KYOCERA

MFAH

Milling Cutter for Finishing Aluminum

Low Cutting Forces Minimize Burrs and Chipping for High Quality Machining

Easily Adjust Blade Runout for 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

MFAH

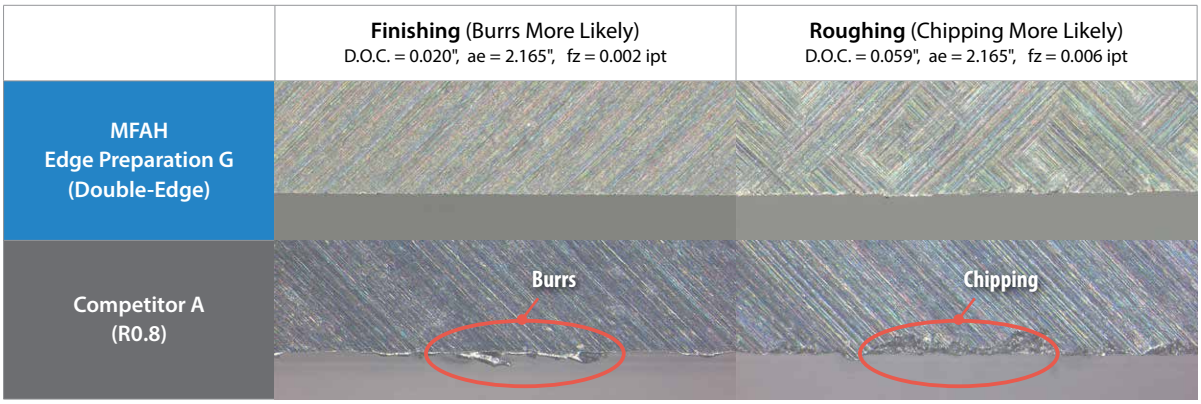
Milling Cutter for Finishing Aluminum

Low Cutting Forces Minimize Burrs for High Quality Machining Results
Easily Adjustable Blade Runout with 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)

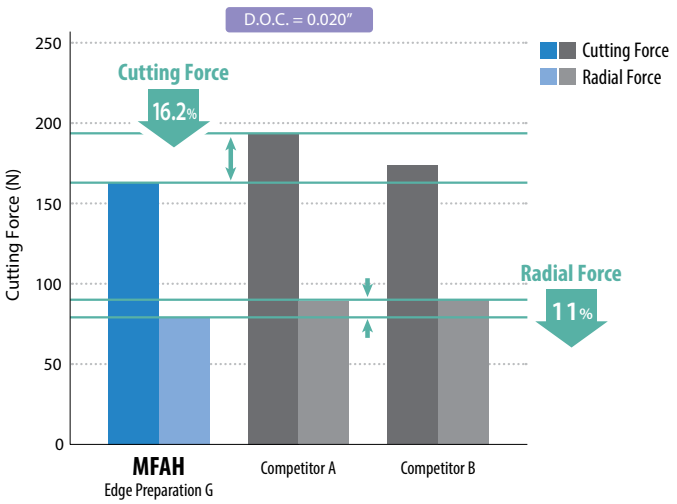


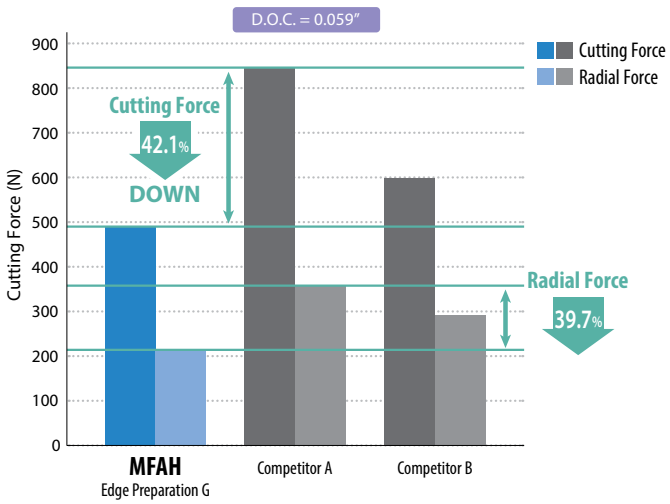
Cutting Conditions: Vc = 8,200 sfm, Wet, Cutting Dia. Ø80mm
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece: 383.0 Aluminum

2 Low Cutting Force Design

Low Cutting Force, Reduced Chattering and High Efficiency Machining

Cutting Force Comparison (Internal Evaluation)





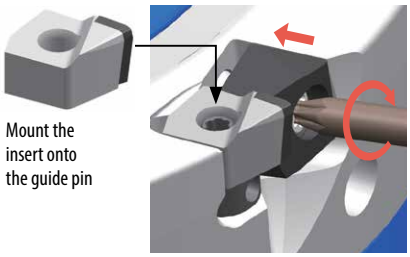
Cutting Conditions: Vc = 8,200 sfm, ae = 2.165", fz = 0.004 ipt Wet, Cutting Dia. Ø80mm
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece: 383.0 Aluminum

3 Adjustable Blade Runout

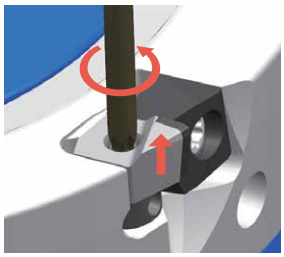
Easily Install Inserts and Adjust Blade Runout

Burr and Chipping Comparison (Internal Evaluation)

Easy Insert Installment
Guide Pin Allows for Easier Positioning

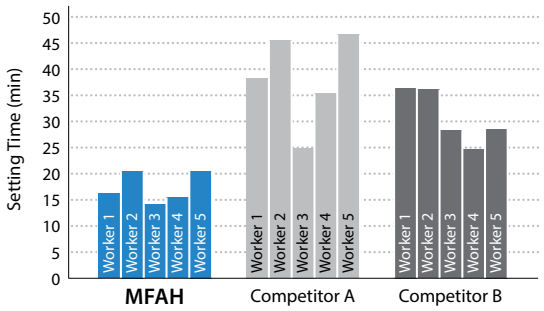


Easily Adjust Blade Runout
Adjustable from Both the Front and Outer Periphery



Unique Design for Easily Adjusting from the Front

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



The MFAH can drastically shorten insert setting time

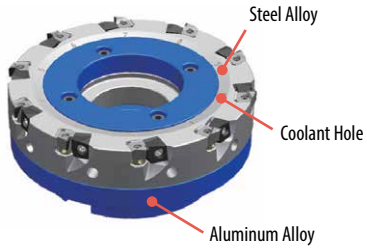
4 Large Tooling Lineup

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

3 Different Edge Designs Offer a Variety of Machining Applications

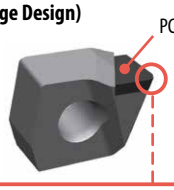
Cutter Body

Steel Body
Ø50mm – Ø125mm

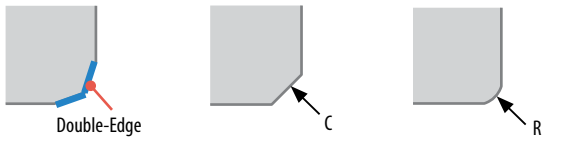


Light-Weight Hybrid Body
Ø80mm – Ø315mm

Insert (Edge Design)



3 Different Edge Designs Offer a Variety of Machining Applications



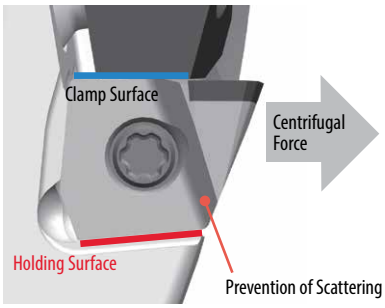
ENET0905PAER-G
Minimizes Burrs and Chipping
First Recommendation

ENET0905PAER-C
Low Cutting Force
Low Rigidity Workpiece

ENET0905PAER-R
Tough Edge
High Interruption Workpiece

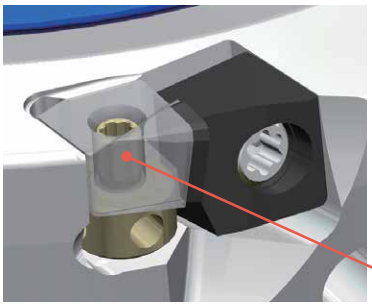
5 Safety Enhancements During High-Speed Revolution

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

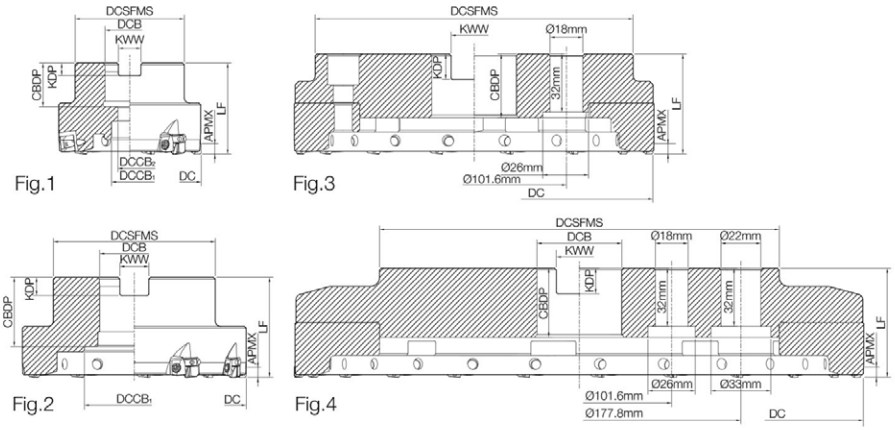


Prevention of Scattering by Wedge-shape Design

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



Prevention of Scattering with Guide Pin



Toolholder Dimensions (Metric Size)

Part Number		Stock	No. of Inserts	Dimensions (mm)										Coolant Hole	Drawing	Max. RPM	Weight (kg)	Coolant Through Arbor Bolt	Coolant Cover (Included if Listed)	Coolant Cover (Optional / Sold Separately)
				DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX							
Inch Bore Diameter	MFAH 080RA-6T-SF	●	6	80	62	1.000"	20	13	50	1.063"	0.236"	0.375"	4.6	✓	Fig.1	14,600	0.83	HH12X35HC (HF0500X35HC)	-	-
	080RA-10T-SF	●	10														0.78			
	100RA-8T-254-SF	●	8	100						0.945"						13,000	1.21			
	100RA-12T-254-SF	●	12														1.16			
	100RA-8T-SF	●	8		85	1.250"	42	-		1.339"	0.315"	0.500"			Fig.2		1.33	HF16X44HC (HF0625X44HC)		
	100RA-12T-SF	●	12														1.29			
	125RA-10T-254-SF	●	10	125	60	1.000"	20	13		0.945"	0.236"	0.375"			Fig.1	11,400	1.8	HH12X35HC (HF0500X35HC)	CC-125-MFAH	
	125RA-16T-254-SF	●	16														1.74			
	125RA-10T-SF	●	10		89	1.500"	55			1.496"	0.394"	0.625"			Fig.2		2	HF20X53HA		
	125RA-16T-SF	●	16														1.95			
	160RA-12T-SF	●	12	160	130	2.000"	70		55		0.433"	0.750"				8,000	3.4	HF24X60HA	CC-160-MFAH	
	160RA-20T-SF	●	20														3.3			
	200RA-16T-SF	□	16	200	175	1.875"	126	-		1.378"	0.551"	1.000"			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			CC-250-MFAH
	250RA-32T-SF	□	32														6.9			
	315RA-24T-SF	□	24	315	220		220		60	1.496"					Fig.4	3,500	11.7			CC-315-MFAH
	315RA-40T-SF	□	40														11.5			
Metric Bore Diameter	MFAH 080RA-6T-M-SF	●	6	80	62	27	20	13	50	27	7	12.4	4.6	✓	Fig.1	14,600	0.82	HH12X35HC	-	-
	080RA-10T-M-SF	●	10														0.78			
	100RA-8T-M27-SF	●	8	100						24						13,000	1.2			
	100RA-12T-M27-SF	●	12														1.15			
	100RA-8T-M-SF	●	8		85	32	42	-		30	8	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	12.4			Fig.1	11,400	1.8	HH12X35H	CC-125-MFAH	
	125RA-16T-M27-SF	●	16														1.73			
	125RA-10T-M-SF	●	10		94	40	55		55	33	9	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	25.7			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
• Inch thread coolant-through arbor bolts in ( ) available (sold separately)

● : Standard Item
□ : Made to Order

Applicable Inserts P6

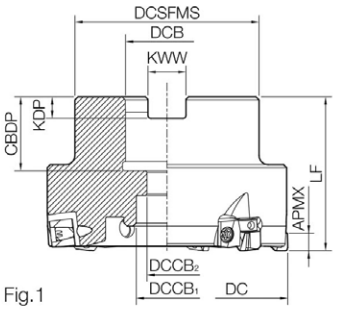


Fig.1

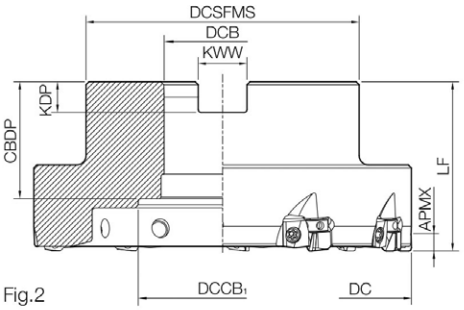


Fig.2

Toolholder Dimensions (Metric Size)

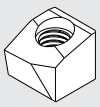
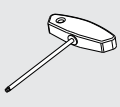
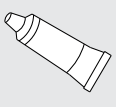
	Part Number	Stock	No. of Inserts	Dimensions (mm)										Coolant Hole	Drawing	Max. RPM	Weight (kg)	Arbor Bolt (Included if Listed)
				DC	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	APMX					
Inch Bore Diameter	MFAH 080RS-6T-SF	●	6	80	50	1.000"	20	13	50	1.063"	0.236"	0.375"	4.6	×	Fig.1	14,600	1	HH12X35
	080RS-10T-SF	●	10														0.98	
	100RS-8T-SF	●	8	100	70	1.250"	45	-		1.339"	0.315"	0.500"			Fig.2	13,000	2	-
	100RS-12T-SF	●	12														1.55	
	125RS-10T-SF	●	10	125	89	1.500"	55		55	1.496"	0.394"	0.625"				11,400	2.63	
	125RS-16T-SF	●	16															
Metric Bore Diameter	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	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	12.4				14,600	1	HH12X35
	080RS-10T-M-SF	●	10														1.11	
	100RS-8T-M-SF	●	8	100	70	32	45	-		30	8	14.4			Fig.2	13,000	2	-
	100RS-12T-M-SF	●	12														1.51	
	125RS-10T-M-SF	●	10	125	89	40	55		55	33	9	16.4				11,400	3	
	125RS-16T-M-SF	●	16														2.5	

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

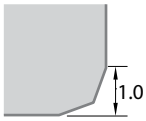
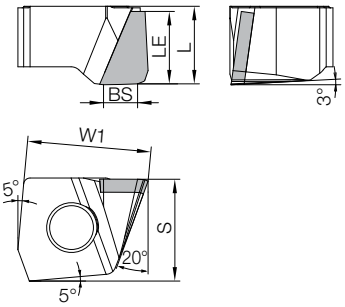
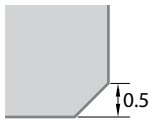
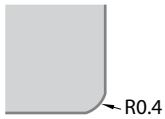
● : Standard Item

Applicable Inserts P6

Spare Parts

Part Number		Clamp	Clamp Screw	Wrench	Adjustment 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			Part Number	Dimensions (mm)					PCD
				W1	S	L	BS	LE	KPD001
 General Purpose (Double-Edge)	 1.0		**ENET 0905PAER-G**	9.61	7.9	6.02	2.6	5.6	●
 Low Cutting Force	 0.5		**ENET 0905PAER-C**	9.61	7.9	6.02	3.0	5.6	●
 Tough Edge	 R0.4		**ENET 0905PAER-R**	9.61	7.9	6.02	3.1	5.6	●

Recommended Cutting Conditions

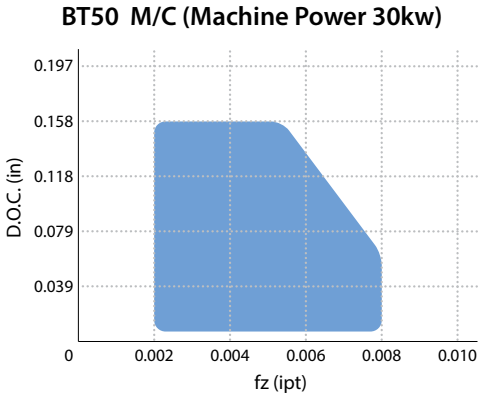
Workpiece	Property	Cutting Speed Vc (sfm)	Feed, Fz fz (ipt)	Recommended Grade
Aluminum Alloy	Si Ratio ≤ 12.5%	3,280 – 8,200 – 9,840	0.002 – 0.004 – 0.008	KPD001
	Si Ratio ≥ 12.5%	1,310 – 1,970 – 2,630	0.002 – 0.004 – 0.008	

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



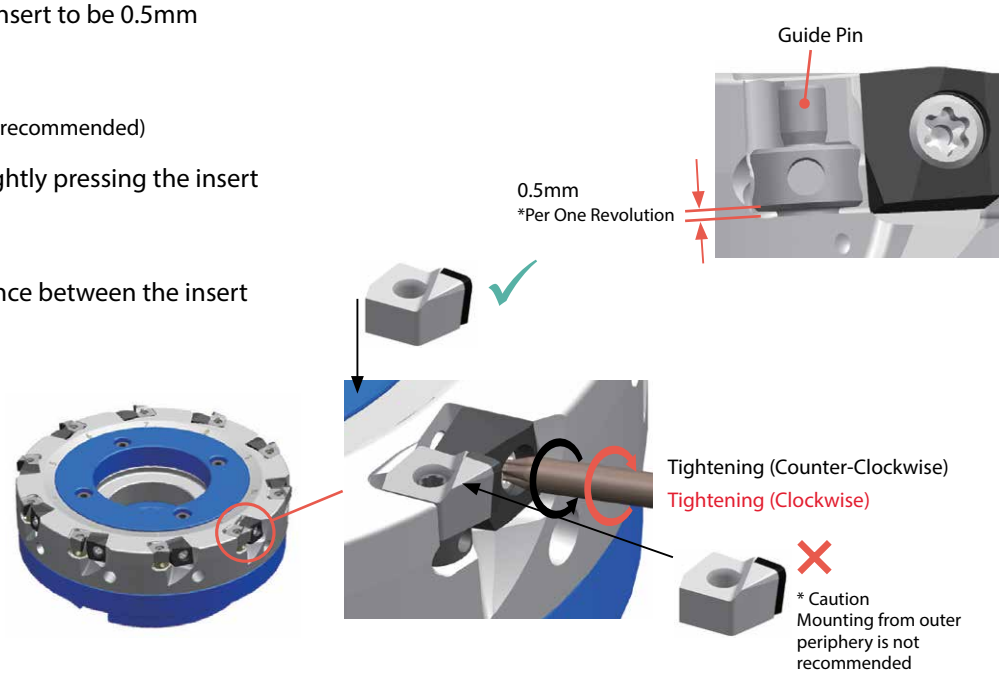
Cutting Conditions: Vc = 8,200 sfm, ae = 2.165", Wet, Cutting Dia. Ø80mm
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece: 383.0 Aluminum

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

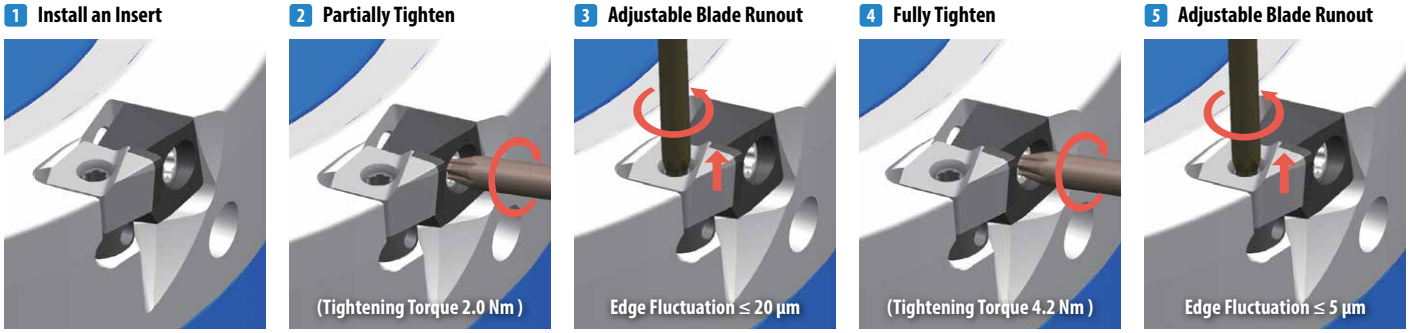
Cutting Diameter DC (mm)	Cutter Max. Revolution n (RPM)	Max. Cutting Speed Vc max (sfm)
Ø50	19,200	9,990
Ø63	16,800	10,910
Ø80	14,600	12,040
Ø100	13,000	13,400
Ø125	11,400	14,690
Ø160	8,000	13,190
Ø200	5,600	11,550
Ø250	4,500	11,590
Ø315	3,500	11,370

How to Mount Inserts

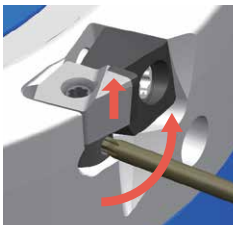
1. Adjust the clearance between adjustment screw for cutting edge and the surface of insert to be 0.5mm
2. Mount insert on guide pin
   (Be sure to install from the head)
   (Mounting from outer periphery is not recommended)
3. Tighten the clamp screw while lightly pressing the insert against the holding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



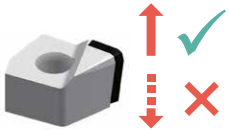
How to Adjust Blade Runout



1. Install inserts into all pockets
2. Partially tighten the clamp screw
   (Recommended Torque 2.0 Nm)
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 of 4.2 Nm
5. Slightly adjust position of cutting edge
   (Recommended Position Difference: ≤ 5 µm)
   *All inserts should be fine-tuned



Adjustment from outer periphery is possible



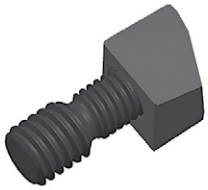
Adjustment must conclude with insert moving upward as shown above

Caution

Replacing the Insert Clamp

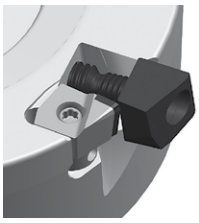
Correct Mounting Procedure for Clamp and Clamp Screw

1 Assembly



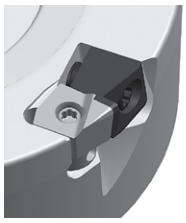
Screw the clamp screw into the clamp
(About one revolution)

2 Installation



Attach to holder

3 Tightening

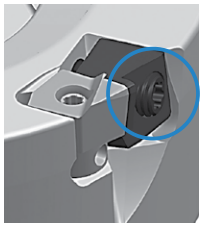


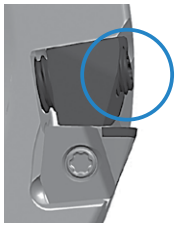
Tighten with recommended torque
(Installation complete

Mounting Position of Clamp Screw

Correct Positioning
(There is no protruding head of the screw)

Wrong Positioning
(The screw head is protruding outside the clamp)





After tightening the clamp screw with the recommended torque, please check the protrusion of the clamp screw.
If it is protruding outside the clamp, please reinstall

When clamp screws need to be replaced and completely removed, a balance adjustment is necessary after installation

While in Use

⚠ Caution

Only 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 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

⚠ Caution

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

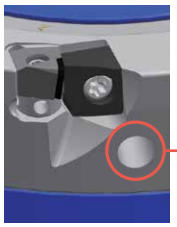
* See P5 for Recommended Cutting Conditions at Max. Revolution

Do not adjust the balance screw

⇒ 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 Adjust

KYOCERA

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