

MD90

NEW



High efficiency and premium quality aluminium machining

Improved machining efficiency with fine pitch cutter

Excellent machining quality with unique PCD inserts

Lightweight design compatible with BT30

Custom-designed options also available



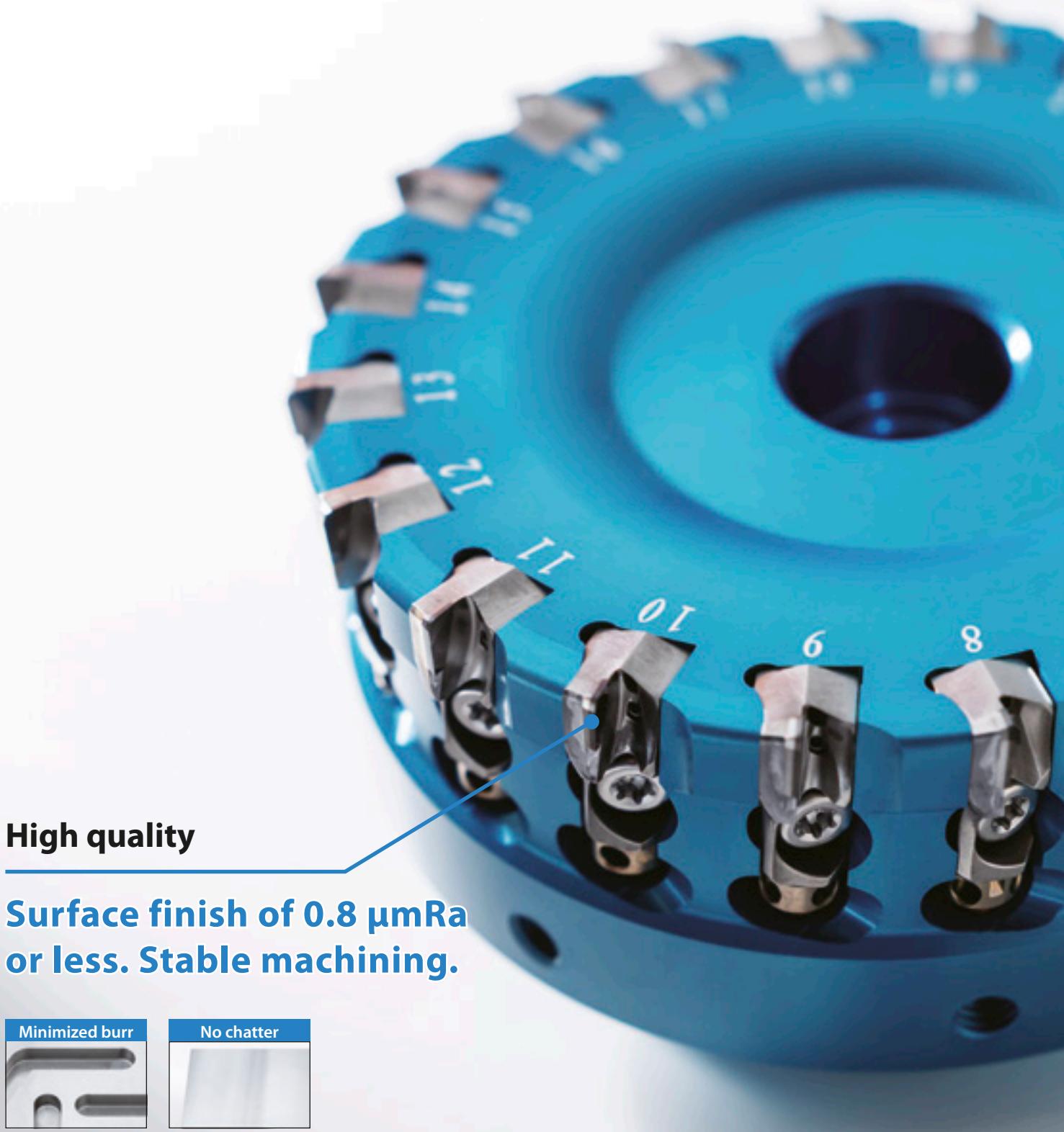
**KEEPS YOU
AHEAD**



Super fine pitch cutter for aluminium machining

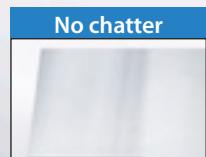
MD90

Improved machining efficiency of aluminium parts with super fine pitch specifications.
Unique design provides high quality and high precision results with long tool life.



High quality

**Surface finish of 0.8 µmRa
or less. Stable machining.**



Vc = 2,500 m/min. (n = 8,000 min-1), ap × ae = 0.2 × 75 mm, fz = 0.08 mm/t (Vf = 12,800 mm/min.)
Wet ADC12 BT50 Ø100 (20 inserts) (Internal evaluation)

Engineered to perfection

A new generation of super fine pitch cutters combine multiple aspects of Kyoceras leading milling technology.

Machine aluminium with higher speeds and higher quality with PCD inserts.

High efficiency

Capable of $V_f \geq 24,000$ mm/min.

High-efficiency machining achieved with an ultra-fine pitch design.

Custom designed options allow for further efficiency improvements.

Machining efficiency comparison (Internal evaluation)

MD90
18 inserts (Custom designs)

$V_f = 26,800$ mm/min.



Competitor A
14 inserts

$V_f = 21,000$ mm/min.

$V_c = 2,500$ m/min. ($n = 10,000$ min $^{-1}$), $ap \times ae = 0.2 \times 53$ mm, $f_z = 0.15$ mm/t Wet ADC12 BT30 Ø80 mm

Lightweight

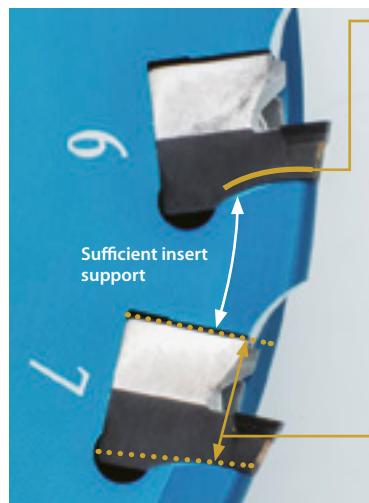
Compatible with BT30

Offering lightweight aluminium body sizes from Ø80 mm.

Largest cutter diameter of Ø125 mm weighs less than 1.5 kg.

High efficiency

The shape of the cutter maintains super fine pitch specifications



Curved contact surface

Maximized pitch maintains multiple inserts and rigidity.
Reduces chattering by dispersing stress.

Chatter resistance comparison (Internal evaluation)

MD90 (16 inserts)

Competitor A (14 inserts)

Scatter prevention

Firm insert hold

Ultra fine pitch with lightweight design

Largest cutter diameter of Ø125 mm weighs less than 1.5kg.
Compatible with BT30.

Cutting diameter	No. of inserts	Weight (kg)	Body
Ø40	6	0.26	Steel
Ø50	10	0.37	
Ø63	14	0.62	
Ø80	16	0.6	Aluminium
Ø100	20	0.96	
Ø125	24	1.48	

Metric bore diameter

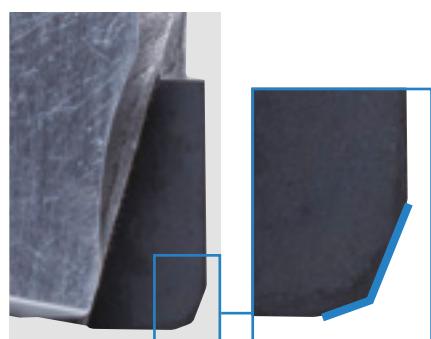
High quality

High machined surface quality, high precision and long tool life

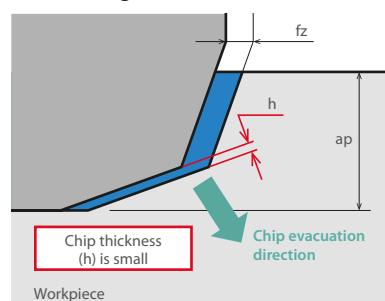
Suppresses burr formation

Double-edge (Standard type)

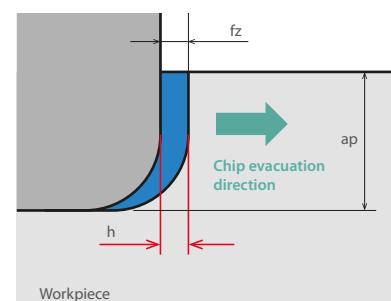
Controls the chip evacuation direction and suppresses distortion caused by chip separation.



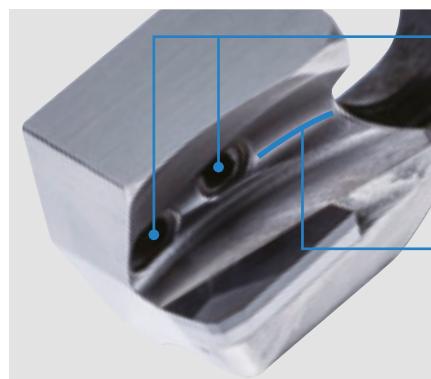
Double-edge



Corner R



Achieves stable machining



Double coolant holes

Effective cooling of cutting edge and workpiece to achieve superior surface finishes.

Suppresses chip biting and insert defects.

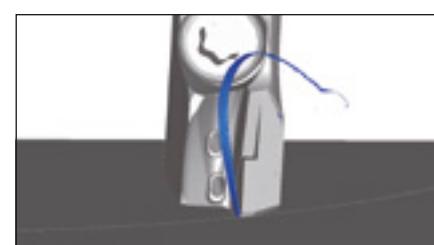
Streamlined chip pocket

Good chip control protects cutter body.

Stable cutter balance delivers high-precision machining and longer tool life.

Chip evacuation simulation

Evacuate chips along the pocket.



Image

Performance

Achieve high-efficiency and high-quality machining with ultra-fine pitch specifications

BT30
Ø80 - 16 inserts
Vf = 9,500 mm/min.



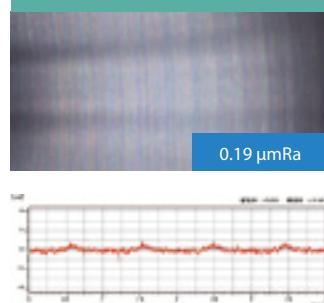
n = 9,900 min-1 (Vc = 2,500 m/min.)
Vf = 9,500 mm/min. (fz = 0.06 mm/t)
ap × ae = 0.3 × 50 mm
ADC12 Wet Ø80
MD90-080RA-T16CSF
LNGX1807PDFR-G (KPD01A)
(Internal evaluation)

Surface finish evaluation

Suppresses burr formation and edge chipping



Excellent surface finish



Machining efficiency comparison (Internal evaluation)

MD90
(16 inserts)

Vf = 9,500 mm/min.

Efficiency
↑

Competitor A
(14 inserts)

Vf = 8,300 mm/min.

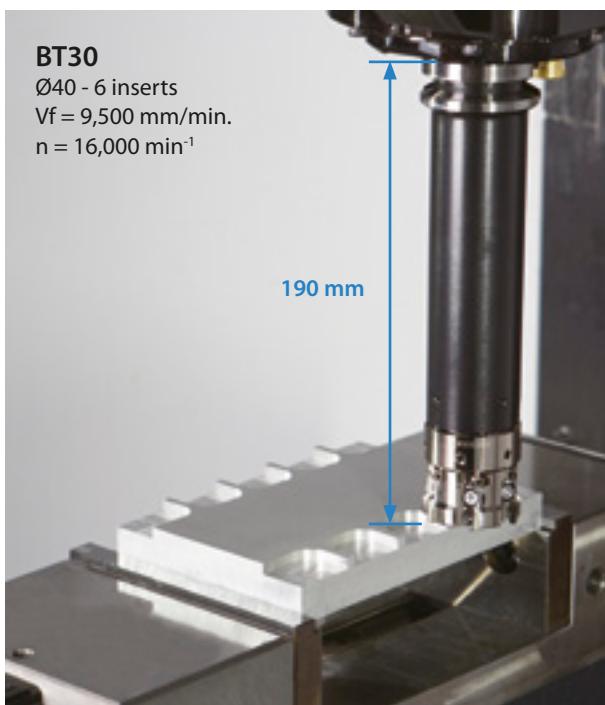
Since the MD90 has a high number of cutting edges, table feed (Vf) can be improved.
Efficiency can be improved while maintaining the same machining quality as competitor.

Performance

Achieves stable machining even with a long overhang

BT30
Ø40 - 6 inserts
Vf = 9,500 mm/min.
n = 16,000 min⁻¹

190 mm

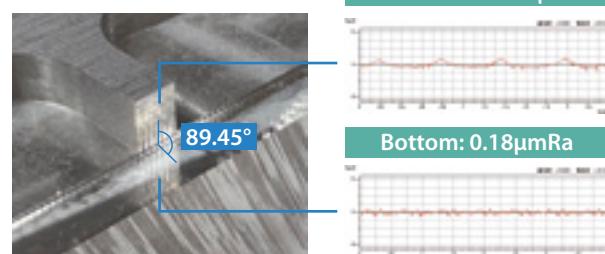


n = 16,000 min-1 (Vc = 2,000 m/min.)
Vf = 9,500 mm/min. (fz = 0.1 mm/t)
ap × ae = 5 × 5 mm ADC12 Wet Ø40 (6 inserts)
MD90-040RS-T6CMSF
LNGX180704PDFR-RR (KPD01A)
(Internal evaluation)



Surface finish evaluation

Wall surface: 0.32 μmRa



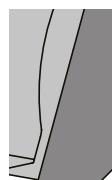
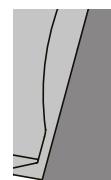
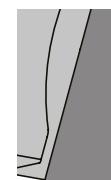
Custom designs

For various machining applications

We can make your custom design needs a reality across a variety of applications.

Please contact our sales representatives for details.

Examples

Cutting diameter	Ø20 ~ Ø350
No. of inserts	Depends on cutting diameter
Cutting edge shape	<p>Corner chamfer</p>  <p>Corner R</p>  <p>Sharp corner</p> 



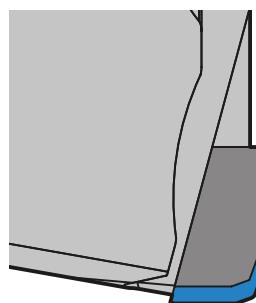
Regrinding

Standard amount of regrinding

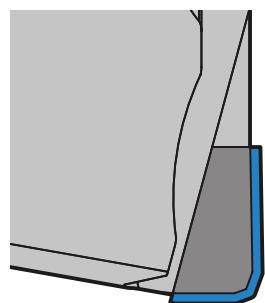
Front face only : 0.1 mm (up to 5 times).
 Entire circumference : 0.1 mm (up to 3 times).

The above is for reference only.
 Please contact our sales representatives for details.

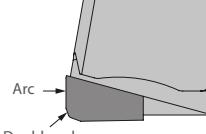
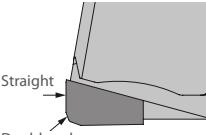
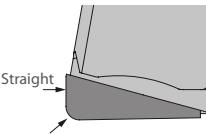
Front face only



Entire circumference

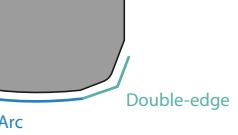
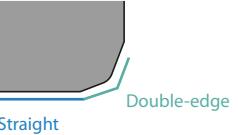
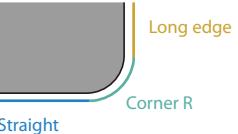


Insert

	Shape	Description	Dimension (mm)			PCD
			L	RE	LE (APMX)	
Standard	 Double-edge General purpose	LNGX1807PDFR-G			4	●
	 Straight Double-edge Low cutting force	LNGX1807PDFR-L	-		4	●
Long edge	 Straight Corner R(RE)	LNGX180704PDFR-RR	18.1	0.4	8	●
		LNGX180708PDFR-RR		0.8		●

The dimension indicated for LE (APMX) is brand new. Please note that it may change after regrinding.

● : Available

Type	Shape	Features and applications
G	 Arc Double-edge	1 st recommendation. Suppresses burrs and ensures high-quality surface finish. Achieves longer tool life and stable machining.
L	 Straight Double-edge	Low cutting force with straight wiper edge. Provides suitable results even with lower rigidity workpieces or clamping power.
RR	 Straight Corner R Long edge	Corner radius (R). Suitable for machining with larger D.O.C and heavy loads.

Polycrystalline diamond Average particle size: 1 μ m

KPD01A Achieves both wear resistance and chipping resistance required for machining with ultra-fine pitch tools.
Stable, high-efficiency machining is possible.

*Please refer to page 6 about APMX.

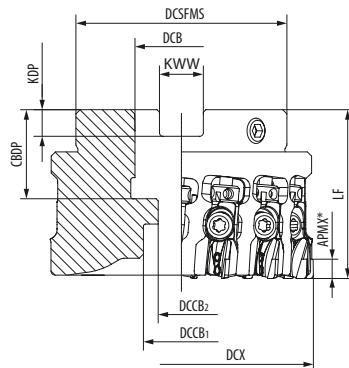


Fig.1

Toolholder dimensions

Metric Bore Diameter	Description	Availability	No. of inserts	Dimension (mm)								Rake angle	Coolant hole	Shape	Weight (kg)	Max. revolution (min ⁻¹)	Arbor bolt (Attachment)	
				DCX	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP							
MD90-	040RS-T6CMSF	●	6	40	38.5	16	13.5	9	40	19	5.6	8.4	+5°	Yes	Fig.1	0.26	HH8X25H	
	050RS-T10CMSF	●	10	50	48.5	22	18	11		21	6.3	10.4				0.37	25,000	
	063RS-T14CMSF	●	14	63	50					0.62	HH10X30H							

Maximum number of revolutions

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece.

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Available

Recommended cutting conditions

Workpiece	Property	Cutting speed Vc (m/min)	Feed fz (mm/t)	Recommended grade
Aluminum alloy	Si ratio 12.5% or below	1,000 - 2,000 - 3,000	0.05 - 0.10 - 0.20	KPD01A
	Si ratio 12.5% or above	400 - 600 - 800	0.05 - 0.10 - 0.20	

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

*Please refer to page 6 about APMX.

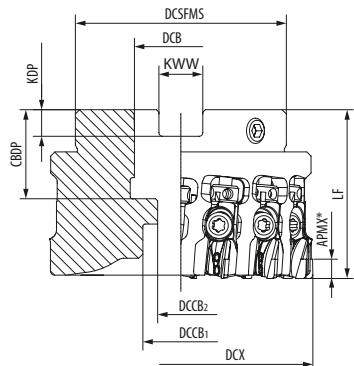


Fig.1

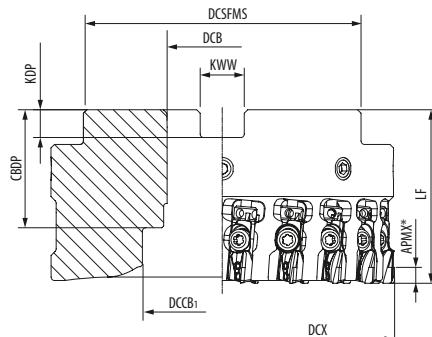


Fig.2

Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)								Rake angle	Coolant hole	Shape	Weight (kg)	Max. Revolution (min ⁻¹)	Arbor bolt (Attachment)		
			DCX	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP								
MD90-	●	16	80	60	80	27	20	13	50	24	7	12.4	Yes	Fig. 1	0.6	20,000	HH12X35H	
	●	20	100							30	8	14.4			0.96	18,000		
	●		32	45		-	24	7		12.4	Fig. 2	0.88		HF16X40HA				
	●	24	125			27	20	13	55	33	9	16.4		Fig. 1	1.48	16,000	HH12X35H	
	●					40	55	-		24	7	12.4		Fig. 2	1.31		HF20X53HA	

Custom sizes of Ø125 and above are also available (~Ø350).

● : Available

Maximum number of revolutions

Set the number of revolutions per minute within the recommended cutting speed specified by the workpiece.

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts

Clamp screw	Wrench	Adjust screw	Adjust wrench
BH4X8TR	TTW-15	AJ-3110	LW-2
Torque for insert clamp 3.5 N.m		-	-

How to install inserts

1 Mount an insert



2 Partially tighten



3 Adjust insert run-out



4 Fully tighten



Torque: 1.0 N.m

Insert run-out 5 μ m or less

Torque: 3.5 N.m

1 Mount inserts into all pockets

2 Partially tighten the clamp screw (Recommended torque 1.0 N.m)

3 Turn the screw with the wrench to adjust and make sure that all screw heights are within 5 μ m of each other (Recommended)

4 Fully tighten the clamp screw with tightening torque 3.5 N.m

Precautions

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 parts may scatter due to the centrifugal force and cutting load.

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

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.

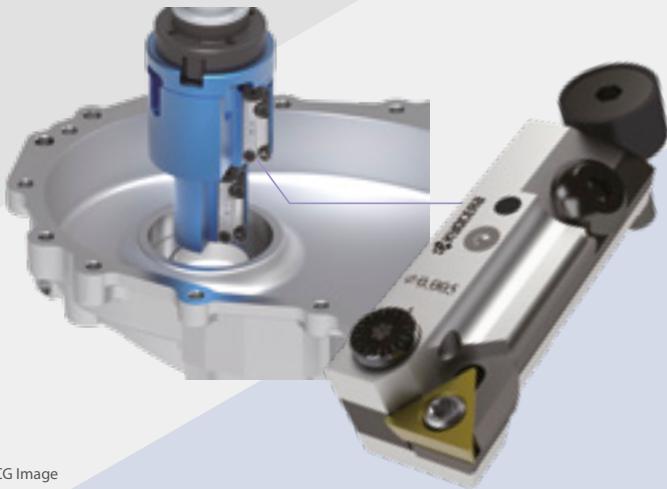
Recommended cutting conditions at max. revolution.

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

This could lead to improper dynamic balance.



Kyocera solutions for EV parts machining



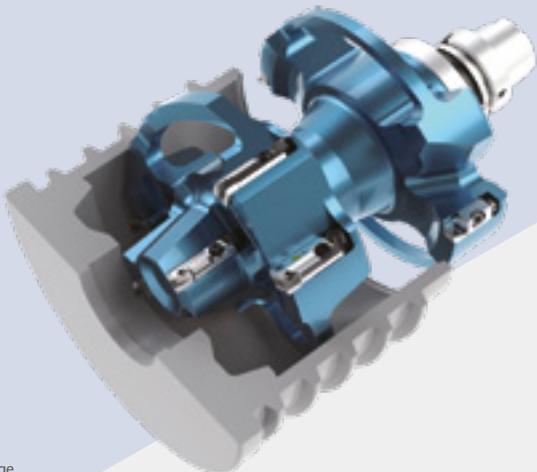
CG Image

High-rigidity fine-tuning unit

K-Bore

New adjustable cartridge design.

- Simple, high-precision, fine-tuning system
- Smooth operation
- Rectangular cartridge for higher rigidity.



CG Image

High efficiency finishing bore cutter

Machining motor cases and motor housings with high precision and efficiency

- Multi-flute, high-efficiency design
- Weight reduction through body design optimisation
- Flutes are optimized for chip flow.

WE KNOW IT'S ALL ABOUT UNDERSTANDING REAL LIFE TO
ENGINEER THE RIGHT SOLUTION, THAT...

**KEEPS YOU
AHEAD**

