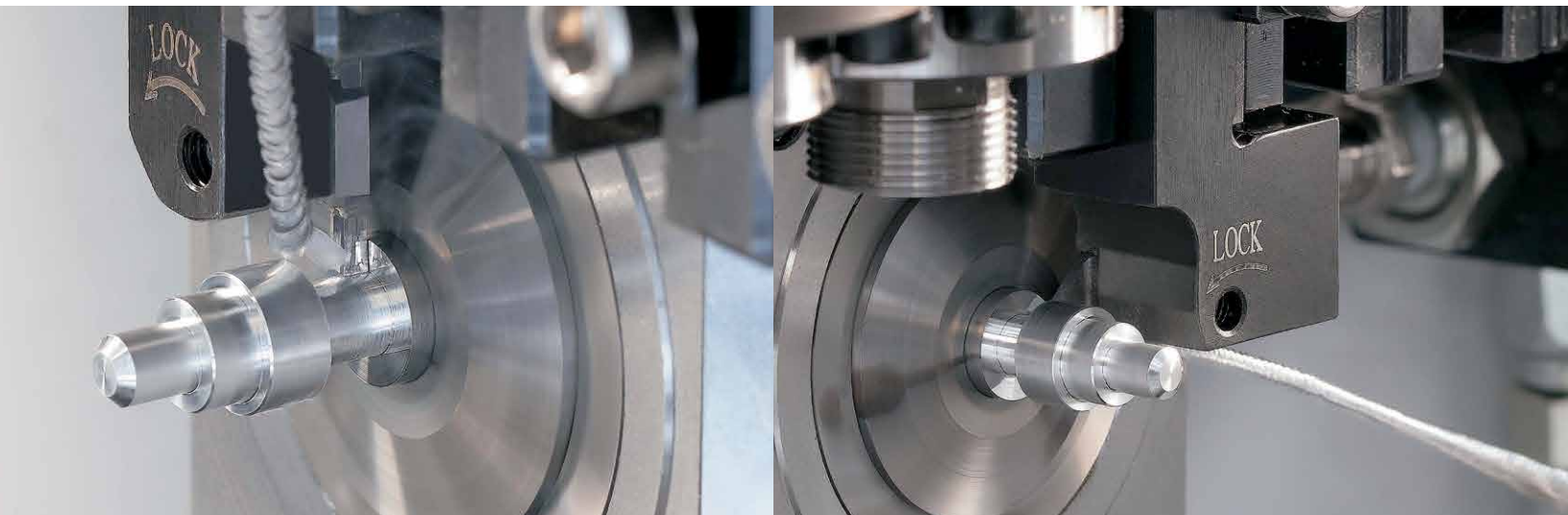




Aluminum Alloy Machining Solutions

for Small Part Applications

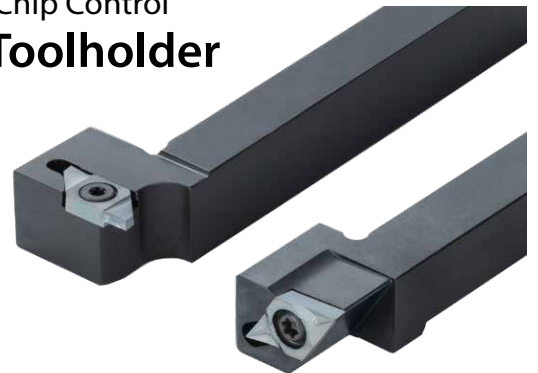


Improved Productivity in Aluminum Small Part Machining

Molded PCD
APD Chipbreaker



Improved Chip Control
Y-axis Toolholder



Molded PCD
AGT Chipbreaker
for KTKF holders



Aluminum Alloy Machining

Solutions for Small Part Applications

PCD Chipbreaker for Finishing

Multi-funtional PCD Chipbreaker for Grooving and Traversing with Excellent Chip Control

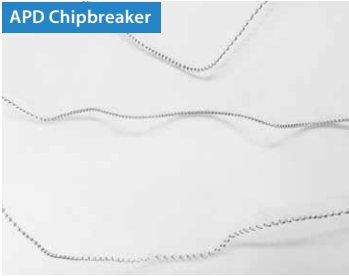
Y-axis Toolholders for High Quality Aluminum Machining Results

Superior Chip Control Improves Machining Quality and Productivity

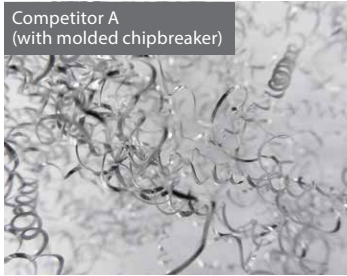
Molded PCD APD Chipbreaker

APD Chipbreaker shows good chip control from small to large D.O.C.

APD Chipbreaker



Competitor A
(with molded chipbreaker)



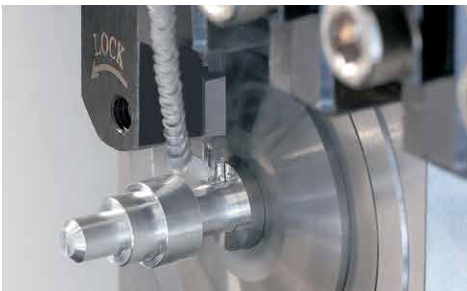
Improved
Chip Control

Excellent
Surface Finish

High Performance Across a Variety of Machining Applications

Molded PCD AGT Chipbreaker for KTKF holders

Unique chipbreaker design provides excellent chip control



Improved Chip
Control

Multi-funtional
PCD Chipbreaker
for Grooving and
Traversing

New Toolholders Maintain Stable Machining

Improved Chip Control Y-axis Toolholder

Excellent Chip Evacuation with Y-axis Tuning Prevents Chip Entanglement

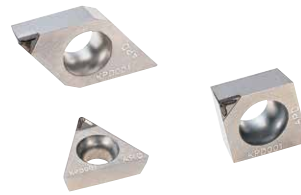


Controls Chip
Evacuation

APD Chipbreaker

Molded PCD Chipbreaker

Superior Chip Control when Machining Aluminum



Improved Chip Control

Beautiful Surface Finish

1 Good Chip Control Improves Productivity

Challenges

- ✓ Chip clogging causes machining downtime
- ✓ Low quality, cloudy finish results



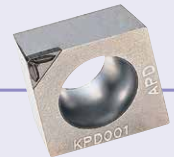
Long chips can cause these problems



Chip clogging reduces surface finish quality

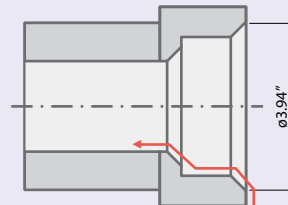
SOLUTION

Newly developed molded chipbreaker design
Improved chip control increases productivity

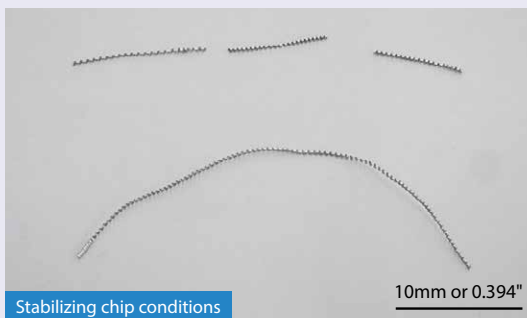


Head ADC12

Cutting Conditions : $n = 2700 \text{ RPM}$, $V_c = \sim 2,790 \text{ sfm}$, $D.O.C = 0.020"$, $f = 0.004 \text{ ipr}$
CCMT09T304APD KPD001



APD Chipbreaker



Stabilizing chip conditions

Chips are evacuated smoothly
No chip clogging and long chips

Competitor B (without chipbreaker)



Chip clogging

2

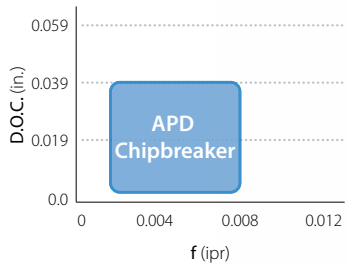
Newly Designed Molded Chipbreaker for Precise Chip Control

Chipbreaker Features

- Dot for large D.O.C.**
Controls chips with step
- Dot for medium D.O.C.**
Controls chips with side of dot
- Land for small D.O.C.**
Good Control of thin chips
- Front edge dots**
Stable chip control with a dot that protrudes to the corner



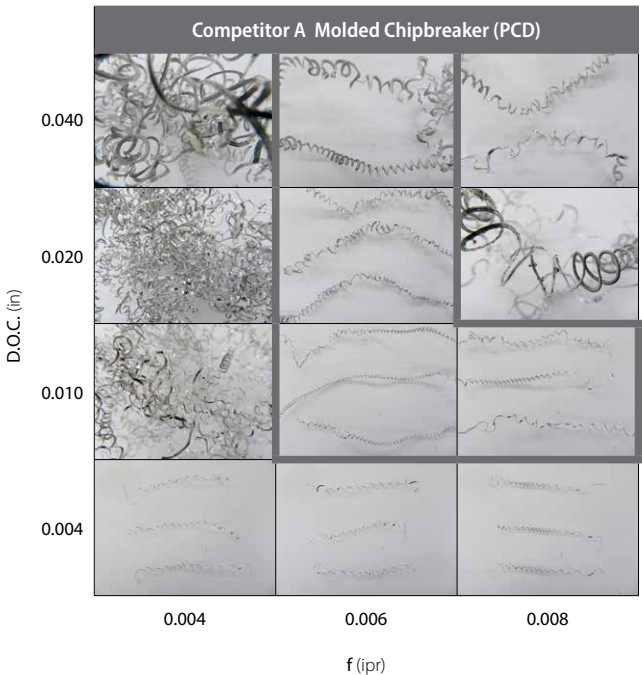
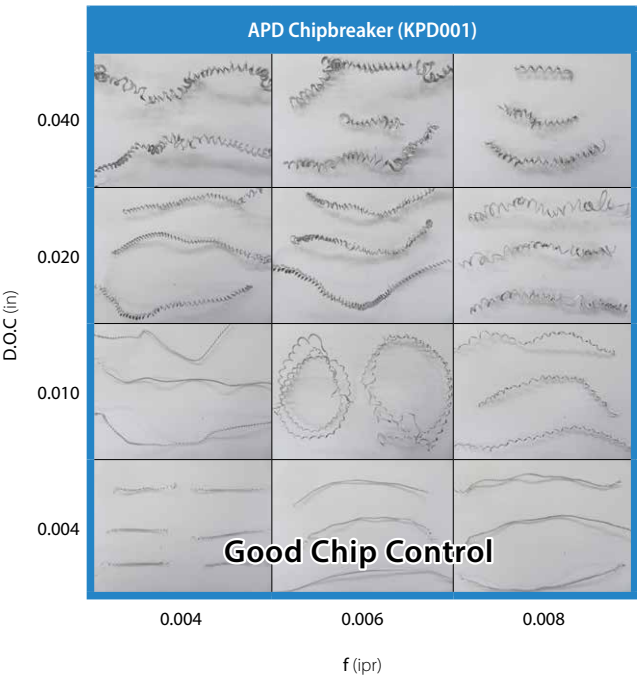
Chipbreaker Map



Chip Control Comparison (Internal evaluation)

APD chipbreaker showed stable machining up to 0.040" D.O.C. under various cutting conditions.

Excellent chip control from small D.O.C. to large D.O.C.



Cutting Conditions : Vc = 1,640 sfm, D.O.C. = 0.004" - 0.040", f = 0.004 - 0.008 IPR, Continuous external turning , Wet, Workpiece : 5052

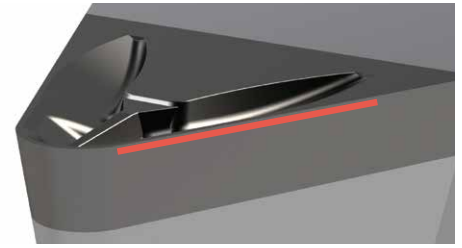
3 Excellent Surface Finish

APD Chipbreaker with sharp edge showed better surface finish compared to competitor

APD Chipbreaker (Indicated by red line on the right pic)

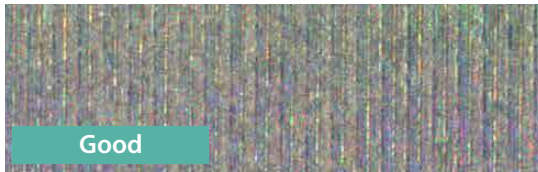


Competitor C

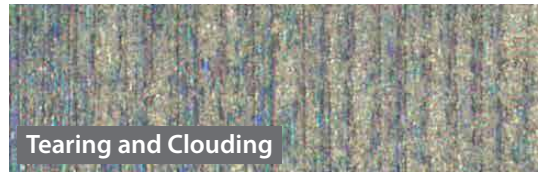


Surface Finish Comparison (Internal evaluation)

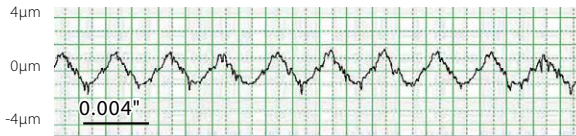
APD Chipbreaker (KPD001)



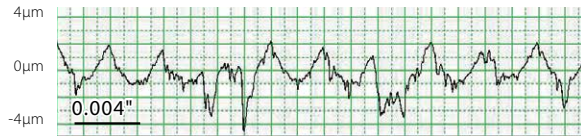
Competitor D Molded Chipbreaker (PCD)



0.64µmRa



0.84µmRa



Cutting Conditions : Vc = 1460 , D.O.C. = 0.010" , f = 0.004 ipr, Continuous external turning , Wet, Workpiece : ADC12

APD Inserts

Shape	Part Number	Dimensions (in)					No. of Cutting Edges	KPD001
		IC	S	D	RE	LE		
	CCMT 32505APD	3/8	5/32	0.173	0.008	0.106	1	●
	3251APD				1/64	0.106		●
	3252APD				1/32	0.106		●
	DCMT 32505APD	3/8	5/32	0.173	0.008	0.106	1	●
	3251APD				1/64	0.106		●
	3252APD				1/32	0.106		●
	TPMT 2205APD	1/4	1/8	0.130	0.008	0.102	1	●
	221APD				1/64	0.098		●
	222APD				1/32	0.098		●

● : Standard Stock

Recommended Cutting Conditions

Workpiece	PCD KPD001	Notes
Aluminum Alloy	Vc : sfm	980 ~ 4,920
	D.O.C. (in)	~ 0.039
	fz (ipt)	0.002 ~ 0.008
Brass	Vc : sfm	980 ~ 4,920
	D.O.C. (in)	~ 0.039
	fz (ipt)	0.002 ~ 0.008

AGT Chipbreaker

Molded PCD Chipbreaker for KTKF Holders

Improved Chip Control for Various Aluminum Alloy Machining Applications

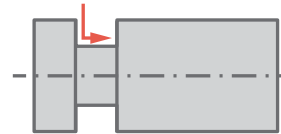
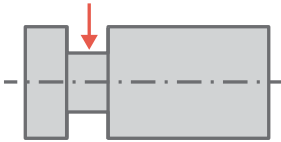


Improved Chip Control

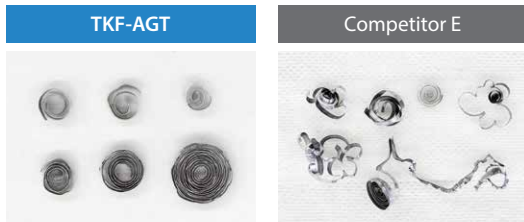
Multi-functional PCD Chipbreaker for Grooving and Traversing

1 Stable Machining for a Wide Range of Applications

Chip control and surface finish comparison with grooving and traversing

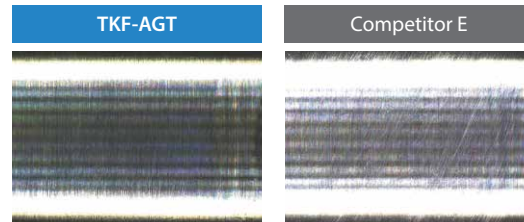


Chip Control Comparison (Grooving)



Cutting Conditions : Vc = 820 sfm, D.O.C. = 0.079", Wet Workpiece : 6061

Surface Finish Comparison (Traversing)



Cutting Conditions : Vc = 820 sfm, D.O.C. = 0.020", Wet Workpiece : 6061

AGT Chipbreaker showed better chip control when grooving compared to competitor. It also showed superior surface finish with less scratching when traversing.

2 Unique Chipbreaker Provides Excellent Chip Control



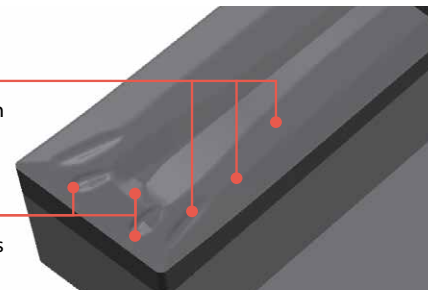
Dots

Traversing

Reduces chip clogging by adjusting the width of the chipbreaker to the D.O.C.
Dots around cutting edge for small D.O.C.

Grooving

Stable machining with three chipbreaker dots

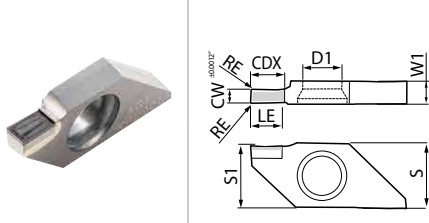


Sloped Cutting Edge

Reduces chattering with low cutting force design
Good surface finish with excellent chip evacuation



TKF-AGT Inserts

Shape	Part Number	Dimensions (in)									Angle	No. of Cutting Edges	KPD001
		CW	CDX	RE	W1	S	S1	D1	LE	PSIRR			
	TKF12R 200-AGT	0.079	0.189	0.004 ^{+0/-0.002}	0.118	0.343	0.327	0.197	0.165	0°	1	●	
	250-AGT	0.098	0.189	0.004 ^{+0/-0.002}	0.118	0.343	0.327	0.197	0.165	0°	1	●	

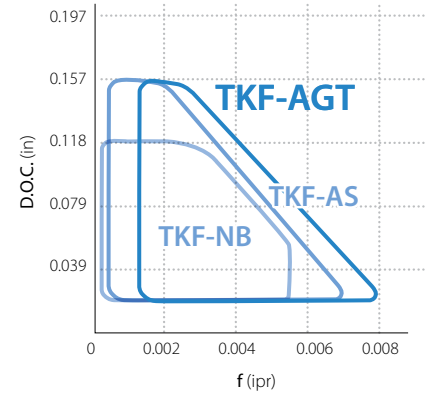
● : Standard Stock

Recommended Cutting Conditions

Workpiece		PCD	
		KPD001	
		Grooving	Traversing
Aluminum Alloy	Vc: sfm	660 ~ 1,640	
	fz: (ipt)	0.001 ~ 0.006	0.001 ~ 0.008
Brass	Vc: sfm	330 ~ 1,150	
	fz: (ipt)	0.001 ~ 0.006	0.001 ~ 0.008

- PCD inserts are for traversing and grooving applications.
- When using in cut-off machining, maximum cut-off diameter is $\varnothing 0.315"$ ($\varnothing 8mm$). Set the feed rate less than 0.003 ipr.
- Cutting with coolant is recommended.

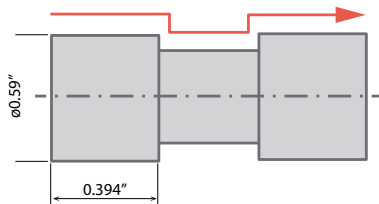
Chipbreaker Map



Case Studies

Spool Valve A6061

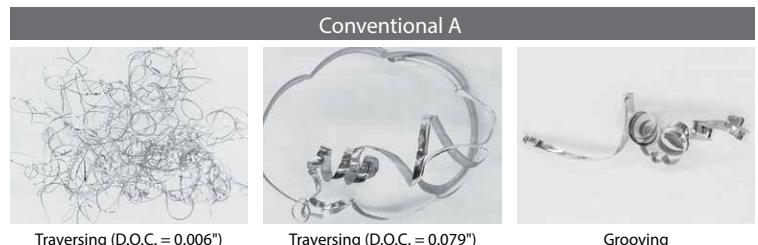
n = 6,500 RPM
 D.O.C. = 0.079" (Grooving), 0.006" / 0.079" (Traversing)
 f = 0.004 ipr, Wet



Chip Control Improved




Good chip control without chip clogging



Chip clogging occurred

Y-axis Toolholders

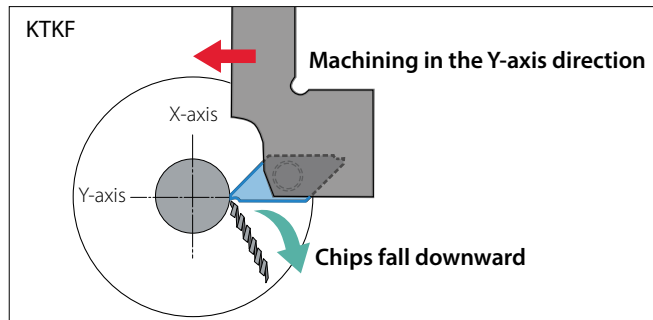
Improved Chip Control

New Toolholder Designs for Better Chip Evacuation in Small Parts Machining

Controls Chip Evacuation



1 Controlled Chip Evacuation for Stable Machining



The Y-axis machining direction allows the chips to fall down and away from the workpiece, improving chip evacuation.

2 KTKF Grooving and Cut-Off System and External Turning Holders

KTKF

Back Turning, Threading and Cut-off



KTKFR1216JX-12-Y : Shank 1216 Type
KTKFR1616JX-12-Y : Shank 1616 Type
Applicable Inserts : TKF12R...

For more details, see Kyocera Y-axis Toolholder brochure.

External Turning

Front turning



SDJCR1212JX-11FF-Y : Shank 1212 Type
SDJCR1616JX-11FF-Y : Shank 1616 Type
Applicable Inserts : DC□□325...



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