THE NEW VALUE FRONTIER

KYOCERA

High Efficiency Milling Cutter for Finishing Aluminum | MFAH

High Efficiency Milling Cutter for Finishing Aluminum

MFAH

NEW

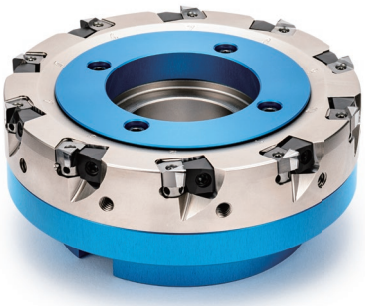
Low Cutting Force Minimizes Burrs and Chipping for High Quality Machining Results

Easily Adjust Blade Runout for Highly Efficient Machining

Large Lineup for Milling Various Applications

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

3 Different Cutting Edge Designs



Light-weight Hybrid Body

Steel Body

High Efficiency Milling Cutter for Finishing Aluminum

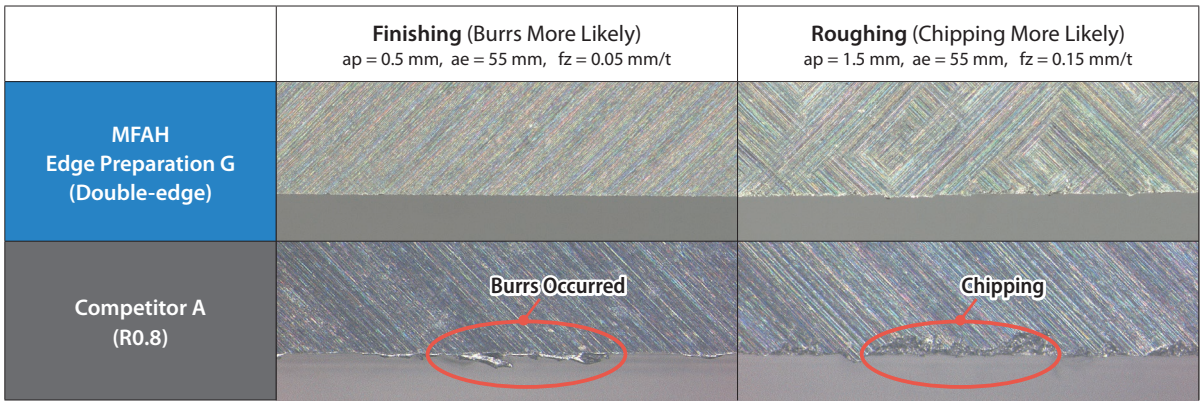
MFAH

Low Cutting Force Minimizes Burrs for High Quality Machining Results. Easy Blade Runout Adjustment
2 Body Types and 3 Inserts for a Variety of Milling Applications

1 Minimizes Burrs for High Quality Machining Results

Large True Rake Angle and Double-edge Insert Designs

Burr and Chipping Comparison (Internal Evaluation)

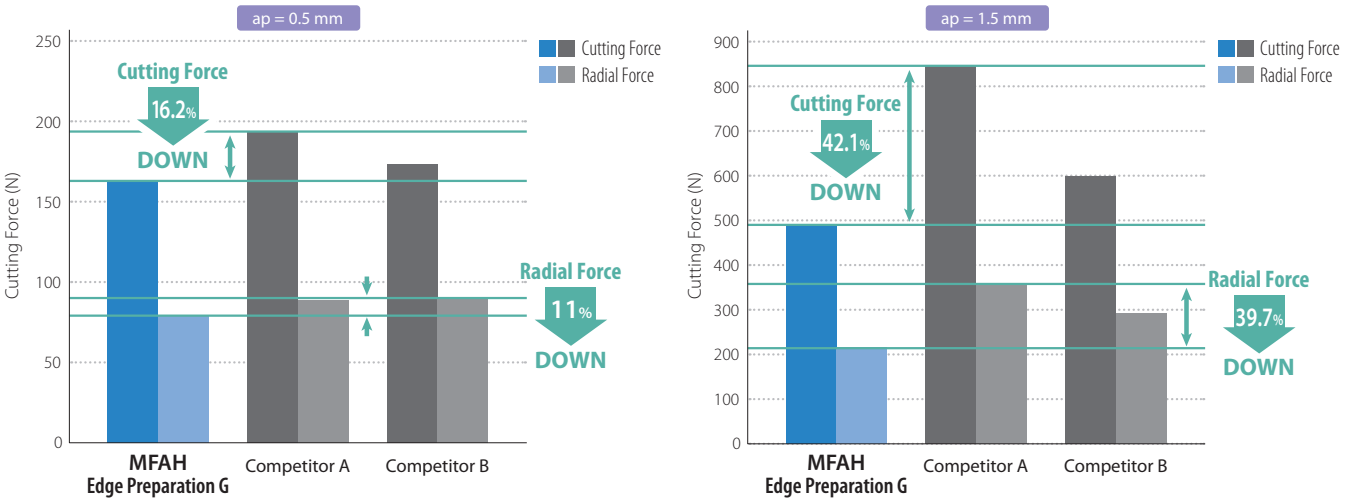


Cutting Conditions: Vc = 2,500 m/min, Wet, Cutting Dia. ø80
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece: ADC12

2 Low Cutting Force Design

Low Cutting Force, Reduced Chattering and High Efficiency Machining

Cutting Force Comparison (Internal Evaluation)

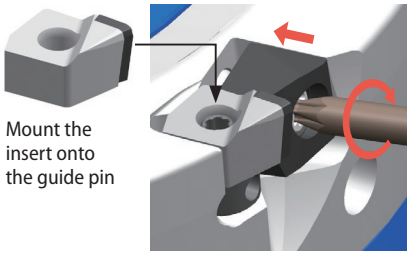


Cutting Conditions: Vc = 2,500 m/min, ae = 55 mm, fz = 0.1 mm/t, Wet, Cutting Dia. ø80
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece: ADC12

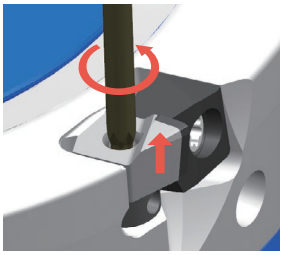
3 Adjustable Blade Runout

Easily Install Inserts and Adjust Blade Runout

Easy Insert Installment
Guide Pin Allows for Easier Positioning

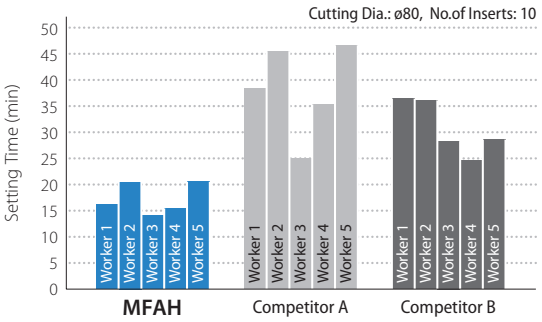


Easily Adjust Blade Runout
Adjustable from Both the Front and Outer Periphery



Unique Design for Easily Adjusting from the Front

Blade Runout Setting Time Comparison (Internal Evaluation)
Operation Time of 5 Workers Comparison



The MFAH can drastically shorten the setting time

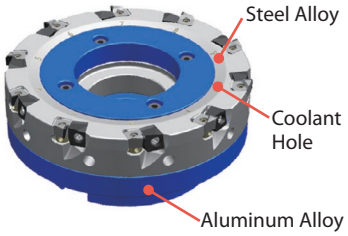
4 Large Tooling Lineup

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

3 Different Edge Designs Offer a Variety of Machining Applications

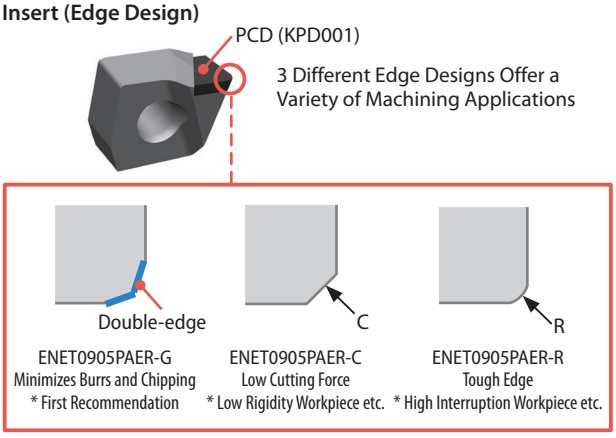
Cutter Body

Steel Body
ø50mm – ø125mm



Light-weight Hybrid Body
ø80mm – ø315mm

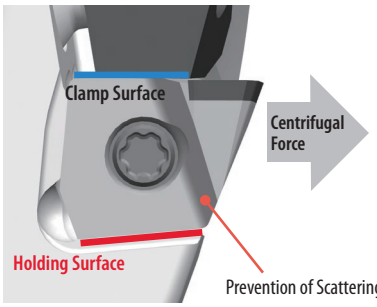
Insert (Edge Design)



5 Safety Enhancements during High-speed Revolution

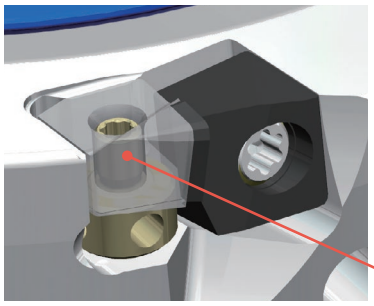
Scattering Prevention Mechanism

1 Prevention of Scattering by Wedge-shape Design
New wedge-shape feature holds insert firmly in place and reduces chattering



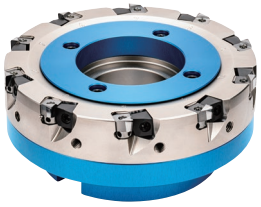
Prevention of Scattering by Wedge-shape Design

2 Prevention of Scattering with Guide Pin
Guide pins improve safety during high-speed rotation



Prevention of Scattering with Guide Pin

MFAH (Light-weight Hybrid Body)



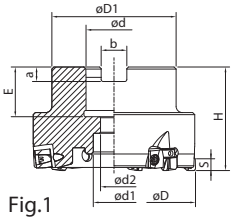


Fig.1

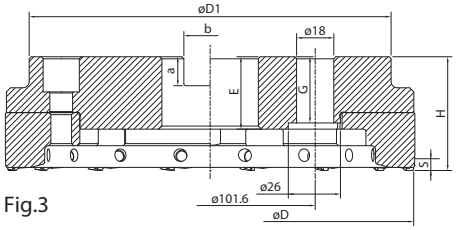


Fig.3

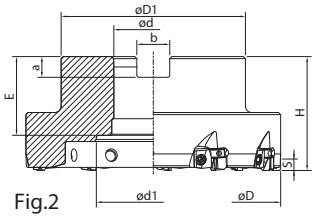


Fig.2

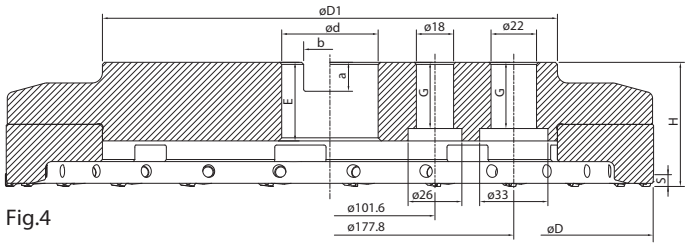


Fig.4

Toolholder Dimensions

Description			Stock	No.of Inserts	Dimension (mm)											Coolant Hole	Drawing	Max. Revolution	Weight	Arbor Bolt (Attachment)	Coolant Cover (Attachment)	Coolant Cover (Optional)
					øD	øD1	ød	ød1	ød2	H	E	a	b	S	G			(min^{-1})	(kg)			
Bore Dia. Inch spec	MFAH	080RA-6T-SF	●	6	80	62	25.4	20	13	50	27	6.0	9.5	4.6	–	Yes	Fig.1	14,600	0.83	HH12X35HC	–	–
		080RA-10T-SF	●	10															0.78			
		100RA-8T-254-SF	●	8	100						24							13,000	1.21			
		100RA-12T-254-SF	●	12															1.16			
		100RA-8T-SF	●	8		85	31.75	42	–		34	8.0	12.7				Fig.2		1.33	HF16X44HC		
		100RA-12T-SF	●	12															1.29			
		125RA-10T-254-SF	●	10	125	60	25.4	20	13		24	6.0	9.5				Fig.1	11,400	1.80	HH12X35H	CC-125-MFAH	
		125RA-16T-254-SF	●	16															1.74			
		125RA-10T-SF	●	10		89	38.1	55		55	38	10.0	15.9				Fig.2		2.00	HF20X53HA		
		125RA-16T-SF	●	16															1.95			
		160RA-12T-SF	●	12	160	130	50.8	70				11.0	19.1					8,000	3.4	HF24X60HA	CC-160-MFAH	
		160RA-20T-SF	●	20															3.3			
		200RA-16T-SF	△	16	200	175	47.625	126	–		35	14.0	25.4		32		Fig.3	5,600	4.9	–	–	CC-200-MFAH
		200RA-24T-SF	△	24															4.8			
		250RA-20T-SF	△	20	250	140		165										4,500	7.0			CC-250-MFAH
		250RA-32T-SF	△	32															6.9			
		315RA-24T-SF	△	24	315	220		220		60	38						Fig.4	3,500	11.7			CC-315-MFAH
		315RA-40T-SF	△	40															11.5			
Metric	MFAH	080RA-6T-M-SF	●	6	80	62	27	20	13	50	27	7.0	12.4	4.6	–	Yes	Fig.1	14,600	0.82	HH12X35HC	–	–
		080RA-10T-M-SF	●	10															0.78			
		100RA-8T-M27-SF	●	8	100						24							13,000	1.20			
		100RA-12T-M27-SF	●	12															1.15			
		100RA-8T-M-SF	●	8		85	32	42	–		30	8.0	14.4				Fig.2		1.32	HF16X48HC		
		100RA-12T-M-SF	●	12															1.27			
		125RA-10T-M27-SF	●	10	125	60	27	20	13		24	7.0	12.4				Fig.1	11,400	1.80	HH12X35H	CC-125-MFAH	
		125RA-16T-M27-SF	●	16															1.73			
		125RA-10T-M-SF	●	10		94	40	55		55	33	9.0	16.4				Fig.2		2.1	HF20X53HA		
		125RA-16T-M-SF	●	16																		
		160RA-12T-M-SF	●	12	160	125		57										8,000	3.5	HF24X60HA	CC-160-MFAH	
		160RA-20T-M-SF	●	20															3.4			
		200RA-16T-M-SF	△	16	200	175	60	126	–		35	14.0	25.7		32		Fig.3	5,600	4.7	–	–	CC-200-MFAH
		200RA-24T-M-SF	△	24															4.6			
		250RA-20T-M-SF	△	20	250	140		165										4,500	6.9			CC-250-MFAH
		250RA-32T-M-SF	△	32															6.8			
		315RA-24T-M-SF	△	24	315	220		220		60	38						Fig.4	3,500	11.7			CC-315-MFAH
		315RA-40T-M-SF	△	40															11.5			

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

● : Standard Stock △ : Made to Order

MFAH (Steel Body)

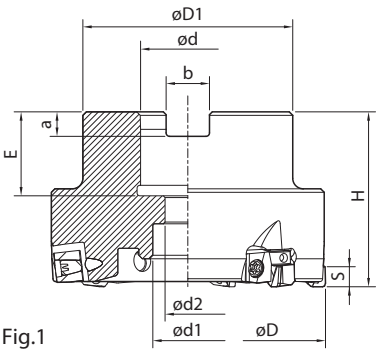


Fig.1

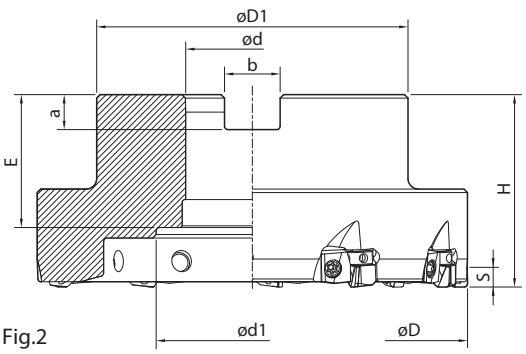


Fig.2

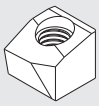
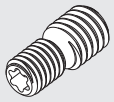
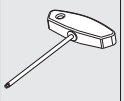
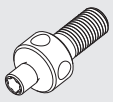
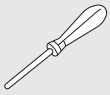
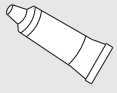
Toolholder Dimensions

Description			Stock	No.of Inserts	Dimension (mm)										Coolant Hole	Drawing	Max. Revolution	Weight	Arbor Bolt (Attachment)
					øD	øD1	ød	ød1	ød2	H	E	a	b	S			(min^{-1})	(kg)	
Bore Dia. Inch spec	MFAH	080RS-6T-SF	●	6	80	50	25.4	20	13	50	27	6.0	9.5	4.6	No	Fig.1	14,600	1.02	HH12X35
		080RS-10T-SF	●	10														0.98	
		100RS-8T-SF	●	8	100	70	31.75	45	–		34	8.0	12.7			Fig.2	13,000	1.59	–
		100RS-12T-SF	●	12														1.55	
		125RS-10T-SF	●	10	125	89	38.1	55		55	38	10.0	15.9				11,400	2.63	
		125RS-16T-SF	●	16														2.56	
Metric	MFAH	050RS-4T-M-SF	●	4	50	48	16	13.6	9	40	19	5.6	8.4	4.6		Fig.1	19,200	0.44	HH8X25
		050RS-5T-M-SF	●	5														0.43	
		063RS-5T-M-SF	●	5	63	61	22	23	11		21	6.3	10.4				16,800	0.69	HH10X30
		063RS-6T-M-SF	●	6														0.68	
		080RS-6T-M-SF	●	6	80	60	27	20	13	50	24	7.0	12.4				14,600	1.16	HH12X35
		080RS-10T-M-SF	●	10														1.11	
		100RS-8T-M-SF	●	8	100	70	32	45	–		30	8.0	14.4			Fig.2	13,000	1.56	–
		100RS-12T-M-SF	●	12														1.51	
		125RS-10T-M-SF	●	10	125	89	40	55		55	33	9.0	16.4				11,400	2.6	
		125RS-16T-M-SF	●	16														2.5	

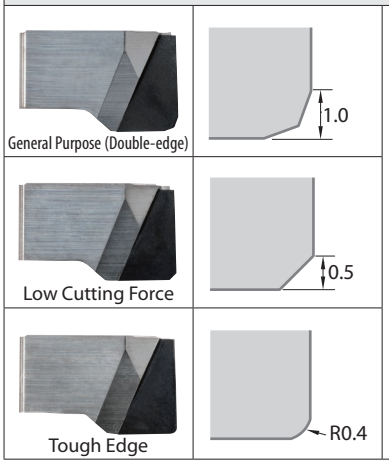
Confirm the total weight of the cutter and the arbor is within the machine's acceptable range

● : Standard Stock

Spare Parts

Description		Clamp	Clamp Screw	Wrench	Adjust Screw	Wrench	Balance Screw	Anti-seize Compound	Applicable Inserts
									
Light-weight Hybrid Body	MFAH080RA- … ~ MFAH315RA- …	C08R	W5X13L	TTW-15	AJ-4170	DTPM-8	HS6X4	P-37	ENET0905***
Steel Body	MFAH050RS- … ~ MFAH125RS- …								

Applicable Inserts

Shape	Description	Dimension (mm)						Angle(°)	PCD
		A	T	ød	W	Z	S	α	KPD001
	ENET 0905PAER-G	9.61	7.9	3.4	6.02	2.6	5.6	3°	●
	ENET 0905PAER-C	9.61	7.9	3.4	6.02	3.0	5.6	3°	●
	ENET 0905PAER-R	9.61	7.9	3.4	6.02	3.1	5.6	3°	●

● : Standard Stock

Recommended Cutting Conditions

Recommended Cutting Conditions

Workpiece	Property	Cutting Speed Vc (m/min)	Feed, Fz fz (mm/t)	Recommended Grade
Aluminum Alloy	Si Ratio 12.5% or Below	1,000 – **2,500** – 3,000	0.05 – **0.10** – 0.20	KPD001
	Si Ratio 12.5% or Above	400 – **600** – 800	0.05 – **0.10** – 0.20	

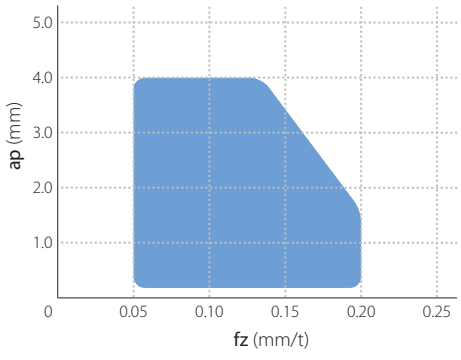
Recommended cutting conditions are reference values

Please adjust cutting speed and feed rate according to actual machining conditions taking into account machine and workpiece rigidity

Do not use the cutter at speeds exceeding the maximum cutting speed limit

Cutting Performance

BT50 M/C (Machine Power 30kw)



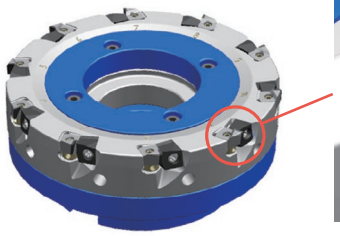
Cutting Conditions: Vc = 2,500 m/min, ae = 55 mm, Wet, Cutting Dia. ø80
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece: ADC12

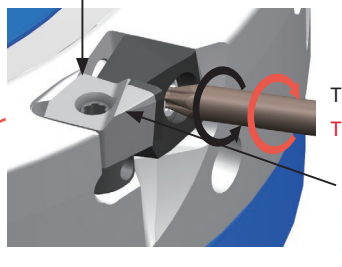
Max. Revolution and Max. Cutting Speed for Each Cutting Diameter

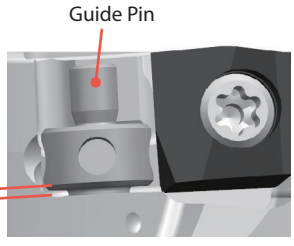
Cutting Diameter øD (mm)	Cutter Max. Revolution n (min^{-1})	Max. Cutting Speed Vc max (m/min)
ø50	19,200	3,016
ø63	16,800	3,325
ø80	14,600	3,669
ø100	13,000	4,084
ø125	11,400	4,477
ø160	8,000	4,021
ø200	5,600	3,519
ø250	4,500	3,534
ø315	3,500	3,464

How to Mount Insert

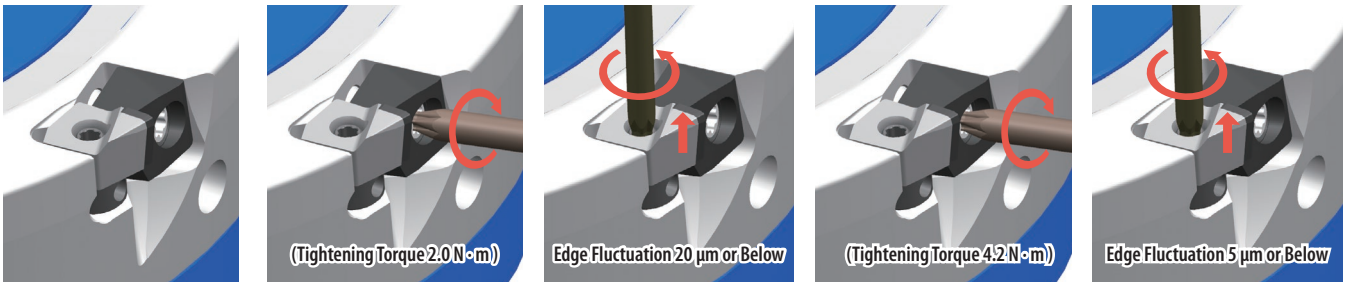
1. Adjust the clearance between adjustment screw for cutting edge and the surface of insert to be 0.5 mm
2. Mount insert on guide pin
   (Be sure to install from the head)
   (Mounting from outer periphery is not recommended)
3. Tighten the clamp screw while lightly pressing the insert against the holding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



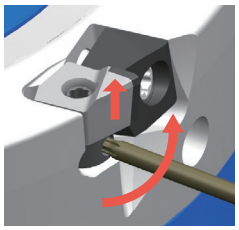




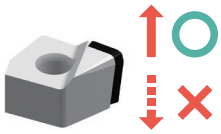
How to Adjust Blade Runout



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



Adjustment edge fluctuation from outer periphery is workable



* Caution
Do not adjust cutting edge to lower position

Cautions

While in Use

⚠Caution

Please use within recommended cutting conditions

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

Inserts or cutter body may be damaged due to the centrifugal force and cutting load

Please do not use under the following conditions:

When cutter is not fully loaded with inserts

If the body and/or clamp is damaged

If a clamp or clamp screw is removed

If inserts that have different regrind amounts are mounted

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

Injury can occur when touching the cutting edge

Dynamic Balance

Balance adjustment on the cutter is completed before shipping

Balance adjustment has been made with special high precision inserts to be ISO balance grade (ISO1940/1) G2.5

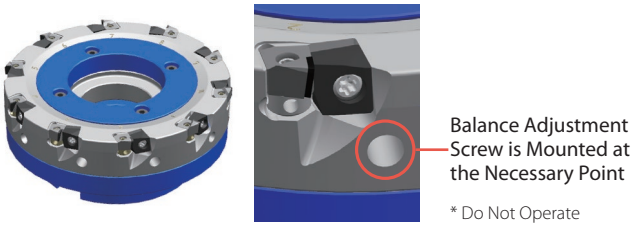
* See P5 for Recommended Cutting Conditions at Max. Revolution

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

⇒This could lead to improper dynamic balance

Do not completely remove clamp and clamp screw from cutter

⇒This requires additional balance adjustment



* Do Not Operate