KYOCERA

MD90

Super Fine Pitch Cutter for Aluminum Machining

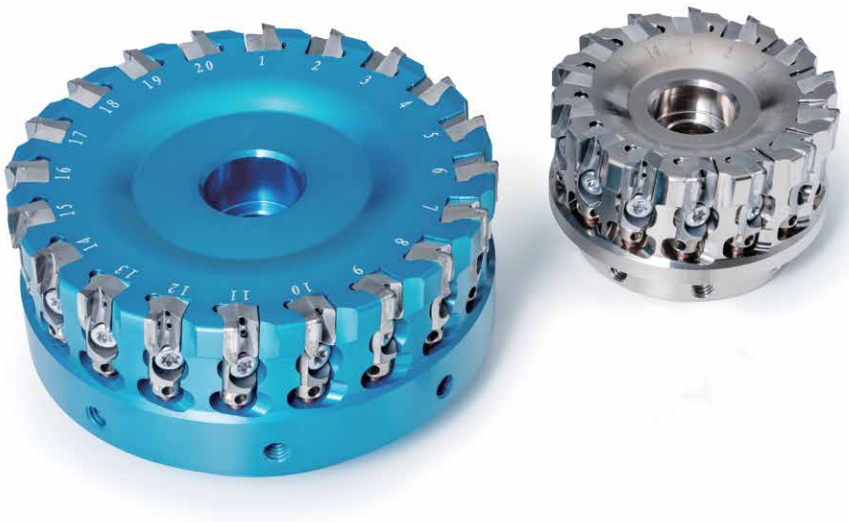
Premium Quality, High-Speed Aluminum Machining

Improved machining efficiency with fine pitch cutter

Excellent machining quality with unique PCD inserts

Lightweight design compatible with BT30

Custom-designed options available



Super Fine Pitch Cutter for Aluminum Machining

MD90

Improved machining efficiency of aluminum parts with super fine pitch specifications

Unique design provides high quality and high precision results with long tool life

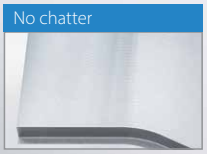
Premium Quality Finish

Capable of 0.8 µmRa finish or less

Stable machining

Minimized burr

No chatter



Vc = 8,200 sfm (n = 8,000 rpm), D.O.C. x ae = 0.008 x 2.953", fz = 0.003 ipt (Vf = 500 ipm) Wet ADC12 BT50 ø100mm (20 flute)
(Internal Evaluation)

Engineered to perfection

A new generation of super fine pitch cutters combine multiple aspects of Kyocera's leading milling technology

Machine aluminum with higher speeds and higher quality with PCD inserts

High Efficiency Machining

Capable of Vf ≥ 945 ipm

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 Flute (Custom Design)**	**Vf = 1,055 ipm**	Efficiency 1.2x
Competitor A 14 Flute	**Vf = 825 ipm**	

Vc = 8,200 sfm (n = 10,000 rpm), D.O.C x ae = 0.008 x 2.087", fz = 0.006 ipt Wet ADC12 BT30 ø80mm

Lightweight Body

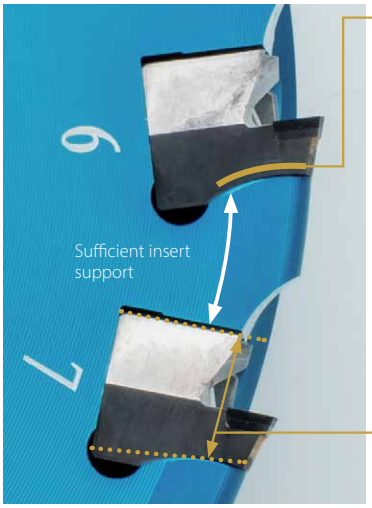
Compatible with BT30

Offering lightweight aluminum body sizes from ø80mm

Largest cutter diameter of ø125mm weighs less than 1.5 kg

1 Unique design provides efficiency and high quality machining results

High Efficiency Cutter design engineered with ultra-fine pitch specifications

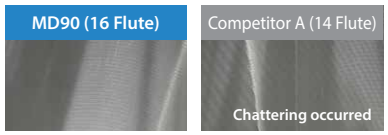


Curved Contact Surface

Maximized pitch maintains multiple inserts and rigidity

Reduces chattering by dispersing stress

Chatter Resistance Comparison
(Internal Evaluation)



Vc = 9,840 sfm, D.O.C. x ae = 0.008" x 2.756"
fz = 0.003 ipt Wet ADC12 ø80mm (Prototype)

Scatter Prevention

Firm insert hold

Ultra-Fine Pitch with Lightweight Design

Largest cutter diameter of ø125mm weighs less than 1.5 kg

Compatible with BT30

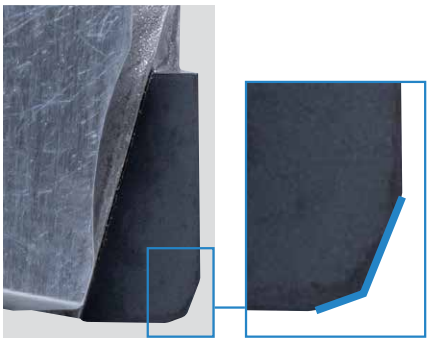
Cutting Dia.	No. of Inserts	Weight (kg)	Body
ø2.000"	10	0.37	Steel
ø2.500"	14	0.62	
ø40mm	6	0.26	
ø50mm	10	0.37	
ø63mm	14	0.62	
ø80mm	16	0.6	Aluminum
ø100mm	20	0.97	
ø125mm	24	1.49	

High Quality High machined surface quality, high precision and long tool life

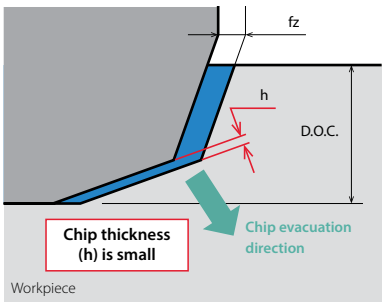
Suppresses Burr Formation

Double-Edge (Standard Type)

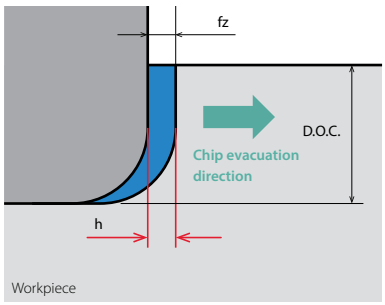
Controlls the chip evacuation direction and suppresses distortion caused by chip separation



Double-Edge



Corner R



Stable Machining

Double Coolant Holes

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

Suppresses chip biting and surface defects

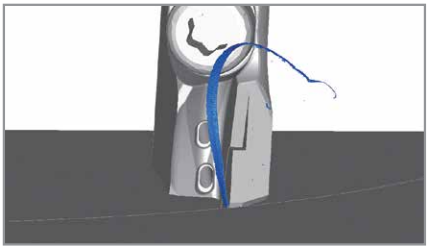
Streamlined Chip Pocket

Good chip control protects cutter body

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

Chip Evacuation Simulation

Evacuates chips along the pocket



Performance

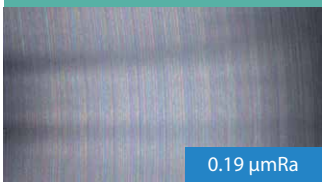
High-efficiency and high-quality machining performance with ultra-fine pitch specifications

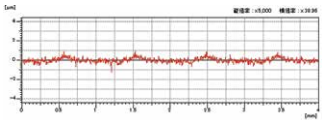
n = 9,900 rpm (Vc = 8,200 sfm)
Vf = 375 ipm (fz = 0.0024 ipt)
D.O.C. x ae = 0.012" x 1.969"
ADC12 Wet ø50mm
MD90-080RA-T16CSF
LNGX1807PDFR-G (KPD01A)
(Internal Evaluation)

Surface Finish Evaluation

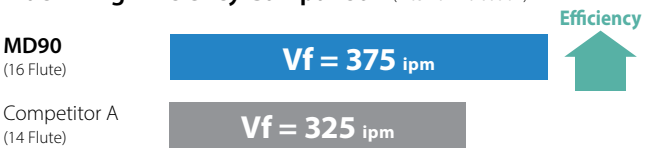
Suppresses Burr Formation and Edge Chipping

Excellent Surface Finish





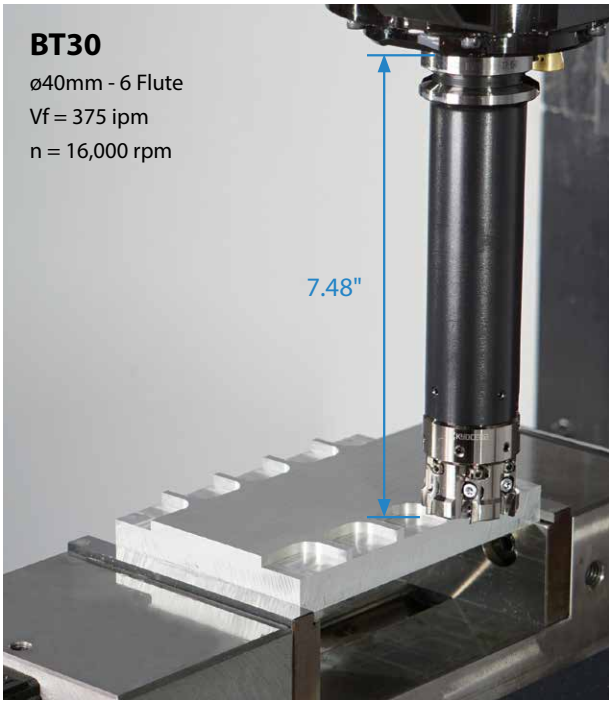
Machining Efficiency Comparison (Internal Evaluation)



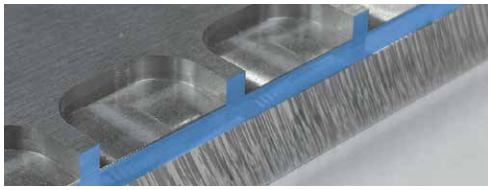
Since the MD90 has a high number of cutting edges, table feed (Vf) can be improved.
Efficiency can be improved while maintaining the same machining quality as competitor.

Stability

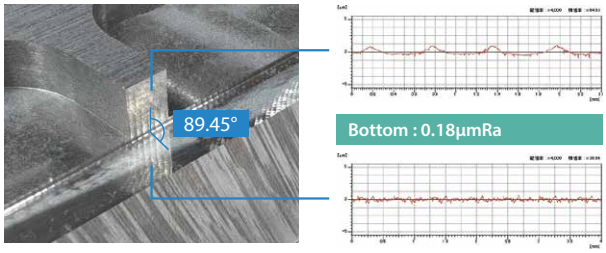
Stable machining even with a long overhang setup



n = 16,000 rpm (Vc = 6,560 sfm)
Vf = 375 ipm (fz = 0.004 ipt)
D.O.C. x ae = 0.197" x 0.197" ADC12 Wet ø1.575" (6 Flutes)
MD90-040RS-T6CMSF
LNGX180704PDFR-RR (KPD01A)
(Internal Evaluation)



Surface finish evaluation



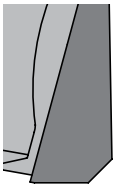
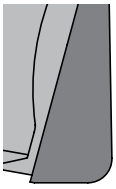
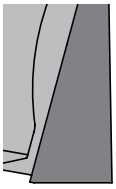
Custom Designs (Made to Order)

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 Dia.	ø20mm ~ ø350mm
No. of Inserts	Depends on cutting diameter
Cutting Edge Shape	Corner chamfer  Corner R  Sharp corner 

Regrinding

Standard amount of regrinding

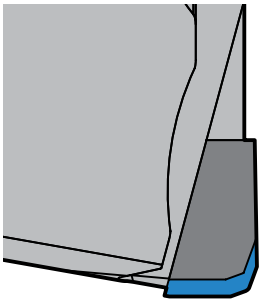
Front face only : 0.004" (up to 5 times)

Entire circumference : 0.004" (up to 3 times)

The above is for reference only.

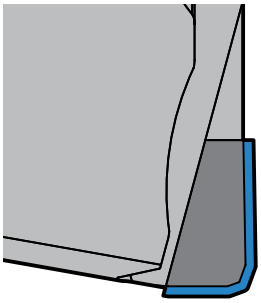
Please contact our sales representatives for details.

Front Face Only



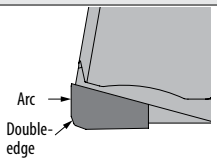
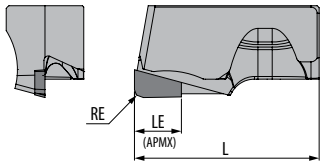
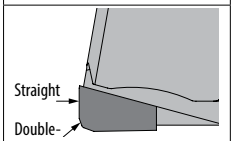
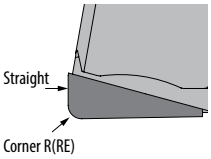
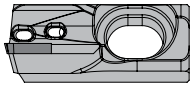
Regrinding Section

Entire Circumference



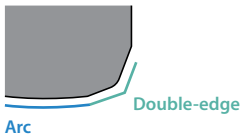
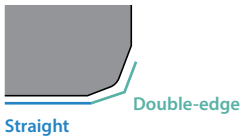
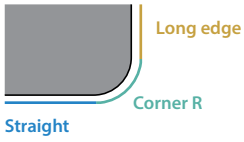
Regrinding Section

Inserts

Shape			Part Number	Dimensions (mm)			PCD
				L	RE	LE (APMX)	KPD01A
 Standard	 Arc, Double-edge — General Purpose	 RE, LE (APMX), L	LNGX1807PDFR-G	18.1	-	4	●
	 Straight, Double-edge — Low Cutting Force		LNGX1807PDFR-L				●
 Long Edge	 Straight, Corner R(RE)		LNGX180704PDFR-RR		0.4	8	●
			LNGX180708PDFR-RR		0.8		●

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

● : Standard Item

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

Polycrystalline Diamond | Average Particle Size : 1 µm

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.

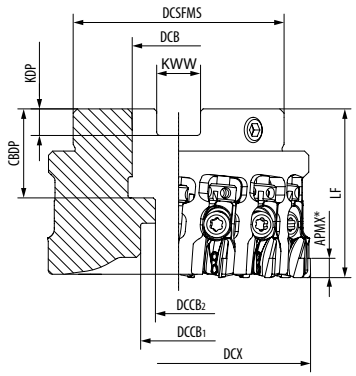


Fig.1

Toolholder Dimensions

Unit	Bore Dia.	Part Number	Std. Item	No. of Inserts	Dimensions (mm)									Rake Angle	Coolant Hole	Fig.	Weight (kg)	Max. RPM	Arbor Bolt (Attachment)
					DCX	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	A.R.					
Inch	Inch Bore Dia.	MD90- **2000RS-T10CSF**	●	10	2.000	1.910	0.750	0.669	0.433	1.575	0.750	0.187	0.313	+5°	Yes	1	0.37	25,000	HH3/8-1.25H
		2500RS-T14CSF	●	14	2.500	1.750		0.750									0.62		
mm	Metric Bore Dia.	MD90- **040RS-T6CMSF**	●	6	40	38.5	16	13.5	9	40	19	5.6	8.4	+5°	Yes	1	0.26	25,000	HH8X25H
		050RS-T10CMSF	●	10	50	48.5	22	18	11		21	6.3	10.4				0.37		HH10X30H
		063RS-T14CMSF	●	14	63	50											0.62		

Maximum number of revolutions

● : Standard Item

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 chips and parts to scatter even under no load.

Recommended Cutting Conditions

Workpiece	Property	Cutting Speed Vc (sfm)	Feed fz (ipt)	Recommended Grade
Aluminum Alloy	Si Ratio ≤ 12.5%	3280 - **6,560** - 9,840	0.002 - **0.004** - 0.008	KPD01A
	Si Ratio ≥ 12.5%	1,310 - **1,970** - 2,620	0.002 - **0.004** - 0.008	

Numbers in **Bold** are recommended starting 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

MD90 (Aluminum Body)

*Please refer to page 6 about APMX.

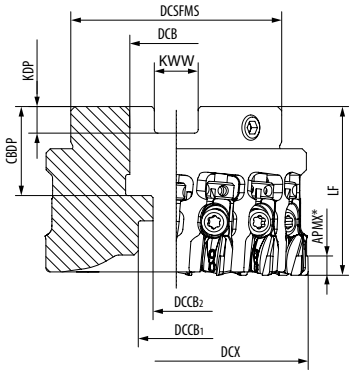


Fig.1

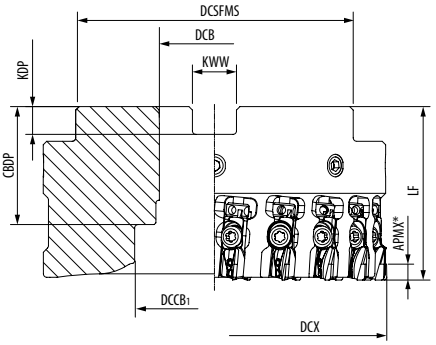


Fig.2

Toolholder Dimensions

Unit	Bore Dia.	Part Number	Std. Item	No. of Inserts	Dimensions (mm)									Rake Angle	Coolant Hole	Fig.	Weight (kg)	Max. RPM	Arbor Bolt (Attachment)
					DCX	DCSFMS	DCB	$DCCB_1$	$DCCB_2$	LF	CBDP	KDP	KWW	A.R.					
mm	Inch Bore Dia.	MD90- 080RA-T16CSF	●	16	80	60	1.000"	20	13	50	1.063"	0.236"	0.375"	+5°	Yes	1	0.6	20,000	HH12X35H
		100RA-T20C254SF	●	20	100	80											0.97	18,000	
		100RA-T20CSF	●				1.250"	45	-		1.339"	0.315"	0.500"			2	0.89		HF16X40HA
		125RA-T24C254SF	●	24	125		1.000"	20	13	55	1.063"	0.236"	0.375"			1	1.49	16,000	HH12X35H
		125RA-T24CSF	●				1.500"	55	-		1.496"	0.394"	0.625"			2	1.34		HF20X53HA
	Metric Bore Dia.	MD90- 080RA-T16CMSF	●	16	80	60	27	20	13	50	24	7	12.4	+5°	Yes	1	0.6	20,000	HH12X35H
		100RA-T20C27MSF	●	20	100	80											0.96	18,000	
		100RA-T20CMSF	●				32	45	-		30	8	14.4			2	0.88		HF16X40HA
		125RA-T24C27MSF	●	24	125		27	20	13	55	24	7	12.4			1	1.48	16,000	HH12X35H
		125RA-T24CMSF	●				40	55	-		33	9	16.4			2	1.31		HF20X53HA

Custom sizes of ø125mm and above are also available (~ø350mm) (Made to order).

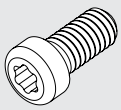
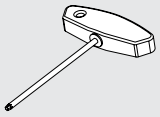
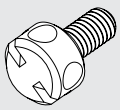
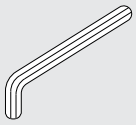
● : Standard Item

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 chips and parts to scatter even under no load.

Spare Parts

Clamp Screw	Wrench	Adjustment Screw	Adjustment 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

Torque : 1.0 N·m

3 Adjust insert runout

Insert Runout 5 µm or less

4 Fully tighten

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 µm 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

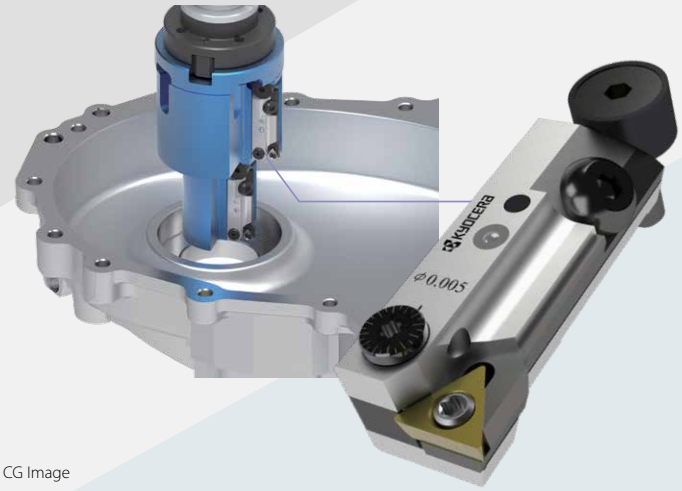
Balance adjustment on the cutter is completed before shipping

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's Solutions for EV Parts Machining



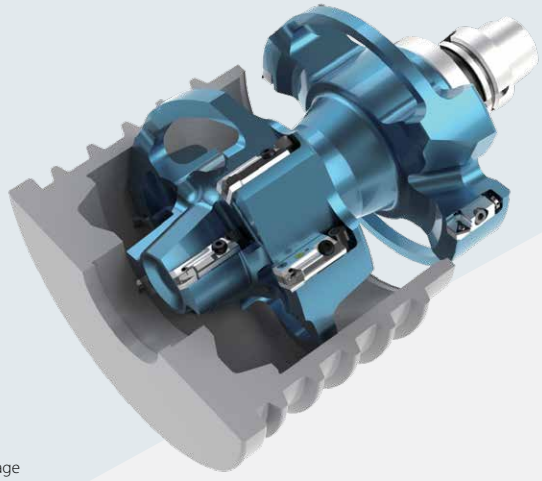
CG Image

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 optimization
- Flutes are optimized for chip flow

KYOCERA Precision Tools
238 Marc Drive
Cuyahoga Falls, OH 44223
Customer Service | 800.823.7284 - Option 1
Technical Support | 800.823.7284 - Option 2

Official Website | www.kyoceraprecisiontools.com
Distributor Website | portal.kyoceraprecisiontools.com
Email | ctsales@kyoceraptl.com