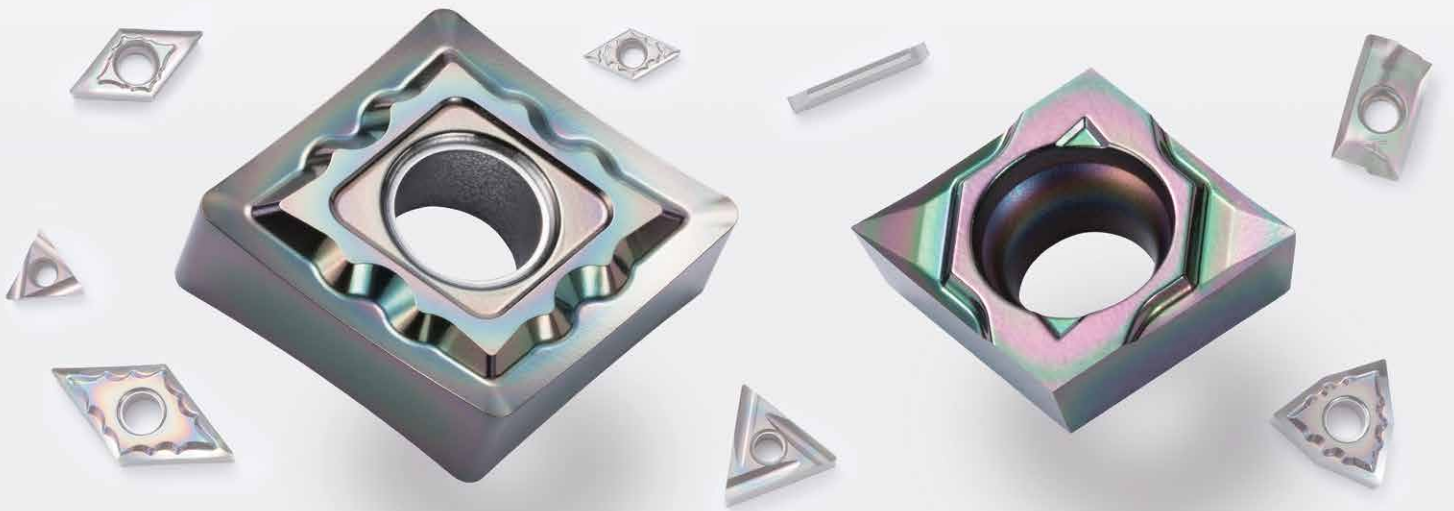




# PDL010/PDL025

DLC Coating



High Quality and Long Tool Life for Machining Aluminum

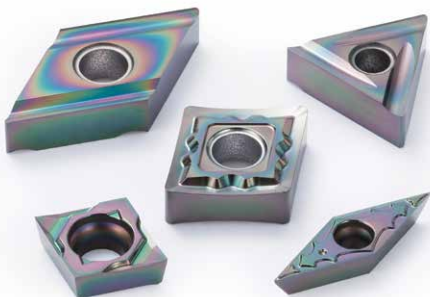
Achieves Long Tool Life with Hardness Close to that of Diamond

Excellent Surface Finish with Aluminum Welding Resistance

Large Lineup for Turning, Milling, and Cut-Off Operations

**NEW**

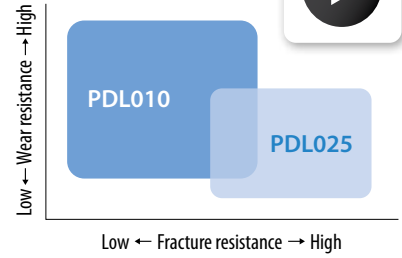
New High Wear Resistant Coating PDL010



DLC Coating

# PDL010 / PDL025

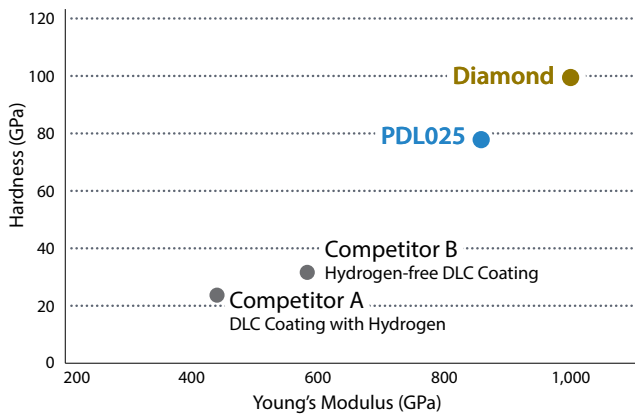
Achieves Long Tool Life with Hardness Close to that of Diamond  
Large Lineup for Turning, Milling, and Cut-Off Operations



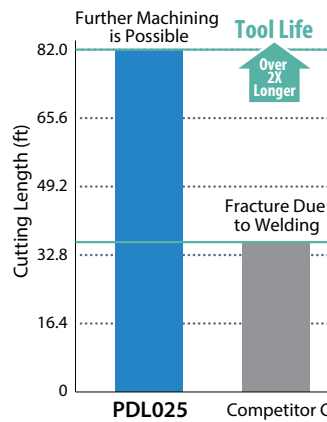
## 1 Long and Stable Tool Life

High Hardness with Kyocera's Proprietary Hydrogen-free DLC Coating

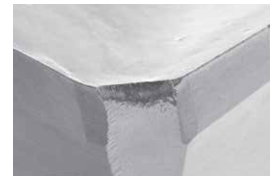
Coating Properties



Tool Life (Internal Evaluation)



PDL025 After Machining 82 ft



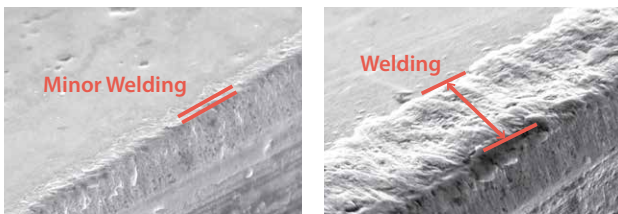
Competitor C After Machining 36 ft

Cutting Conditions:  $V_c = 1,640$  sfm,  $f_z = 0.008$  ipt, D.O.C.  $\times ae = 0.118'' \times 0.197''$ , Dry  
Cutter Dia.  $\varnothing 1.000''$  Workpiece: 7175

## 2 Excellent Surface Finish

Excellent Surface Finish with Aluminum Welding Resistance

Welding Resistance Comparison (Internal Evaluation)



PDL025

Competitor D

Cutting Conditions:  $V_c = 2,630$  sfm,  $f_z = 0.004$  ipt, D.O.C.  $\times ae = 0.118'' \times 0.197''$ , Dry  
Cutter Dia.  $\varnothing 1.000''$  Workpiece: 5052 Cutting Length: 187 ft

Machined Surface Comparison (Internal Evaluation)



PDL025

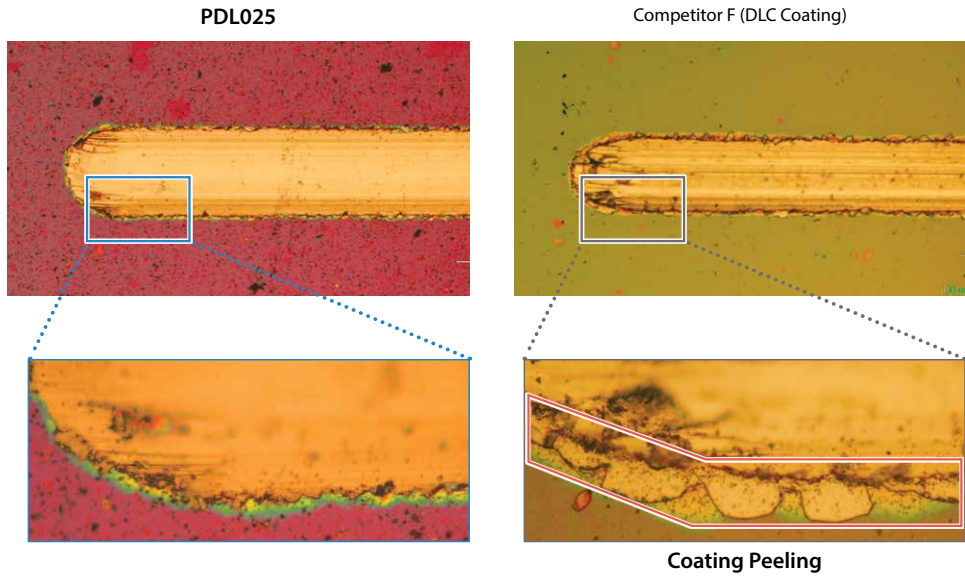
Competitor E

Cutting Conditions:  $V_c = 2,630$  sfm,  $f_z = 0.004$  ipt, D.O.C.  $\times ae = 0.118'' \times 0.197''$ , Dry  
Cutter Dia.  $\varnothing 1.000''$  Workpiece: 6061  
Cutting Length: PDL025 (157 ft), Competitor E (46 ft)

### 3 Stable Machining

#### Stable Machining Due to DLC Coating Layer with Excellent Peeling Resistance Improved Chip Evacuation Due to High Lubrication

Scratch Test: Coating Conditions Comparison with Load 80 N (Internal Evaluation)



Chip Shape

PDL025



Even Chips with Small Curl Diameter

Carbide (Non-Coated)



Cutting Conditions:  $V_c = 2630$  sfm,  $f_z = 0.004$  ipt,  
D.O.C.  $\times$  ae =  $0.118'' \times 0.197''$ , Dry Cutter Dia. 1.000"  
Insert BDGT11T304FR-JA Workpiece: 5052

### 4 Large Tooling Lineup

Wide Range of Applications Including Turning, Cut-off, and Milling Operations

Turning



(PDL010 / PDL025)

Cut-off



(PDL025)

Milling

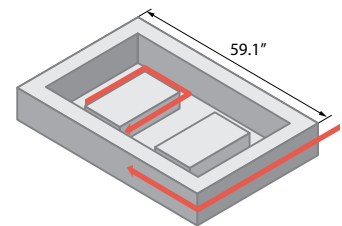


(PDL025)

#### Case Study

##### Block A5052

$V_c = 1480$  sfm  
 $f_z = 0.006$  ipt  
( $V_f = 74.803$  ipm)  
D.O.C.  $\times$  ae =  $0.079'' \times \sim 3.150''$   
Wet  
MEC080R-11-7T (7-Flute)  
BDGT11T308FR-JA PDL025



Number of Workpieces

**PDL025** 7 pcs/edge

Competitor G (6-Flute) 5 pcs/edge

Tool Life






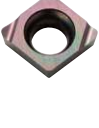
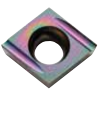





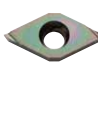






1.4X

PDL025 has less welding compared to Competitor G and tool life is improved by 1.4 times.

Perpendicular walls with excellent surface finish.

(User Evaluation)


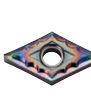


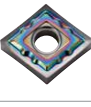
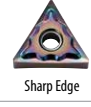




# Turning Inserts (Positive)

Shape	Part Number	Dimensions (in)				Relief Angle	DLC Coating	
		I.C.	Thickness	Hole Diameter	Corner R (re)		PDL010	PDL025
Minute Depth of Cut 	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 	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 	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 	CCGT 3251AH	3/8	5/32	0.173	1/64	7°	○	●
	3252AH				1/32		○	●
Finishing-Medium 	CCGT 32505 $\frac{P}{L}$ -A3	3/8	5/32	0.173	0.008	7°	○	○
	3251 $\frac{P}{L}$ -A3				1/64		○	○
	3252 $\frac{P}{L}$ -A3				1/32		○	○
	CCGT 4305 $\frac{P}{L}$ -A3	1/2	3/16	0.217	0.008	7°	○	○
	431 $\frac{P}{L}$ -A3				1/64		○	○
432 $\frac{P}{L}$ -A3	1/32	○	○					
Finishing 	CCET 1109013ML-F	0.138	0.055	0.075	<0.002	7°	○	○
	110902ML-F				<0.004		○	○
	110905ML-F				<0.008		○	○
	11091ML-F				<1/64		○	○
	CCET 141102ML-F	0.169	0.071	0.091	<0.004	7°	○	○
	141105ML-F				<0.008		○	○
14111ML-F	<1/64	○	○					
Low Feed 	CCET 215013MF $\frac{P}{L}$ -U	1/4	3/32	0.110	<0.002	7°	○	○
	21502MF $\frac{P}{L}$ -U				<0.004		○	○
	21505MF $\frac{P}{L}$ -U				<0.008		○	○
	CCET 325013MF $\frac{P}{L}$ -U	3/8	5/32	0.173	<0.002	7°	○	○
	32502MF $\frac{P}{L}$ -U				<0.004		○	○
32505MF $\frac{P}{L}$ -U	<0.008	○	○					
3251MF $\frac{P}{L}$ -U	<1/64	○	○					
Minute Depth of Cut 	DCGT 21502MP-CF	1/4	3/32	0.110	<0.004	7°	○	○
	21505MP-CF				<0.008		○	○
Finishing 	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	○	●					
Shape	Part Number	Dimensions (in)				Relief Angle	DLC Coating	
		I.C.	Thickness	Hole Diameter	Corner R (re)		PDL010	PDL025
Finishing 	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 	DCGT 3251AH	3/8	5/32	0.173	1/64	7°	○	●
	3252AH				1/32		○	●
Finishing-Medium 	DCGT 32505 $\frac{P}{L}$ -A3	3/8	5/32	0.173	0.008	7°	○	○
	3251 $\frac{P}{L}$ -A3				1/64		○	○
	3252 $\frac{P}{L}$ -A3				1/32		○	○
Finishing 	DCET 215013MR-F	1/4	3/32	0.110	<0.002	7°	○	○
	21502M $\frac{P}{L}$ -F				<0.004		○	○
	21505M $\frac{P}{L}$ -F				<0.008		○	○
	2151M $\frac{P}{L}$ -F				<1/64		○	○
	DCET 325013MR-F	3/8	5/32	0.173	<0.002	7°	○	○
32502M $\frac{P}{L}$ -F	<0.004				○		○	
32505M $\frac{P}{L}$ -F	<0.008	○	○					
3251M $\frac{P}{L}$ -F	<1/64	○	○					
Low Feed 	DCET 215013MFR-U	1/4	3/32	0.110	<0.002	7°	○	○
	21502M $\frac{P}{L}$ -U				<0.004		○	○
	21505M $\frac{P}{L}$ -U				<0.008		○	○
	DCET 325013MFR-U	3/8	5/32	0.173	<0.002	7°	○	○
32502M $\frac{P}{L}$ -U	<0.004				○		○	
32505M $\frac{P}{L}$ -U	<0.008	○	○					
3251M $\frac{P}{L}$ -U	<1/64	○	○					
Finishing-Medium 	TCGT 2205 $\frac{P}{L}$ -A3	1/4	1/8	0.110	0.008	7°	○	○
	221 $\frac{P}{L}$ -A3				1/64		○	○
	222 $\frac{P}{L}$ -A3				1/32		○	○
Minute Depth of Cut 	VPGT 2202MP-CF	1/4	1/8	0.110	<0.004	11°	○	○
	2205MP-CF				<0.008		○	○
Finishing 	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°	○	○
2205MP-CK	<0.008				○		●	
Finishing-Medium 	VCGT 331AH	3/8	3/16	0.173	1/64	7°	○	●
	332 $\frac{P}{L}$ -A3				1/32		○	○
Finishing-Medium 	VCGT 331 $\frac{P}{L}$ -A3	3/8	3/16	0.173	1/64	7°	○	○
	332 $\frac{P}{L}$ -A3				1/32		○	○

• Inserts with corner R (re) dimension shown with inequality sign (ex: <0.004) indicates minus tolerance of corner R (re).

● : U.S. Stock ○ : World Express (Shipping: 7-10 Business Days)


## Turning Inserts (Negative)

Shape	Part Number	Dimensions (in)				Relief Angle	DLC Coating		Shape	Part Number	Dimensions (in)				Relief Angle	DLC Coating	
		I.C.	Thickness	Hole Diameter	Corner R (r <sub>e</sub> )		PDL010	PDL025			I.C.	Thickness	Hole Diameter	Corner R (r <sub>e</sub> )		PDL010	PDL025
Finishing-Medium 	CNGG 431 P <sub>L</sub> -A3	1/2	3/16	0.203	1/64	0°	○	○	Medium-Roughing 	DNMG 431AH	1/2	3/16	0.203	1/64	0°	○	●
	432 P <sub>L</sub> -A3				1/32		○	○		432AH				1/32		○	●
Medium-Roughing 	CNGG 431AH	1/2	3/16	0.203	1/64	0°	○	●	Finishing-Medium 	TNGG 331 P <sub>L</sub> -A3	3/8	3/16	0.150	1/64	0°	○	○
	432AH				1/32		○	●		332 P <sub>L</sub> -A3				1/32		○	○
Medium-Roughing 	CNMG 431AH	1/2	3/16	0.203	1/64	0°	○	●	Medium-Roughing 	TNGG 331AH	3/8	3/16	0.150	1/64	0°	○	○
	432AH				1/32		○	●		332AH				1/32		○	○
Finishing-Medium 	DNGG 431 P <sub>L</sub> -A3	1/2	3/16	0.203	1/64	0°	○	○	Medium-Roughing 	TNMG 331AH	3/8	3/16	0.150	1/64	0°	○	○
	432 P <sub>L</sub> -A3				1/32		○	○		332AH				1/32		○	○
Medium-Roughing 	DNGG 431AH	1/2	3/16	0.203	1/64	0°	○	●	Medium-Roughing 	WNGG 431AH	3/8	3/16	0.150	1/64	0°	○	○
	432AH				1/32		○	●		432AH				1/32		○	○


• Right-hand (R) is shown for inserts with angles.

● : U.S. Stock ○ : World Express (Shipping: 7-10 Business Days)

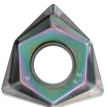
## Milling Inserts (for MEC Cutters)

Shape	Part Number	Dimensions (in)					Angle (°)		DLC Coating
		A	T	∅d	W	r <sub>e</sub>	α	β	PDL025
	BDGT 11T302FR-JA	0.264	0.150	0.110	0.433	0.008	18°	13°	○
	11T304FR-JA					1/64			●
	11T308FR-JA					1/32			●
	BDGT 170404FR-JA	0.378	0.193	0.173	0.669	1/64	18°	13°	●
	170408FR-JA					1/32			○
	170420FR-JA					5/64			●
170431FR-JA	0.122					○			

## Milling Inserts (for MEW Cutters)

Shape	Part Number	Dimensions (in)						DLC Coating
		A	T	∅d	Z	W	r <sub>e</sub>	PDL025
	LOGT 100408FR-AM	0.268	0.157	0.142	0.437	0.110	1/32	●
	LOGT 150508FR-AM	0.350	0.220	0.193	0.626	0.110	1/32	●


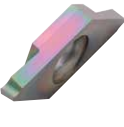
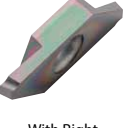
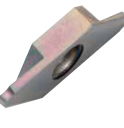
## Milling Inserts (for MFWN Cutters)

Shape	Part Number	Dimensions (in)					DLC Coating
		∅D	T	∅d	Z	r <sub>e</sub>	PDL025
	WNGT 080608FN-AM	0.552	0.262	0.244	0.061	0.031	●

● : U.S. Stock



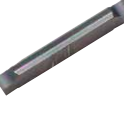
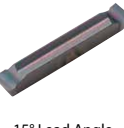
## Cut-Off Inserts (TKF)

Shape	Part Number	Dimensions (in)							Angle (°)	DLC Coating
		W		ØD max	rε	T	H	Ød	θ	PDL025
		in	mm							
 <p>With Right Lead Angle</p>	TKF12 <sup>R/L</sup> 100-S-16DR	0.039	1.00	0.472	0.001	0.118	0.343	0.197	16°	○
	125-S-16DR	0.049	1.25							○
	150-S-16DR	0.059	1.50							○
	200-S-16DR	0.079	2.00							○
	TKF12 <sup>R/L</sup> 050-S	0.020	0.50	0.472	0.001	0.118	0.343	0.197	0°	○
	070-S	0.028	0.70							○
	100-S	0.039	1.00							○
	125-S	0.049	1.25							○
	150-S	0.059	1.50							○
	200-S	0.079	2.00							○
 <p>With Right Lead Angle</p>	TKF16 <sup>R/L</sup> 150-S-16DR	0.059	1.50	0.630	0.002	0.158	0.374	0.197	16°	○
	200-S-16DR	0.079	2.00							○
	TKF16 <sup>R/L</sup> 150-S	0.059	1.50	0.630	0.002	0.158	0.374	0.197	0°	○
	200-S	0.079	2.00							○

• Right-hand (R) is shown for inserts with angles.

○ : World Express (Shipping: 7-10 Business Days)

## Cut-Off Inserts (GDG)

Shape	Part Number	Dimensions (in)							Angle (°)	DLC Coating
		Edge Width (W)			rε	M	L	H	θ	PDL025
		in	mm	Tolerance						
 <p>Low Cutting Force 2-Edge</p>	GDG 2020N-005PG	0.079	2.0	±0.0008	0.002	0.067	0.787	0.169	0°	○
	2520N-005PG	0.098	2.5							○
	3020N-005PG	0.118	3.0							○
 <p>15° Lead Angle Low Cutting Force 2-Edge</p>	GDG 2020R-005PG-15D	0.079	2.0	±0.0008	0.002	0.067	0.787	0.169	15°	○
	2520R-005PG-15D	0.098	2.5							●
	3020R-005PG-15D	0.118	3.0							○

○ : World Express (Shipping: 7-10 Business Days)

## Recommended Cutting Conditions

Turning	Chipbreaker	Aluminum Alloy	Cutting Speed Vc (sfm)	Feed Rate f (ipr)	
Negative	A3	Si 10% or Less	1,310 ~ 1,640 ~ 2,630	0.004 ~ 0.012	
	AH		660 ~ 980 ~ 1,970	0.004 ~ 0.014	
Positive	SK	Si 10% or Less	330 ~ 490 ~ 980	0.001 ~ 0.005	
	CK		330 ~ 490 ~ 980	0.001 ~ 0.005	
	CF		330 ~ 490 ~ 980	0.001 ~ 0.006	
	AH		330 ~ 660 ~ 980	0.002 ~ 0.010	
	A3		330 ~ 660 ~ 980	0.002 ~ 0.008	
	F		Si 10% or Less Cutting Dia. > Ø0.394"	330 ~ 820 ~ 1,640	0.001 ~ 0.008
			Si 10% or Less Cutting Dia. < Ø0.394"	330 ~ 660 ~ 980	0.001 ~ 0.008
	U		Si 10% or Less Cutting Dia. > Ø0.394"	330 ~ 820 ~ 1,640	0.001 ~ 0.008
Si 10% or Less Cutting Dia. < Ø0.394"		330 ~ 660 ~ 980	0.001 ~ 0.008		

Milling	Aluminum Alloy	Cutting Speed Vc (sfm)	Feed Rate f (ipr)
LOGT (for MEW Cutters)	Si 13% or Less	660 ~ 2,950	0.002 ~ 0.012
	Si 13% or Greater	660 ~ 980	0.002 ~ 0.008
BDGT (for MEC Cutters)	Si 13% or Less	660 ~ 2,950	0.002 ~ 0.012
	Si 13% or Greater	660 ~ 980	0.002 ~ 0.008
WNGT (for MFWN Cutters)	Si 13% or Less	660 ~ 2,950	0.004 ~ 0.012
	Si 13% or Greater	660 ~ 980	0.004 ~ 0.008

Cut-Off	Aluminum Alloy	Cutting Speed Vc (sfm)	Feed Rate f (ipr)
TKF	Si 10% or Less	660 ~ 1,640	0.0004 ~ 0.0012
GDG		660 ~ 1,640	0.0004 ~ 0.0020



**KYOCERA Precision Tools**

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Hendersonville, NC 28792  
Customer Service | 800.823.7284 - Option 1  
Technical Support | 800.823.7284 - Option 2



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