PCD TOOLS

Industrial Tools Department

KORLOY

Contents

PCD Product Descriptions

KORLOY PCD tools feature extremely high hardness and outstanding wear resistance thanks to their material technology combining a strict control of diamond crystals size, and a manufacturing process realized at ultra high temperature and pressure levels. KORLOY PCD tools answer the wide demand for machining aluminum alloy and non ferrous metals in the automotive and aerospace industry, while delivering an exceptional increase in productivity and precision.

PCD Insert/Blade

KORLOY PCD insert blades perform their best on aluminum alloy and non-ferrous metals resulting high efficiency and high quality

PCD Endmills

KORLOY PCD Endmills guarantee long tool life and high productivity by shortening overall cycle time with diamond edge application

PCD Reamers

KORLOY's PCD Reamer guarantees excellent surface finish and high accuracy for economical machining

PCD Drills

KORLOY PCD drill guarantees excellent cutting performance and tool life in aluminum alloy machining with full or partial diamond application on the tip

PCD Milling Cutter

KORLOY PDC Milling Cutter, Aero Mill features accurate and economical face milling with adjustable blade height

PCD Boring Tools

KORLOY PCD Boring Tools enlarges holes with high precision and presents an excellent quality of finishing

PCD Forming Tools

KORLOY PCD Forming Tools is the solution to today's increased complexity of workpieces' shapes, while shortening cycle time

Technical Data

PCD products are manufactured by binding poly-crystalline diamond in high density through super high pressure process, which enables an extremely high wear resistance.

PCD tool technical manual

❶ Material

Polycrystalline diamond = Particle sintered diamond

❷ Structure

[Diamond crystal grain + diamond additive (metal, ceramic)]
Sintering with high temperature and pressure (1200℃ , 50k atm)

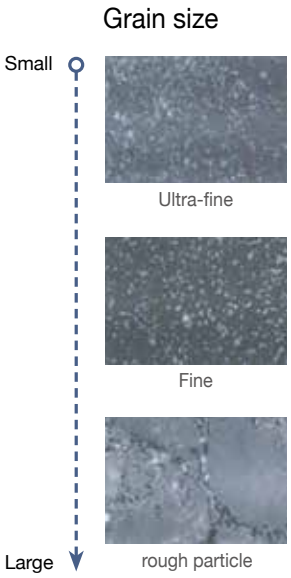
❸ Specification

(1) Rough particle => High density and high heat conductivity - Good wear resistance, but low surface roughness

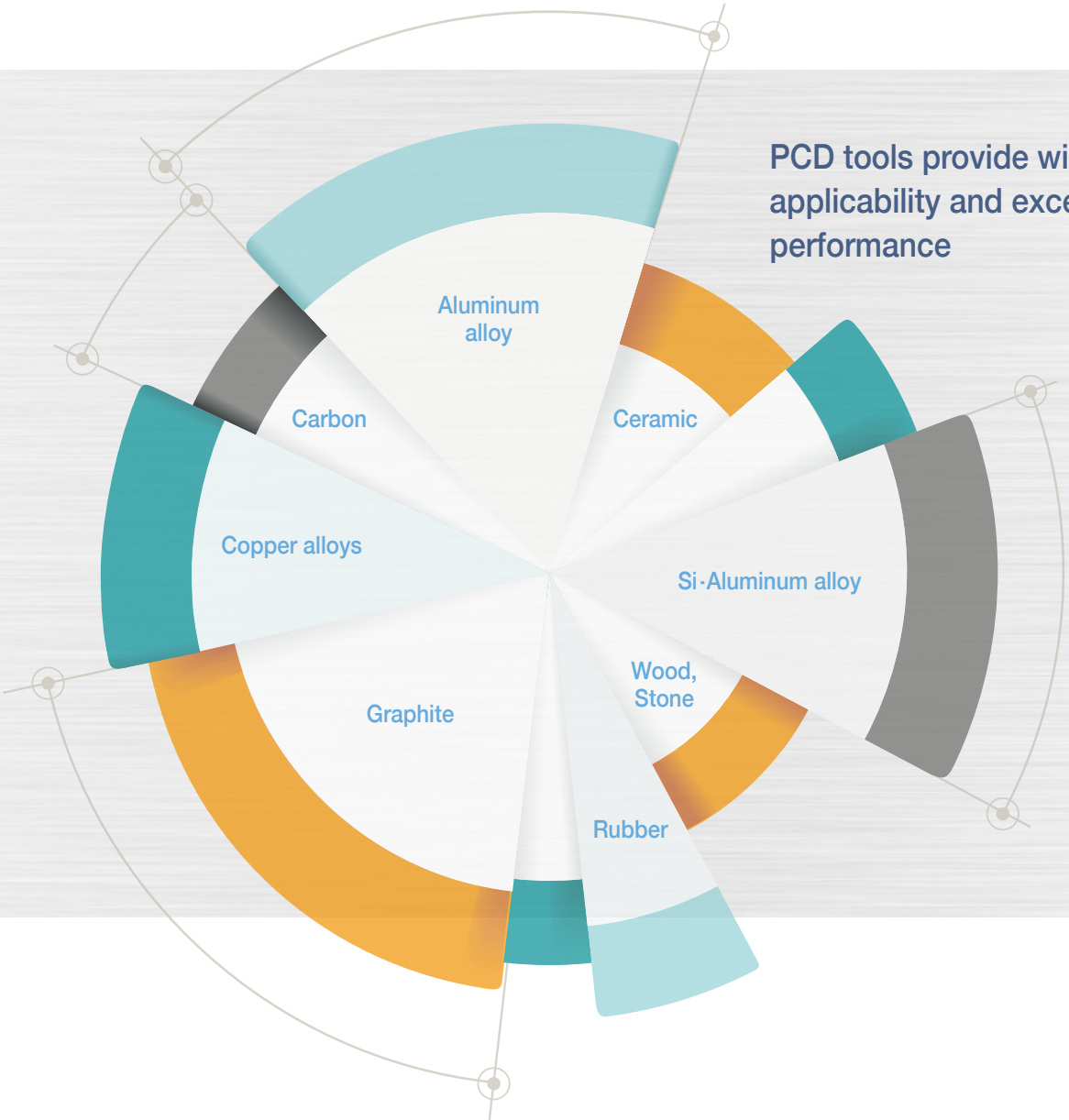
(2) Low oxidation temperature. Drawing oxidation can happen for hard material processing

(3) Fine particle => Excellent resistance to wear and chipping for general cutting

(4) Ultra fine particle => Excellent surface finish and chipping resistance

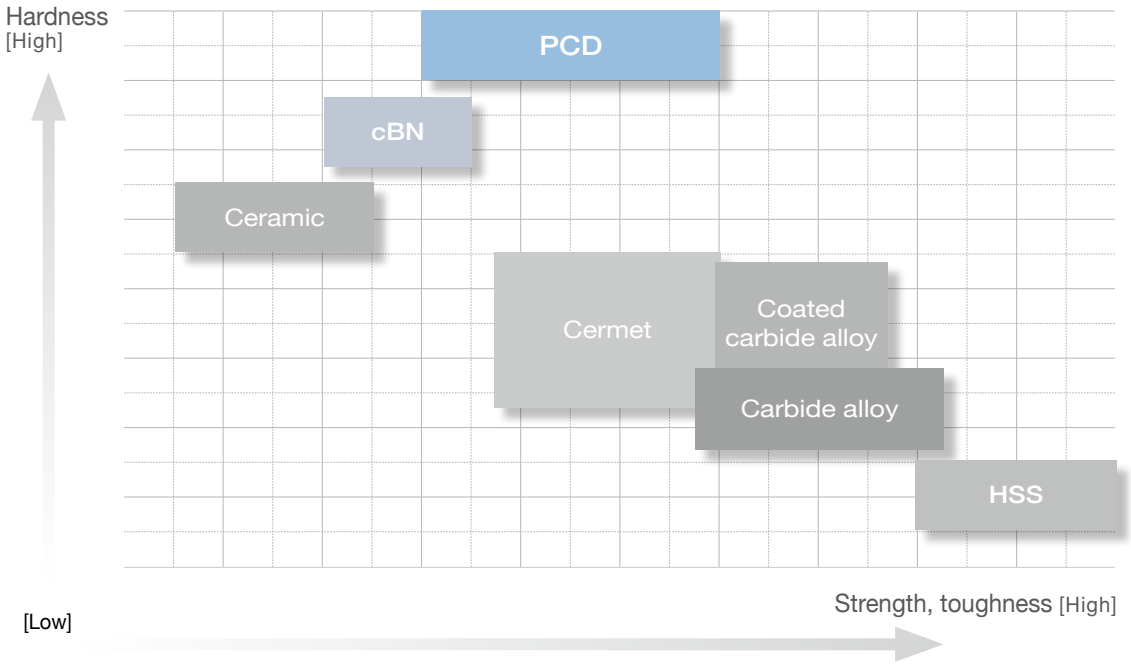


PCD tools provide wide machining applicability and exceptional product performance

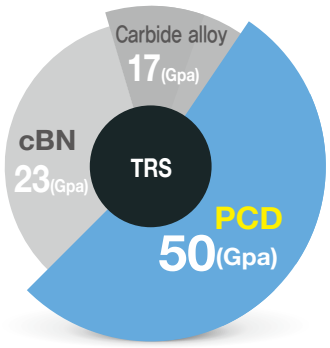


● PCD form

● Hardness and strength of PCD

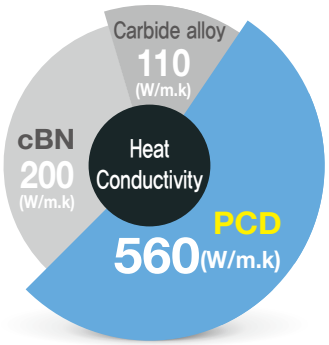


TRS (Transverse Rupture Strength)



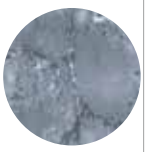
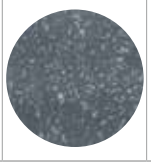
* **TRS**
Flexural strength, or material property defining the degree of ductility or brittleness

Heat conductivity (Heat conduction)



* **Thermal conductivity**
Material property to conduct heat

PCD material

Grade	Feature	Use	Grain size(㎛)	Grain	Hardness (Hv)	Transverse rupture strength (kgf/㎟)
DP90	Material with rough diamond particle sintered. High percentage of diamond and excellent wear resistance	Processing of high-Si Al alloy, Al compound material, carbide alloy, ceramic semi-sintered compound and rough machining of embossed product. Processing of ceramic sintered coumpound, stone and rock.	Over 25		10,000 ~ 12,000	110
DP150	Fine diamond sintered material. Same grain size of diamond and good coherence which enable processing effectiveness and wear resistance	Rough machining of non ferrous metal, and processing of carbide alloy, ceramic sintered compound, embossed products rough machining. Face processing and cutting of FRP, hard rubber, graphite, wood and mineral board.	10		10,000 ~ 12,000	200
DP200	Ultra fine diamond grain sintered material. Good sharpness of blade and toughness	Rough machining of non ferrous metal, carbide alloy, ceramic sintered compound, embossing product. Cutting and face processing of FRP, hard rubber, graphite, wood and mineral board.	0.5		8,000 ~ 10,000	220

Recommending cutting condition

Work piece	Cutting speed	Feed	1 time cutting depth	Recommending material	
				1st time	2nd time
Aluminum alloy (4%~8%Si)	1,000 ~ 3,000	0.1 ~ 0.6	~ 3	DP150	DP200
Aluminum alloy (9%~14%Si)	600 ~ 2,500	0.1 ~ 0.5			
Aluminum alloy (15%~18%Si)	300 ~ 700	0.1 ~ 0.4			
Copper alloy	~ 1,000	0.05 ~ 0.2			
Tempered plastic		0.1 ~ 0.3	~ 2		
Wood material	~ 4,000	0.1 ~ 0.4	-		
Carbide	10 ~ 30	~ 0.2	~ 0.5	DP90	DP150

Comparison between cBN and PCD

Category		PCD	cBN
Thermal stability	**Under common air condition**	Oxidation from 700℃	Stable up to 1300℃
	Under vacuum condition	Stable up to 1400℃	Stable up to 1500℃
Use		Non ferrous metal, glass fiber, wood, hard plastic	Heat treated iron, hard material

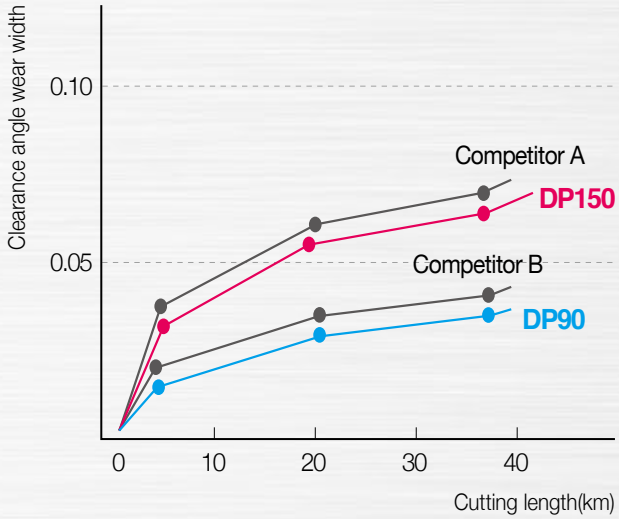
● Cutting test case

Continuous cutting test

(Work piece : Al-25%Si)

vc = 800m/min
fn = 0.1mm/rev
ap = 0.2mm, Dry

Designation : SPGN120304
Holder : FP11R

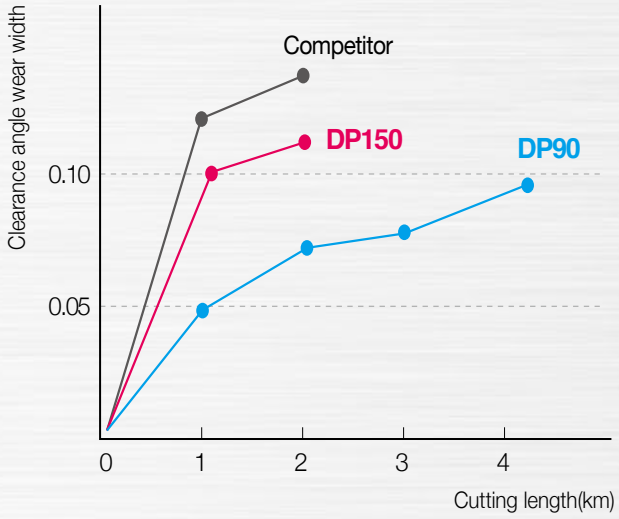


Interrupted cutting test

(Work piece : Al-20%Si)

vc = 350m/min
fn = 0.2mm/rev
ap = 0.18mm, Dry

Designation : CNMX120408
Holder : PCLNL2525

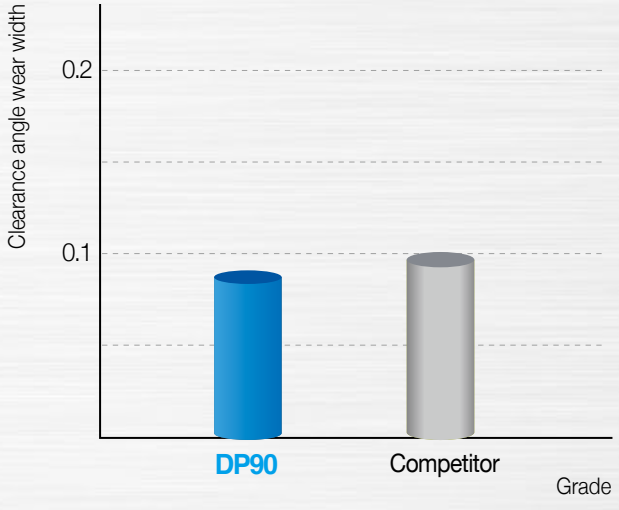


Continuous cutting test

(Work piece : Al-25%Si)

vc = 15m/min
fn = 3.7mm/rev
ap = 0.5mm, Dry

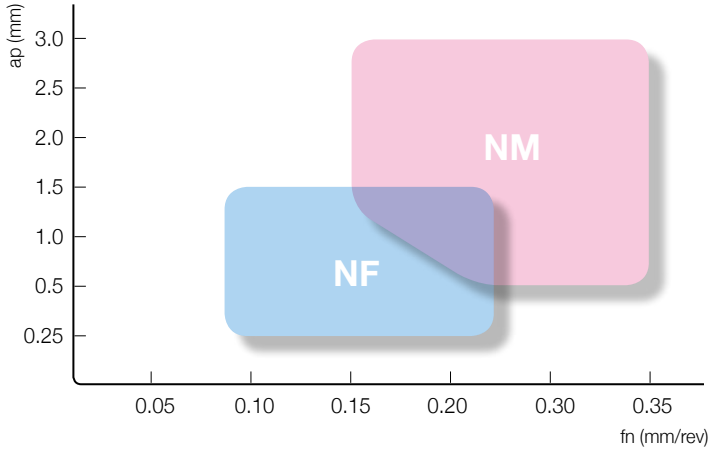
Designation : SPGN120304
Holder : FP11R

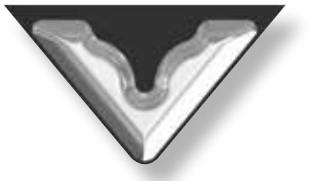


Chip breaker insert

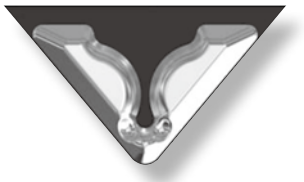
- Shorten the processing time with excellent chip elimination rate, and enhanced productivity
- Make the chip stable under high speed and high carry processing for stable process
- Enhance product quality and lower the defective ratio with excellent surface roughness and tolerance of dimension.
- With exclusive 3 dimensional chip breaker design, cutting resistance and strength of cutting blade are enhanced, which extend tool life

Chip processing area





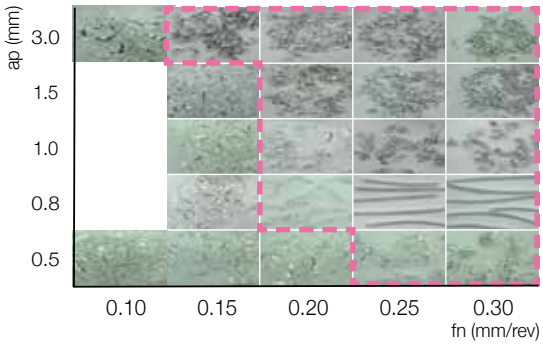
NM



NF

Chip discharge result

NM



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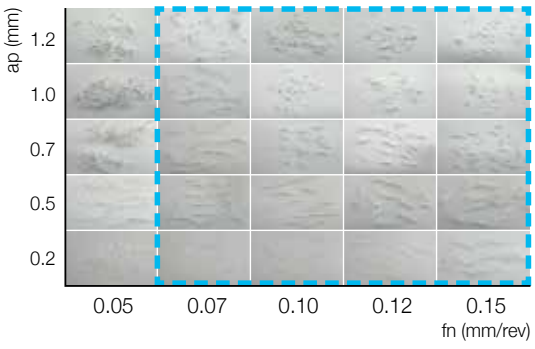
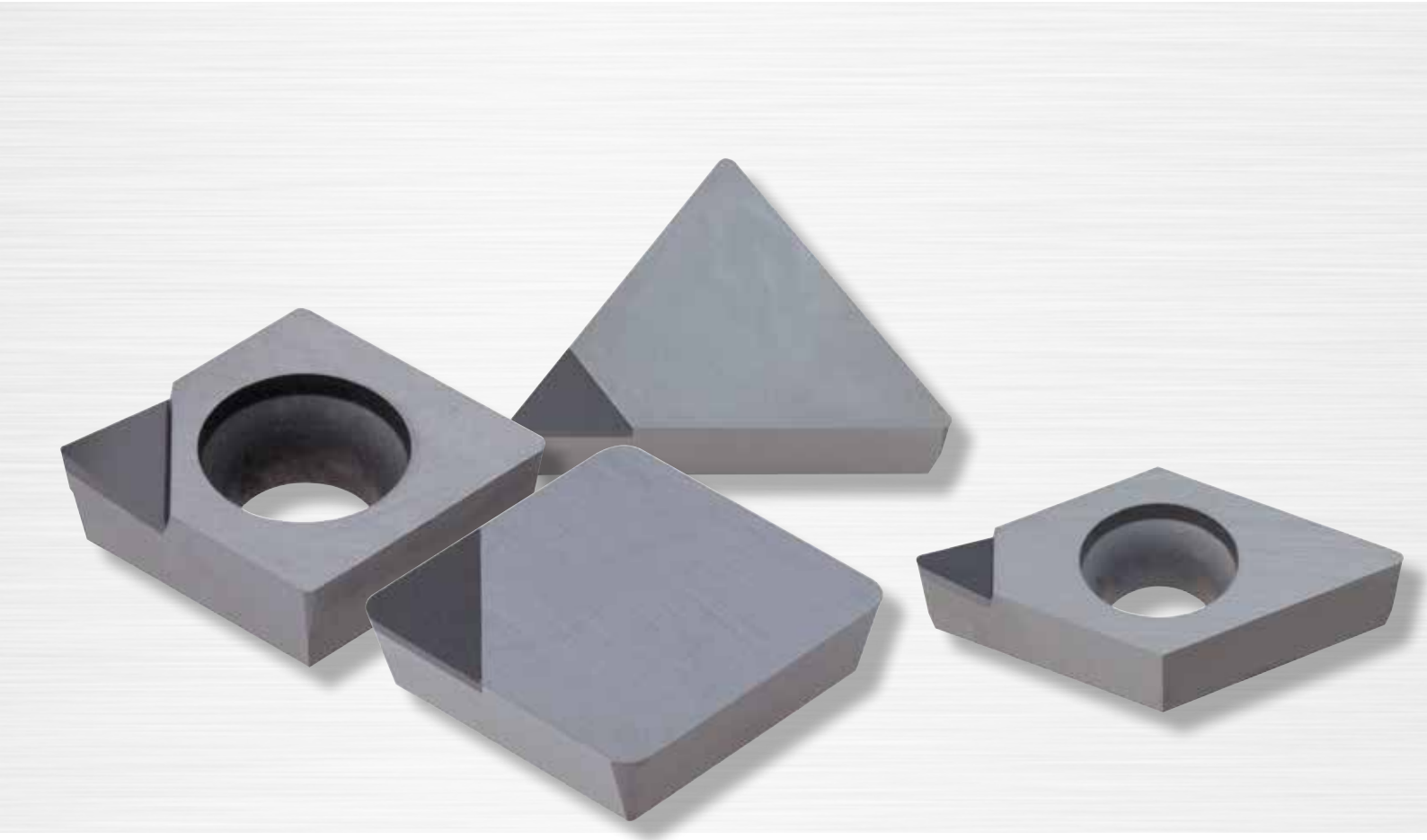


Insert / Blade

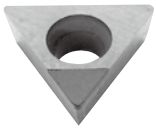
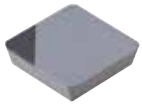
Wide machining applicability covers turning and milling on aluminum alloy and non-ferrous metals. High hardness of PCD insert/blade results in excellent wear resistance, high precision and high efficiency.



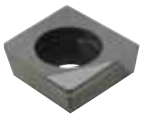
● PCD insert (Negative/Positive)

Type	Designation		Grade			Dimensions (mm)				Applicable Holder	
			DP90	DP150	DP200	Inscribed circle	Thickness	Nose R	Hole size		
CN○○ 80° Nega 	CNMM	120404		●		12.7	4.76	0.4	5.16	DCBNR/L	DCLNR/L
		120408		●		12.7	4.76	0.8	5.16	MCKNR/L	MCLNR/L
		120412				12.7	4.76	1.2	5.16	MCMNN	PCBNR/L
										PCLNR/L	
	CNMX	120404				12.7	4.76	0.4	5.16		
		120408				12.7	4.76	0.8	5.16		
		120412				12.7	4.76	1.2	5.16		
DN○○ 55° Nega 	DNMM	150404		●		12.7	4.76	0.4	5.16	DDJNR/L	MDJNR/L
		150408		●		12.7	4.76	0.8	5.16	MDNNN	MDQNR/L
		150412				12.7	4.76	1.2	5.16	MDUNR/L	PDJNR/L
										PDNNR/L	PDSNR/L
	DNMX	150404				12.7	4.76	0.4	5.16	PDUNR/L	
		150408				12.7	4.76	0.8	5.16		
		150412				12.7	4.76	1.2	5.16		
TN○○ 60° Nega 	TNMX	160404				9.525	4.76	0.4	3.81	MTENNS	MTFNR/L
		160408				9.525	4.76	0.8	3.81	MTGNR/L	MTJNR/L
		160412				9.525	4.76	1.2	3.81	PTFNR/L	PTGNR/L
										PTTNR/L	WTENN
										WTJNR/L	WTXNR/L
VN○○ 35° Nega 	VNMX	160404				9.525	4.76	0.4	3.81	MVJNR/L	
		160408				9.525	4.76	0.8	3.81	MVQNR/L	
		160412				9.525	4.76	1.2	3.81	MVUNR/L	
										MVVNN	
CC○○ CP○○ 80° Posi 	CCMT	060202		●		6.35	2.38	0.2	2.8	SCACR/L	
		060204		●		6.35	2.38	0.4	2.8	SCLCR/L	
		060208				6.35	2.38	0.8	2.8		
		09T304		●		9.525	3.97	0.4	4.4		
		09T308		●		9.525	3.97	0.8	4.4		
		09T312				9.525	3.97	1.2	4.4		
	CPMT	080204				7.94	2.38	0.4	3.4		
		080208				7.94	2.38	0.8	3.4		
		080212				7.94	2.38	1.2	3.4		
		090304				9.525	3.18	0.4	4.4		
		090308				9.525	3.18	0.8	4.4		
		090312				9.525	3.18	1.2	4.4		
DC○○ 55° Posi 	DCMT	070202		●		6.35	2.38	0.2	2.8	SDACR/L	
		070204		●		6.35	2.38	0.4	2.8	SDJCR/L	
		070208				6.35	2.38	0.8	2.8	SDNCN	
		11T302				9.525	3.97	0.2	4.4	SDQCR/L	
		11T304		●		9.525	3.97	0.4	4.4	SDUCR/L	
		11T308		●		9.525	3.97	0.8	4.4	SDZCR/L	
SC○○ SP○○ 90° Posi 	SCMT	09T304				9.525	3.97	0.4	4.4	SSBCR/L	
		09T308				9.525	3.97	0.8	4.4	SSDCN	
		09T312				9.525	3.97	1.2	4.4	SSKCR/L	
										SSSCR/L	
	SPGW	090302				9.525	3.18	0.2	4.4		
		090304				9.525	3.18	0.4	4.4		
		090308				9.525	3.18	0.8	4.4		

● PCD insert (Negative/Positive)

Type	Designation		Grade			Dimensions (mm)				Applicable Holder
			DP90	DP150	DP200	Inscribed circle	Thickness	Nose R	Hole size	
TB ○○ TC ○○ 60° Posi TP ○○	**TBGW**	060102				3.97	1.59	0.2	2.8	STUBR/L
		060104				3.97	1.59	0.4	2.8	
	TCMT	090201				5.56	2.38	0.1	2.5	STACR/L STFCR/L STFPR/L STGCR/L STTCR/L
		090202				5.56	2.38	0.2	2.5	
		090204				5.56	2.38	0.4	2.5	
		110201				6.35	2.38	0.1	2.8	
		110202				6.35	2.38	0.2	2.8	
		110204				6.35	2.38	0.4	2.8	
	TPGB	080204				4.76	2.38	0.4	2.4	
		080208				4.76	2.38	0.8	2.4	
		090204		●		5.56	2.38	0.4	2.5	
		090208		●		5.56	2.38	0.8	2.5	
		110304				6.35	3.18	0.4	3.3	
		110308				6.35	3.18	0.8	3.3	
	**TPGW**	080202				4.76	2.38	0.2	2.4	
		080204				4.76	2.38	0.4	2.4	
		090204	●			6.35	3.18	0.2	3.4	
		090208	●			6.35	3.18	0.4	3.4	
		110302				6.35	3.18	0.8	3.4	
		110304		●		9.525	4.76	0.4	3.81	
		110308		●		9.525	4.76	0.8	3.81	
		160404				-	-	-	-	
		160408				-	-	-	-	
	TPGT	110302				6.35	3.18	0.2	3.4	STFPR/L STUPR/L
		110304				6.35	3.18	0.4	3.4	
VB ○○ VC ○○ 35° Posi	**VBMT**	110302				6.35	3.18	0.2	3.4	SVABR/L SVHBR/L SVJBR/L SVQBR/L SVUBR/L
		110304		●		6.35	3.18	0.4	3.4	
		110308		●		6.35	3.18	0.8	3.4	
		160402				9.525	4.76	0.2	4.4	
		160404		●		9.525	4.76	0.4	4.4	
		160408		●		9.525	4.76	0.8	4.4	
		160412		●		9.525	4.76	1.2	4.4	
	**VCMT**	110302				6.35	3.18	0.2	3.4	SVJCR SVVCN
		110304		●		6.35	3.18	0.4	3.4	
		110308		●		6.35	3.18	0.8	3.4	
		160404		●		9.525	4.76	0.4	4.4	
		160408		●		9.525	4.76	0.8	4.4	
		160412				9.525	4.76	1.2	4.4	
TP ○○ 60° Posi	**TPGN**	090204				5.56	2.38	0.4	-	CTFPR/L CTGPR/L
		090208				5.56	2.38	0.8	-	
		110302				6.35	3.18	0.2	-	
		110304		●		6.35	3.18	0.4	-	
		110308		●		6.35	3.18	0.8	-	
		160302				9.525	3.18	0.2	-	
		160304				9.525	3.18	0.4	-	
		160308				9.525	3.18	0.8	-	
SP ○○ 90° Posi	**SPGN**	090304		●		9.525	3.18	0.4	-	CSDPN CSKPR/L
		090308				9.525	3.18	0.8	-	
		120304				12.7	3.18	0.4	-	
		120308				12.7	3.18	0.8	-	

● PCD milling insert

Type	Designation		Grade			Dimensions (mm)				Applicable Holder
			DP90	DP150	DP200	length	Width	Thickness	Hole size	
	**CDEW**	1204R-XAF			●	12.7	4.76	-	4.4	APD(M)
		1204L-XAF			●	12.7	4.76	-	4.4	APD(M)
		1204R-NAF			●	12.7	4.76	-	4.4	APD(M)
		1204L-NAF			●	12.7	4.76	-	4.4	APD(M)
		1204R-XAW			●	12.7	4.76	-	4.4	APD(M)
		1204L-XAW			●	12.7	4.76	-	4.4	APD(M)
		1204R-NAW			●	12.7	4.76	-	4.4	APD(M)
		1204L-NAW			●	12.7	4.76	-	4.4	APD(M)
	**SNEW**	09T3ADTR-XAF			●	9.525	3.97	-	4.4	MAPD(M)
		09T3ADTR-NAF			●	9.525	3.97	-	4.4	MAPD(M)
		09T3ADTR-XAW			●	9.525	3.97	-	4.4	MAPD(M)
		09T3ADTR-NAW			●	9.525	3.97	-	4.4	MAPD(M)

● PCD blade

Type	Designation	Grade			Dimensions (mm)				Applicable Holder
		DP90	DP150	DP200	length	Width	Thickness	Hole size	
	BAMPR–XAF		●		25.5	10.5	7	6.7	APD(M)-PB
	BAMPR–XAW		●		25.5	10	7	6.7	APD(M)-PB
	BAMPR–XAWR		●		25.5	10	7	6.7	APD(M)-PB
	BKMPMR–XAF		●		30	13.5	10	6.4	KMP(M)
	BKMPMR–XAWR		●		30	13	10	6.4	KMP(M)

Aero Mill Series

Aero Mill mini

Aero Mill

Aero Mill plus

KMP

● Aero Mill mini

- Availability of PCD as well as carbide inserts
- Maximum adjustment range ±0.1mm, in 2㎛ as a fine control unit
- Through coolant system
- Simplified cutter structure
- Wide chip pocket area for aluminum alloy finishing and roughing
- Balance level reachable with a balancing screw : G2.5

● Aero Mill

- Milling tool for finishing aluminum alloy with an adjustable cutting height
- PCD and carbide inserts available
- Chip cover design for higher durability and better chip evacuation.
- Cutter body made of aluminum alloy for high speed machining
- Balance level reachable with a balancing screw : G2.5

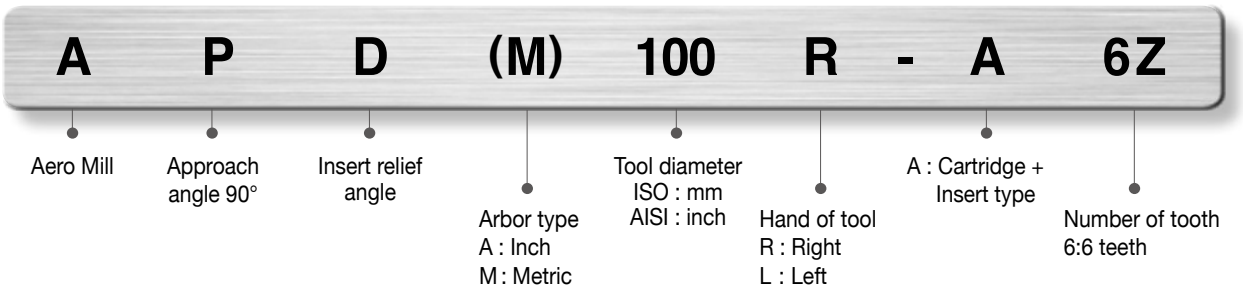
● Aero Mill plus

- Blade type simple cutter geometry without a chip cover enabling diverse number of cutting edges
- Direct coolant injection onto the blade increasing tool life
- Simple clamping system with a spanner adjustment system improving fine control(1㎛) and shortening setting time by 50%, compared to existing 5 edges type cutters
- Exclusive lightweight coolant bolts reducing the cutter weight by 30%, compared to existing Ø125 cutters

Specification	Aero Mill Mini	Aero Mill	Aero Mill Plus
Cutter diameter	Ø32 ~ Ø63	Ø80 ~ Ø315	Ø80 ~ Ø315
Applicable inserts	PCD and carbide inserts	PCD and carbide inserts	PCD blades
Structure	Steel body and inserts	Aluminum body and inserts	Aluminum body and blades
Through coolant	Direct injection onto the edge	Central injection	Direct injection onto the edge
Application	Roughing and finishing	Roughing and finishing	Medium cutting to finishing
Max. rpm	26,000 (for Ø32)	16,000 (for Ø80)	16,000 (for Ø80)

Aero Mill

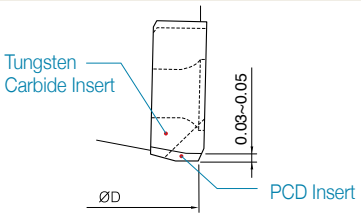
● Code System



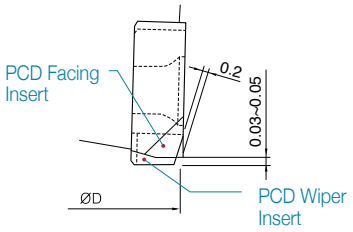
● Coolant parts

Diameter(mm)	Type	Designation	Shape	Note
Ø80	Coolant Bolt	CBP080-IN/MM		Extra charge
Ø100		CBP100-IN		
		CBP100-MM-1		
Ø125		CBP125-IN		
		CBP125-MM-1		
Ø160		CBP160-IN		
		CBP160-MM		
Ø200	Coolant Cover	CCP200		
Ø250		CCP250		
Ø315		CCP315		

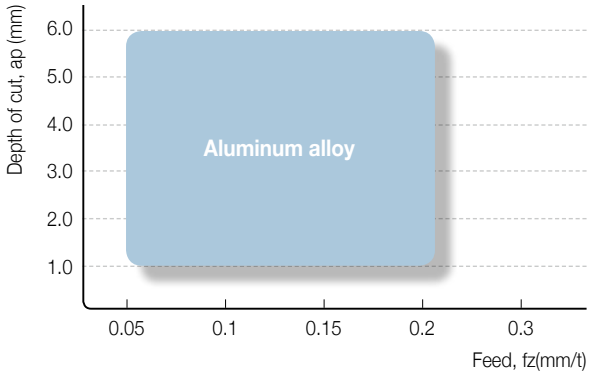
Tungsten Carbide, PCD Insert



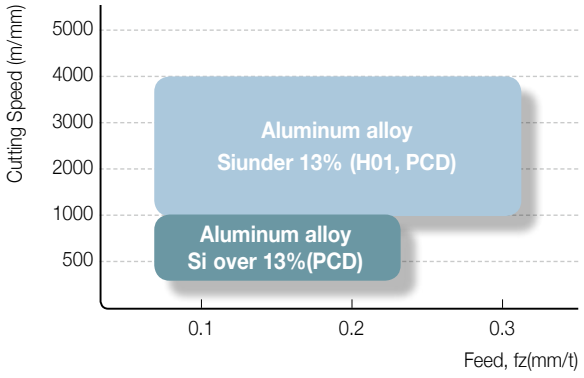
PCD Facing, PCD Wiper Insert



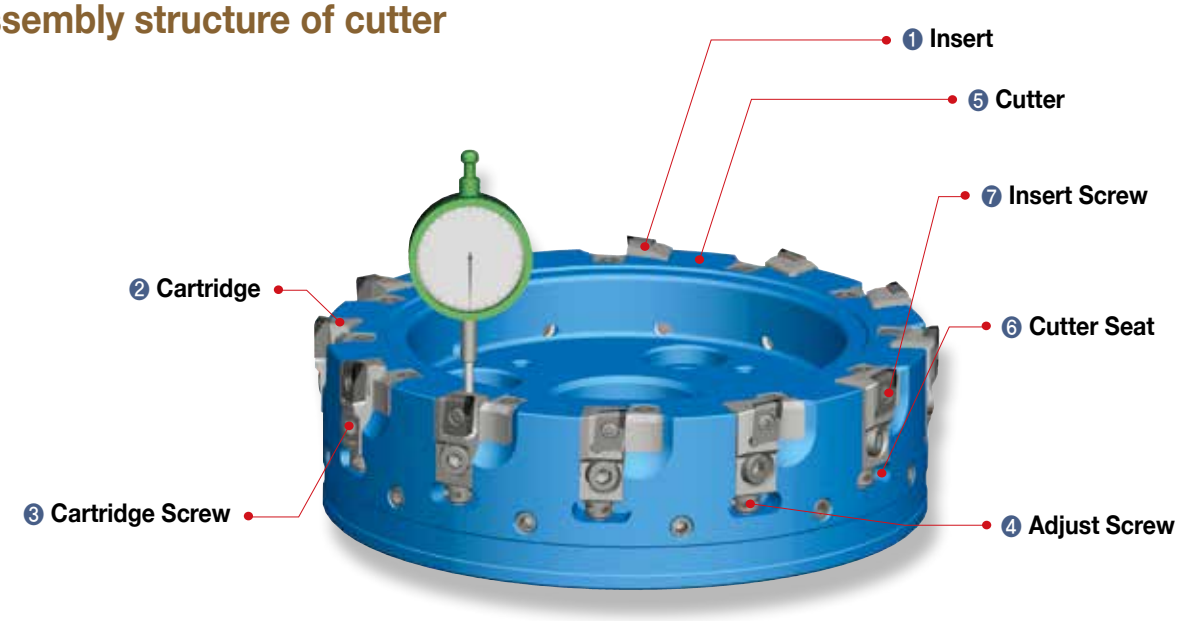
● Application range



● Recommended cutting condition

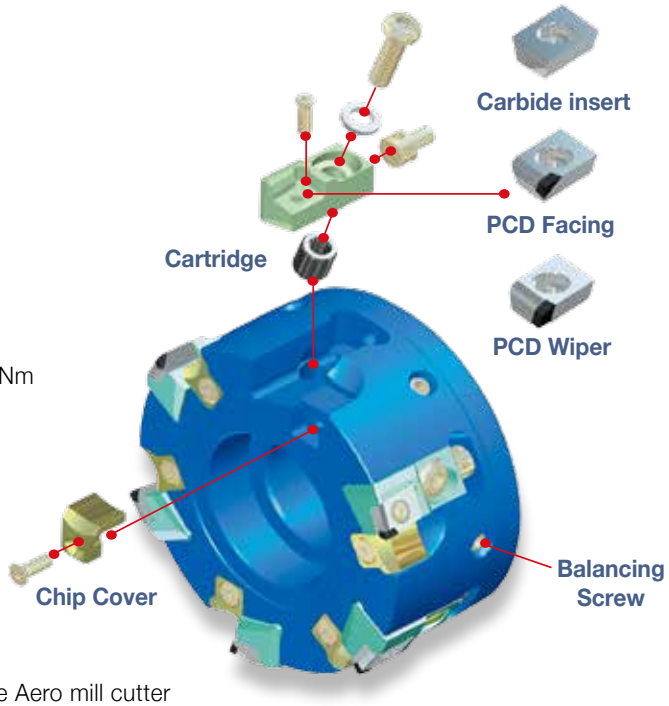


Assembly structure of cutter



How to assemble the Aero mill

1. Place ④Adjust screw in ⑥Cutter Seat
2. Insert ②Cartridge to ④Adjust screw in ⑥Cutter Seat
3. Insert ③Cartridge screw and joint right direction by 10Nm
4. Place Insert on the Cartridge and joint them together by 5Nm
5. Disassembly is performed in reverse order of the assembly



How to adjust run-out of the Aero mill

1. Clean the measuring instrument and set the position of the Aero mill cutter
2. Release ③Cartridge screw first, then joint slightly by 2Nm
3. Rotate the ④Adjust screw right direction and adjust it up to 5㎛ (dial gage)
4. Joint ③Cartridge screw tightly by 10Nm
5. Adjust it to the zero tolerance by rotating ④Adjust screw to the right direction

※ When you rotate ④Adjust screw to the right direction, inserts move to upper direction

CAUTION

1. Please use OHP film to protect PCD insert and blade when you adjust tolerance.It can cause chipping during adjusting run-out

2. Please rotate the adjust screw to right direction only. When you exceed zero tolerance, should release cartridge screw first and rotate adjust screw to left direction, then rotate it to right and adjust again

Cutting test case

Cylinder Head

(Aluminum alloy AC4CH-HB)

vc = 3.534m/min
fn = 0.16mm/t
ap = 3.5mm,Wet,Roughing

vc = 3.926m/min
fn = 0.33mm/t
ap = 3.5mm,Wet,Finishing

Cutter : CDEW1204R-XAF(6Z), CDEW1204R-XAW(2Z) APDM125R-A8Z (8Flutes)
Test result: Rmax(Rz)㎛ = 2.40(1.41), roughing / Rmax(Rz)㎛ = 1.73(1.47), finishing

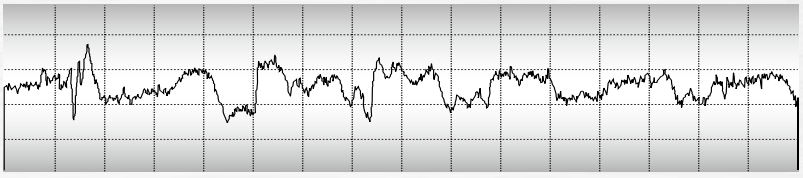
Surface Finish

(Aluminum alloy A6061)

vc = 1.570m/min
fz = 0.1mm/t
ap = 0.5mm,Wet

vf = 3.000m/min
s = 5,000rpm
machine = PCV620

Cutter : APD100R-A6Z (6Flutes)
Insert : CDEW1204R-XCF(H01)



- Rmax : 2.1㎛
- Rz : 1.6㎛
- Ra : 0.3㎛

APD(M) - A

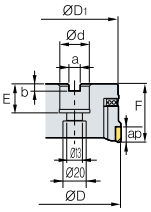


Fig. 1

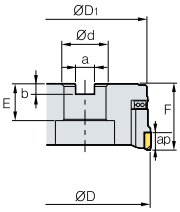


Fig. 2

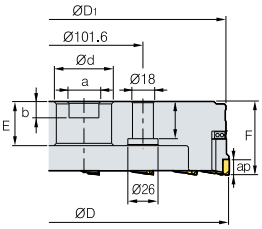


Fig. 3

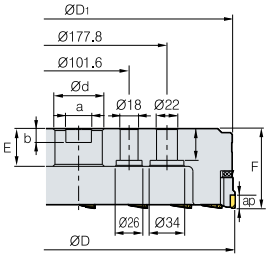


Fig. 4

(mm)

Designation			ØD	ØD1	Ød	a	b	E	F	ap	Max rpm	kg	Fig.
APD(M)	080R/L-A6Z	6	80	76	25.4(27)	9.5(12.4)	6(7)	25(22)	50	10	16000	0.75	1
	100R/L-A6Z	6	100	95	31.75(32)	12.7(14.4)	8(8)	32(28)	50	10	15000	0.95	2
	125R/L-A8Z	8	125	120	38.1(40)	15.9(16.4)	10(9)	38(30)	63	10	12500	1.8	2
	160R/L-A10Z	10	160	155	50.8(40)	19.0(16.4)	11(9)	38(30)	63	10	10000	2.9	2
	200R/L-A12Z	12	200	195	47.625(60)	25.4(25.7)	14(14)	38(38)	63	10	8000	4.0	3
	250R/L-A16Z	16	250	245	47.625(60)	25.4(25.7)	14(14)	38(38)	63	10	6500	6.3	3
	315R/L-A18Z	18	315	310	47.625(60)	25.4(25.7)	14(14)	38(38)	80	10	5000	11.3	4

( )Metric Size

● Available Inserts

CDEW-XCF

CDEW-XAF,NAF

CDEW-XAW,NAW

Designation	Use	Uncoated	PCD		Application range	
		H01	DP150	DP200	Finish machining	Rough machining
CDEW1204R/L-XCF	Facing	●			△	◎
CDEW1204R/L-XAF / NAF	Facing			●	◎	○
CDEW1204R/L-XAW / NAW	Wiper			●	◎	x

◎ : Optimum, ○ : Suitable, △ : Available, x : Not applicable

● Available Arbors

Designation	General Arbor	NC Arbors
APD(M)080R/L-A6Z	NT*□□-(M/U)-FMA25.4-25	BT**□□-FMA25.4-□□
APD(M)100R/L-A6Z	NT*□□-(M/U)-FMA31.75-□□	BT**□□-FMA31.75-□□
APD(M)125R/L-A8Z	NT*□□-(M/U)-FMA38.1-□□	BT**□□-FMA38.1-□□
APD(M)160R/L-A10Z	NT*□□-(M/U)-FMA50.8-□□	BT**□□-FMA50.8-□□
APD(M)200R/L-A12Z	NT*□□-(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□
APD(M)250R/L-A16Z	NT*□□-(M/U)-FMA47.625-25, KCP-8***	BT**□□-FMA47.625-□□
APD(M)315R/L-A18Z	NT*□□-KCP-8***8***(Center Ring Plug)	-

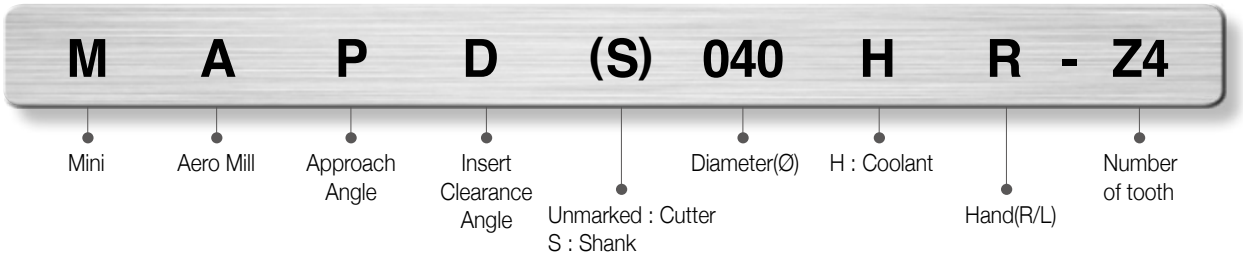
*□□-NT Number **□□-BT Number ***Over Milling 5

● Parts

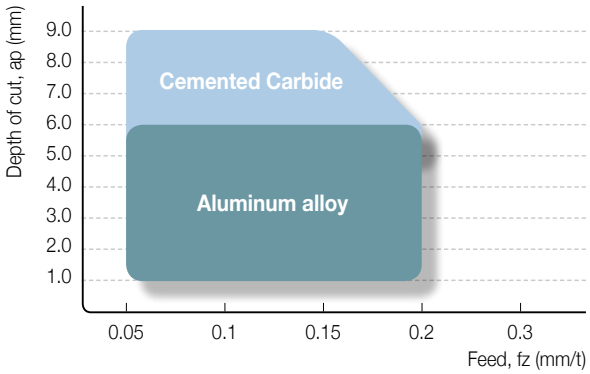
Cartridge	Chip cover	Chip cover Screw	Insert Screw	Adjust Screw	Cartridge Screw	Wrench for Insert	Wrench for Cartridge
							
LAPDR/L-AJ	CAPDR/L-AJ	PTMA0411	FTNA0411	AZ0514	BHA0619-NYLOK	TW15S	HW50

Aero Mill Mini

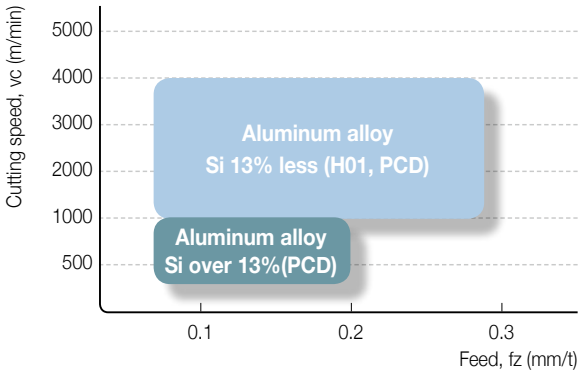
Code System



Application range



Recommended cutting condition



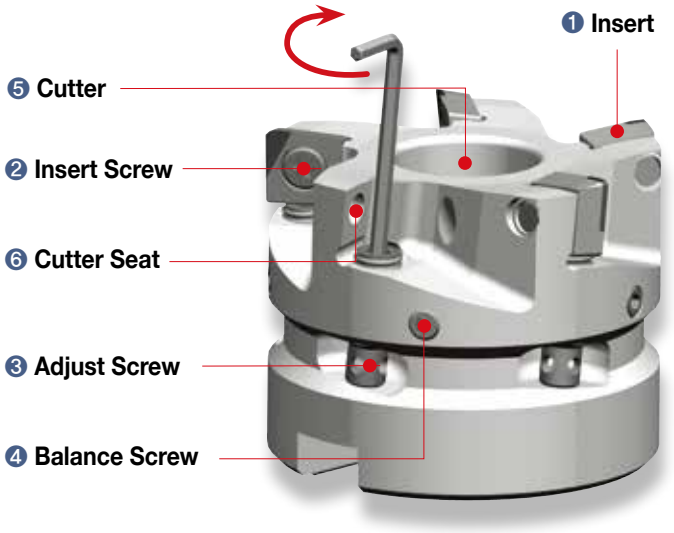
Application range

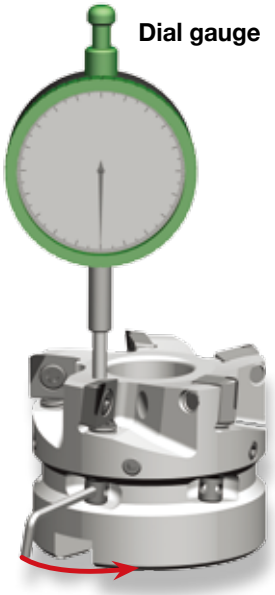
Diameter(mm)	Max. revolution (rpm)
Ø32	26,000
Ø40	24,500
Ø50	22,000
Ø63	20,000

Coolant bolt – sold separately

Coolant bolt code	Designation	Available cutter(Ø)
CB0525	MAPD040HR/L-Z4	Ø40
CB1025	MAPD050HR/L-Z5	Ø50
	MAPD063HR/L-Z6	Ø63

Assembly structure of cutter



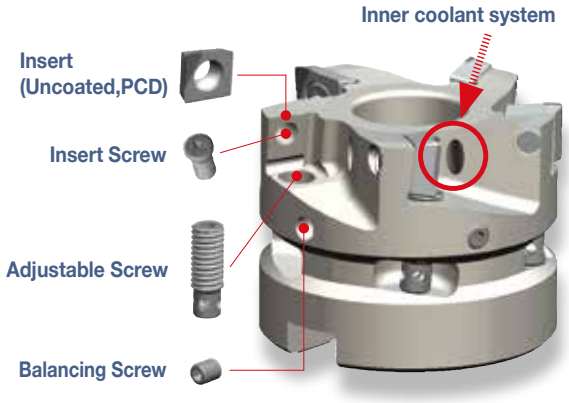


How to assemble the Aero mill mini

1. Use an HW20L wrench at a ⑥Cutter Seat so that the bottom part of an ③Adjust Screw should be very close to the cutter body

2. After clamping the ③Adjust Screw, mount an ①Insert on the ⑥Cutter Seat, tightening the adjacent ②Insert Screw. Repeat this with remaining inserts.

3. Assembly should be done in reverse order



How to adjust run-out of the Aero mill mini

1. Make air blows onto measuring apparatus and ⑥Cutter Seats to remove dust

2. Use an HW20L wrench to make ③Adjust Screws be close to the bottom. After that, mount individual ①Insert on each ⑥Cutter Seat, tightening an adjacent ②Insert Screw in torque of 2Nm.

3. Tight the ③Adjust Screws clockwise to reach the first numerical target. — The final target should be between -2㎛ and -3㎛.

4. Following reaching the first numerical target, completely clamp ②Insert Screws in torque of 5Nm.

5. Tight the ③Adjust Screws clockwise to reach the final numerical target of between -2㎛ and -3㎛.
※ Inserts might be floating when turning the adjust screw clockwise

6. In case of exceeding the final numerical target, repeat this process from No.2. Otherwise certain changes on cutting edges could be caused.

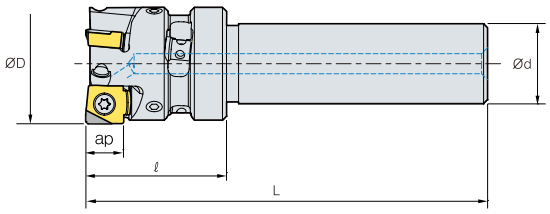
CAUTION

1. Please be advised that chipping can be caused on cutting edges when using the dial gauge to adjust mounted inserts. It is highly recommended to using a piece of protective films like cellophane paper or OHP.

2. The maximum adjustment should be made within ±0.1. Too much adjusting might damage ②Insert Screws.

3. ②Insert Screws are prone to be damaged by stress concentration. Please replace them with new ones every six month.

MAPDS HR/L-Z

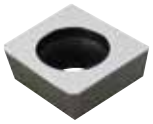


(mm)

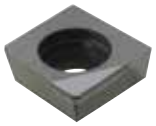
Designation			ØD	Ød	ℓ	L	ap	Max rpm	kg
MAPDS	032HR/L-Z3	3	32	20	35	100	9.5	26,000	0.35
	040HR/L-Z4	4	40	20	35	100	9.5	24,500	0.42

● Available Inserts

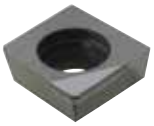
SNEW



SNEW-XAF



SNEW-NAF (Strengthened Edge)



Designation	Uncoated	PCD	
	H01	DP150	DP200
SNEW 09T3ADFR	●		
SNEW 09T3ADTR-XAF			●
SNEW 09T3ADTR-NAF			●

● Available Arbors

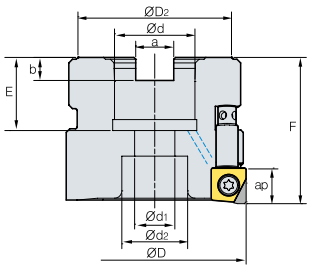
Designation	NC Arbors
MAPD040HR/L-Z4	BT**□□-FMC16-□□
MAPD050HR/L-Z5	BT**□□-FMC22-□□
MAPD063HR/L-Z6	BT**□□-FMC22-□□

● Parts

Insert Screw	Adjust Screw	Balance Screw	Wrench for Insert	Adjust Wrench
				
FTKA0408	AHX0617F·NYLOK	KHD0405	TW15S	HW20L

MAPD HR/L-Z

AA
90°

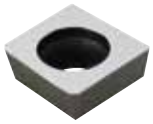


(mm)

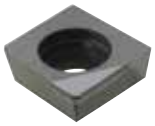
Designation			ØD	ØD2	Ød	a	b	E	F	Ød1	Ød2	ap	Max rpm	kg
MAPD	040HR/L-Z4	4	40	34	16	8.4	5.6	18	40	9	14	9.5	24,000	0.24
	050HR/L-Z5	5	50	42	22	10.4	6.3	20	40	11	18	9.5	22,000	0.35
	063HR/L-Z6	6	63	42	22	10.4	6.3	20	40	11	18	9.5	20,000	0.65

● Available Inserts

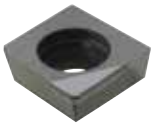
SNEW



SNEW-XAF



SNEW-NAF (Strengthened Edge)



Designation	Uncoated	PCD	
	H01	DP150	DP200
SNEW 09T3ADFR	●		
SNEW 09T3ADTR-XAF			●
SNEW 09T3ADTR-NAF			●

● Available Arbors

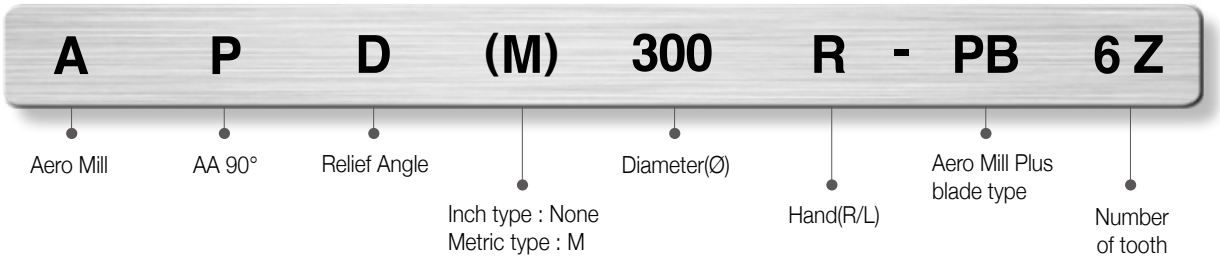
Designation	NC Arbors
MAPD040HR/L-Z4	BT**□□-FMC16-□□
MAPD050HR/L-Z5	BT**□□-FMC22-□□
MAPD063HR/L-Z6	BT**□□-FMC22-□□

● Parts

Insert Screw	Adjust Screw	Balance Screw	Wrench for Insert	Adjust Wrench
				
FTKA0408	AHX0617F·NYLOK	KHD0405	TW15S	HW20L

Aero Mill Plus

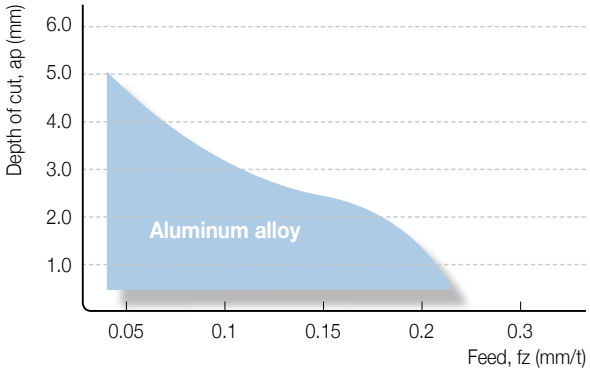
Code System



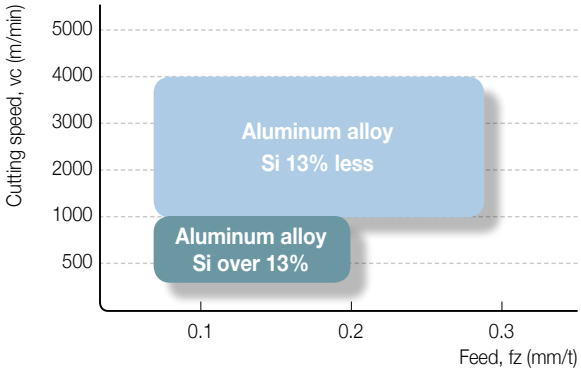
Coolant parts

Diameter(mm)	Type	inch / mm	Designation	Shape	Material	Note
Ø80	Coolant bolt	inch, mm	CB12-AMP80		Steel	Included
Ø100		inch	CB16-AMP100			
		mm	CB16-AMP100M			
Ø125		inch	CB20-AMP125			
		mm	CB20-AMP125M			
Ø160		inch	CB24-AMP160			
		mm	CB20-AMP125M			
Ø200	Coolant cover	inch, mm	CCV-AMP200		Aluminum	Extra charge
Ø250			CCV-AMP250			
Ø315			CCV-AMP315			

Application range



Recommended cutting speed

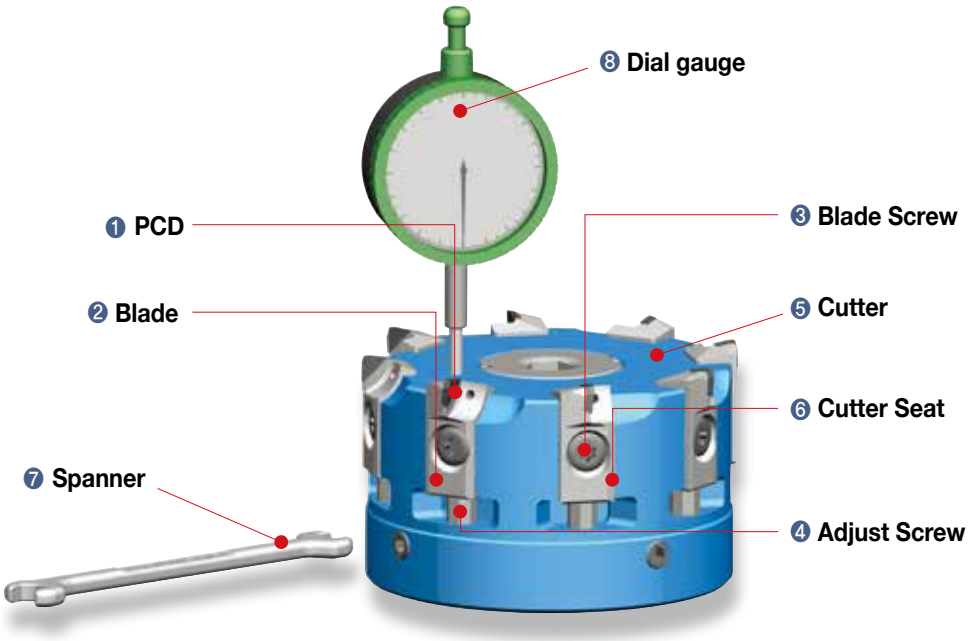


Max. RPM

Diameter (mm)	Max. revolution (rpm)
Ø80	20,000
Ø100	18,000
Ø125	16,000
Ø160	13,000

Diameter (mm)	Max. revolution (rpm)
Ø200	10,000
Ø250	8,000
Ø315	7,000

Assembly structure of cutter



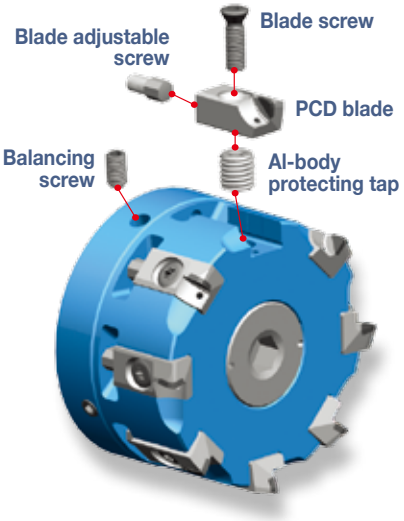
How to Assemble the Aero Mill Plus

1. Place ④Adjust screw in ⑥Cutter Seat

2. Insert ②Blade to ④Adjust screw in ⑥Cutter Seat
(Fasten vertically, since screwing horizontally is not possible)

3. Place ④Adjust screw in ⑥Cutter Seat

4. Disassembly is performed in reverse order of the assembly



How to Adjust the Run-out on the Aero Mill Plus

1. Clean the measuring instrument and set the position of the Aero-Mill cutter

2. Release ③Blade screw first, then joint slightly by 2Nm

3. Rotate the ④Adjust screw right direction and adjust it up to -20μ (dial gage)

4. Joint ③Blade screw tightly by 10Nm

5. Adjust it to the zero tolerance by rotating ④Adjust screw to the right direction

※ When you rotate ④Adjust screw to the right direction, blades move to upper direction

CAUTION

1. Please use OHP film to protect PCD blade when you adjust tolerance. It can cause chipping during adjusting run-out

2. Please rotate the adjust screw to right direction only.
When you exceed zero tolerance, should release cartridge screw first and rotate adjust screw to left direction, then rotate it to right and adjust again

● Cutting test case

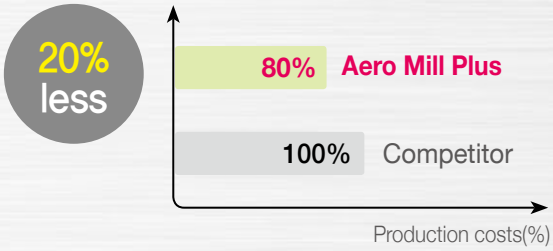
Ladder Frame

(Aluminum alloy ADC12)

vc = 2.356m/min
fn = 0.042mm/min
ap = 0.039(Main side)
0.157(Projecting part)

wet (Internal and external coolant)

Tools : PCD Blade BAMPR-XAF
Cutter APDM125R-PB10Z (10flute)



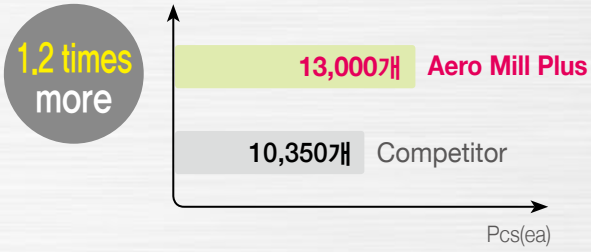
Timing Cover

(Aluminum alloy ADC12)

vc = 1.760m/min
fz = 0.052mm/min
ap = 0.039(Main side)
0.157(Projecting part)

wet (through coolant)

Tools : PCD Blade BAMPR-XAF
Cutter APDM080R-PB5Z (5flute)



APD(M) - PB

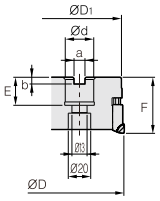


Fig. 1

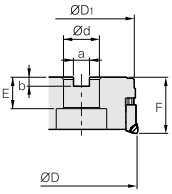


Fig. 2

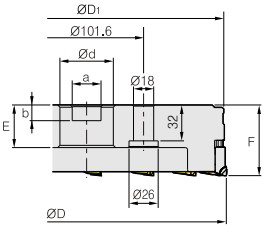


Fig. 3

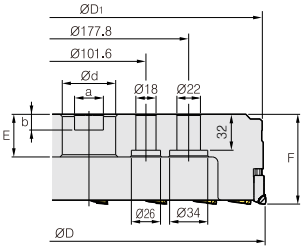


Fig. 4

(mm)

Designation		⊚	Max	ØD	ØD1	Ød	a	b	E	F	ap	kg	Fig.
APD(M)-PB	080R/L-PB6Z	6	10	80	77	25.4(27)	9.5(12.4)	6(7)	23.5	50	5	0.55	1
	080R/L-PB8Z	8	10	80	77	25.4(27)	9.5(12.4)	6(7)	23.5	50	5	0.55	1
	100R/L-PB6Z	6	12	100	97	31.75(32)	12.7(14.4)	8	34(32)	50	5	0.92	2
	100R/L-PB8Z	8	12	100	97	31.75(32)	12.7(14.4)	8	34(32)	50	5	0.92	2
	125R/L-PB8Z	8	14	125	122	38.1(40)	15.9(16.4)	10(9)	40(35)	63	5	1.9	2
	125R/L-PB10Z	10	14	125	122	38.1(40)	15.9(16.4)	10(9)	40(35)	63	5	1.9	2
	160R/L-PB10Z	10	20	160	157	50.8(40)	19.0(16.4)	11(9)	41(35)	63	5	3.3	2
	160R/L-PB12Z	12	20	160	157	50.8(40)	19.0(16.4)	11(9)	41(35)	63	5	3.3	2
	200R/L-PB12Z	12	26	200	197	47.625(60)	25.4(25.7)	14	40	63	5	4.0	3
	250R/L-PB16Z	16	32	250	247	47.625(60)	25.4(25.7)	14	40	63	5	6.5	3
	315R/L-PB18Z	18	42	315	312	47.625(60)	25.4(25.7)	14	40	63	5	11.3	4

( )Metric Size

Available Inserts

BAMPR-XAF

BAMPR-XAW

BAMPR-XAWR

Designation	Application	PCD	Application range	
		DP150	Finish machining	Rough machining
BAMPR-XAF	Facing	●	△	○
BAMPR-XAW	Wiper (Flat)	●	○	x
BAMPR-XAWR	Wiper (Radius)	●	○	x

○ : Suitable, △ : Available, X : Not applicable

Available Arbors

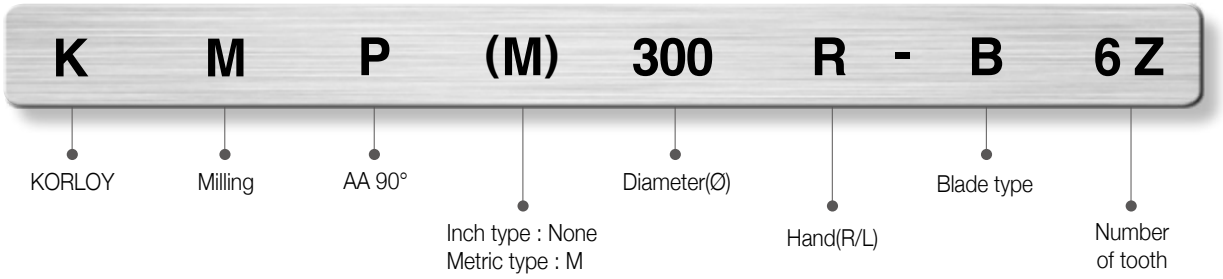
Designation	NC Arbors
APD(M)080R/L-PB□□Z	BT□□-FMA25.4(FMC27)-□□
APD(M)100R/L-PB□□Z	BT□□-FMA31.75(FMC32)-□□
APD(M)125R/L-PB□□Z	BT□□-FMA38.1(FMB40)-□□
APD(M)160R/L-PB□□Z	BT□□-FMA50.8(FMB/FMC40)-□□
APD(M)200R/L-PB□□Z	BT□□-FMA47.625(FMB60)-□□
APD(M)250R/L-PB□□Z	
APD(M)315R/L-PB□□Z	

Parts

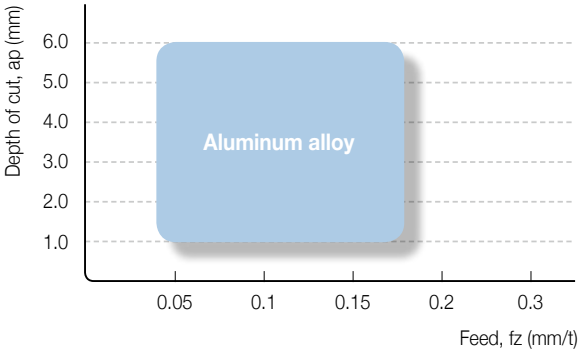
Blade screw	Blade adjustable screw	Al-body protecting tap	Balancing screw	Wrench for insert	Wrench for cartridge
					
ETKA0620	AZ0514-SPN6	UZD1010	KHE0610	SPN-6	TW25-100

KMP(M)

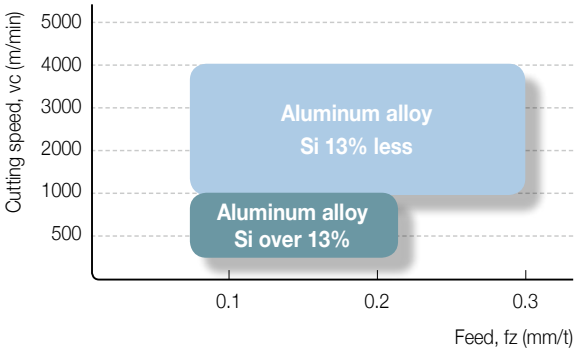
Code System



Application Range



Recommended Cutting Speed

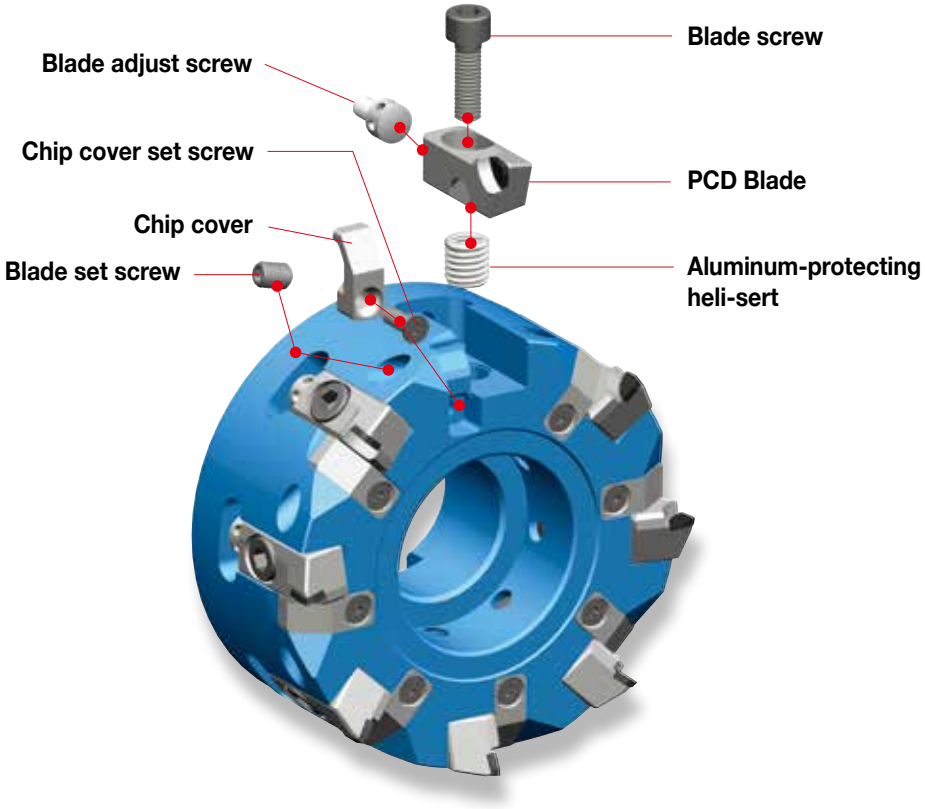


Max. RPM

Diameter (mm)	Max. revolution (rpm)
Ø80	20,000
Ø100	18,000
Ø125	16,000
Ø160	13,000

Diameter (mm)	Max. revolution (rpm)
Ø200	10,000
Ø250	8,000
Ø315	7,000

Assembly structure of cutter



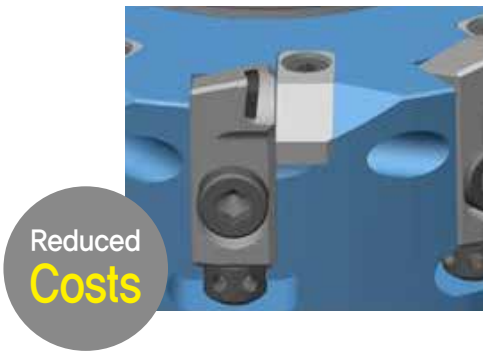
Features

1. The lightweight body of aluminum alloy keeps the main spindle from having overload in high speed machining.

2. The cutter specifically designed for PCD blades has now increased number of corners. Special aluminum alloy of which material property has high toughness was employed to provide strong cutting performance.

3. Wide chip pocket areas are applicable for finishing or roughing aluminum alloy.

4. Cutter damage problem has been solved by the use of chip covers in high speed machining.



Steel body chip cover

- Protects aluminum body
- Saves maintenance costs due to the replaceable cover

Light coolant bolt

- Exclusive light coolant bolt
- Tool weight 30% save

Milling Cutter
KMP(M)

KMP(M)

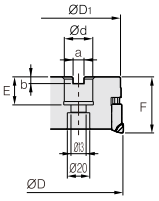


Fig. 1

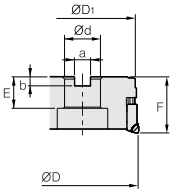


Fig. 2

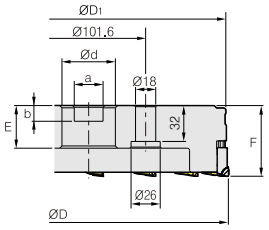


Fig. 3

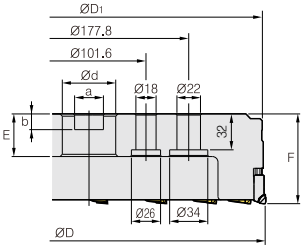


Fig. 4

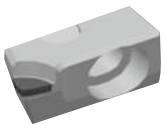
(mm)

Designation		⊚	Max	ØD	ØD1	Ød	a	b	E	F	ap	Max rpm	kg	Fig.
KMP(M)	080R/L-B6Z	6	8	80	76	25.4(27)	9.5(12.4)	6(7)	25(22)	50	5	25000	0.75	1
	100R/L-B8Z	8	10	100	95	31.75(32)	12.7(14.4)	8	32(28)	50	5	21000	0.95	2
	125R/L-B10Z	10	12	125	120	38.1(40)	15.9(16.4)	10(9)	38(30)	63	5	18000	1.8	2
	160R/L-B12Z	12	18	160	155	50.8(40)	19.0(16.4)	11(9)	38(30)	63	5	14500	2.9	2
	200R/L-B12Z	12	24	200	195	47.625(60)	25.4(25.7)	14	38	63	5	12000	4.0	3
	250R/L-B15Z	15	30	250	245	47.625(60)	25.4(25.7)	14	38	63	5	9000	6.3	3
	315R/L-B18Z	18	38	315	310	47.625(60)	25.4(25.7)	14	38	80	5	7000	11.3	4

( )Metric Size

● Available Inserts

BKMPMR-XAF



BKMPMR-XAWR

Designation	Application	PCD	Application range	
		DP150	Finish machining	Rough machining
BKMPMR-XAF	Facing	●	△	○
BKMPMR-XAWR	Wiper (Radius)	●	○	x

○ : Suitable, △ : Available, X : Not applicable

● Available Arbors

Designation	NC Arbors
KMP(M)080R/L-B6Z	BT□□-FMA25.4(FMC27)-□□
KMP(M)100R/L-B8Z	BT□□-FMA31.75(FMC32)-□□
KMP(M)125R/L-B10Z	BT□□-FMA38.1(FMB40)-□□
KMP(M)160R/L-B12Z	BT□□-FMA50.8(FMB/FMC40)-□□
KMP(M)200R/L-B12Z	BT□□-FMA47.625(FMB60)-□□
KMP(M)250R/L-B15Z	
KMP(M)315R/L-B18Z	

● Parts

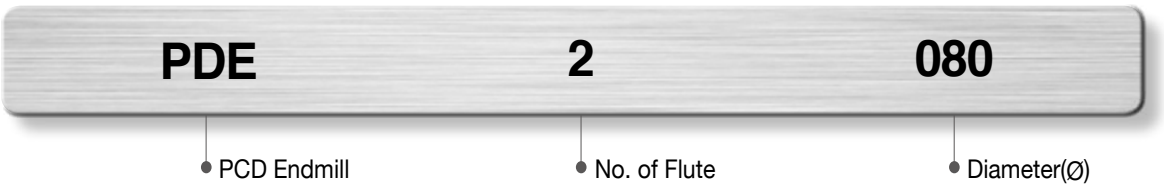
Chip cover	Chip cover Screw	Adjust Screw	Balancing screw	Balancing screw	Wrench for insert	Wrench for cartridge
						
CKMPMR/L-MP	PTMA0411	AZ0514	BHA0619-NYLOK	KHE0610	HW30L	HW50

Endmill

KORLOY PCD Endmills guarantee long tool life and high productivity by shortening overall cycle time with diamond edge application

- High rake angle insert reducing burr creation
- High speed and high efficiency machining
- Improved surface finish
- Ideally suited for finishing non ferrous metals and machining reinforced plastics

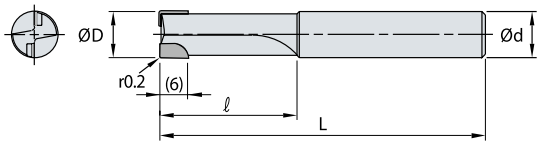
Code System



Recommended Cutting Condition

Work piece	vc(m/min)	rpm	fz(mm/t)
Aluminum Alloy, Copper	30 ~ 300	2,000 ~ 12,000	0.02 ~ 0.07
Reinforced Plastic	35 ~ 300	2,800 ~ 16,000	0.04 ~ 0.12
Carbon steel, Graphite	10 ~ 100	5,300 ~ 16,000	0.04 ~ 0.2

PDE1000/2000



(mm)

Designation			ØD	Ød	ℓ	L
PDE	1	**1040**	4	6	15	45
		1050	5	6	15	50
		1060	6	6	20	60
	2	**2060**	6	8	20	60
		2070	7	8	20	60
		2080	8	8	20	60
		2090	9	10	25	70
		2100	10	10	25	70
		2120	12	12	25	75

Drill

KORLOY PCD drill guarantees excellent cutting performance and tool life in aluminum alloy machining with full or partial diamond application on the tip

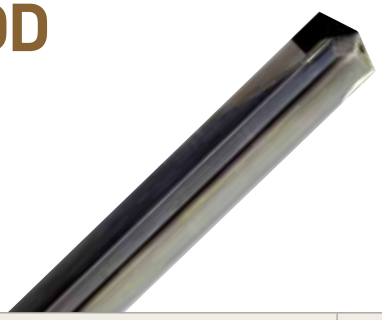
- Improved surface roughness and hole tolerance
- High precision hole making tool ideally suited for aerospace components or composite materials
- Hole making capability complying with the demanding IT tolerance level 7~8
- Longer tool life and higher productivity
- Stepped drill design for a sharp cut with lower cycle time

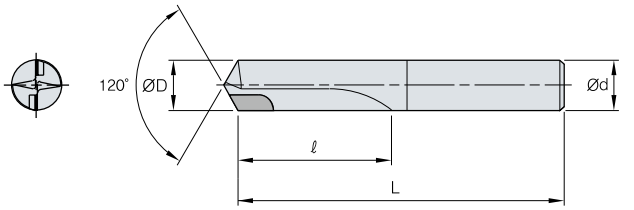
Code System

Recommended Cutting Condition

Work piece	vc(m/min)	fz(mm/t)
Aluminum Alloy	50 ~ 250	0.05 ~ 0.20 / 0.10 ~ 0.40

PDD





(mm)

Designation		ØD	Ød	ℓ	L
PDD	**0500**	5.0	5.0	30	80
	0550	5.5	5.5	30	80
	0600	6.0	6.0	30	80
	0650	6.5	6.5	40	95
	0700	7.0	7.0	40	95
	0750	7.5	7.5	45	100
	0800	8.0	8.0	45	100
	0850	8.5	8.5	50	110
	0900	9.0	9.0	50	110
	0950	9.5	9.5	55	115
	1000	10.0	10.0	55	115
	1050	10.5	10.5	60	120
	1100	11.0	11.0	60	120
	1150	11.5	11.5	65	125
	1200	12.0	12.0	65	125

Reamer

KORLOY's PCD Reamer guarantees excellent surface finish
and high accuracy for economical machining

- Using PCD tools significantly improves tool life (10 times longer than the carbide type)
- Excellent surface finish and high accuracy with small margins of error
- High cutting angle shortens cutting time and increases productivity
- Custom tools provided in various forms according to our customers' cutting environment
- Multi-stage geometry integrated with copying form enables the possibility of machining multiple holes at once
- Ability to produce clean unburned surfaces at cutting speeds over 300m/min
- Stable machining even with water-soluble emulsion type cutting fluid

Specifications	PCD Reamer	Carbide Reamer
Cutting speed, vc(m/min)	**120**	120
Feed rate, fn(mm/rev)	**0.2**	0.2
Diameter increase(mm/hole)	**0.4**	0.4
Cutting fluid	**Water-soluble**	Oil
Surface roughness (Rz)	**3** exellent	8
Roundness	**5** exellent	10

Code System

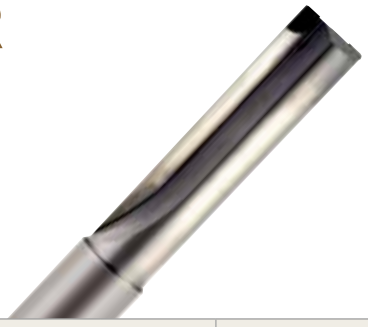
PDR **2** **032**

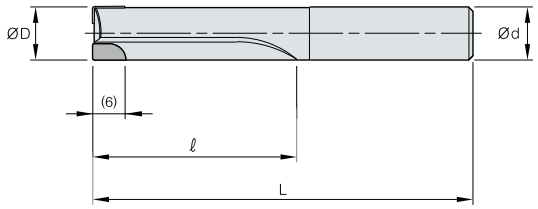
- PDR: PCD Reamer
- 2: No. of Flute
- 032: Diameter(Ø): 070 : Ø70

Recommended Cutting Condition

Work piece	vc(m/min)	fz(mm/t)
Aluminum Alloy	50 ~ 250	0.05 ~ 0.20

PDR





(mm)

Designation			ØD	Ød	ℓ	L
PDR	**2050**	2	5.0	6.0	30	65
	2060	2	6.0	6.0	40	75
	2070	2	7.0	8.0	40	75
	2080	2	8.0	8.0	40	75
	2090	2	9.0	10.0	40	85
	2100	2	10.0	10.0	40	85
	2120	2	12.0	12.0	50	95
	2140	2	14.0	16.0	50	95
	2150	2	15.0	16.0	50	100
	4160	4	16.0	16.0	50	100
	4180	4	18.0	20.0	60	110
	4200	4	20.0	20.0	60	110

Forming Tool

KORLOY PCD Forming Tools are the solution to today's increased complexity of workpieces' shapes, while shortening cycle time

- Increased productivity due to long tool life and excellent surface finish
- Shortens cycle time using complex forms combining copying and multi-stage design

※ **Forming tools will be made to order**

Mono Tool

KORLOY PCD Mono Tools are ideal for high precision machining due to its structure with integrated arbors

- Standard through coolant type
- Good performance in roughing as well as finishing
- Balance level : G2.5
- Surface roughness(Rz) : 3~25㎛

Code System

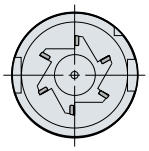
PDF	6	032	-	HSK63A
PCD Face Cutter	Blade No.	Diameter(Ø)		Shank size

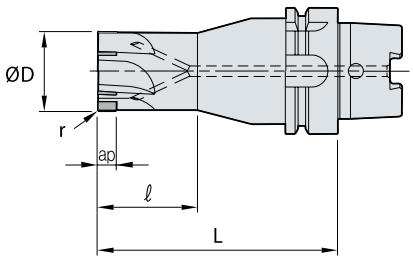
Recommended Cutting Condition

Work piece	vc(m/min)	fz(mm/t)	ap(mm)
Aluminum Alloy, Copper	200 ~ 2,000	0.02 ~ 0.1	0.05 ~ 4.0

PDF4000/6000

AA
90°





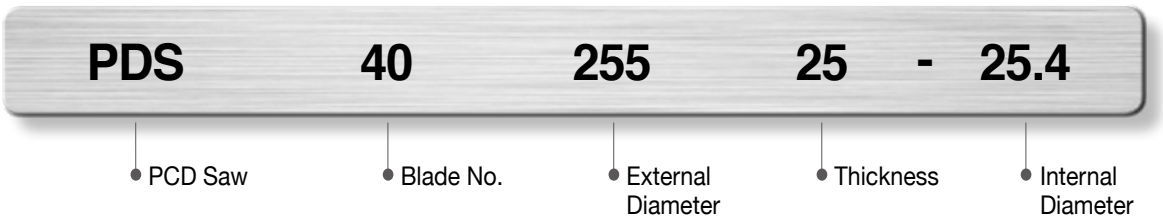
(mm)

Designation		⊙	ØD	r	ap	ℓ	L
PDF	**4032-HSK50A**	4	32	0.5	8	50	120
	4040-HSK50A	4	40	0.5	8	50	120
	4032-HSK63A	4	32	0.5	8	50	120
	4040-HSK63A	4	40	0.5	8	50	120
	4050-HSK63A	4	50	0.5	8	50	120
	6063-HSK63A	6	63	0.5	12	-	100
	6063-HSK100A	6	63	0.5	12	-	100

Saw

KORLOY PCD Saw is ideal for high speed and high precision machining of non-ferrous metal – a metal, including alloys, that does not contain iron (ferrite) in appreciable amounts, such as copper, aluminum, magnesium, etc.

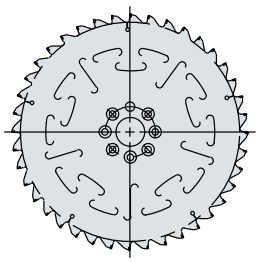
Code System

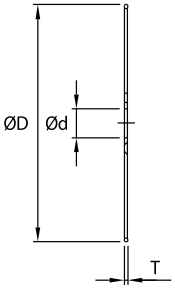


Recommended Cutting Condition

Work piece	vc(m/min)	fz(mm/t)	ap(mm)
Aluminum Alloy, Copper	100 ~ 200	0.02 ~ 0.1	0.05 ~ 2.0

PDS



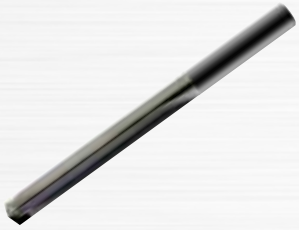


(mm)

Designation			ØD	Ød	T
PDS	**PDS4025525-Ød**	40	255	20/25.4/31.75	2.5
	PDS4025530-Ød	40	255	20/25.4/31.75	3.0
	PDS4825525-Ød	48	255	20/25.4/31.75	2.5
	PDS4825530-Ød	48	255	20/25.4/31.75	3.0
	PDS6025525-Ød	60	255	20/25.4/31.75	2.5
	PDS6025530-Ød	60	255	20/25.4/31.75	3.0
	PDS8025525-Ød	80	255	20/25.4/31.75	2.5
	PDS8025530-Ød	80	255	20/25.4/31.75	3.0
	PDS4030525-Ød	40	305	20/25.4/31.75	2.5
	PDS4030530-Ød	40	305	20/25.4/31.75	3.0
	PDS6030525-Ød	60	305	20/25.4/31.75	2.5
	PDS6030530-Ød	60	305	20/25.4/31.75	3.0
	PDS8030525-Ød	80	305	20/25.4/31.75	2.5
	PDS8030530-Ød	80	305	20/25.4/31.75	3.0

Special PCD Tool Order Form

PCD Drill



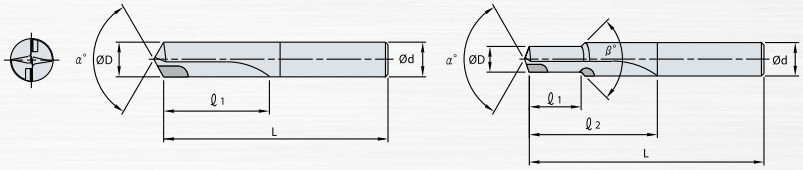
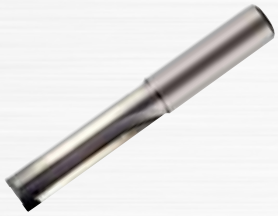


Fig.1 Fig.2

Designation	Fig.	ØD	Ød	α°	β°( )	ℓ1 (ℓ)	ℓ2	L
PDDS _____								

PCD Reamer



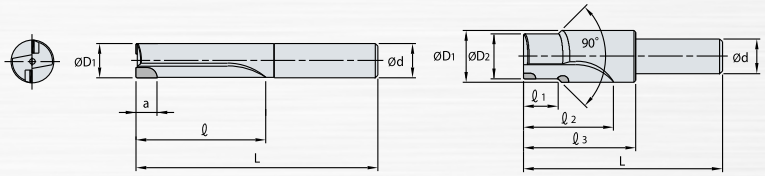


Fig.1 Fig.2

Designation	Fig.	Blade No.	ØD1(ØD)	ØD2( )	Ød	a( )	ℓ1 (ℓ)	ℓ2 ( )	ℓ3 ( )	L
PDRS _____										

PCD Endmill

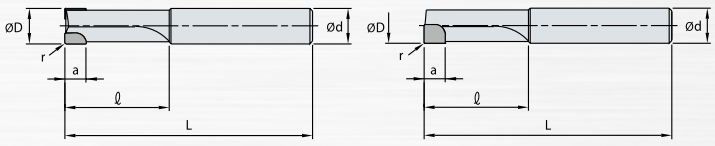
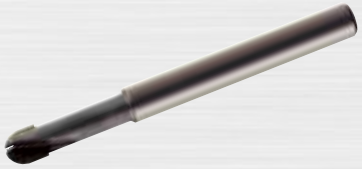


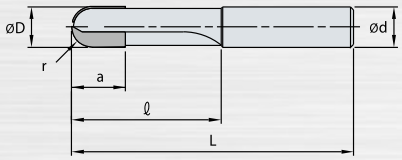
Fig.1 Fig.2

Designation	Fig.	Blade No.	ØD	Ød	r	a	ℓ	L
PDES _____								

※ Unspecified tolerance would follow our standards

PCD Ball Endmill





Designation	Blade No.	ØD	Ød	R	a	ℓ	L
PDBES							

PCD Face Cutter

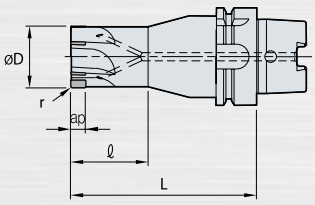


Fig.1

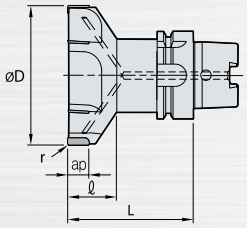
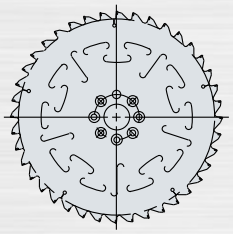
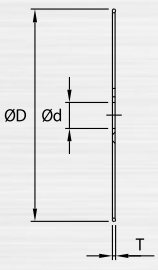


Fig.2

Designation	Fig.	Blade No.	ØD	R	a	ℓ	L
PDFS							

PCD Saw





Designation	Blade No.	ØD	Ød	T
PDSS				

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