

THE NEW VALUE FRONTIER



DLC Coating

PDL010
PDL025

DLC Coating

PDL010/PDL025



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, Cut-Off, and Milling Operations

NEW

New High Wear Resistant
Coating PDL010

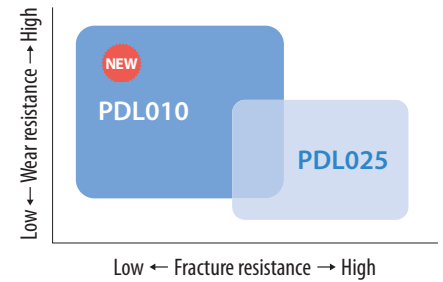


DLC Coating

PDL010/PDL025

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

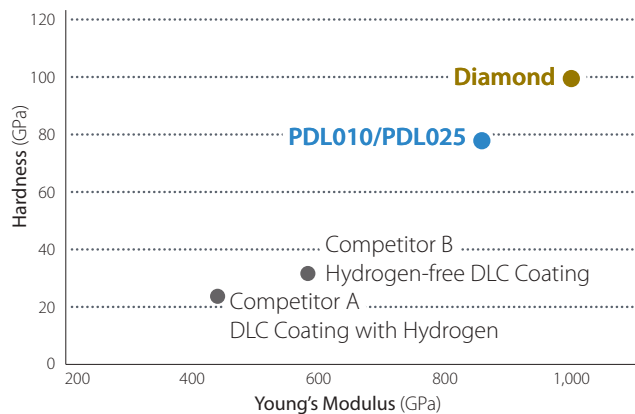
Aluminum Machining Application Map



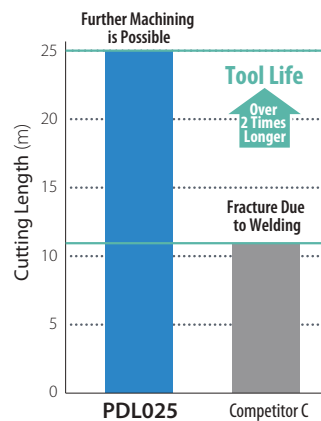
1 Long and Stable Tool Life

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

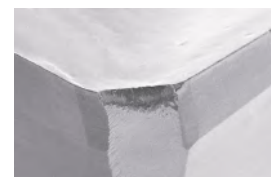
Coating Properties (In-house Evaluation)



Tool Life (In-house Evaluation)



PDL025 After Machining 25 m



Competitor C After Machining 11 m

Cutting Conditions: $V_c = 500$ m/min, $f_z = 0.2$ mm/t, $a_p \times a_e = 3 \times 5$ mm, Dry
Cutter Dia. $\phi 25$ mm Workpiece: A7075

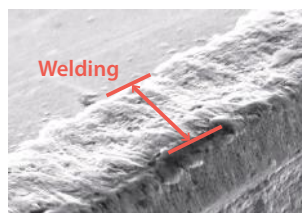
2 Excellent Surface Finish

Excellent Surface Finish with Aluminum Welding Resistance

Welding Resistance Comparison (In-house Evaluation)



PDL025



Competitor D

Cutting Conditions: $V_c = 800$ m/min, $f_z = 0.1$ mm/t, $a_p \times a_e = 3 \times 5$ mm, Dry
Cutter Dia. $\phi 25$ mm Workpiece: A5052 Cutting Length: 57 m

Machined Surface Comparison (In-house Evaluation)



PDL025



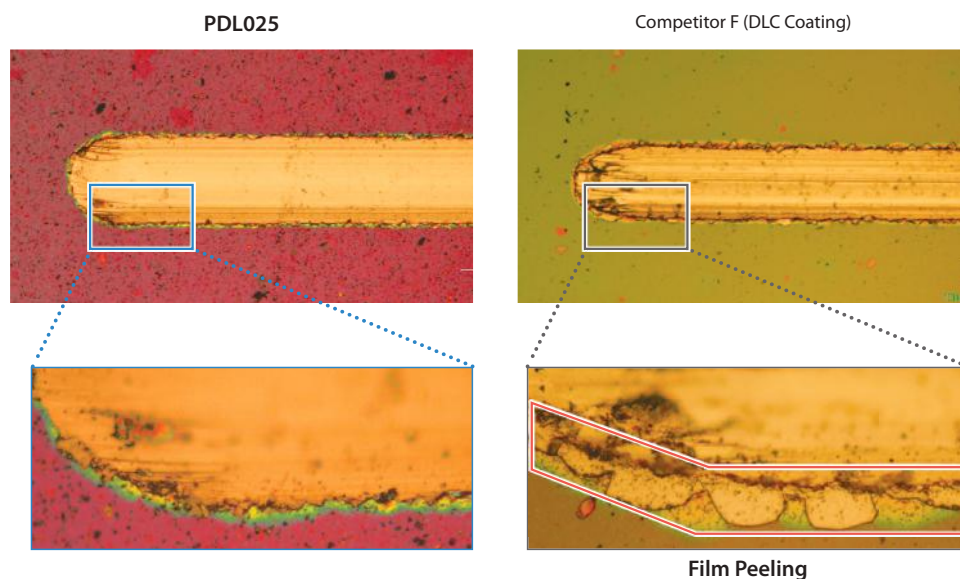
Competitor E

Cutting Conditions: $V_c = 800$ m/min, $f_z = 0.1$ mm/t, $a_p \times a_e = 3 \times 5$ mm, Dry
Cutter Dia. $\phi 25$ mm Workpiece: A6061 Cutting Length: PDL025 (48 m), Competitor E (14 m)

3 Stable Machining

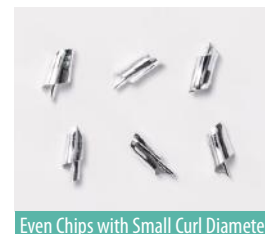
Stable Machining Due to DLC Coating Layer with Excellent Peeling Resistance Improved Chip Evacuation Due to High Lubrication

Scratch Test: Coating Conditions Comparison with Load 80 N (In-house Evaluation)



Chip Shape

PDL025



Carbide (non-coated)



Cutting Conditions: $V_c = 800$ m/min, $f_z = 0.1$ mm/t,
 $a_p \times a_e = 3 \times 5$ mm, Dry Cutter Dia. $\phi 25$ mm
Insert BDGT11T304FR-JA Workpiece: A5052

4 Large Tooling Lineup

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

Turning



(PDL010/PDL025)

Cut-off



(PDL025)

Milling

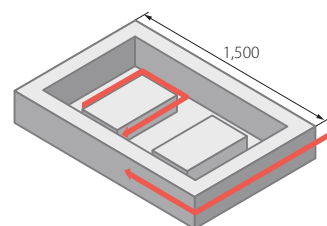


(PDL025)

Case Study

Block A5052

$V_c = 450$ m/min
 $f_z = 0.15$ mm/t
($V_f = 1,900$ mm/min)
 $a_p \times a_e = 2 \times \sim 80$ mm
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
1.4
Times

PDL025 has less welding compared to Competitor G
and tool life is improved by 1.4 times.
A good wall and surface finish is achieved.

(User Evaluation)

Standard Stock Items Description

Turning Inserts (Positive)

Shape		Description	Dimensions (mm)				Relief Angle	DLC Coating	
			I.C.	Thickness	Hole Diameter	Corner R (rε)		PDL 010	PDL 025
Minute Depth of Cut		CCGT 030101MP-CF 030102MP-CF	3.5	1.4	1.9	<0.1 <0.2	7°	●	●
		CCGT 040101MP-CF 040102MP-CF	4.3	1.8	2.3	<0.1 <0.2	7°	●	●
Finishing		CCGT 060201MFP-SK 060202MFP-SK 060204MFP-SK	6.35	2.38	2.8	<0.1 <0.2 <0.4	7°	●	●
		CCGT 09T301MFP-SK 09T302MFP-SK 09T304MFP-SK	9.525	3.97	4.4	<0.1 <0.2 <0.4	7°	●	●
Finishing		CCGT 060201MP-CK 060202MP-CK	6.35	2.38	2.8	<0.1 <0.2	7°	●	●
		CCGT 09T301MP-CK 09T302MP-CK	9.525	3.97	4.4	<0.1 <0.2	7°	●	●
Finishing-Medium		CCGT 09T304AH 09T308AH	9.525	3.97	4.4	0.4 0.8	7°	●	●
Finishing-Medium		CCGT 09T302 ^R / _L -A3 09T304 ^R / _L -A3 09T308 ^R / _L -A3	9.525	3.97	4.4	0.2 0.4 0.8	7°	●	●
		CCGT 120402 ^R / _L -A3 120404 ^R / _L -A3 120408 ^R / _L -A3	12.7	4.76	5.5	0.2 0.4 0.8	7°	●	●
Finishing		CCET 0301005ML-F 030101ML-F 030102ML-F 030104ML-F	3.5	1.4	1.9	<0.05 <0.1 <0.2 <0.4	7°	L L L L	L L L L
		CCET 040101ML-F 040102ML-F 040104ML-F	4.3	1.8	2.3	<0.1 <0.2 <0.4	7°	L L L	L L L
Low Feed		CCET 0602005MF ^R / _L -U 060201MF ^R / _L -U 060202MF ^R / _L -U	6.35	2.38	2.8	<0.05 <0.1 <0.2	7°	●	●
		CCET 09T3005MF ^R / _L -U 09T301MF ^R / _L -U 09T302MF ^R / _L -U 09T304MF ^R / _L -U	9.525	3.97	4.4	<0.05 <0.1 <0.2 <0.4	7°	●	●
Minute Depth of Cut		DCGT 070201MP-CF 070202MP-CF	6.35	2.38	2.8	<0.1 <0.2	7°	●	●
		DCGT 11T301MP-CF 11T302MP-CF	9.525	3.97	4.4	<0.1 <0.2	7°	●	●
Finishing		DCGT 070201MFP-SK 070202MFP-SK 070204MFP-SK	6.35	2.38	2.8	<0.1 <0.2 <0.4	7°	●	●
		DCGT 11T301MFP-SK 11T302MFP-SK 11T304MFP-SK	9.525	3.97	4.4	<0.1 <0.2 <0.4	7°	●	●

Shape		Description	Dimensions (mm)				Relief Angle	DLC Coating	
			I.C.	Thickness	Hole Diameter	Corner R (rε)		PDL 010	PDL 025
Finishing		DCGT 070201MP-CK 070202MP-CK	6.35	2.38	2.8	<0.1 <0.2	7°	●	●
		DCGT 11T301MP-CK 11T302MP-CK	9.525	3.97	4.4	<0.1 <0.2	7°	●	●
Finishing-Medium		DCGT 11T304AH 11T308AH	9.525	3.97	4.4	0.4 0.8	7°	●	●
Finishing-Medium		DCGT 11T302 ^R / _L -A3 11T304 ^R / _L -A3 11T308 ^R / _L -A3	9.525	3.97	4.4	0.2 0.4 0.8	7°	●	●
		DCET 0702005MR-F 070201M ^R / _L -F 070202M ^R / _L -F 070204M ^R / _L -F	6.35	2.38	2.8	<0.05 <0.1 <0.2 <0.4	7°	●	R
Finishing		DCET 11T3005MR-F 11T301M ^R / _L -F 11T302M ^R / _L -F 11T304M ^R / _L -F	9.525	3.97	4.4	<0.05 <0.1 <0.2 <0.4	7°	R	R
		DCET 0702005MFR-U 070201MF ^R / _L -U 070202MF ^R / _L -U	6.35	2.38	2.8	<0.05 <0.1 <0.2	7°	●	R
Low Feed		DCET 11T3005MFR-U 11T301MF ^R / _L -U 11T302MF ^R / _L -U 11T304MFR-U	9.525	3.97	4.4	<0.05 <0.1 <0.2 <0.4	7°	●	R
		TCGT 110302 ^R / _L -A3 110304 ^R / _L -A3 110308 ^R / _L -A3	6.35	3.18	2.8	0.2 0.4 0.8	7°	●	●
Finishing-Medium		VPGT 110301MP-CF 110302MP-CF	6.35	3.18	2.8	<0.1 <0.2	11°	●	●
Finishing		VPGT 080201MP-CK 080202MP-CK	4.76	2.38	2.3	<0.1 <0.2	11°	●	●
		VPGT 110301MP-CK 110302MP-CK	6.35	3.18	2.8	<0.1 <0.2	11°	●	●
Finishing-Medium		VCGT 160404AH	9.525	4.76	4.4	0.4	7°	●	●
Finishing-Medium		VCGT 160404 ^R / _L -A3 160408 ^R / _L -A3	9.525	4.76	4.4	0.4 0.8	7°	●	●

• Inserts with corner R (rε) dimension shown with inequality sign (ex: <0.1) indicates minus tolerance of corner R (rε).
● : Standard Stock
R: R-hand Only in Stock
L: L-hand Only in Stock

Standard Stock Items Description

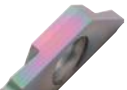
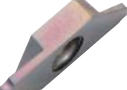
Turning Inserts (Negative)

Shape	Handed Insert shows Right-hand	Description	Dimensions (mm)					DLC Coating	
			I.C.	Thickness	Hole Diameter	Corner R (r _c)	PDL 010	PDL 025	
	Finishing-Medium Sharp Edge	CNGG 120404 ^{R/L} -A3 120408 ^{R/L} -A3	12.70	4.76	5.16	0.4 0.8	● ●	● ●	
	Medium-Roughing Sharp Edge	CNGG 120404AH 120408AH	12.70	4.76	5.16	0.4 0.8	● ●	● ●	
	Medium-Roughing	CNMG 120404AH 120408AH	12.70	4.76	5.16	0.4 0.8	● ●	● ●	
	Finishing-Medium Sharp Edge	DNGG 150404 ^{R/L} -A3 150408 ^{R/L} -A3	12.70	4.76	5.16	0.4 0.8	● ●	● ●	
	Medium-Roughing Sharp Edge	DNGG 150404AH 150408AH	12.70	4.76	5.16	0.4 0.8	● ●	● ●	

Shape	Handed Insert shows Right-hand	Description	Dimensions (mm)					DLC Coating	
			I.C.	Thickness	Hole Diameter	Corner R (r _c)	PDL 010	PDL 025	
	Medium-Roughing	DNMG 150404AH 150408AH	12.70	4.76	5.16	0.4 0.8	● ●	● ●	
	Finishing-Medium Sharp Edge	TNGG 160404 ^{R/L} -A3 160408 ^{R/L} -A3	9.525	4.76	3.81	0.4 0.8	● ●	● ●	
	Medium-Roughing Sharp Edge	TNGG 160404AH 160408AH	9.525	4.76	3.81	0.4 0.8	● ●	● ●	
	Medium-Roughing	TNMG 160404AH 160408AH	9.525	4.76	3.81	0.4 0.8	● ●	● ●	
	Medium-Roughing Sharp Edge	WNGG 080404AH 080408AH	12.70	4.76	5.16	0.4 0.8	● ●	● ●	

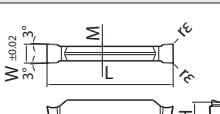
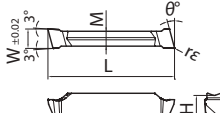
● : Standard Stock

Cut-off TKF

Shape	Handed Insert shows Right-hand	Description	Dimensions (mm)						Angle	DLC Coating
			W	øD max	r _c	T	H	ød	θ	PDL025
	With Right Lead Angle	TKF12 ^{R/L} 100-S-16DR 125-S-16DR 150-S-16DR 200-S-16DR	1.0 1.25 1.5 2.0	12	0.03	3	8.7	5	16°	● ● ● ●
		TKF12 ^{R/L} 050-S 070-S 100-S 125-S 150-S 200-S	0.5 0.7 1.0 1.25 1.5 2.0	5 8 12 12 12 12	0.03	3	8.7	5	0°	● ● ● ● ● ●
	With Right Lead Angle	TKF16 ^{R/L} 150-S-16DR 200-S-16DR	1.5 2.0	16	0.05	4	9.5	5	16°	● ●
		TKF16 ^{R/L} 150-S 200-S	1.5 2.0	16	0.05	4	9.5	5	0°	● ●

● : Standard Stock

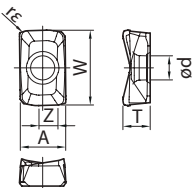
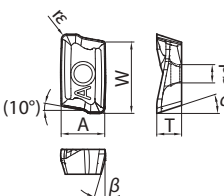
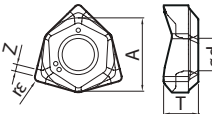
Cut-off GDG

Shape		Description	Dimensions (mm)					Angle	DLC coating	
			Edge Width (W)	r _E	M	L	H	θ	PDL025	
										Tolerance
 Low Cutting Force 2-edge		GDG 2020N-005PG	2.0	±0.02	0.05	1.7	20	4.3	0°	●
	2520N-005PG	2.5	2.1			●				
	3020N-005PG	3.0	2.3			●				
 15° Lead Angle Low Cutting Force 2-edge		GDG 2020R-005PG-15D	2.0	±0.02	0.05	1.7	20	4.3	15°	R
	2520R-005PG-15D	2.5	2.1			R				
	3020R-005PG-15D	3.0	2.3			R				

● : Standard Stock
R: R-hand Only in stock

Standard Stock Items Description

Milling Inserts (for MEW and MFWN Cutters)

Shape	Description	Dimensions (mm)						Angle		DLC coating
		A	T	ød	W	Z	rε	α	β	
 	LOGT 100408FR-AM	6.8	4.0	3.6	11.1	2.8	0.8	—	—	●
	LOGT 150508FR-AM	8.9	5.6	4.9	15.9	2.8	0.8	—	—	●
 	BDGT 11T302FR-JA 11T304FR-JA 11T308FR-JA	6.7	3.8	2.8	11.0	—	0.2 0.4 0.8	18°	13°	● ● ●
	BDGT 170404FR-JA 170408FR-JA 170420FR-JA 170431FR-JA	9.6	4.9	4.4	17.0	—	0.4 0.8 2.0 3.1	18°	13°	● ● ● ●
 	WNGT 080608FN-AM	14.02	6.65	6.2	—	1.5	0.8	—	—	●

● : Standard Stock

Recommended Cutting Conditions

Turning	Chipbreaker	Aluminum Alloy	Cutting Speed Vc (m/min)	Feed Rate f (mm/rev)
Negative	A3	Si 10 % or Less	400 – 500 – 800	0.1 – 0.3
	AH		200 – 300 – 600	0.1 – 0.35
Positive	SK	Si 10 % or Less	100 – 150 – 300	0.03 – 0.12
	CK		100 – 150 – 300	0.03 – 0.12
	CF		100 – 150 – 300	0.02 – 0.15
	AH		100 – 200 – 300	0.05 – 0.25
	A3		100 – 200 – 300	0.05 – 0.2
	F	Si 10 % or Less Cutting Dia. ø10 or More	100 – 250 – 500	0.03 – 0.2
		Si 10 % or Less Cutting Dia. ø10 or Less	100 – 200 – 300	0.03 – 0.2
	U	Si 10 % or Less Cutting Dia. ø10 or More	100 – 250 – 500	0.03 – 0.2
		Si 10 % or Less Cutting Dia. ø10 or Less	100 – 200 – 300	0.03 – 0.2

Cut-off	Aluminum Alloy	Cutting Speed Vc (m/min)	Feed Rate f (mm/rev)
TKF	Si 10 % or Less	200 – 500	0.01 – 0.03
GDG		200 – 500	0.01 – 0.05

Milling Inserts	Aluminum Alloy	Cutting Speed Vc (m/min)	Feed Rate f (mm/rev)
LOGT (For MEW Cutters)	Si 13 % or Less	200 – 900	0.05 – 0.3
	Si 13 % or Greater	200 – 300	0.05 – 0.2
BDGT (For MEC Cutters)	Si 13 % or Less	200 – 900	0.05 – 0.3
	Si 13 % or Greater	200 – 300	0.05 – 0.2
WNGT (For MFWN Cutters)	Si 13 % or Less	200 – 900	0.1 – 0.3
	Si 13 % or Greater	200 – 300	0.1 – 0.2