

THE NEW VALUE FRONTIER



High Efficiency Milling Cutter
for Finishing Aluminum

MFAH

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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)

	Finishing (Burrs More Likely) ap = 0.5 mm, ae = 55 mm, fz = 0.05 mm/t	Roughing (Chipping More Likely) ap = 1.5 mm, ae = 55 mm, fz = 0.15 mm/t
MFAH Edge Preparation G (Double-edge)		
Competitor A (R0.8)		

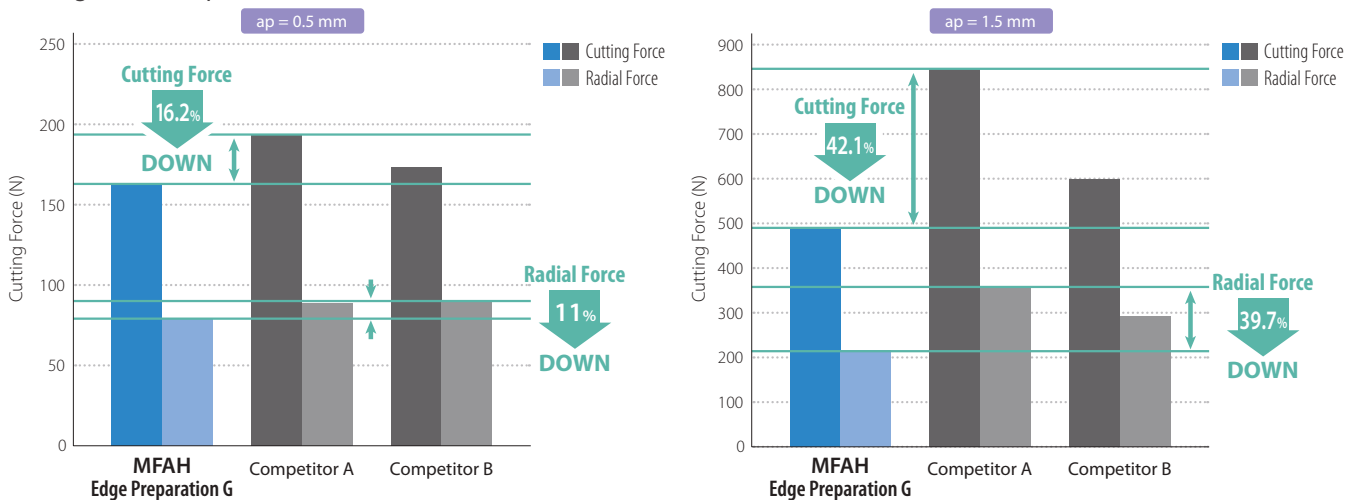
Cutting Conditions: Vc = 2,500 m/min, Wet, Cutting Dia. ø80
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece: ADC12

2

Low Cutting Force Design

Low Cutting Force, Reduced Chattering and High Efficiency Machining

Cutting Force Comparison (Internal Evaluation)



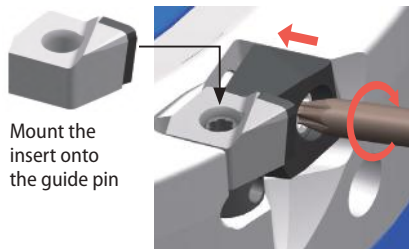
Cutting Conditions: Vc = 2,500 m/min, ae = 55 mm, fz = 0.1 mm/t, Wet, Cutting Dia. ø80
MFAH080RS-10T-SF, ENET0905PAER-G KPD001 Workpiece: ADC12

3 Adjustable Blade Runout

Easily Install Inserts and Adjust Blade Runout

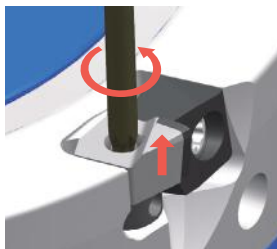
Easy Insert Installment

Guide Pin Allows for Easier Positioning



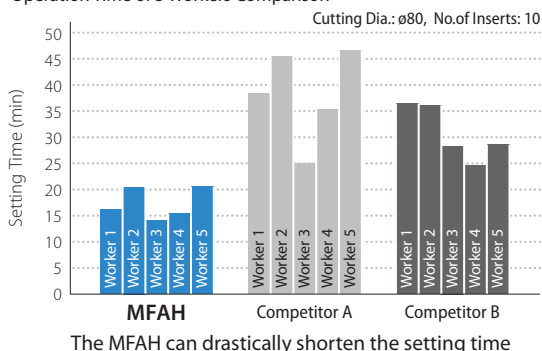
Easily Adjust Blade Runout

Adjustable from Both the Front and Outer Periphery



Blade Runout Setting Time Comparison (Internal Evaluation)

Operation Time of 5 Workers Comparison



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
 $\phi 50\text{mm} - \phi 125\text{mm}$

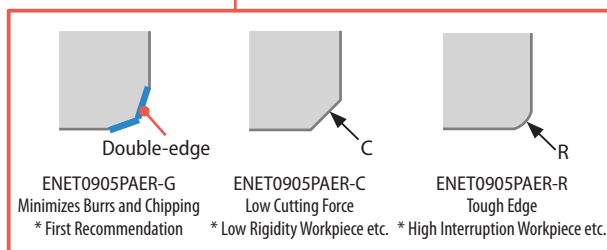


Light-weight Hybrid Body
 $\phi 80\text{mm} - \phi 315\text{mm}$

Insert (Edge Design)



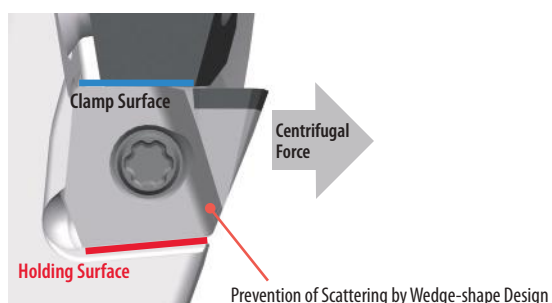
3 Different Edge Designs Offer a Variety of Machining Applications



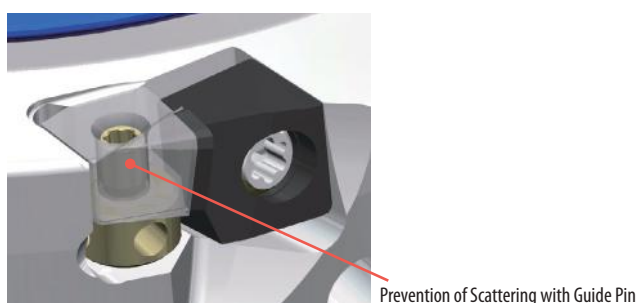
5 Safety Enhancements during High-speed Revolution

Scattering Prevention Mechanism

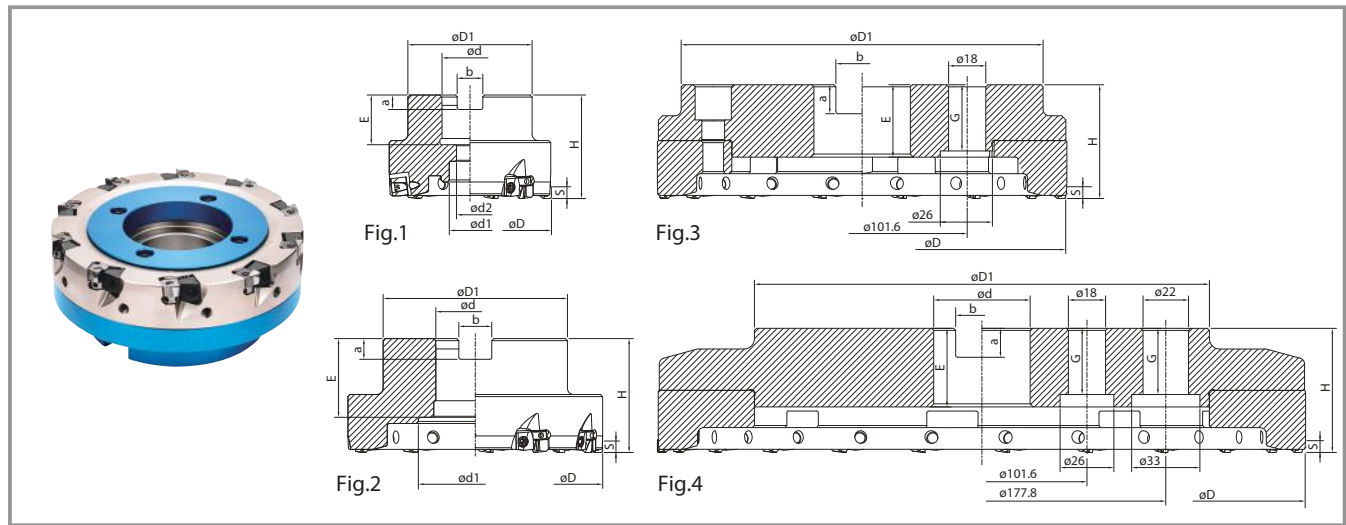
- 1 Prevention of Scattering by Wedge-shape Design
New wedge-shape feature holds insert firmly in place and reduces chattering



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



MFAH (Light-weight Hybrid Body)



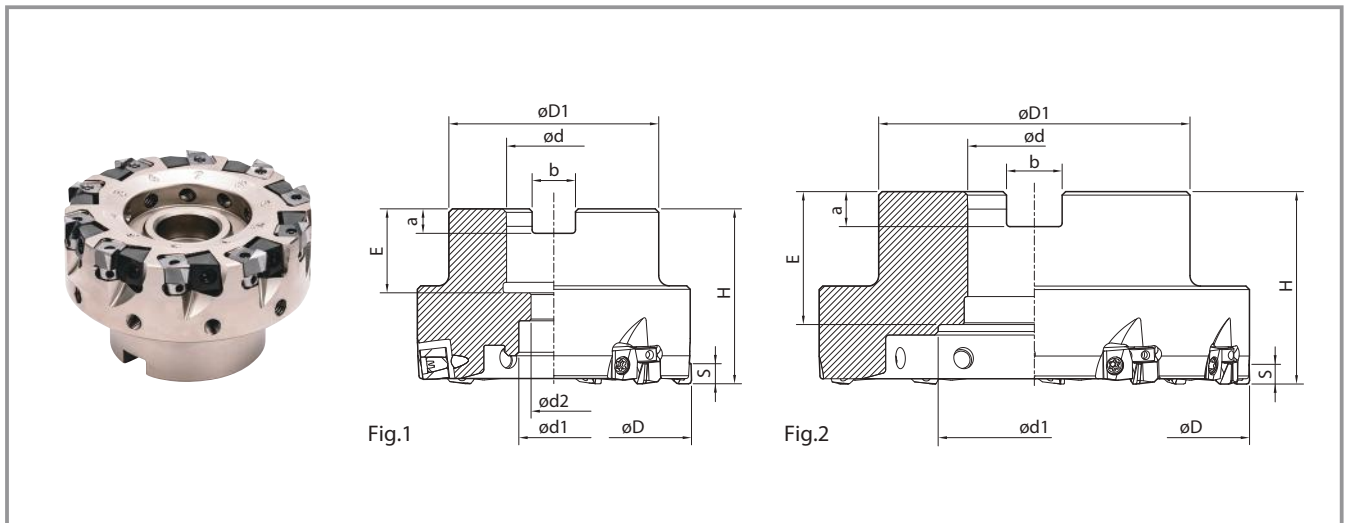
Toolholder Dimensions

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							1.21										
		100RA-12T-254-SF	●	12	100	85	31.75	42	-	34	8.0	12.7	13,000	1.16	HF16X44HC						
		100RA-8T-SF	●	8										1.33							
		100RA-12T-SF	●	12										1.29							
		125RA-10T-254-SF	●	10	125	60	25.4	20	13	24	6.0	9.5	11,400	1.80	HH12X35H	CC-125-MFAH					
		125RA-16T-254-SF	●	16										1.74							
		125RA-10T-SF	●	10										2.00							
		125RA-16T-SF	●	16	160	130	50.8	70	55	38	10.0	15.9	8,000	1.95	HF20X53HA	CC-160-MFAH					
		160RA-12T-SF	●	12										3.4							
		160RA-20T-SF	●	20										3.3							
		200RA-16T-SF	△	16	200	175		126	-	35			5,600	4.9			CC-200-MFAH				
		200RA-24T-SF	△	24										4.8							
		250RA-20T-SF	△	20										250				140	47.625	165	60
		250RA-32T-SF	△	32	6.9																
		315RA-24T-SF	△	24	315	220		220	60	38			3,500		11.7						
		315RA-40T-SF	△	40										11.5							
Metric	MFAH	080RA-6T-M-SF	●	6										80	62			27	20	13	50
		080RA-10T-M-SF	●	10	0.78																
		100RA-8T-M27-SF	●	8	1.20																
		100RA-12T-M27-SF	●	12	100	85	32	42	-	30	8.0	14.4	13,000	1.15	HF16X48HC						
		100RA-8T-M-SF	●	8										1.32							
		100RA-12T-M-SF	●	12										1.27							
		125RA-10T-M27-SF	●	10	125	60	27	20	13	24	7.0	12.4	11,400	1.80	HH12X35H	CC-125-MFAH					
		125RA-16T-M27-SF	●	16										1.73							
		125RA-10T-M-SF	●	10										160				125	40	57	55
		125RA-16T-M-SF	●	16	3.5																
		160RA-12T-M-SF	●	12	200	175		126	-	35			5,600		3.4	HF24X60HA	CC-200-MFAH				
		160RA-20T-M-SF	●	20										4.6							
		200RA-16T-M-SF	△	16										250	140			60	165		
		200RA-24T-M-SF	△	24	6.8																
		250RA-20T-M-SF	△	20	315	220		220	60	38			3,500			11.7					
		250RA-32T-M-SF	△	32										11.5							
		315RA-24T-M-SF	△	24																	
		315RA-40T-M-SF	△	40																	

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)



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	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	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	No	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	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					

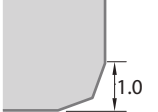
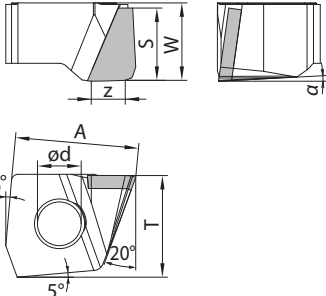
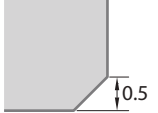
Confirm the total weight of the cutter and the arbor is within the machine's acceptable range

● : 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	<i>a</i>	KPD001
 General Purpose (Double-edge)			ENET 0905PAER-G	9.61	7.9	3.4	6.02	2.6	5.6	3°	●
 Low Cutting Force			ENET 0905PAER-C	9.61	7.9	3.4	6.02	3.0	5.6	3°	●
 Tough Edge			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	

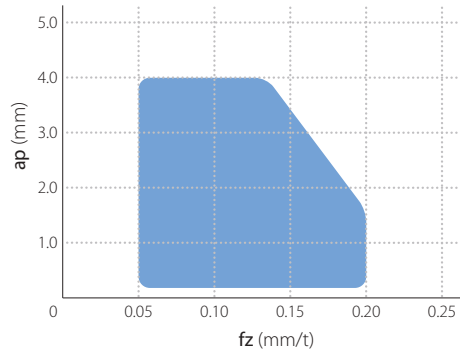
Recommended cutting conditions are reference values

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)



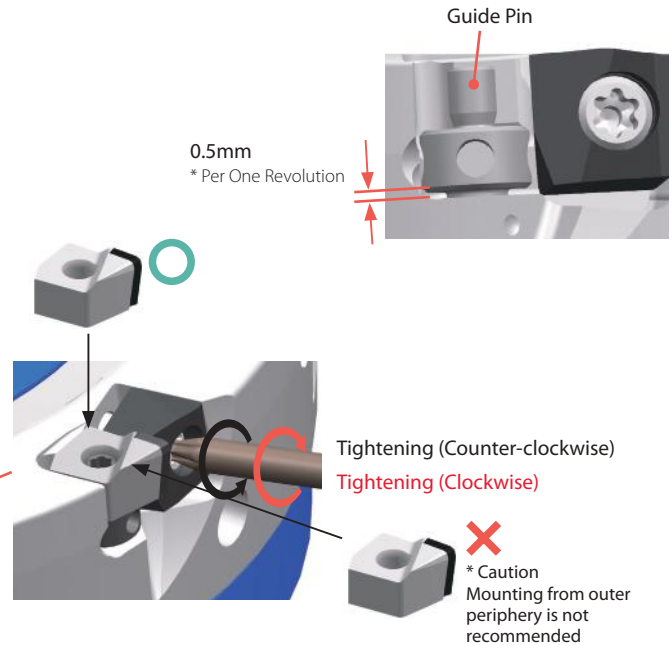
Cutting Conditions: Vc = 2,500 m/min, ae = 55 mm, Wet, Cutting Dia. ø80
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece: ADC12

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

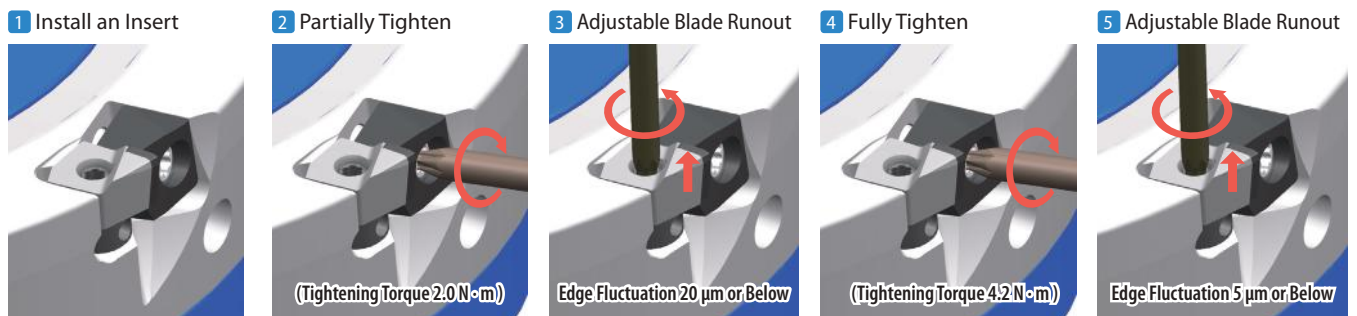
Cutting Diameter øD (mm)	Cutter Max. Revolution n (min ⁻¹)	Max. Cutting Speed Vc max (m/min)
ø50	19,200	3,016
ø63	16,800	3,325
ø80	14,600	3,669
ø100	13,000	4,084
ø125	11,400	4,477
ø160	8,000	4,021
ø200	5,600	3,519
ø250	4,500	3,534
ø315	3,500	3,464

How to Mount Insert

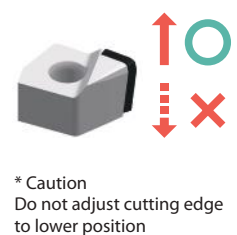
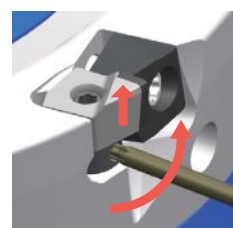
- 1 Adjust the clearance between adjustment screw for cutting edge and the surface of insert to be 0.5 mm
- 2 Mount insert on guide pin
(Be sure to install from the head)
(Mounting from outer periphery is not recommended)
- 3 Tighten the clamp screw while lightly pressing the insert against the holding 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



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



Balance Adjustment Screw is Mounted at the Necessary Point

* Do Not Operate