KYOCERA

PR1725/ PR1705

PVD Coating for Small Parts Machining

Excellent Surface Finish and Long Tool Life

PR1725/PR1705

Unique PVD Coating MEGACOAT NANO PLUS Provides Longer Tool Life and Excellent Surface Finish

Molded Sharp Edge Chipbreaker for Small Parts Machining

FEATURED INSERTS FOR VIBRATION / OSCILLATION MACHINING

- Features and Benefits
- Recommended Inserts (Materials and Chipbreakers)

PR1725

PVD Coating for Small Parts Machining

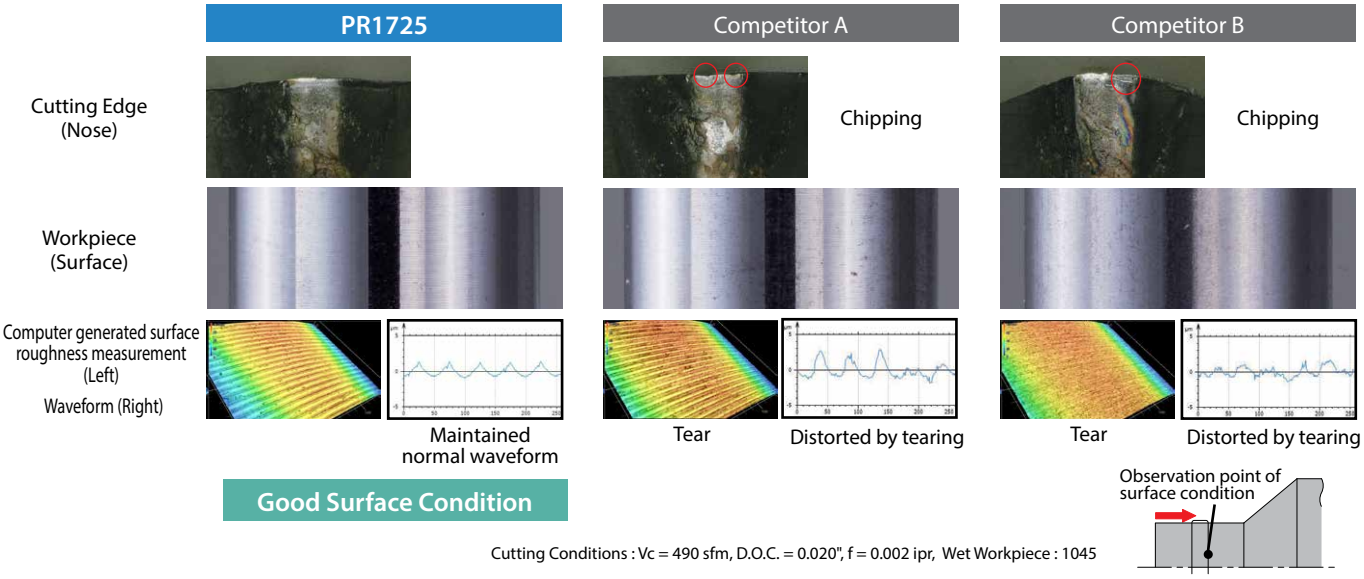
1st Recommendation for Steel Machining
Excellent Surface Finish and Long Tool Life
Great Performance in Small Parts Machining Applications

1 MEGACOAT NANO PLUS Maintains Long Tool Life and Excellent Surface Finish

Long tool life leads to improved cycle time

Excellent surface finish with no tearing lowers quality control costs

Insert cutting edge wear and quality of surface finish comparison (1045) * After 20 min of machining (Internal evaluation)



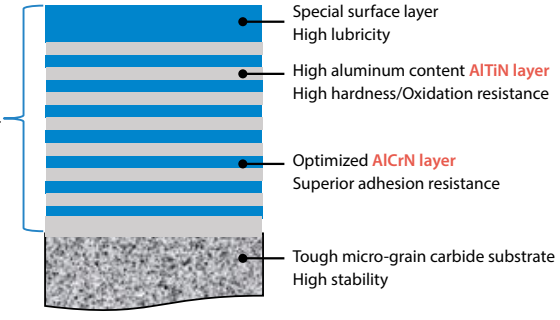
Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.020", f = 0.002 ipr, Wet Workpiece : 1045

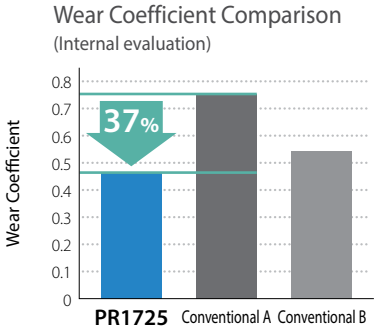
MEGACOAT NANO PLUS

AlTiN/AlCrN Nano laminated film with superior wear resistance and adhesion resistance. Excellent surface finish and long tool life.

REDUCES CRACKING

Reduces abnormal damage such as chipping because of increased lamination layer with a thinner gap than conventional coatings





Superior Wear and Chipping Resistance

High Strength with nano laminated film layer properties
Internal stress optimization reduces chipping

Excellent Surface Finish

Special surface layer with great lubricity reduces adhesion

Applicable to Various Workpiece Materials

Superior high temperature properties and oxidation resistance make for great performance in steel, stainless steel and free-cutting steel

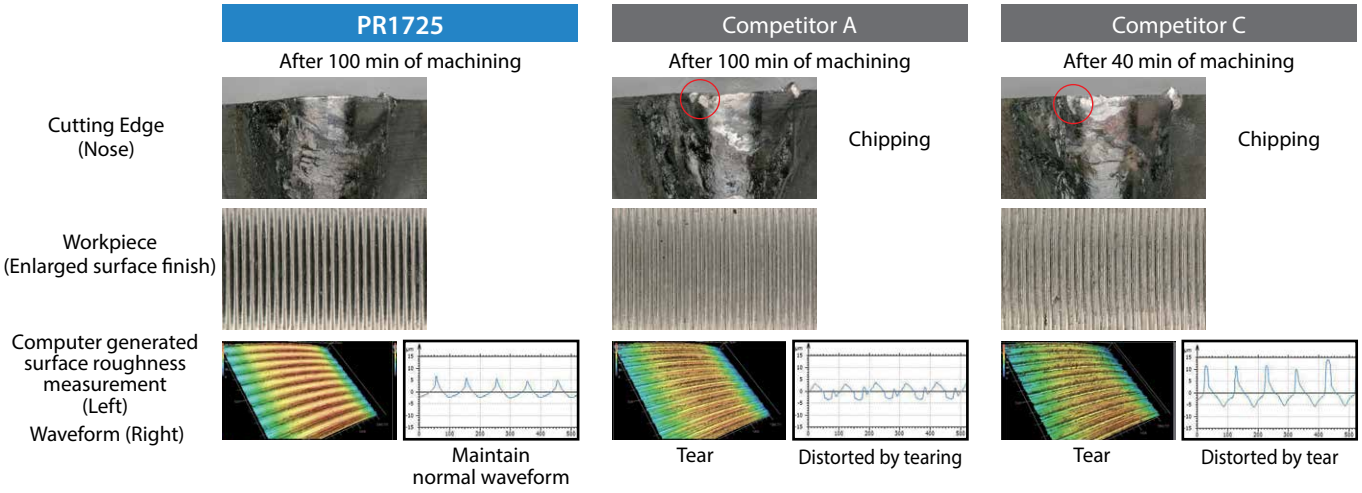
High Machining Stability

Tough micro-grain carbide substrate provides stable machining

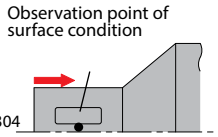
2 One Solution for Various Workpiece Materials

Long tool life for steel, stainless steel, and free-cutting steel

Wear on the cutting edge of insert and quality of the surface finish comparison (Stainless steel: 304) (Internal evaluation)



PR1725 shows less damage on the cutting edge and maintains stable finish results on the workpiece surface

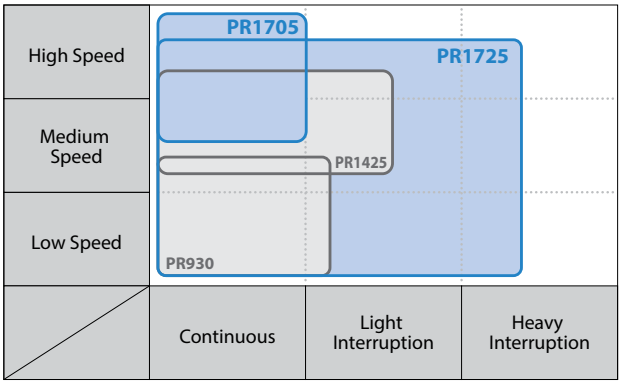


Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.020" , f = 0.004 ipr, Wet Workpiece : 304

3 Applicable to a Wide Range of Machining Applications

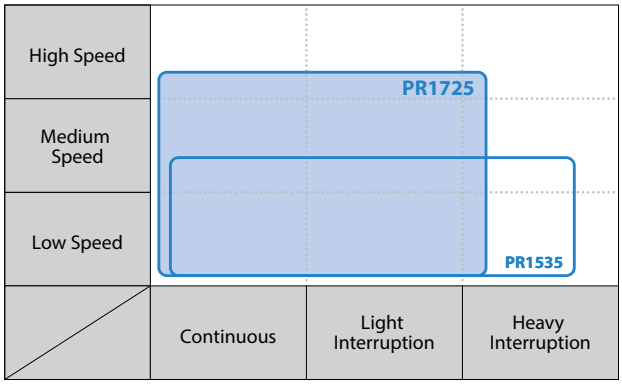
Great performance in both steel and stainless steel from low to high speed machining

Steel



PR1725 : 1st Recommendation for Steel
PR1705 : 1st Recommendation for Free-Cutting Steel

Stainless Steel

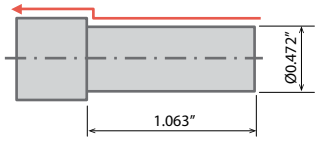


PR1725 : For general purpose high-speed machining
PR1535 : 1st Recommendation for stainless steel machining with long tool life and high-quality surface finish

Case Studies

Shaft 4137

Vc = 360 sfm
D.O.C. = ~0.059"
f = 0.0024 ipr
Wet
DCGT32505MFP-SK PR1725



Tool Life

PR1725 SK Chipbreaker 3,000 pcs/edge — Tool Life x2

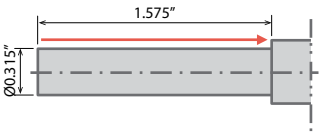
Competitor D (Molded Chipbreaker) 1,500 pcs/edge

PR1725 SK chipbreaker showed 2 times longer tool life when compared to Competitor D

(User Evaluation)

Shaft 4140

Vc = 230 sfm
D.O.C. = 0.039"
f = 0.0020 ipr
Wet
DCGT32505MFP-SK PR1725



Tool Life

PR1725 SK Chipbreaker 250 pcs/edge — Tool Life x1.6

Competitor E (Molded Chipbreaker) 150 pcs/edge

PR1725 SK chipbreaker showed 1.6 times longer tool life when compared to Competitor E

(User Evaluation)

Shaft 1035

Vc = 295 sfm
D.O.C. = 0.012"
f = 0.0024 ipr
Wet
DCGT32505MFP-SK PR1725

Tool Life

PR1725 SK Chipbreaker 300 pcs/edge — Tool Life x1.5

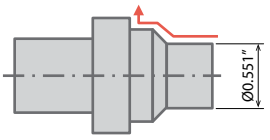
Competitor F (Molded Chipbreaker) 200 pcs/edge

PR1725 SK chipbreaker showed 1.5 times longer tool life when compared to Competitor F

(User Evaluation)

Pin SCM420

Vc = 360 sfm
D.O.C. = 0.008"~ 0.028"
f = 0.0024 ipr
Wet
DCGT32505MFP-GQ PR1725



Tool Life

PR1725 GQ Chipbreaker 200 pcs/edge — Tool Life x1.3

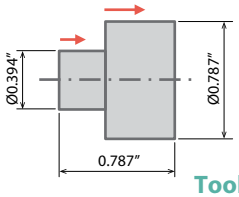
Competitor G (Molded Chipbreaker) 150 pcs/edge

PR1725 GQ chipbreaker showed 1.3 times longer tool life when compared to Competitor G

(User Evaluation)

Shaft 420

Vc = 160 sfm
D.O.C. = 0.0039"
f = 0.0020 ipr
Wet
DCGT32505MFP-GQ PR1725



Tool Life

PR1725 GQ Chipbreaker 600 pcs/edge — Tool Life x2

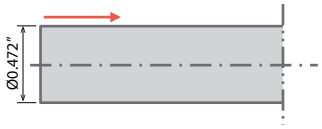
Competitor H (Molded Chipbreaker) 300 pcs/edge

PR1725 GQ chipbreaker showed 2 times longer tool life when compared to Competitor H

(User Evaluation)

Shaft 1137

Vc = 360 sfm
D.O.C. = ~0.079"
f = 0.0020 ipr
Wet
CCET09T304MFR-J PR1725



Tool Life

PR1725 J Chipbreaker 3,000 pcs/edge — Tool Life x3

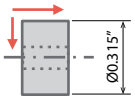
Competitor I (Molded Chipbreaker) 1,000 pcs/edge

PR1725 J chipbreaker showed 3 times longer tool life when compared to Competitor I

(User Evaluation)

Shaft 1045

Vc = 330 sfm
ap = 0.0039"
f = 0.0010 ipr
Wet
DCGT32505MFP-GF PR1725



Tool Life

PR1725 GF Chipbreaker 3,000 pcs/edge — Tool Life x2

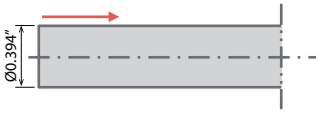
Competitor J (Molded Chipbreaker) 1,500 pcs/edge

PR1725 GF chipbreaker showed 2 times longer tool life when compared to Competitor J

(User Evaluation)

Pin SKS

Vc = 360 sfm
D.O.C. = 0.0079"
f = 0.0020 ipr
Wet
DCGT32505MFP-SK PR1725



PR1725 SK chipbreaker showed good surface finish and accuracy after machining same number of workpieces as the Conventional C

(User Evaluation)

PR1705

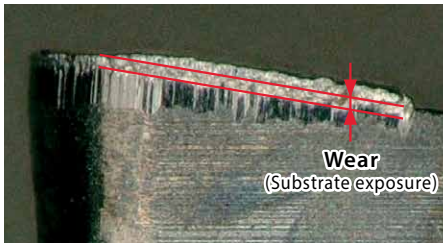
New PVD Coating for Small Parts Machining

High-hardness ultra-fine particle carbide substrates with MEGACOAT NANO PLUS offer excellent wear resistance and high precision machining

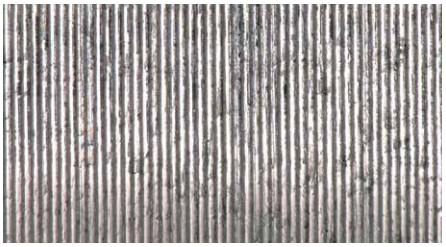
Insert Wear and Surface Finish Comparison (1215) * After 40 min of machining (Internal evaluation)

PR1705

Cutting Edge (Flank Face)

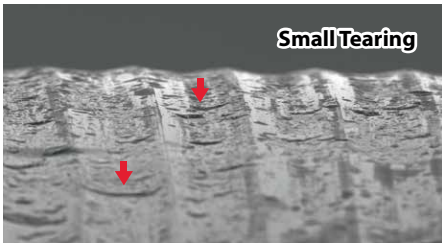


Workpiece *CCD image



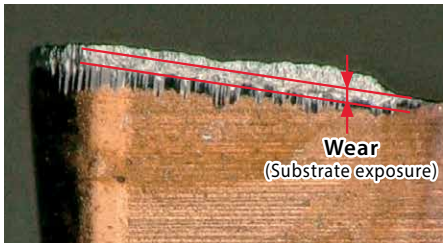
Good surface finish

Tearing on Workpiece (Surface Finish Enlarged)



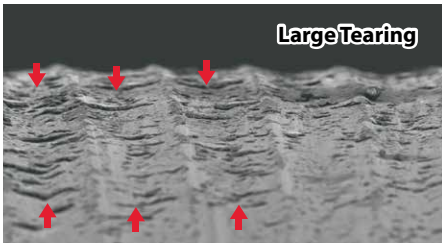
Competitor K

Cutting Edge (Flank Face)



Workpiece *CCD image

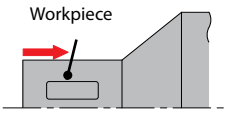
Tearing on Workpiece (Surface Finish Enlarged)



PR1705 showed little adhesion to the cutting edge and good surface finish on the workpiece without tearing

Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.0197" , f = 0.0020 ipr, Wet Workpiece : 1215

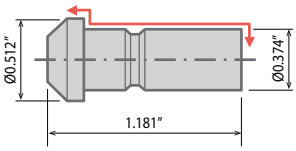
PR1705 improved tool life in continuous machining for steel and electromagnetic soft iron *For more stable machining, use PR1725



Case Studies

Pin 12L14

Vc = 660 sfm
D.O.C. = 0.0047"
f = 0.0016 ipr
Wet
CCGT32502MF PR1705



Tool Life

PR1705 MF Chipbreaker **4,800 pcs/edge** Tool Life x1.5

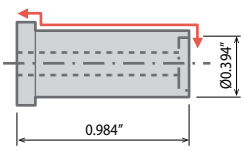
Competitor L (Ground chipbreaker) **3,200 pcs/edge**

PR1705 MF chipbreaker showed 1.5 times longer tool life when compared to competitor L

(User Evaluation)

Shaft 12l14

Vc = 330 sfm
D.O.C. = 0.051"
f = 0.0020 ipr
Wet
DCGT32505MFR-J PR1705



Tool Life

PR1705 J Chipbreaker **5,800 pcs/edge** Tool Life Approx. x1.4

Competitor M (Ground chipbreaker) **4,000 pcs/edge**

PR1705 J chipbreaker showed 1.5 times longer tool life when compared to competitor M

(User Evaluation)

Molded Sharp Edge Chipbreaker

Molded Chipbreaker Series for Small Parts Machining

Extensive lineup to solve various chip control issues
Utilizing PR1725 and PR1705 provides stable machining and extended tool life

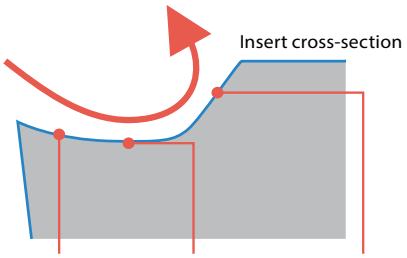
1. Excellent Chip Control in a Wide Range of Machining Applications
2. High-Precision Sharp Edge with Periphery Grinding
3. Anti-welding Properties for Improved Mirror Surface Finish

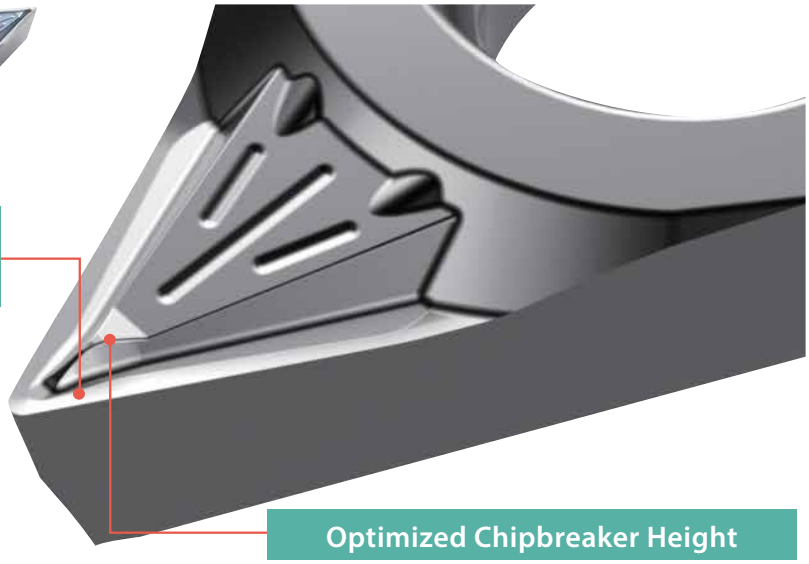
1st Recommendation for Finishing

SKS Chipbreaker NEW

D.O.C.: 0.008" to 0.059"
Excellent Chip Control and Surface Finish

Rake face, bottom face, and chipbreaker face ensure properly curled chips



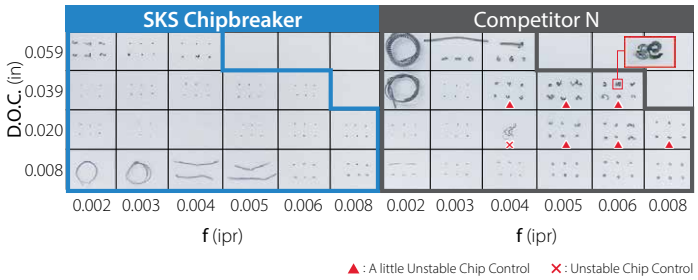


Optimized Chipbreaker Height

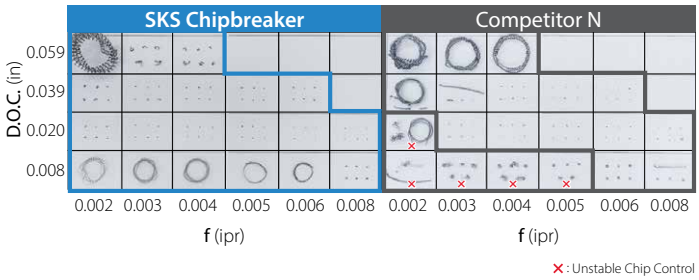
Stabilized chip control when machining at high feed rates
Improved chip evacuation when machining at large D.O.C.

Chip Control Comparison (Internal evaluation)

1045



304



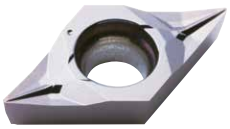
Cutting Conditions : Vc = 330 sfm, Wet, DCGT32505 Type

SKS chipbreaker showed greater chip control when compared to competitor N

1st Recommendation for Semi-finishing

SK Chipbreaker

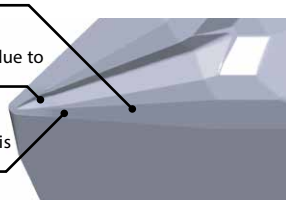
D.O.C.: 0.0197" to 0.118"
The molded chipbreaker maintains both sharpness and chip control



Stable chip evacuation in large D.O.C. due to large rake angle

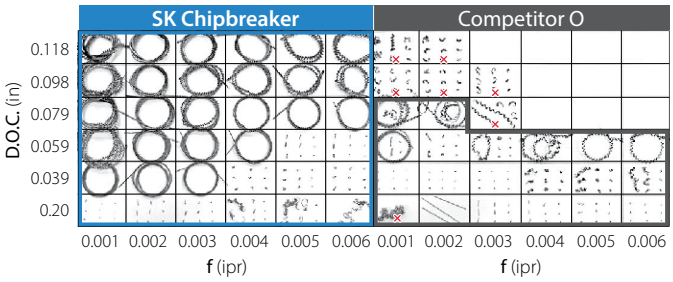
Chip control is improved in small depths of cut due to chipbreaker projecting out to the corner tip

Cutting force is reduced as the cutting edge is lowered towards the center of the workpiece



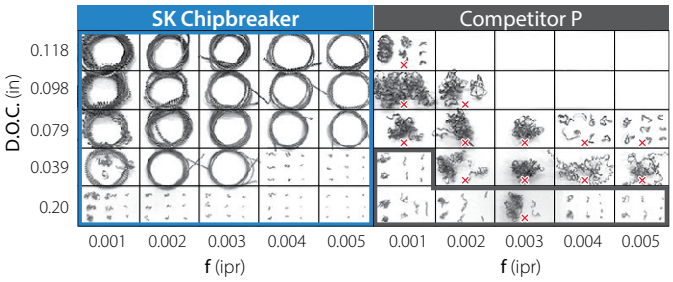
Chip Control Comparison (Internal evaluation)

1045



× : Unstable Chip Control

304



× : Unstable Chip Control

Cutting Conditions : Vc = 330 sfm, Wet, DCGT32505 Type

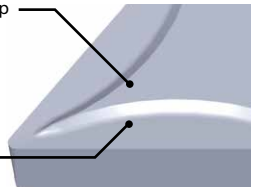
Additional Chipbreakers (Chip Control Oriented)

GQ Chipbreaker for Small to Large D.O.C.

D.O.C.: 0.003" to 0.197" (Steel)
0.003" to 0.118" (Stainless Steel)
For a Wide Range of Applications

Low cutting force design with a small chipbreaker step
Good chip control in small depths of cut with the breaker dot projecting out to the cutting edge

Wide range of acceptable chips is achieved by using an advanced chipbreaker design



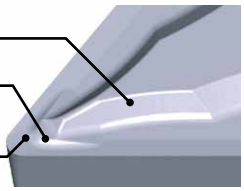
GF Chipbreaker for Finishing

D.O.C.: 0.010" to 0.050"
Controlled Chips during Finishing

High slope recedes away from the cutting edge
⇒ Minimizes chip clogging in large D.O.C.

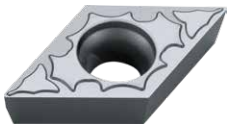
Improved sharpness with large rake angle

Chipbreaker dot extends out to the cutting edge
⇒ Divides the chips into smaller pieces



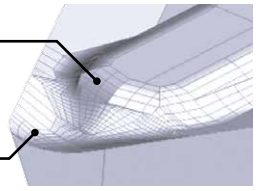
CF Chipbreaker for Minute ap

D.O.C.: 0.0008" to 0.008"
Excellent Chip Formation in Minute **D.O.C.**



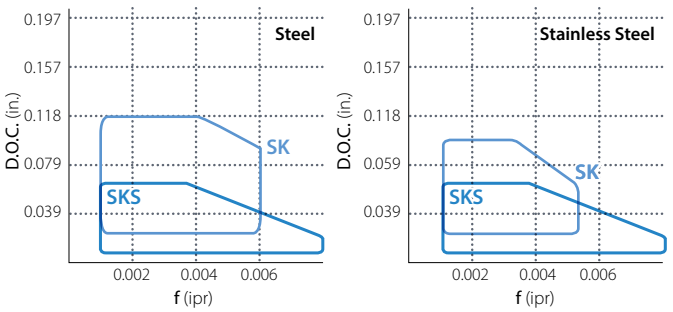
Properly curled chips with special dot design

Large rake angle improves sharpness
Suppresses burr formation and clouding of the workpiece by preventing welding onto the insert

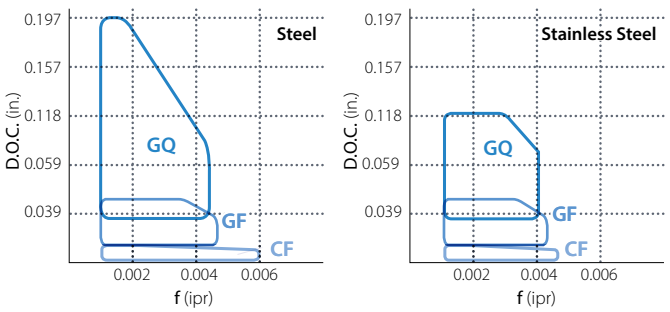


Chipbreaker Map

1st Recommendation for Finishing (Low Cutting Force)

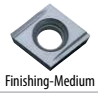


Additional Chipbreakers (Chip Control Oriented)



Positive Inserts

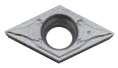
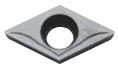
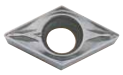
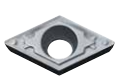
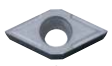
Shape (Handed Inserts Show Left-hand)	Part Number	Dimensions (in) IC	Thickness	Hole	Corner-R (RE)	AN	MEGACOAT NANO PLUS PR1725	PR1705	MEGA COAT NANO PR1535
 Minute D.O.C. Sharp Edge / Polished	CCGT 110902MP-CF	0.138	0.055	0.075	<0.004	7°	●	●	●
	110905MP-CF				<0.008		●	●	●
	CCGT 141102MP-CF	0.169	0.071	0.091	<0.004	7°	●	●	●
	141105MP-CF				<0.008		●	●	●
 Finishing Sharp Edge / Polished	CCGT 110902MFP-PF	0.138	0.055	0.075	<0.004	7°	●		●
	110905MFP-PF				<0.008		●		●
	CCGT 141102MFP-PF	0.169	0.071	0.091	<0.004	7°	●		●
	141105MFP-PF				<0.008		●		●
	CCGT 21502MFP-PF	1/4	3/32	0.110	<0.004	7°	●		●
	21505MFP-PF				<0.008		●		●
	2151MFP-PF				<1/64		●		●
 Finishing Sharp Edge / Polished	CCGT 21502MFP-GF	1/4	3/32	0.110	<0.004	7°	●	●	●
	21505MFP-GF				<0.008		●	●	●
	2151MFP-GF				<1/64		●	●	●
	CCGT 32502MFP-GF	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MFP-GF				<0.008		●	●	●
	3251MFP-GF				<1/64		●	●	●
 Finishing Sharp Edge / Polished	CCGT 215013MFP-SKS	1/4	3/32	0.110	<0.002	7°	●	●	●
	21502MFP-SKS				<0.004		●	●	●
	21505MFP-SKS				<0.008		●	●	●
	CCGT 325013MFP-SKS	3/8	5/32	0.173	<0.002	7°	●	●	●
	32502MFP-SKS				<0.004		●	●	●
	32505MFP-SKS				<0.008		●	●	●
	3251MFP-SKS				<1/64		●	●	●
 Finishing Sharp Edge / Polished	CCGT 21502MFP-SK	1/4	3/32	0.110	<0.004	7°	●	●	●
	21505MFP-SK				<0.008		●	●	●
	2151MFP-SK				<1/64		●	●	●
	CCGT 32502MFP-SK	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MFP-SK				<0.008		●	●	●
	3251MFP-SK				<1/64		●	●	●
 Finishing Sharp Edge / Polished	CCGT 21502MP-CK	1/4	3/32	0.110	<0.004	7°	●		●
	21505MP-CK				<0.008		●		●
	CCGT 32502MP-CK	3/8	5/32	0.173	<0.004	7°	●		●
	32505MP-CK				<0.008		●		●
 Finishing-Medium Sharp Edge / Polished	CCGT 21502MFP-GQ	1/4	3/32	0.110	<0.004	7°	●	●	●
	21505MFP-GQ				<0.008		●	●	●
	2151MFP-GQ				<1/64		●	●	●
	CCGT 32502MFP-GQ	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MFP-GQ				<0.008		●	●	●
	3251MFP-GQ				<1/64		●	●	●
 Finishing Wiper Edge	CCMT 21505WP	1/4	3/32	0.110	0.008	7°	●		
	2151WP				1/64		●		
	2152WP				1/32		●		
	CCMT 32505WP	3/8	5/32	0.173	0.008	7°	●		
	3251WP				1/64		●		
	3252WP				1/32		●		
 Finishing	CCMT 21505PP	1/4	3/32	0.110	0.008	7°	●		●
	2151PP				1/64		●		●
	CCMT 32505PP	3/8	5/32	0.173	0.008	7°	●		●
	3251PP				1/64		●		●
	3252PP				1/32		●		●
 Finishing-Medium	CCMT 21505GK	1/4	3/32	0.110	0.008	7°	●		●
	2151GK				1/64		●		●
	CCMT 32505GK	3/8	5/32	0.173	0.008	7°	●		●
	3251GK				1/64		●		●
	CCMT 431GK	1/2	3/16	0.217	1/64	7°	●		
	432GK				1/32		●		
	433GK				3/64		●		
 Finishing-Medium	CCMT 21505HQ	1/4	3/32	0.110	0.008	7°	●		●
	2151HQ				1/64		●		●
	CCMT 32505HQ	3/8	5/32	0.173	0.008	7°	●		●
	3251HQ				1/64		●		●
	3252HQ				1/32		●		●
 Medium	CCMT 3252	3/8	5/32	0.173	1/32	7°	●		●

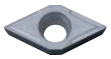
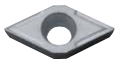
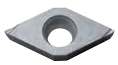
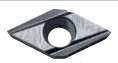
Shape (Handed Inserts Show Left-hand)	Part Number	Dimensions (in) IC	Thickness	Hole	Corner-R (RE)	AN	MEGACOAT NANO PLUS PR1725	PR1705	MEGA COAT NANO PR1535
 Medium Sharp Edge	CCGT 215013MF	1/4	3/32	0.110	<0.002	7°	●		●
	21502MF				<0.004		●		●
	21505MF				<0.008		●	●	●
	2151MF				<1/64		●	●	●
	CCGT 325013MF	3/8	5/32	0.173	<0.002	7°	●		●
	32502MF				<0.004		●	●	●
	32505MF				<0.008		●	●	●
	3251MF				<1/64		●	●	●
 Finishing Sharp Edge	CCET 1109013MR/L-F	0.138	0.055	0.075	<0.002	7°	●		●
	110902MR/L-F				<0.004		●		●
	110905MR/L-F				<0.008		●	Ⓛ	●
	11091MR/L-F				<1/64		●	Ⓛ	●
	CCET 141102MR/L-F	0.169	0.071	0.091	<0.004	7°	●		●
	141105MR/L-F				<0.008		●	●	●
	14111MR/L-F				<1/64		●	Ⓛ	●
 Finishing / Sharp Edge	CCET 32502MR/L-P	3/8	5/32	0.173	<0.004	7°	●		●
	32505MR/L-P				<0.008		●		●
	3251MR/L-P				<1/64		●		●
 Low Feed Sharp Edge	CCET 215013MFR/L-U	1/4	3/32	0.110	<0.002	7°	●	Ⓡ	●
	21502MFR/L-U				<0.004		●	Ⓡ	●
	21505MFR/L-U				<0.008		●	●	●
	CCET 325013MFR/L-U	3/8	5/32	0.173	<0.002	7°	●	Ⓡ	●
	32502MFR/L-U				<0.004		●	●	●
	32505MFR/L-U				<0.008		●	●	●
	3251MFR/L-U				<1/64		●		●
 Low Feed Honed Edge	CCGT 21505MER/L-U	1/4	3/32	0.110	<0.008	7°	●		
	2151MER/L-U				<1/64		●		
	CCGT 32502MER/L-U	3/8	5/32	0.173	<0.004	7°	Ⓡ		
	32505MER/L-U				<0.008		●		
	3251MER/L-U				<1/64		●		
 Low Feed Sharp Edge	CCET 215013MFR/L-J	1/4	3/32	0.110	<0.002	7°	Ⓡ		Ⓡ
	21502MFR/L-J				<0.004		●		●
	21505MFR/L-J				<0.008		●		●
	CCET 32502MFR/L-J	3/8	5/32	0.173	<0.004	7°	●		●
	32505MFR/L-J				<0.008		●		●
	3251MFR/L-J				<1/64		●		●
 Finishing	CPMT 251505PP	5/16	3/32	0.130	0.008	11°	●		●
	25151PP				1/64		●		●
	CPMT 3205PP	3/8	1/8	0.173	0.008	11°	●		●
	321PP				1/64		●		●
	322PP				1/32		●		●
 Finishing	CPMT 25151GP	5/16	3/32	0.130	1/64	11°	●		●
	CPMT 321GP	3/8	1/8	0.173	1/64	11°	●		●
	322GP				1/32		●		●
 Finishing-Medium	CPMH 25151HQ	5/16	3/32	0.138	1/64	11°	●		●
	25152HQ				1/32		●		●
	CPMH 321HQ	3/8	1/8	0.177	1/64	11°	●		●
	322HQ				1/32		●		●
 Medium	CPMH 25151	5/16	3/32	0.138	1/64	11°	●		●
	25152				1/32		●		●
	CPMH 321	3/8	1/8	0.177	1/64	11°	●		●
	322				1/32		●		●
 Finishing Low Carbon Steel	CPMT 25151XP	5/16	3/32	0.130	1/64	11°	●		●
	CPMT 321XP	3/8	1/8	0.173	1/64	11°	●		●
	322XP				1/32		●		●
 Finishing-Medium	CPMH 25151R/L-Y	5/16	3/32	0.138	1/64	11°	●		
	CPMH 321R/L-Y	3/8	1/8	0.177	1/64	11°	●		
Minute D.O.C. Sharp Edge / Polished	DCGT 21502MP-CF	1/4	3/32	0.110	<0.004	7°	●		●
	21505MP-CF				<0.008		●	●	●
	DCGT 32502MP-CF	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MP-CF				<0.008		●	●	●

* Inserts with corner-R (RE) dimension expressed with less than sign (ex. <0.004, <0.008, etc.) indicate models with minus tolerance.

● : Standard Item Ⓡ : Right-hand Only Ⓛ : Left-hand Only

Positive Inserts

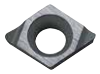
Shape (Handed Inserts Show Left-hand)	Part Number	Dimensions (in) IC	Thickness	Hole	Corner-R (RE)	AN	MEGACOAT NANO PLUS PR1725	PR1705	MEGA COAT NANO PR1535
 Finishing Sharp Edge / Polished	DCGT 21502MFP-GF	1/4	3/32	0.110	<0.004	7°	●	●	●
	21505MFP-GF				<0.008		●	●	●
	2151MFP-GF				<1/64		●	●	●
	DCGT 32502MFP-GF	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MFP-GF				<0.008		●	●	●
	3251MFP-GF				<1/64		●	●	●
 Finishing Sharp Edge / Polished	DCGT 215013MFP-SKS	1/4	3/32	0.110	<0.002	7°	●	●	●
	21502MFP-SKS				<0.004		●	●	●
	21505MFP-SKS				<0.008		●	●	●
	DCGT 325013MFP-SKS	3/8	5/32	0.173	<0.002	7°	●	●	●
	32502MFP-SKS				<0.004		●	●	●
	32505MFP-SKS				<0.008		●	●	●
	3251MFP-SKS				<1/64		●	●	●
 Finishing Sharp Edge / Polished	DCGT 21502MFP-SK	1/4	3/32	0.110	<0.004	7°	●	●	●
	21505MFP-SK				<0.008		●	●	●
	2151MFP-SK				<1/64		●	●	●
	DCGT 32502MFP-SK	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MFP-SK				<0.008		●	●	●
	3251MFP-SK				<1/64		●	●	●
 Finishing Sharp Edge / Polished	DCGT 21502MP-CK	1/4	3/32	0.110	<0.004	7°	●	●	●
	21505MP-CK				<0.008		●	●	●
	DCGT 32502MP-CK	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MP-CK				<0.008		●	●	●
 Finishing-Medium Sharp Edge / Polished	DCGT 21502MFP-GQ	1/4	3/32	0.110	<0.004	7°	●	●	●
	21505MFP-GQ				<0.008		●	●	●
	2151MFP-GQ				<1/64		●	●	●
	DCGT 32502MFP-GQ	3/8	5/32	0.173	<0.004	7°	●	●	●
	32505MFP-GQ				<0.008		●	●	●
	3251MFP-GQ				<1/64		●	●	●
 Finishing Wiper Edge	DCMX 21505WP	1/4	3/32	0.110	0.008	7°	●		
	2151WP				1/64		●		
	2152WP				1/32		●		
	DCMX 32505WP	3/8	5/32	0.173	0.008	7°	●		
	3251WP				1/64		●		
	3252WP				1/32		●		
 Finishing / Wiper Edge	DCMX 2151ᴿ/ₗ-WP	1/4	3/32	0.110	1/64	7°	●		
	DCMX 3251ᴿ/ₗ-WP	3/8	5/32	0.173	1/64	7°	●		
 Finishing	DCMT 21505PP	1/4	3/32	0.110	0.008	7°	●		●
	2151PP				1/64		●		●
	DCMT 32505PP	3/8	5/32	0.173	0.008	7°	●		●
	3251PP				1/64		●		●
	3252PP				1/32		●		●
 Finishing	DCMT 21505GP	1/4	3/32	0.110	0.008	7°	●		●
	2151GP				1/64		●		●
	DCMT 3251GP	3/8	5/32	0.173	1/64	7°	●		●
	3252GP				1/32		●		●
 Finishing-Medium	DCMT 21505GK	1/4	3/32	0.110	0.008	7°	●		●
	2151GK				1/64		●		●
	2152GK				1/32		●		●
	DCMT 32505GK	3/8	5/32	0.173	0.008	7°	●		●
	3251GK				1/64		●		●
	3252GK				1/32		●		●
 Finishing-Medium	DCMT 21505HQ	1/4	3/32	0.110	0.008	7°	●		●
	2151HQ				1/64		●		●
	2152HQ				1/32		●		●
	DCMT 32505HQ	3/8	5/32	0.173	0.008	7°	●		●
	3251HQ				1/64		●		●
	3252HQ				1/32		●		●
 Medium	DCMT 3252	3/8	5/32	0.173	1/32	7°	●		

Shape (Handed Inserts Show Left-hand)	Part Number	Dimensions (in) IC	Thickness	Hole	Corner-R (RE)	AN	MEGACOAT NANO PLUS PR1725	PR1705	MEGA COAT NANO PR1535
 Medium	DCGT 215013M	1/4	3/32	0.110	<0.002	7°	●		
	21502M				<0.004		●		
	21505M				<0.008		●		
	2151M				<1/64		●		
	DCGT 325013M	3/8	5/32	0.173	<0.002	7°	●		
	32502M				<0.004		●		
	32505M				<0.008		●		
	3251M				<1/64		●		
 Medium Sharp Edge	DCGT 215013MF	1/4	3/32	0.110	<0.002	7°	●		●
	21502MF				<0.004		●	●	●
	21505MF				<0.008		●	●	●
	2151MF				<1/64		●	●	●
	DCGT 325013MF	3/8	5/32	0.173	<0.002	7°	●		●
	32502MF				<0.004		●	●	●
	32505MF				<0.008		●	●	●
	3251MF				<1/64		●	●	●
 Finishing Low Carbon Steel	DCMT 2151XP	1/4	3/32	0.110	1/64	7°	●		●
	DCMT 32505XP	3/8	5/32	0.173	0.008	7°	●		●
	3251XP				1/64		●		●
	3252XP				1/32		●		●
 Finishing Sharp Edge	DCET 215013Mᴿ/ₗ-F	1/4	3/32	0.110	<0.002	7°	Ⓡ	●	Ⓡ
	21502Mᴿ/ₗ-F				<0.004		●		●
	21505Mᴿ/ₗ-F				<0.008		●		●
	2151Mᴿ/ₗ-F				<1/64		●		●
	DCET 325013Mᴿ/ₗ-F	3/8	5/32	0.173	<0.002	7°	Ⓡ		Ⓡ
	32502Mᴿ/ₗ-F				<0.004		●		●
	32505Mᴿ/ₗ-F				<0.008		●	●	●
	3251Mᴿ/ₗ-F				<1/64		●	●	●
 FInishing Sharp Edge	DCET 21501Fᴿ/ₗ-U	1/4	3/32	0.001	0.001	7°	Ⓡ		
 Low Feed Sharp Edge	DCET 215013MFᴿ/ₗ-U	1/4	3/32	0.110	<0.002	7°	Ⓡ		Ⓡ
	21502MFᴿ/ₗ-U				<0.004		●	Ⓡ	●
	21505MFᴿ/ₗ-U				<0.008		●	Ⓡ	●
	DCET 325013MFᴿ/ₗ-U	3/8	5/32	0.173	<0.002	7°	Ⓡ	Ⓡ	Ⓡ
	32502MFᴿ/ₗ-U				<0.004		●	Ⓡ	●
	32505MFᴿ/ₗ-U				<0.008		●	●	●
	3251MFᴿ/ₗ-U				<1/64		Ⓡ	Ⓡ	Ⓡ
 Low Feed Honed Edge	DCGT 21502MEᴿ/ₗ-U	1/4	3/32	0.110	<0.004	7°	Ⓡ		
	21505MEᴿ/ₗ-U				<0.008		●		
	2151MEᴿ/ₗ-U				<1/64		●		
	DCGT 32502MEᴿ/ₗ-U	3/8	5/32	0.173	<0.004	7°	●		
	32505MEᴿ/ₗ-U				<0.008		●		
	3251MEᴿ/ₗ-U				<1/64		●		
 Low Feed Sharp Edge	DCET 215013MFᴿ/ₗ-J	1/4	3/32	0.110	<0.002	7°	Ⓡ		Ⓡ
	21502MFᴿ/ₗ-J				<0.004		●		●
	21505MFᴿ/ₗ-J				<0.008		●		●
	DCET 325013MFᴿ/ₗ-J	3/8	5/32	0.173	<0.002	7°	Ⓡ		Ⓡ
	32502MFᴿ/ₗ-J				<0.004		●	Ⓡ	●
	32505MFᴿ/ₗ-J				<0.008		●	Ⓡ	●
	3251MFᴿ/ₗ-J				<1/64		Ⓡ	●	Ⓡ
 Low Feed Honed Edge	DCGT 325013MEᴿ/ₗ-J	3/8	5/32	0.173	<0.002	7°	Ⓡ		
	32502MEᴿ/ₗ-J				<0.004		Ⓡ		
	32505MEᴿ/ₗ-J				<0.008		Ⓡ		
	3251MEᴿ/ₗ-J				<1/64		●		
Super Fine  Finishing Sharp Edge / Precision	DPET 21505Mᴿ/ₗ-FSF	1/4	3/32	0.110	<0.008	11°	●		
	DPET 325013Mᴿ/ₗ-FSF	3/8	5/32	0.173	<0.002	11°	Ⓡ		
	32502Mᴿ/ₗ-FSF				<0.004		Ⓡ		
	32505Mᴿ/ₗ-FSF				<0.008		Ⓡ		
Super Fine  Low Feed Sharp Edge / Precision	DPET 215013MFᴿ/ₗ-USF	1/4	3/32	0.110	<0.002	11°	Ⓡ		
	21502MFᴿ/ₗ-USF				<0.004		Ⓡ		
	21505MFᴿ/ₗ-USF				<0.008		Ⓡ		
	DPET 325013MFᴿ/ₗ-USF	3/8	5/32	0.173	<0.002	11°	Ⓡ		
	32502MFᴿ/ₗ-USF				<0.004		Ⓡ		
	32505MFᴿ/ₗ-USF				<0.008		Ⓡ		

* Inserts with corner-R (RE) dimension expressed with less than sign (ex. <0.004, <0.008, etc.) indicate models with minus tolerance.

● : Standard Item Ⓡ : Right-hand Only Ⓛ : Left-hand Only

Positive Inserts

Shape Handed Inserts Show Left-hand	Part Number	Dimensions (in)					MEGACOAT NANO PLUS		MEGA COAT NANO
		IC	Thickness	Hole	Corner-R (RE)	AN	PR1725	PR1705	PR1535
Super Fine  Finishing Sharp Edge / Precision	JCET 110902M□-FSF	0.138	0.055	0.075	<0.004	7°	●		
 Finishing / Sharp Edge	JCET 110905M□-F	0.138	0.055	0.075	<0.008	7°	●		●
	11091M□-F				<1/64		●		●
 Minute D.O.C. Sharp Edge / Polished	TBGT 12102MP-CF	5/32	1/16	0.091	<0.004	5°	●		●
	12105MP-CF				<0.008		●	●	●
 Finishing Sharp Edge / Polished	TBGT 12102MFP-PF	5/32	1/16	0.091	<0.004	5°	●		●
	12105MFP-PF				<0.008		●		●
	1211MFP-PF				<1/64		●		●
 Finishing	TBET 121013M□	5/32	1/16	0.091	<0.002	5°	●		●
	12102M□				<0.004		●		●
	12105M□				<0.008		●	Ⓛ	●
	1211M□				<1/64		●	●	●
 Finishing Wiper Edge	TCMX 18151WP	7/32	3/32	0.098	1/64	7°	●		
	TCMX 2151WP	1/4	3/32	0.110	1/64	7°	●		
Super Fine  Low feed Sharp Edge / Precision	TCET 22013MF□-USF	1/4	1/8	0.110	<0.002	7°	Ⓡ		
	2202MF□-USF				<0.004		Ⓡ		
	2205MF□-USF				<0.008		Ⓡ		
 Low Feed / Honed Edge	TCGT 151505ME□-U	3/16	3/32	0.091	<0.008	7°	Ⓡ		
	TCGT 2205ME□-U	1/4	1/8	0.110	<0.008	7°	●		
	221ME□-U				<1/64		Ⓡ		
 Minute D.O.C. Sharp Edge / Polished	TPGT 151502MP-CF	3/16	3/32	0.091	<0.004	11°	●		●
	151505MP-CF				<0.008		●	●	●
	TPGT 181502MP-CF	7/32	3/32	0.118	<0.004	11°	●		●
	181505MP-CF				<0.008		●	●	●
 Finishing Sharp Edge / Polished	TPGT 181502MFP-PF	7/32	3/32	0.118	<0.004	11°	●		●
	181505MFP-PF				<0.008		●		●
	18151MFP-PF				<1/64		●		●
 Finishing Wiper Edge	TPMX 181505WP	7/32	3/32	0.110	0.008	11°	●		
	18151WP				1/64		●		
	18152WP				1/32		●		
	TPMX 2205WP	1/4	1/8	0.130	0.008	11°	●		
	221WP				1/64		●		
	222WP				1/32		●		
 Finishing Wiper Edge	TPMX 221□-WP	1/4	1/8	0.130	1/64	11°	●		
 Finishing	TPMT 181505PP	7/32	3/32	0.110	0.008	11°	●		●
	18151PP				1/64		●		●
	TPMT 2205PP	1/4	1/8	0.130	0.008	11°	●		●
	221PP				1/64		●		●
	222PP				1/32		●		●
 Finishing	TPMT 181505GP	7/32	3/32	0.110	0.008	11°	●		●
	18151GP				1/64		●		●
	TPMT 221GP	1/4	1/8	0.130	1/64	11°	●		●
	222GP				1/32		●		●
	TPMT 321GP	3/8	1/8	0.173	1/64	11°	●		●

Shape Handed Inserts Show Left-hand	Part Number	Dimensions (in)					MEGACOAT NANO PLUS		MEGA COAT NANO
		IC	Thickness	Hole	Corner-R (RE)	AN	PR1725	PR1705	PR1535
 Finishing-Medium	TPMT 181505HQ	7/32	3/32	0.110	0.008	11°	●		●
	18151HQ				1/64		●		●
	TPMT 2205HQ	1/4	1/8	0.130	0.008	11°	●		●
	221HQ				1/64		●		●
	222HQ				1/32		●		●
	TPMT 3205HQ	3/8	1/8	0.173	0.008	11°	●		●
	321HQ				1/64		●		●
	322HQ				1/32		●		●
 Finishing Low Carbon Steel	TPMT 18151XP	7/32	3/32	0.110	1/64	11°	●		●
	TPMT 221XP	1/4	1/8	0.130	1/64	11°	●		●
	222XP				1/32		●		●
	TPMT 321XP	3/8	1/8	0.173	1/64	11°	●		●
	322XP				1/32		●		●
 Finishing Sharp Edge	TPGH 151502□	3/16	3/32	0.091	0.004	11°	●		●
	151505□				0.008		●	●	●
	15151□				1/64		●	●	●
	TPGH 181502□	7/32	3/32	0.118	0.004	11°	●		●
	181505□				0.008		●	●	●
	18151□				1/64		●	●	●
	TPGH 21505□	1/4	3/32	0.138	0.008	11°	●	Ⓛ	●
	2151□				1/64		●	Ⓛ	●
	TPGH 2205□	1/4	1/8	0.130	0.008	11°	●	●	●
	221□				1/64		●	●	●
	222□				1/32		●	Ⓛ	●
	TPGH 3205□	3/8	1/8	0.177	0.008	11°	●		●
	321□				1/64		●	Ⓛ	●
	322□				1/32		●		●
	TPGH 151502M□	3/16	3/32	0.091	<0.004	11°	Ⓛ		
	151505M□				<0.008		●	●	
	15151M□				<1/64		●	●	
	TPGH 181502M□	7/32	3/32	0.118	<0.004	11°	Ⓛ		
	181505M□				<0.008		●	Ⓛ	
	18151M□				<1/64		●	●	
	TPGH 2151M□	1/4	3/32	0.138	<1/64	11°	Ⓛ		
	TPGH 2205M□	1/4	1/8	0.130	<0.008	11°	●	●	
	221M□				<1/64		●	●	
	222M□				<1/32		Ⓛ	Ⓛ	
	TPGH 3205M□	3/8	1/8	0.177	<0.008	11°	Ⓛ		
	321M□				<1/64		●	Ⓛ	
	322M□				<1/32		Ⓛ		
 Medium	TPGH 181502□-H	7/32	3/32	0.118	0.004	11°	Ⓛ		Ⓛ
	181505□-H				0.008		Ⓛ		Ⓛ
	18151□-H				1/64		Ⓛ		Ⓛ
	TPGH 2205□-H	1/4	1/8	0.130	0.008	11°	●		●
	221□-H				1/64		●		●
	222□-H				1/32		●		●
	TPGH 321□-H	3/8	1/8	0.177	1/64	11°	●		●
	322□-H				1/32		●		●
	TPGH 2205M□-H	1/4	1/8	0.130	<0.008	11°	Ⓛ		
	221M□-H				<1/64		Ⓛ		
	TPGH 321M□-H	3/8	1/8	0.177	<1/64	11°	Ⓛ		
Super Fine  Finishing Sharp Edge / Precision	TPET 151505□-FSF	3/16	3/32	0.091	0.008	11°	Ⓛ		
	TPET 22013□-FSF	1/4	1/8	0.130	0.002	11°	Ⓛ		
	2202□-FSF				0.004		●		
	2205□-FSF				0.008		●		
	TPET 151505M□-FSF	3/16	3/32	0.091	<0.008	11°	Ⓛ		
	TPET 22013M□-FSF	1/4	1/8	0.130	<0.002	11°	Ⓛ		
	2202M□-FSF				<0.004		●		
	2205M□-FSF				<0.008		●		
 Finishing Sharp Edge	TPEH 151502M□-P	3/16	3/32	0.091	<0.004	11°	●		●
	151505M□-P				<0.008		●		●
	15151M□-P				<1/64		●		●
	TPEH 181502M□-P	7/32	3/32	0.118	<0.004	11°	●		●
	181505M□-P				<0.008		●		●
	18151M□-P				<1/64		●		●
	TPEH 2202M□-P	1/4	1/8	0.130	<0.004	11°	●		●
	2205M□-P				<0.008		●		●
	221M□-P				<1/64		●		●

* Inserts with corner-R (RE) dimension expressed with less than sign (ex. <0.004, <0.008, etc.) indicate models with minus tolerance.

● : Standard Item Ⓡ : Right-hand Only Ⓛ : Left-hand Only

Positive Inserts

Shape (Handed Inserts Show Left-hand)	Part Number	IC	Thickness	Hole	Corner-R (RE)	AN	MEGACOAT NANO PLUS PR1725	MEGACOAT NANO PLUS PR1705	MEGA COAT NANO PR1535
Super Fine	TPET 151505F$^{R}_{L}$-USF	3/16	3/32	0.091	0.008	11°	●		
	TPET 2202F$^{R}_{L}$-USF	1/4	1/8	0.130	0.004	11°	Ⓛ		
	2205F$^{R}_{L}$-USF				0.008		●		
	TPET 151505MF$^{R}_{L}$-USF	3/16	3/32	0.091	<0.008	11°	●		
Low Feed Sharp Edge / Precision	TPET 2202MF$^{R}_{L}$-USF	1/4	1/8	0.130	<0.004	11°	Ⓛ		
	2205MF$^{R}_{L}$-USF				<0.008		●		
	VBMT 2205PP	1/4	1/8	0.110	0.008	5°	●		●
	221PP				1/64		●		●
	222PP				1/32		●		●
	VBMT 331PP	3/8	3/16	0.173	1/64	5°	●		●
	332PP				1/32		●		●
Finishing	333PP				3/64		●		●
	VBMT 221GP	1/4	1/8	0.110	1/64	5°	●		●
	VBMT 331GP	3/8	3/16	0.173	1/64	5°	●		
Finishing	332GP				1/32		●		
	VBMT 2205VF	1/4	1/8	0.110	0.008	5°	●		●
	221VF				1/64		●		●
	222VF				1/32		●		●
	VBMT 3305VF	3/8	3/16	0.173	0.008	5°	●		
	331VF				1/64		●		
	332VF				1/32		●		
Finishing	333VF				3/64		●		
	VBMT 221HQ	1/4	1/8	0.110	1/64	5°	●		●
	222HQ				1/32		●		●
	VBMT 331HQ	3/8	3/16	0.173	1/64	5°	●		
	332HQ				1/32		●		
Finishing-Medium	333HQ				3/64		●		
	VBET 22013M$^{R}_{L}$-F	1/4	1/8	0.110	<0.002	5°	●		●
	2202M$^{R}_{L}$-F				<0.004		●	Ⓡ	●
Finishing Sharp Edge	2205M$^{R}_{L}$-F				<0.008		●	●	●
	VBET 22013M$^{R}_{L}$-Y	1/4	1/8	0.110	<0.002	5°	●		●
	2202M$^{R}_{L}$-Y				<0.004		●		●
	2205M$^{R}_{L}$-Y				<0.008		●		●
Finishing-Medium Sharp Edge	221M$^{R}_{L}$-Y				<1/64		●		●
	VBGT 22013M$^{R}_{L}$-Y	1/4	1/8	0.110	<0.002	5°		Ⓡ	
	2202M$^{R}_{L}$-Y				<0.004			Ⓡ	
	2205M$^{R}_{L}$-Y				<0.008			●	
	221M$^{R}_{L}$-Y				<1/64			●	
	VBGT 3305M$^{R}_{L}$-Y	3/8	3/16	0.173	<0.008	5°		Ⓡ	
Finishing-Medium	331M$^{R}_{L}$-Y				<1/64			Ⓡ	
	VCGT 2202MP-CF	1/4	1/8	0.110	<0.004	7°	●		●
Minute D.O.C. Sharp Edge / Polished	2205MP-CF				<0.008		●		●
	VCGT 2202MFP-GF	1/4	1/8	0.110	<0.004	7°	●	●	●
Finishing Sharp Edge / Polished	2205MFP-GF				<0.008		●	●	●
	VCGT 2202MFP-SKS	1/4	1/8	0.110	<0.004	7°	●	●	●
	2205MFP-SKS				<0.008		●	●	●
Finishing Sharp Edge / Polished	221MFP-SKS				<1/64		●	●	●
	VCMT 151505PP	3/16	3/32	0.091	0.008	7°	●		●
	15151PP				1/64		●		●
	VCMT 331PP	3/8	3/16	0.173	1/64	7°	●		●
Finishing	332PP				1/32		●		●
	VCMT 151505VF	3/16	3/32	0.091	0.008	7°	●		●
Finishing	15151VF				1/64		●		●
	VCMT 151505HQ	3/16	3/32	0.091	0.008	7°	●		●
Finishing-Medium	15151HQ				1/64		●		●

Shape (Handed Inserts Show Left-hand)	Part Number	IC	Thickness	Hole	Corner-R (RE)	AN	MEGACOAT NANO PLUS PR1725	MEGACOAT NANO PLUS PR1705	MEGA COAT NANO PR1535
	VCET 2202M$^{R}_{L}$-F	1/4	1/8	0.110	<0.004	7°	●		●
	2205M$^{R}_{L}$-F				<0.008		●		●
Finishing Sharp Edge	221M$^{R}_{L}$-F				<1/64		●		●
	VCET 22013M$^{R}_{L}$-Y	1/4	1/8	0.110	<0.002	7°	●		●
	2202M$^{R}_{L}$-Y				<0.004		●		●
	2205M$^{R}_{L}$-Y				<0.008		●		●
Finishing-Medium Sharp Edge	221M$^{R}_{L}$-Y				<1/64		●		●
	VPGT 2202MP-CF	1/4	1/8	0.110	<0.004	11°	●	●	●
Minute D.O.C. Sharp Edge / Polished	2205MP-CF				<0.008		●	●	●
	VPGT 2202MFP-GF	1/4	1/8	0.110	<0.004	11°	●	●	●
Finishing Sharp Edge / Polished	2205MFP-GF				<0.008		●	●	●
	VPGT 2202MFP-SKS	1/4	1/8	0.110	<0.004	11°	●	●	●
	2205MFP-SKS				<0.008		●	●	●
Finishing Sharp Edge / Polished	221MFP-SKS				<1/64		●	●	●
	VPGT 151502MP-CK	3/16	3/32	0.091	<0.004	11°	●	●	●
	151505MP-CK				<0.008		●	●	●
	VPGT 2202MP-CK	1/4	1/8	0.110	<0.004	11°	●	●	●
Finishing Sharp Edge / Polished	2205MP-CK				<0.008		●	●	●
	VPET 151502M$^{R}_{L}$-F	3/16	3/32	0.091	<0.004	11°	●		●
	151505M$^{R}_{L}$-F				<0.008		●		●
	VPET 22013M$^{R}_{L}$-F	1/4	1/8	0.110	<0.002	11°	Ⓡ		Ⓡ
	2202M$^{R}_{L}$-F				<0.004		Ⓡ		Ⓡ
Finishing Sharp Edge	2205M$^{R}_{L}$-F				<0.008		●		●
	VPET 151502MF$^{R}_{L}$-U	3/16	3/32	0.091	<0.004	11°	●		●
	151505MF$^{R}_{L}$-U				<0.008		●		●
	VPET 22013MF$^{R}_{L}$-U	1/4	1/8	0.110	<0.002	11°	●		●
	2202MF$^{R}_{L}$-U				<0.004		●		●
Low Feed Sharp Edge	2205MF$^{R}_{L}$-U				<0.008		●		●
	VPET 22013MF$^{R}_{L}$-J	1/4	1/8	0.110	<0.002	11°	Ⓡ		Ⓡ
	2202MF$^{R}_{L}$-J				<0.004		●		●
Low Feed Sharp Edge	2205MF$^{R}_{L}$-J				<0.008		●		●
	WBGT 12102MP$^{R}_{L}$-CF	5/32	1/16	0.091	<0.004	5°	●		●
Minute D.O.C. Sharp Edge / Polished	12105MP$^{R}_{L}$-CF				<0.008		●	Ⓛ	●
	WBGT 12102MFP$^{R}_{L}$-PF	5/32	1/16	0.091	<0.004	5°	●		●
	12105MFP$^{R}_{L}$-PF				<0.008		●		●
	WBGT 151502MFP$^{R}_{L}$-PF	3/16	3/32	0.091	<0.004	5°	●		●
Finishing Sharp Edge / Polished	151505MFP$^{R}_{L}$-PF				<0.008		●		●
	WBMT 12105$^{R}_{L}$-DP	5/32	1/16	0.091	0.008	5°	●		●
	1211$^{R}_{L}$-DP				1/64		●		●
	WBMT 151505$^{R}_{L}$-DP	3/16	3/32	0.091	0.008	5°	●		●
Finishing	15151$^{R}_{L}$-DP				1/64		●		●
	WBET 121013M$^{R}_{L}$-F	5/32	1/16	0.091	<0.002	5°	Ⓛ		Ⓛ
	12102M$^{R}_{L}$-F				<0.004		●	Ⓛ	●
	12105M$^{R}_{L}$-F				<0.008		●	Ⓛ	●
	1211M$^{R}_{L}$-F				<1/64		●	Ⓛ	●
	WBET 151502M$^{R}_{L}$-F	3/16	3/32	0.091	<0.004	5°	Ⓛ		Ⓛ
Finishing Sharp Edge	151505M$^{R}_{L}$-F				<0.008		Ⓛ		Ⓛ
	15151M$^{R}_{L}$-F				<1/64		●		●
	WBET 151502M$^{R}_{L}$-P	3/16	3/32	0.091	<0.004	5°	●		●
	151505M$^{R}_{L}$-P				<0.008		●		●
Finishing Sharp Edge	15151M$^{R}_{L}$-P				<1/64		●		●
	WPMT 2151GP	1/4	3/32	0.110	1/64	11°	●		
Finishing	WPMT 321GP	3/8	1/8	0.173	1/64	11°	●		
	WPMT 21505HQ	1/4	3/32	0.110	0.008	11°	●		
	2151HQ				1/64		●		
	WPMT 321HQ	3/8	1/8	0.173	1/64	11°	●		
Finishing-Medium	322HQ				1/32		●		
	WPGT 2151M$^{R}_{L}$-Y	1/4	3/32	0.110	<1/64	11°	Ⓛ	●	
Finishing-Medium									

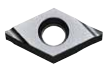
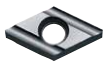
* Inserts with corner-R (RE) dimension expressed with less than sign (ex. <0.004, <0.008, etc.) indicate models with minus tolerance.

● : Standard Item Ⓡ : Right-hand Only Ⓛ : Left-hand Only

Negative Inserts

Shape (Handed Inserts Show Right-hand)	Part Number	Dimensions (in) IC	Thickness	Hole	Corner-R (RE)	MEGACOAT NANO PLUS PR1725	MEGA COAT NANO PR1535
 Finishing-Medium / Sharp Edge /Polished	CNGG 4305MFP-SK	1/2	3/16	0.203	<0.008	●	●
	431MFP-SK				<1/64	●	●
 Medium-Roughing / Sharp Edge /Polished	CNGG 431FP-TK	1/2	3/16	0.203	1/64	●	●
	432FP-TK				1/32	●	●
 Finishing-Medium / Sharp Edge /Polished	DNGG 4305MFP-SK	1/2	3/16	0.203	<0.008	●	●
	431MFP-SK				<1/64	●	●
 Large DOC	DNMG 4305R/L-LD	1/2	3/16	0.203	0.008	Ⓡ	Ⓡ
	431R/L-LD				1/64	Ⓡ	Ⓡ
 Medium-Roughing / Sharp Edge /Polished	DNGG 431FP-TK	1/2	3/16	0.203	1/64	●	●
	432FP-TK				1/32	●	●
 Finishing-Medium / Sharp Edge /Polished	TNGG 3302MFP-SK	3/8	3/16	0.150	<0.004	●	●
	3305MFP-SK				<0.008	●	●
	331MFP-SK				<1/64	●	●
 Large DOC	TNMG 3305R/L-LD	3/8	3/16	0.150	0.008	Ⓡ	Ⓡ
	331R/L-LD				1/64	Ⓡ	Ⓡ
 Medium-Roughing / Sharp Edge /Polished	TNGG 331FP-TK	3/8	3/16	0.150	1/64	●	●
	332FP-TK				1/32	●	●
 Finishing Surface Finishing Oriented / Sharp Edge	TNGG 3305R/L-S	3/8	3/16	0.150	0.008	●	●
	331R/L-S				1/64	●	●
	332R/L-S				1/32	●	●
 Finishing-Medium / Sharp Edge /Polished	VNGG 3305MFP-SK	3/8	3/16	0.150	<0.008	●	●
	331MFP-SK				<1/64	●	●

Small Double-Sided Inserts

Shape (Handed Inserts Show Right-hand)	Part Number	Dimensions (in) IC	Thickness	Hole	Corner-R (RE)	MEGACOAT NANO PLUS PR1725	PR1705	MEGA COAT NANO PR1535
 Finishing-Medium Sharp Edge /Polished	CNGU 24202MFP-SK	0.295	1/8	0.142	<0.004	●		●
	24205MFP-SK				<0.008	●		●
 Medium-Roughing Honed Edge	CNMU 24205E-GK	0.295	1/8	0.142	0.008	●		●
	2421E-GK				1/64	●		●
 Finishing / Sharp Edge	CNGU 242013MFR/L-F	0.295	1/8	0.142	<0.002		Ⓡ	
	24202MFR/L-F				<0.004	Ⓡ	Ⓡ	Ⓡ
	24205MFR/L-F				<0.008	Ⓡ	Ⓡ	Ⓡ
	2421MFR/L-F				<1/64	Ⓡ	Ⓡ	Ⓡ
 Low Feed / Sharp Edge	CNGU 242013MFR/L-U	0.295	1/8	0.142	<0.002		Ⓡ	
	24202MFR/L-U				<0.004	Ⓡ	Ⓡ	Ⓡ
	24205MFR/L-U				<0.008	Ⓡ	Ⓡ	Ⓡ
	2421MFR/L-U				<1/64	Ⓡ	Ⓡ	Ⓡ
 Finishing-Medium / Sharp Edge /Polished	DNGU 22202MFP-SK	0.276	1/8	0.142	<0.004	●		●
	22205MFP-SK				<0.008	●		●
	2221MFP-SK				<1/64	●		●
 Medium-Roughing / Honed Edge	DNMU 22205E-GK	0.276	1/8	0.142	0.008	●		●
	2221E-GK				1/64	●		●
 Finishing / Sharp Edge	DNGU 22202MFR/L-F	0.276	1/8	0.142	<0.004	Ⓡ		Ⓡ
	22205MFR/L-F				<0.008	Ⓡ	Ⓡ	Ⓡ
	2221MFR-F				<1/64	●		●
 Low Feed / Sharp Edge	DNGU 22202MFR/L-U	0.276	1/8	0.142	<0.004	Ⓡ	Ⓡ	Ⓡ
	22205MFR/L-U				<0.008	Ⓡ	Ⓡ	Ⓡ
	2221MFR/L-U				<1/64	Ⓡ		Ⓡ
 Low Feed / Honed Edge	DNGU 22202MER/L-U	0.276	1/8	0.142	<0.004	Ⓡ	Ⓡ	
	22205MER/L-U				<0.008	Ⓡ	Ⓡ	
	2221MER/L-U				<1/64	Ⓡ	Ⓡ	
 Finishing / Sharp Edge	TNGU 18202MFR/L-F	7/32	1/8	0.118	<0.004	Ⓡ	Ⓡ	Ⓡ
	18205MFR/L-F				<0.008	Ⓡ	Ⓡ	Ⓡ
	1821MFR/L-F				<1/64	Ⓡ	Ⓡ	Ⓡ
 Low Feed / Sharp Edge	TNGU 18202MFR/L-U	7/32	1/8	0.118	<0.004	Ⓡ		Ⓡ
	18205MFR/L-U				<0.008	Ⓡ	Ⓡ	Ⓡ
	1821MFR/L-U				<1/64	Ⓡ	Ⓡ	Ⓡ
 Low Feed / Honed Edge	TNGU 1821MER/L-U	7/32	1/8	0.118	<1/64	Ⓡ	Ⓡ	

* Inserts with corner-R (RE) dimension expressed with less than sign (ex. <0.004, <0.008, etc.) indicate models with minus tolerance.

● : Standard Item Ⓡ : Right-hand Only Ⓛ : Left-hand Only

Expanded lineup of PR1725/PR1705 for a wide variety of product series and applications

Small Parts Machining

KTKF Series

Cut-off

Cut-off for small parts machining
TKF

Cut-off for small parts machining
Sub-spindle operations
TKFS

Back Turning

For Back turning
TKFB

For Back turning
TKFB
GQ Chipbreaker

Threading

For Threading
TKFT

Multipurpose

KTKF for small part machining applications
TKF GTP Chipbreaker

Small Internal Machining

EZ Bar Series

Boring

For Small internal machining
EZ Bar

Indexable boring bar
EZ Bar PLUS

Small Internal Grooving

High-Precision Small Internal Grooving
SIGC

Back Turning

For Back turning
ABS/ABW

Copying

25° Insert Profiling Tools
ZBMT

FEATURED INSERTS FOR VIBRATION MACHINING

Chips issues are common when machining small parts

There is an increasing demand for reducing labor, increasing automation, and productivity improvement in small parts machining as the trend for lights-out machining grows.

CHALLENGES:

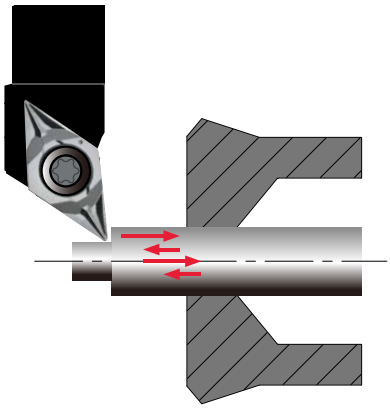
Shorter tool life : Chipping due to chip entanglement
Decline in quality : Chips causing damage to the workpiece
Costly downtime : Stopping machines to clean or remove chips

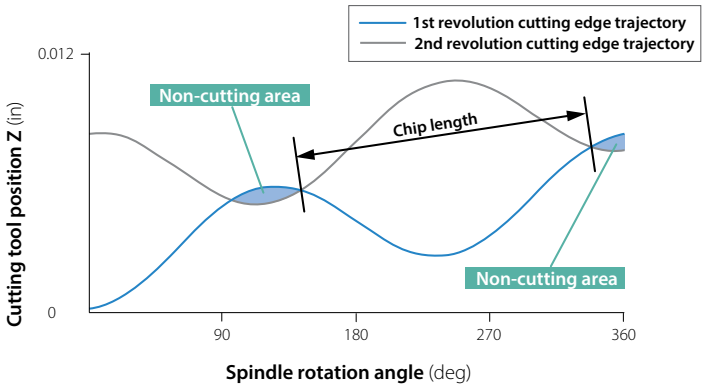
Utilizing vibration machining

What is vibration or ocsillation machining?

This unique vibration machining method generates intentional micro vibrations of a tool or workpiece in a cutting direction to finely cut chips. This creates a stable and intermittent discharge of chips to prevent entanglement issues with the workpiece and is compatible with a variety of workpiece materials.

Example of vibration machining





Unique inserts designed for high precision, high quality, and high productivity

Combination of a high toughness substrate and special coating to withstand high machining load

PVD Coating MEGACOAT NANO
PR1535

+

Low cutting resistance enables longer tool life and stable machining

Controls chips with a slanted cutting edge

Molded Sharp Edge Chipbreaker
SK Chipbreaker
CK Chipbreaker

MEGACOAT NANO

PR1535

Fracture resistant with a tough substrate and high heat-resistant coating
Stable machining with high machining load in vibration machining

1. Toughening by a new cobalt mixing ratio
   *Internal evaluation
2. Various machining applications, from continuous to heavy interruption
3. MEGACOAT NANO coating technology for long tool life and stable machining

23% Fracture toughness *

	Base material hardness (HV)	Fracture toughness (MPam$^{1/2}$)	Flexural strength (Mpa)
PR1225	1,600	13.0	3,400
PR1535	1,320	16.0	3,700

Cracking comparison by diamond indenter (Internal evaluation)

Long cracks Short cracks

Shock Resistance

Molded Sharp Edge Chipbreaker

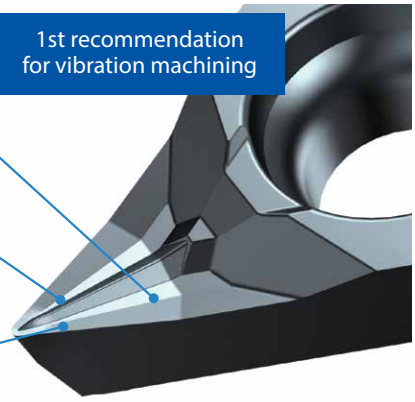
SK Chipbreaker / CK Chipbreaker

Unique sharp edge chipbreaker maintains long tool life and stable machining in vibration machining

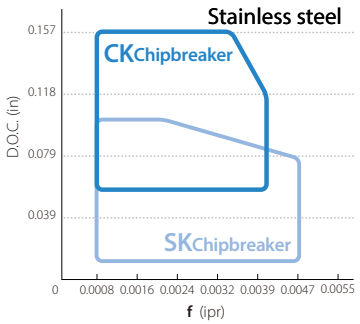
SK Chipbreaker Low cutting force, for finishing

1st recommendation for vibration machining

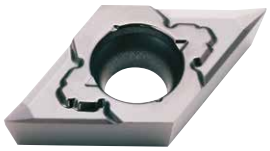
- Stable chip evacuation in large D.O.C. due to large rake angle
- Chip control is improved in small depths of cut due to chipbreaker projecting out to the corner tip
- Cutting force is reduced as the cutting edge is lowered towards the center of the workpiece



Applicable chipbreaker range (for vibration machining)

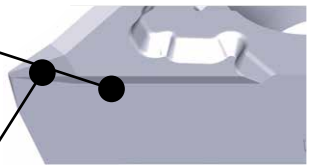


CK Chipbreaker Low cutting force, for general purpose



Cutting force is reduced as the cutting edge is lowered towards the center of the workpiece

Large rake angle reduces cutting force
Stable chip evacuation

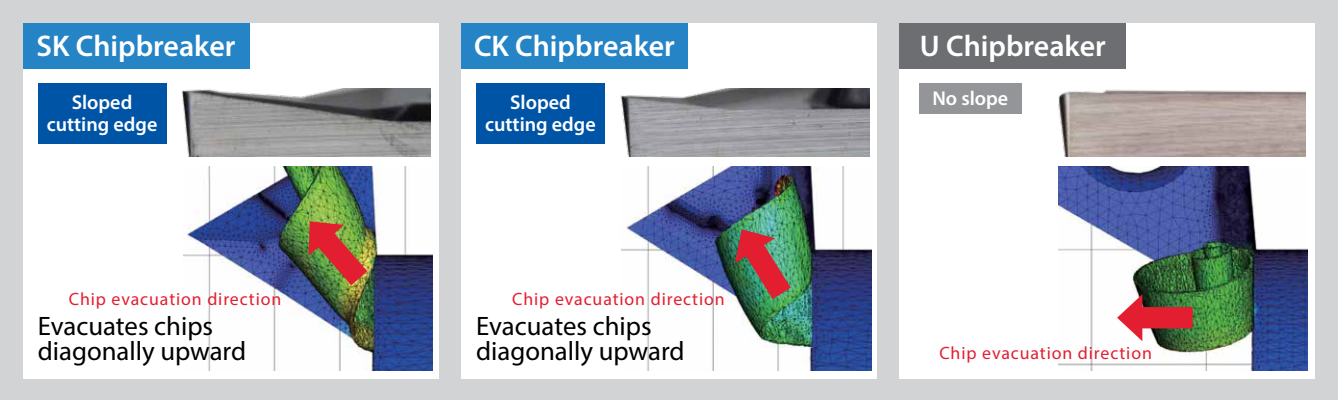


FEATURED INSERTS FOR VIBRATION MACHINING

Chip evacuation examples (Internal evaluation)

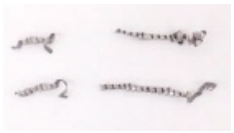
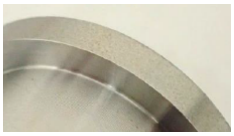
SK and CK chipbreakers evacuate chips upward with sloped cutting edge

Prevents workpiece damage due to chip entanglement



Machining condition comparison in vibration machining (Internal evaluation)

SK chipbreaker shows good chip condition, reduced burrs, and excellent surface finish.
In vibration machining, the combination of PR1535 and SK or CK chipbreakers provides excellent performance

	SK Chipbreaker	Competitor Q (Sloped cutting edge)	Competitor R (No slope)
Chips	✓ 	⊘ 	⊘ 
Surface finish	✓ 	✓ 	⊘ 
Burr	✓ 	⊘ 	✓ 

Cutting Conditions : Vc = 200 sfm, f = 0.002 ipr, D.O.C. = 0.079", 304

KYOCERA

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