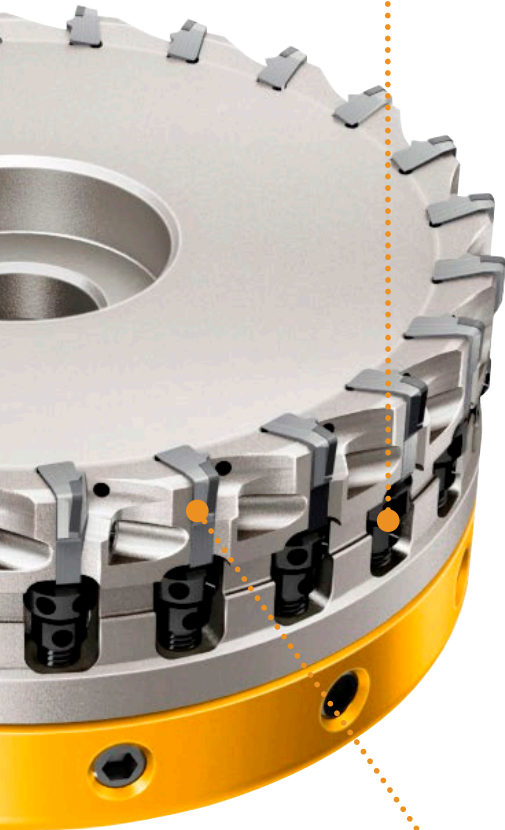
Standard Through Coolant Arbor

Special Alloy Steel

*1 Except DC=50, 63mm

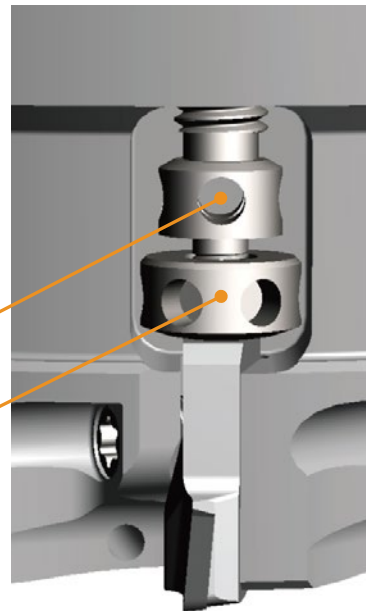
High Precision, Easy Setting

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



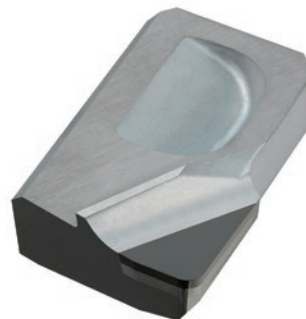
Inserts, PCD Grades and CBN Grades

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 = 50, 63mm



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



NEW
CBN Grades
Milling of Cast Irons
(GAMP: 0°)

High Feed Finish Milling Cutter for Aluminum Alloys and Cast Irons

FMAX Common 1"/25.4mm DCON for BT-30 Holder

Optimized weight for BT-30 Holders

DC	For Compact and Smaller Machining Centers		FMAX	
	Number of Teeth	WT (kg)	Number of Teeth	WT (kg)
100	10	1.06	12	1.85
	16	1.11	18	1.81
125	14	1.44	16	3.33
	20	1.48	24	3.27

Light Weight, High Rigidity Body

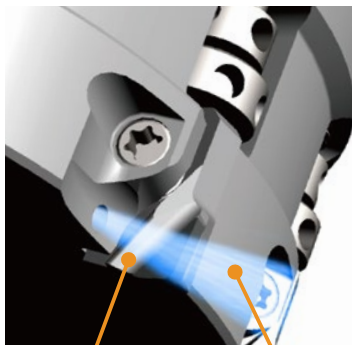
A special alloy steel and aluminum body combine to provide rigidity and light weight.



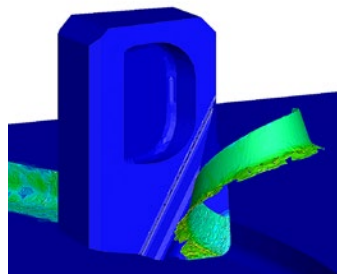
High Efficiency Machining

Multi-blade design ideal for low power machines.

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.

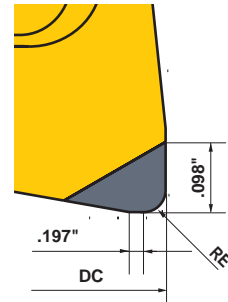
Inserts for Specific Applications

CBN Grades for Milling of Gray Cast Irons



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 alloys is an economical and disposable insert that does not require re-grinding.



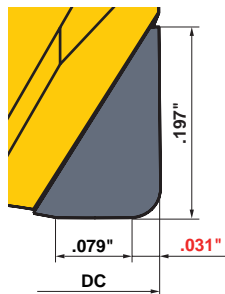
PCD Grades for Milling of Aluminum Alloys

General Purpose Inserts

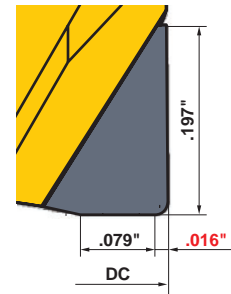
Inserts with corner R(RE) = .031 inch are excellent for general applications, and can be used in a wide variety of cutting areas. They are able to exhibit outstanding cutting edge stability, particularly under high-load conditions such as heavy interrupted cutting.

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.

RE=.031"

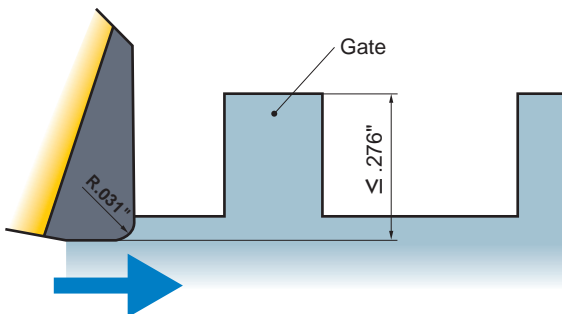


RE=.016"

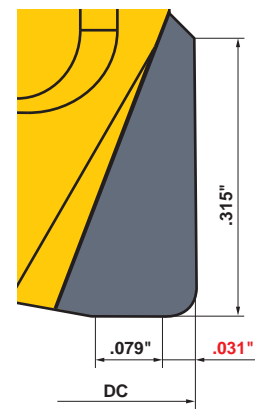


Long Edge Inserts

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.



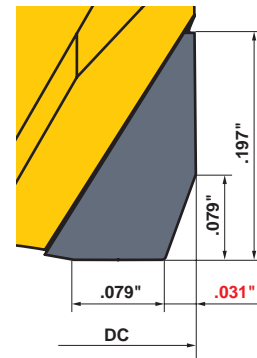
RE=.031"



Burr Prevention Inserts

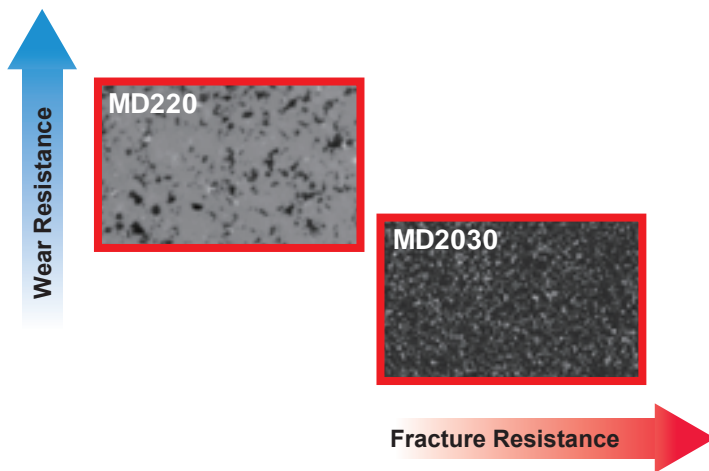
The tool cutting edge angle is effective at reducing the thickness of chips, with minimal; if any burrs generated in comparison to conventional products. The finely-detailed R shape of the corner portion prevents chipping and enhances both stability and tool life.

Burr Prevention Type

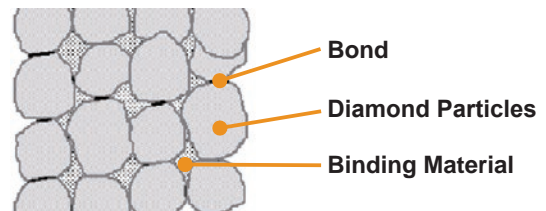


Features of the Grades

PCD Grade Diamond Sintered Segment Containing Ultra Microparticle Diamond



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.

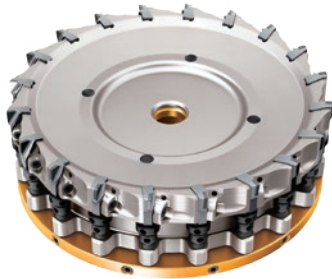
FACE MILLING <HIGH FEED FINISHING>



FMAX For Compact and Smaller Machining Centers

P M **K** N S H

Fig.1
ø100
ø125



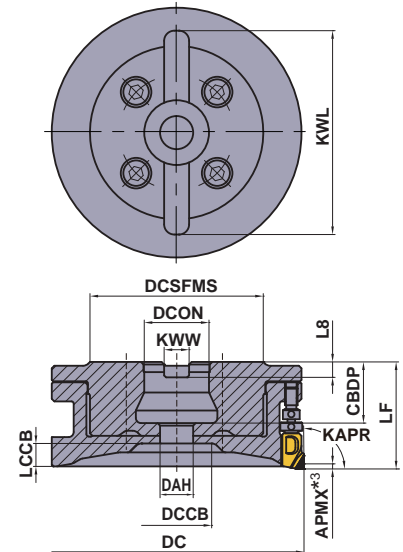
Metric Standard

For Inch Arbors

Arbor Type

DC=mm, DCON=Inch

GAMP: +5° GAMF: 0°



Right hand tool holder only.

DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCON	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).

Mounting Dimensions

DCON	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

Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Balance Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
TSS04505S	KSN3	KSS2	HSS04004G	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.

★ : Inventory maintained in Japan.

FACE MILLING

<HIGH FEED FINISHING>

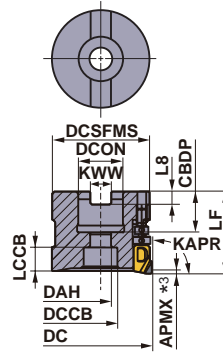


FMAX - 50/63

P M **K** N S H



Fig.1
ø50
ø63



Right hand tool holder only.

Metric Standard

For Metric Arbors

Arbor Type

DC=mm, DCON=mm

GAMP: +5° GAMP: -6° -3°

(mm)

DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCON	WT (kg)	RPMX (min ⁻¹)	Fig.
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

(mm)

DCON	DC	Tool Holder Type	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
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

(mm)

Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Balance Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
TSS04505S	KSN2	KSS2	HSS04004G	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.

● : Inventory maintained. ★ : Inventory maintained in Japan.

FACE MILLING

<HIGH FEED FINISHING>



FMAX

P M **K** N S H



Fig.1
ø3.000"
ø4.000"

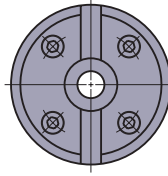
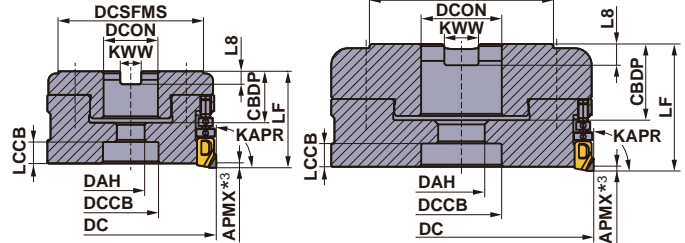
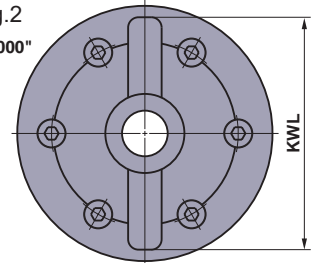


Fig.2
ø5.000"



Arbor Type

DC=Inch, DCON=Inch

GAMP: +5° GAMF: 0°

Right hand tool holder only.

(inch)

DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCON	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	FAMXUR0524E	●	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

(inch)

DCON	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

(inch)

DC	Tool Holder Type	Insert Clamp Screw	Micro Adjustment Nut	Large Adjustment Screw	Balance Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø.098"
3.000	FMAXUR03	TSS04505S	KSN2	KSS2	HSS05005G	HSCXU50012H	TKY10T	RKY25S
4.000	FMAXUR04	TSS04505S	KSN2	KSS2	HSS06006G	HSCXU62514H	TKY10T	RKY25S
5.000	FMAXUR05	TSS04505S	KSN2	KSS2	HSS08008G	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.

FACE MILLING

<HIGH FEED FINISHING>



FMAX

- P M **K** N S H



Metric Standard

For Inch Arbors

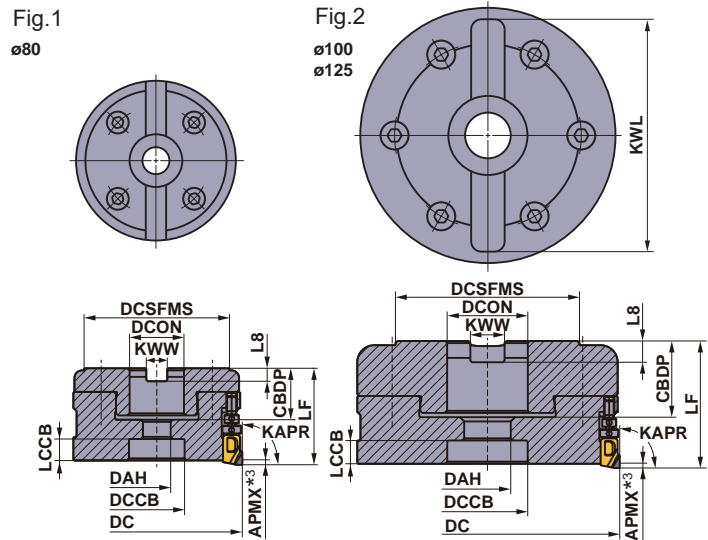
Arbor Type

DC=mm, DCON=Inch

GAMP: +5° GAMF: 0°

Right hand tool holder only.

(mm)



DC	Order Number	Stock	*1 Coolant Thru	*2 No.T	LF	DCON	WT (kg)	RPMX (min ⁻¹)	Fig.
80	FMAXR08010C	★	Y	10	45	25.4 [1.00"]	1.11	24500	1
80	FMAXR08014C	★	Y	14	45	25.4 [1.00"]	1.09	24500	1
100	FMAXR10012D	★	Y	12	50	31.75 [1.25"]	1.85	22000	2
100	FMAXR10018D	★	Y	18	50	31.75 [1.25"]	1.81	22000	2
125	FMAXR12516E	★	Y	16	60	38.1 [1.50"]	3.33	19600	2
125	FMAXR12524E	★	Y	24	60	38.1 [1.50"]	3.27	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 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000 mm/min).

Mounting Dimensions

(mm)

DCON	DC	Tool Holder Type	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
25.4 [1.00"]	80	FMAXR080	24	13	26	11	68	9.5	6	—	1
31.75 [1.25"]	100	FMAXR100	32	17	32	10	79	12.7	8	90	2
38.1 [1.50"]	125	FMAXR125	36	22	38	12	88	15.9	10	112	2

Spare Parts

(mm)

DC	Tool Holder Type	Insert Clamp Screw	Micro Adjustment Nut	Large Adjustment Screw	Balance Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
80	FMAXR080	TSS04505S	KSN2	KSS2	HSS05005G	HSCX12030H	TKY10T	RKY25S
100	FMAXR100	TSS04505S	KSN2	KSS2	HSS06006G	HSCX16035H	TKY10T	RKY25S
125	FMAXR125	TSS04505S	KSN2	KSS2	HSS08008G	HSCX20035H	TKY10T	RKY25S

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


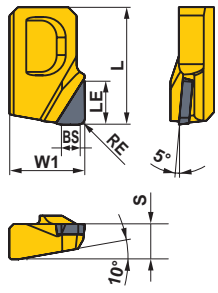

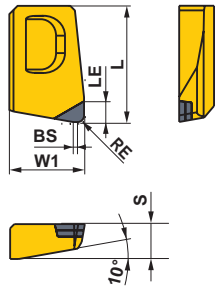
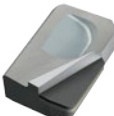
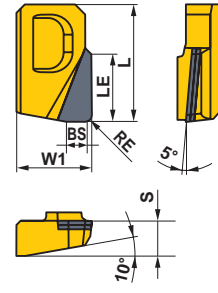
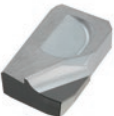
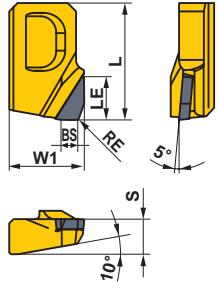
Note 1) Refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out.

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

● : Inventory maintained. ★ : Inventory maintained in Japan.
(PCD inserts are available with 1 piece in one case.)

■ Inserts

(inch)

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 Irons 	NEW NP-GOEN1404PXSR05			●	.551	.098	.354	.165	.020	.016	
	NEW NP-GOEN1408PXSR05			●	.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	.551	.354	.165	.079	.004	
Burr Prevention											

For Aluminum Alloys : Sharp Edge

● = NEW

For Gray Cast Irons : Chamfered 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.

Recommended Cutting Conditions

(inch)

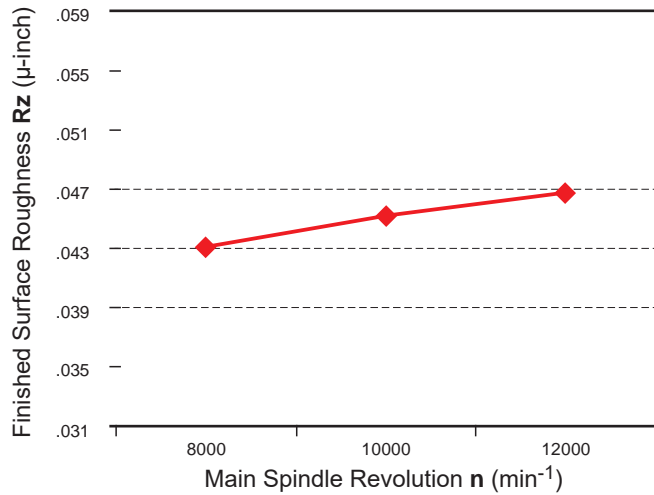
Workpiece Material	Properties	Grade	Cutting Speed vc (SFM)	Depth of Cut		Feed per Tooth fz (IPT)	Cutting Mode
				ae	ap		
K	Gray Cast Irons	Tensile Strength ≤350MPa	MB4120 3280 (2295–4265)	≤ 0.8 DC	≤ .020	.003 (.002–.006)	Dry Cutting
N	Aluminum Alloys	Content Si < 5%	MD2030 MD220 8200 (6560–9840)	≤ 0.2 DC	≤ .118 (.020–.118)	.003 (.002–.008)	Wet Cutting
				≤ 0.5 DC	≤ .098 (.020–.098)		
				≤ 0.8 DC	≤ .079 (.020–.079)		
		Content 5% ≤ Si ≤ 10%	MD2030 MD220 8200 (6560–9840)	≤ 0.2 DC	≤ .118 (.020–.118)	.003 (.002–.008)	Wet Cutting
				≤ 0.5 DC	≤ .098 (.020–.098)		
				≤ 0.8 DC	≤ .079 (.020–.079)		
	Content 10% < Si < 15%	MD220 MD2030 1970 (1310–2625)	≤ 0.2 DC	≤ .118 (.020–.118)	.003 (.002–.008)	Wet Cutting	
			≤ 0.5 DC	≤ .098 (.020–.098)			
			≤ 0.8 DC	≤ .079 (.020–.079)			
	Content Si ≥ 15%	MD220 MD2030 1970 (1310–2625)	≤ 0.2 DC	≤ .118 (.020–.118)	.003 (.002–.008)	Wet Cutting	
			≤ 0.5 DC	≤ .098 (.020–.098)			
			≤ 0.8 DC	≤ .079 (.020–.079)			

(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.

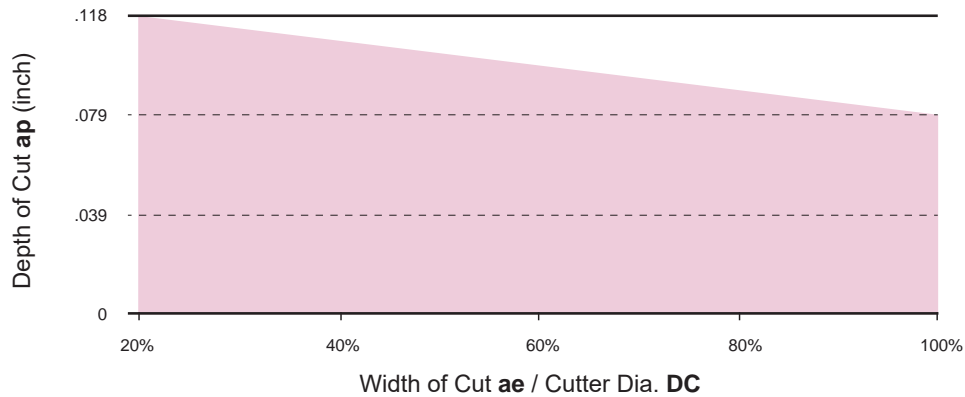
Cutting Performance

Finished Surface Roughness (Rz)

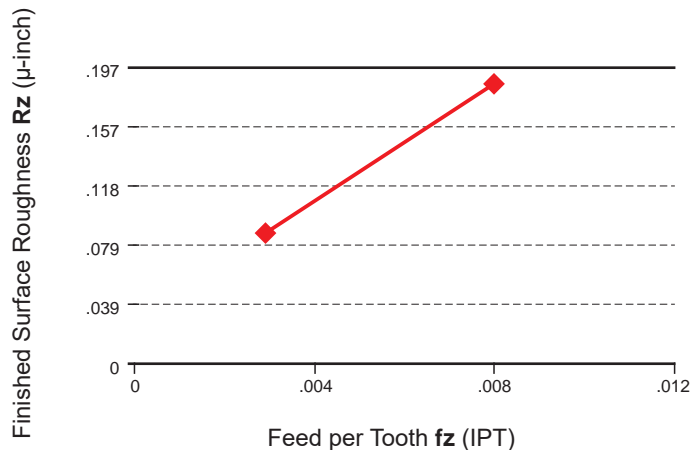


<Cutting Conditions>
 Workpiece Material : AISI 383.0 Cylinder Head
 Tool : FMAXR12524E
 Insert : GOER1408PXR2
 Grade : MD2030
 Revolution : n = 8000–12000 min⁻¹
 Feed per Tooth : fz = .003 IPT
 Depth of Cut : ap = .079 inch
 Width of Cut : ae = 2.677 inch x 3
 Cutting Mode : Internal Coolant 580 psi

Effective Chip Disposal Range

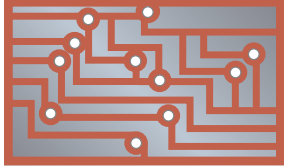
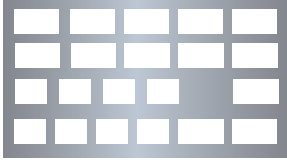


Gray Cast Iron Finished Surface Roughness (Rz) Comparison by CBN Grade





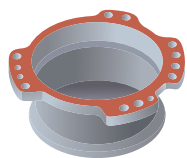
<Cutting Conditions>
 Workpiece Material : AISI No.35 B
 Tool : FAMXUR0524E
 Insert : NP-GOEN1408PXR05
 Grade : MB4120
 Revolution : n = 2546 min⁻¹
 Feed per Tooth : fz = .003 IPT .008 IPT
 Depth of Cut : ap = .020 inch
 Cutting Mode : Dry Cutting

Application Examples

Cutter Body		FMAXR12520CLW	FMAXR16016D
Insert (Grade)		GOER1401ZXFR2 (MD220)	NP-GOEN1408PXSRO5 (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						
Insert (Grade)		GOER1401ZXFR2 (MD220)						
Workpiece		AISI 383.0 						
Cutting Conditions	Cutting Speed vc (SFM)	3605						
	Revolution n (min ⁻¹)	7000						
	Feed per Tooth fz (IPT)	.002						
	Table Feed vf (IPM)	138						
	Depth of Cut ap (inch)	.012						
	Width of Cut ae (inch)	.787 – 1.181						
Cutting Mode		Wet Cutting						
Machine		Vertical MC (BT30)						
Results		<p>Tool Life (feet)</p> <table border="1"> <tr> <td>Conventional</td> <td>16400</td> </tr> <tr> <td>FMAX</td> <td>49200</td> </tr> <tr> <td>Can Continue</td> <td>82000</td> </tr> </table> <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	FMAX	49200	Can Continue	82000
Conventional	16400							
FMAX	49200							
Can Continue	82000							

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

Re-grinding of a PCD Insert

The maximum material to be re-grinding is .024 inch.

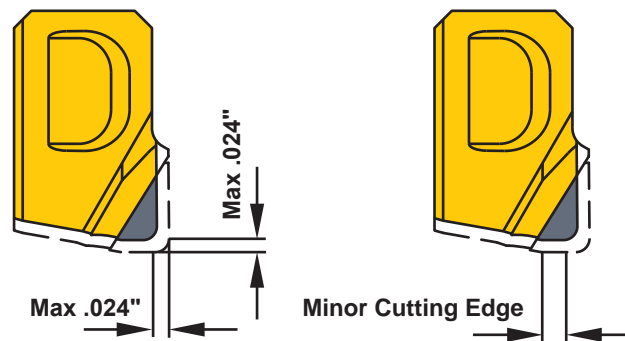
Use similar inserts after re-grinding to maintain balance.

Problems may occur if the cutter isn't balanced correctly.

After re-grinding the minor edge will reduce in size and may affect surface finishes.

Check the diameter offset after fitting re-grinding inserts.

* Please contact us regarding optimum re-grinding conditions.



For your safety

●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching inserts or spare parts, please use the attached wrench or driver. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

MITSUBISHI MATERIALS U.S.A. CORPORATION

Customer Service : 800-523-0800
Technical Service : 800-486-2341

LOS ANGELES HEAD OFFICE
3535 Hyland Avenue, Suite 200, Costa Mesa, CA 92626
TEL : 714-352-6100 FAX : 714-668-1320

NORTH CAROLINA OFFICE
105 Corporate Center Drive Suite A, Mooresville, NC 28117
TEL : 980-312-3100 FAX : 704-746-9292

CHICAGO OFFICE
1314B North Plum Grove Road, Schaumburg, IL 60173
TEL : 847-252-6300 FAX : 847-519-1732

TORONTO OFFICE
3535 Laird Road, Units 15 & 16, Mississauga, Ontario, L5L 5Y7, Canada
TEL : 905-814-0240 FAX : 905-814-0245

MMC METAL DE MEXICO, S.A. DE C.V.
Av. La Cañada No.16, Parque Industrial Bernardo Quintana,
El Marques, Queretaro, CP76246, Mexico
TEL : +52-442-221-6136 FAX : +52-442-221-6134

URL : <http://www.mmus-carbide.com>
(Tool specifications subject to change without notice.)