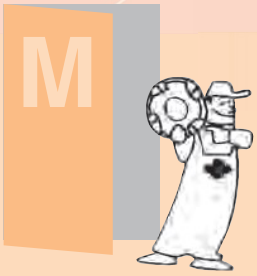
PCD / Binderless PCD SUMICRYSTAL M1 to M35

M



PCD - SUMIDIA

M SUMICRYSTAL

Stock Markings and Symbols

●: Standard stocked item
★: Worldwide Warehouse Item
▲: Limited Avaibility Item, made to order, or discontinued (please confirm stock availability).

Blank: Made-to-order item
— mark: Not available

PCD Inserts

■ General Features

Sumitomo PCD - SUMIDIA® sintered diamond series has 4 grades (DA90, DA150, DA2200, DA1000) with individual features depending on the optimum combination of diamond particle size and binder, as well as the NPD10 grade (nano-polycrystalline diamond) where nano-order diamond particles are directly bound with high strength without using binders.
PCD is suited for a wide range of applications from machining of aluminum alloy to machining of hard brittle materials and cemented carbide.

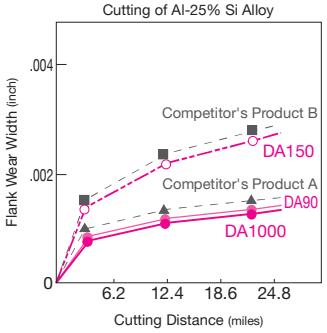
■ Grades, Features and Applications

Grade		Features	Applications	Average grain size of diamond particles (μm)	Hardness HK (GPa)	Transverse Rupture Strength (GPa)
SUMIDIA Binderless	NPD10	100% diamond structure that directly binds nano-order diamond particles with high strength. Demonstrates optimum wear and fracture resistance as well as the best edge sharpness.	· Finishing of Cemented Carbide · Machining of Hard Brittle Material (Ceramics)	up to 0.05	120 to 130	≈ 3.15
SUMIDIA®	DA1000	High-density sintered grade made of ultra-fine grained diamond that demonstrates excellent wear and fracture resistance as well as edge sharpness.	· Machining of High-Silicon Aluminum Alloy · Rough, Interrupted and Finishing Machining of Aluminum Alloy · Woodcraft or Wooden Board Cutting/ Facing · General Finishing of Non-Ferrous Metals	up to 0.5	50 to 60	≈ 2.60
	DA2200	Sintered grade made of ultra-fine grained diamond that demonstrates optimum wear and fracture resistance and excellent edge sharpness.	· Rough, Interrupted and Finishing Machining of Aluminum Alloy · Woodcraft or Wooden Board Cutting/ Facing	0.5	45 to 55	≈ 2.45
	DA150	Grade with micro-grained sintered diamond particles. With strong diamond particle bonding, it has an excellent balance of machinability and wear resistance.	· General Finishing of Non-Ferrous Metals · Finishing of Semi-Sintered Ceramics and Mold-Extruded Products · FRP, Hard Rubber & Carbon Cutting · Wooden or Inorganic Board Cutting/Facing	5	50 to 60	≈ 1.95
	DA90	Contains coarser diamond particles than other grades, giving it good wear resistance suitable for the machining of carbides and high-silicon aluminum. Shows the highest diamond content for excellent wear resistance.	· Machining of High-Silicon Aluminum Alloy · Machining of Aluminum Composite (MMC) · Green or Semi-Sintered Cemented Carbide & Ceramic Roughing · Machining of Sintered Ceramics/Stone/ Rock	up to 50	50 to 65	≈ 1.10

Transverse rupture strength measured with test piece equivalent to insert PCD layer

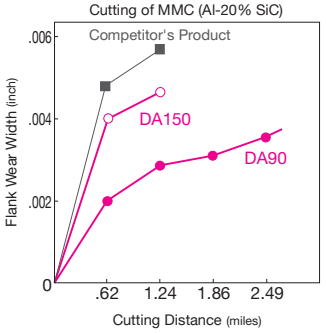
■ Performance

Test Results for Continuous Cutting of Al-25% Si Alloy



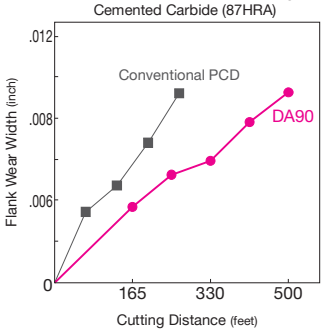
Part Material : Al-25% Si alloy
Tool Cat. No. : SPG421
Holder : FP11R
Cutting Conditions : v_c=1,640 SFM, f=0.004 IPR, a_p=5.1" Dry

Test Results for Continuous Cutting of MMC (Al-20% SiC)



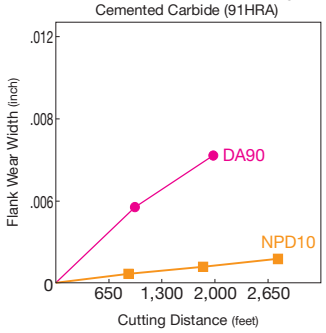
Part Material : MMC (Al-20%SiC)
Tool Cat. No. : CNMX432
Holder : PCLN2525
Cutting Conditions : v_c=1,150 SFM, f=0.008 IPR, a_p=4.5" Wet

Test Results for Continuous Cutting of Cemented Carbide (87HRA)



Part Material :
Cemented carbide (87HRA)
Tool Cat. No. : NF-DCMA21.51
Cutting Conditions : v_c = 65 SFM, f = 0.004 IPR, a_p = 5.1" Wet

Test Results for Continuous Cutting of Cemented Carbide (91HRA)

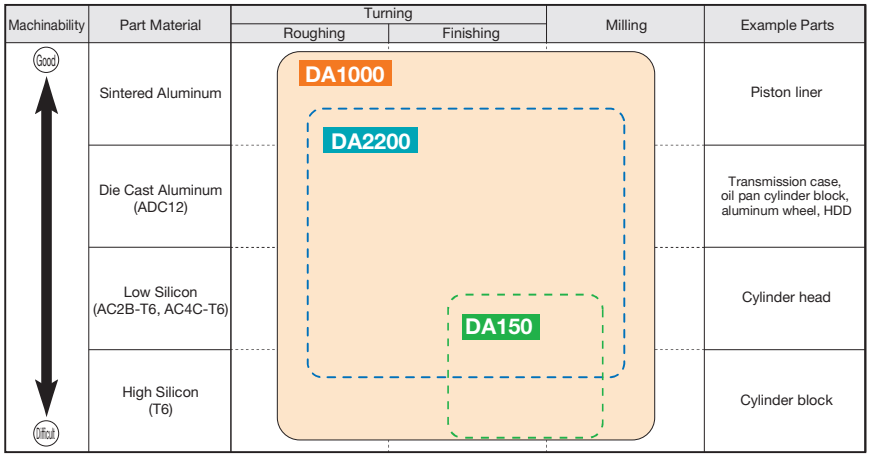


Part Material :
Cemented carbide (91HRA)
Tool Cat. No. :
DCMA32.51RH (NPD10)
NF-DCMW11T304 (DA90)
Cutting Conditions : v_c = 65 SFM, f = 0.002 IPR, a_p = 1.27" Dry

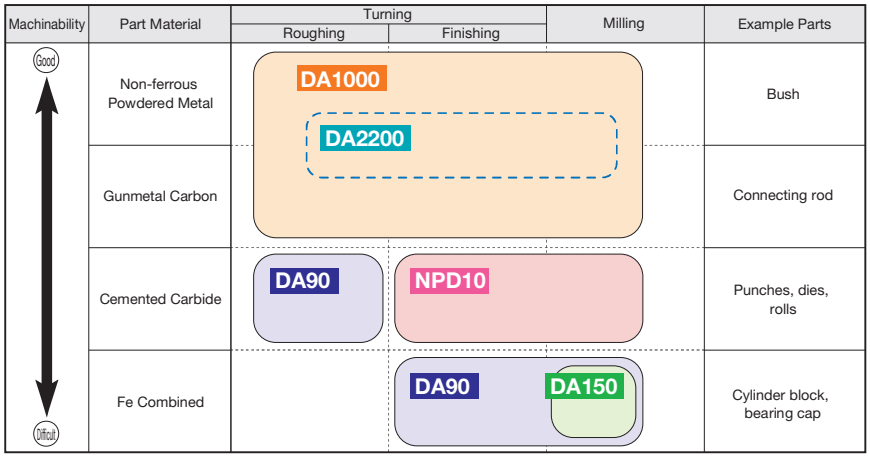
PCD Inserts

■ Application Range

● Aluminum



● Non-aluminum



■ Recommended Cutting Conditions

Part Material	Cutting Speed v_c(SFM)	Feed Rate f(IPR)	Depth of Cut a_p(inch)
Aluminum Alloy	up to 9,850	up to 0.008	up to 0.12
Copper Alloy	up to 3,300	up to 0.008	up to 0.12
Reinforced Plastics	up to 3,300	up to 0.016	up to 0.079
Wooden or Inorganic Board (cutting, etc.)	up to 13,100	up to 0.016	—
Cemented Carbide	up to 100	up to 0.008	up to 0.0197
Carbon	330 to 1,970	0.04	0.079

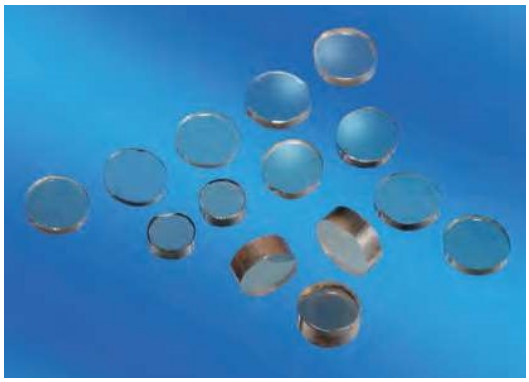
■ PCD (SUMIDIA) Grinding Method

Functions		Description
Grinding Machine	—	(1) A special-purpose high-rigidity grinding machine. (2) Capable of wet grinding operations.
Grinding Wheel	Abrasive Grain	Diamond
	Grain Size	Rough Grinding: 400 mesh, Finish Grinding: 800 to 1,500 mesh
	Bond	Vitrified or Metal Bond Dedicated for Polycrystalline Diamond Tool
	Concentration	100 to 125
	Dressing	Use a WA stick with a mesh of about 400.
Grinding Conditions	Peripheral Speed	2,600 to 3,300 SFM
	Table Rocking	30 to 60 cycle/min
	Grinding Fluid	Water-soluble Grinding Fluid (Solution Type)
Others	—	(1) The rake face is generally lapped. (2) Inspect for edge chipping using a microscope with a magnification of 30 to 50 times. (3) Machining of non-ferrous metals requires a sharp cutting edge. (4) Surfaces that were cut by EDM should have more than 0.002" ground off.

*Please contact us for details on regrinding of NPD10.

PCD - SUMIDIA Binderless Inserts

Nano-Polycrystalline Diamond

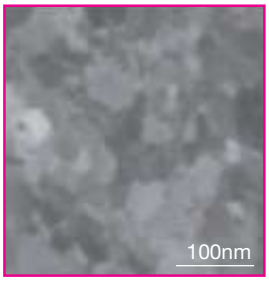


■ General Features

Nano-polycrystalline diamond is polycrystalline diamond that directly binds nano-order diamond particles with high strength without using any binders. This proprietary Sumitomo material is harder than polycrystalline diamond with a binder, achieving excellent wear resistance and fracture resistance.
Binderless PCD tools use this super-high-performance nano-polycrystalline diamond material in their cutting edges.

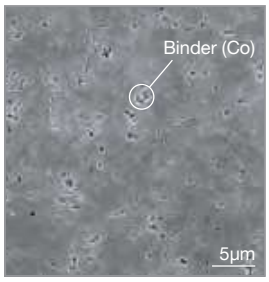
■ Comparison of Structures

Nano-Polycrystalline Diamond Tool SEM Profile



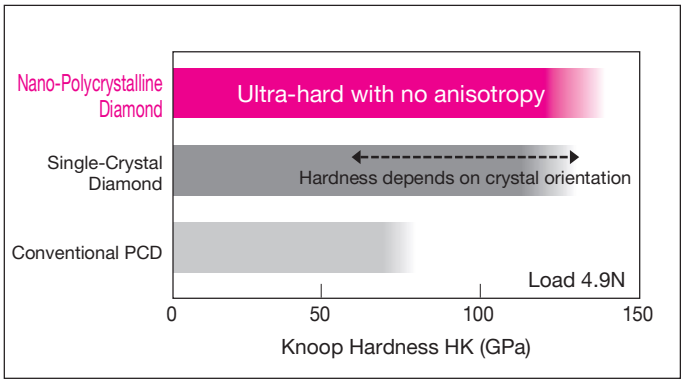
Diamond particles (30 to 50nm)

Conventional PCD SEM Profile



Diamond particles (1 to 10μm)

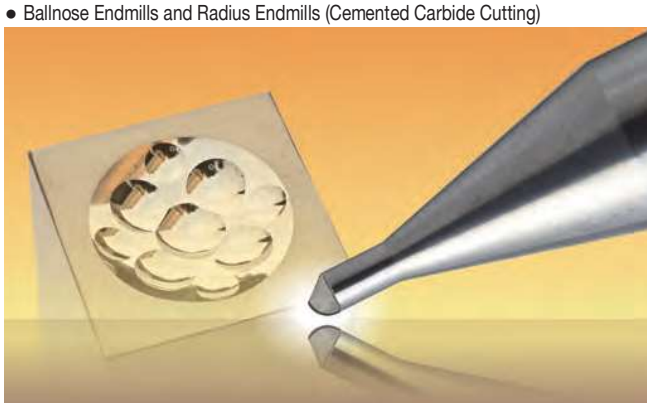
■ Hardness



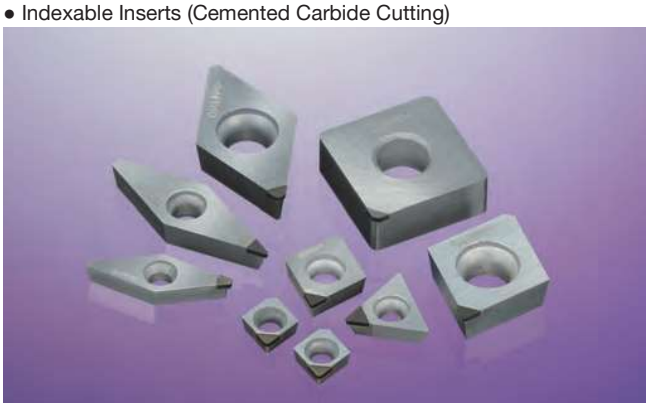
PCD - SUMIDIA - Binderless

■ Application Examples

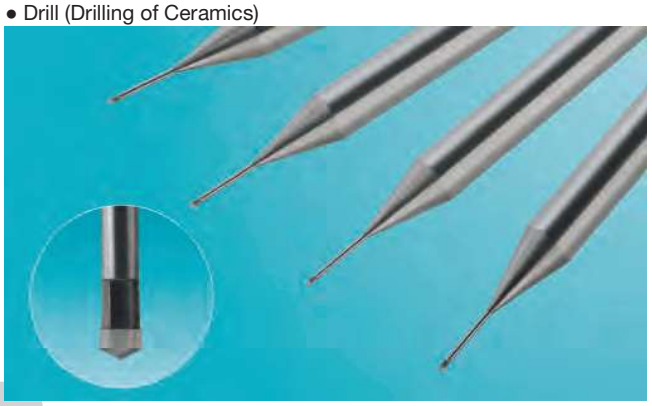
● Ballnose Endmills and Radius Endmills (Cemented Carbide Cutting)



● Indexable Inserts (Cemented Carbide Cutting)

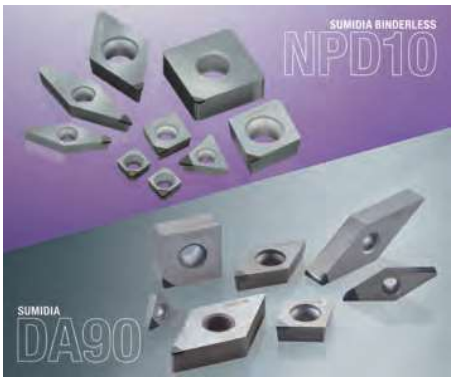


● Drill (Drilling of Ceramics)



● Tool Holder (Ultra-Precision Cutting of Cemented Carbide)

NPD10/DA90



■ General Features

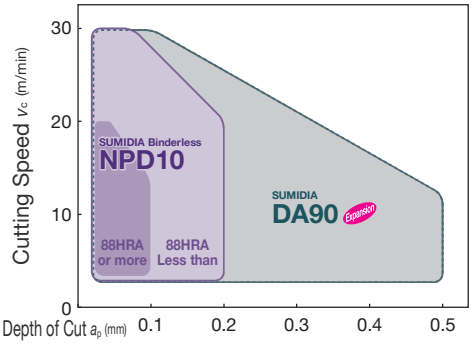
NPD10 is made from high-hardness nano-polycrystalline diamond. This is a pure diamond material, but unlike single-crystal diamonds, it has no anisotropy.
It achieves extended tool life and machining accuracy superior to conventional diamond tools when machining hard brittle materials such as cemented carbide.

DA90 is a PCD - polycrystalline diamond grade in which coarse diamond particles have been sintered to form a dense structure. The high diamond content, with high wear resistance, makes it ideal for roughing of cemented carbide and hard brittle material.
Optimized design and mass production technology have been developed, achieving the same performance as conventional tools with higher cost-performance.

■ Features

- Ideal for Finishing of Hard Brittle Materials Including Cemented Carbide (NPD10)
  High-precision cutting of cemented carbide thanks to the outstanding wear resistance of nano-polycrystalline diamond
- Superior dimensional tolerance maintained for a long time (NPD10)
  Tool replacement count can be drastically reduced compared to conventional diamond tools, enabling work efficiency to be improved and total costs to be reduced.
- Ideal for Roughing of Hard Brittle Materials Including Cemented Carbide (DA90)
  Stable tool life in sintered surface machining of cemented carbide and roughing of hard brittle materials thanks to the outstanding wear resistance of the coarse-grained polycrystalline diamond
- Uses PCD - SUMIDIA NF Insert (DA90)
  Optimized design and mass production technology have been developed, achieving the same performance as conventional tools with higher cost-performance.

■ Application Range (Cemented Carbide Machining)



■ Applications of NPD10 and DA90 (Cemented Carbide)

Grade	SUMIDIA Binderless NPD10		SUMIDIA DA90	
Dimensional Tolerance	◎	Best	△	The first recommendation is NPD10
Tool Life (Wear Resistance)	◎	Best a_p = 0.008" or below f = 0.004 IPR or below recommended	○	a_p = 0.008" or above can also be used
Sintered surface machining of cemented carbide	×	Impossible	◎	Best
Machined surface quality	◎	Best	△	The first recommendation is NPD10

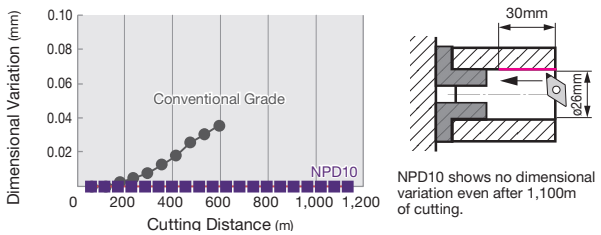
■ Recommended Cutting Conditions (Cemented Carbide Machining)

Part Material				Grade	Cutting Conditions		
Class		Hardness (HRA)	Our Grades		Cutting Speed v_c (SFM)	Feed Rate f (IPR)	Depth of Cut a_p (Inch)
VM, VC	40	88 or more	G5, D2	NPD10	15 - 65	.0012 - .0027	.0012 - .0027
VM, VC	70, 60, 50	83 less than 88	G7, G6	NPD10	15 - 100	.0012 - .0079	.0012 - .0079
VM, VC	—	83 or more	G7, G6 G5, D2	DA90	15 - 100	.0012 - .0079	.0012- .0197

Min. - Max. Coolant: Dry (NPD10)/Wet (DA90)

■ Machining Precision (NPD10)

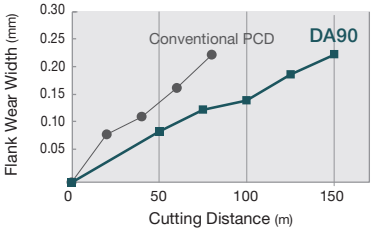
Internal machining of cemented carbide: VM30 (91HRA)



Part Material : Cemented carbide: VM30 (91HRA)
Tool Cat. No. : DCMA32.51RH
Cutting Conditions : v_c=65 SFM, f=0.002 IPR, a_p=0.002" Dry

■ Wear Resistance (DA90)

External machining of cemented carbide: VC50 (87HRA)



Part Material : Cemented carbide: VC50 (87HRA)
Tool : NF-DCMA21.51
Cutting Conditions : v_c=65 SFM, f=0.004 IPR, a_p=0.008" Wet

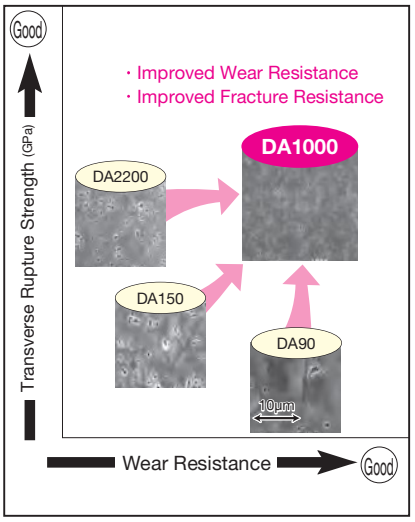
DA1000

■ Features

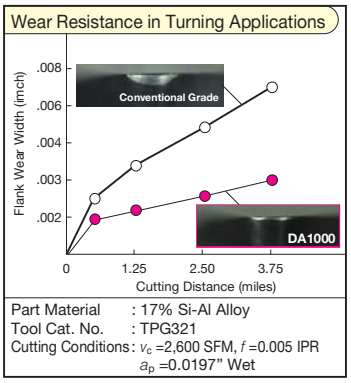
Ultra-high-density sintered ultra-fine grained diamond

- Significantly improved surface roughness on machined surfaces
- Excellent wear resistance and strength
- High-performance, high-precision, high-efficiency machining of all aluminum and non-ferrous alloys

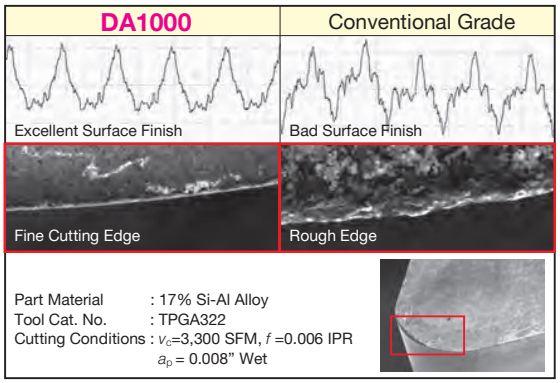
■ Position of DA1000



■ Cutting Performance



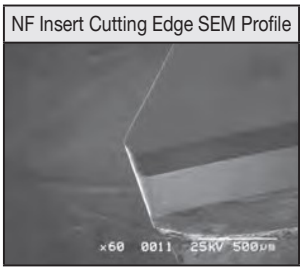
Part Material : 17% Si-Al Alloy
Tool Cat. No. : TPG321
Cutting Conditions : v_c =2,600 SFM, f =0.005 IPR
a_p =0.0197" Wet



Part Material : 17% Si-Al Alloy
Tool Cat. No. : TPGA322
Cutting Conditions : v_c=3,300 SFM, f =0.006 IPR
a_p = 0.008" Wet

■ NF Insert

The NF PCD insert uses optimized design and improved mass production techniques that maintain good performance of DA1000 yet offer higher cost efficiency. It makes the most of the PCD - SUMIDIA DA1000 grade, with excellent fracture and wear resistance and good work material finished surface roughness.

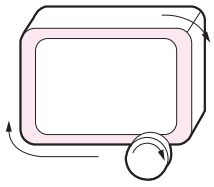


High-precision cutting edge quality

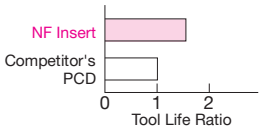
- Total cost effectiveness with high performance and lower price
  · Optimum design utilizing improved mass production techniques provides a lower cost.
  · Regrindable type results in huge total cost reduction.
- Wide lineup from general turning to milling
  · Wide range of items in stock for small diameter boring and external turning to milling.
  · Negative/positive type inserts that can be used on standard lever-lock and pin-lock type holder are also in stock.

■ Application Examples

• Milling of Aluminum Alloy Oil Pump Cover

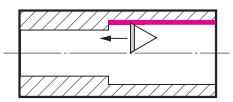


Results:
1.5 times longer tool life than competitors' PCD, with higher cost performance.

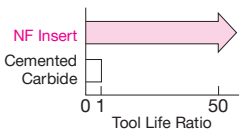


Part Material : A383 Aluminum, Tool Cat. No.: NF-TEEN32R
Cutting Conditions : v_c = 9,850 SFM, f_z = 0.0024 IPR, a_p = 0.008" Wet

• Boring of Aluminum Valve Bore



Results:
No initial breakage, tool life is more than 50 times that of carbides.



Part Material : A383 Aluminum, Tool Cat. No.: NF-TPG221P
Cutting Conditions : v_c = 1,750 SFM, f = 0.00197 IPR, a_p = 0.008" Wet

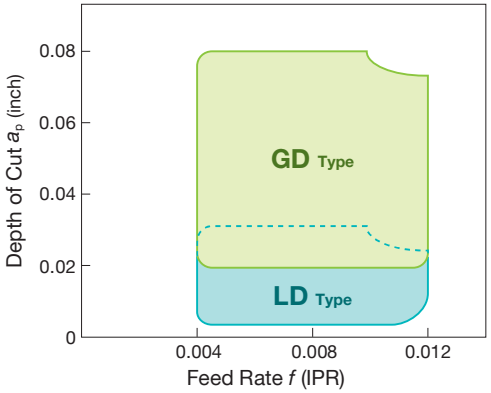
LD / GD

■ Features

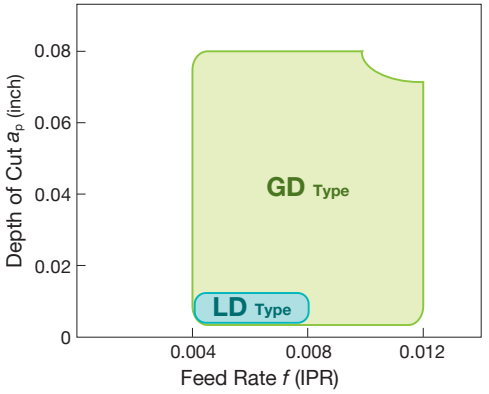
- PCD insert with chipbreaker
- Provides excellent chip control in medium finishing and finishing of aluminum alloy.
- Solves chip control problems and dramatically improves work efficiency.
- Achieves long, stable tool life by employing high-toughness grade DA1000.

■ Application Range

- Wrought Aluminum Alloy (6061)

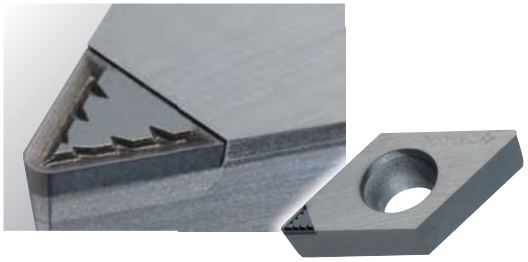


- Cast Aluminum Alloy (A383)



LD Type Chipbreaker for Finishing

Provides excellent chip control in finishing

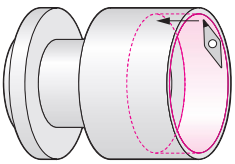


■ Cutting Performance

For Wrought Aluminum Alloy Machining

- Machining Details: Internal Diameter Machining of Machine Components

Provides good chip control at shallow depths of cut for wrought materials



Break Master LD Type

Without Chipbreaker

Part Material: 6061 Aluminum, Tool Cat. No.: NF-VCMT220.5LD (DA1000)
Cutting Conditions : v_c = 650 SFM, f = 0.008 IPR , a_p = 0.004" Wet

GD Type Chipbreaker for Medium Finishing

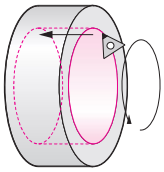
Provides excellent chip control in medium finishing

■ Cutting Performance

For Aluminum Alloy Casting Machining

- Machining Details: Internal Diameter Machining of Transmission Components

Finely breaks chips in machining of cast materials



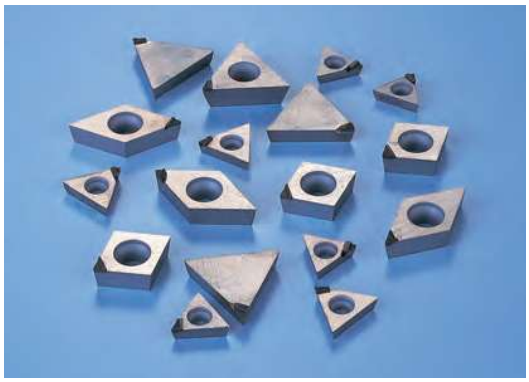
Break Master GD Type

Without Chipbreaker

Part Material: A383 Aluminum, Tool Cat. No.: NF-TPMT221GD (DA1000)
Cutting Conditions : v_c = 1,312 SFM, f = 0.009 IPR, a_p = 0.087" Wet

Note: Regrinding this product will adversely affect chip control performance.

DM



■ Features

- Economy One-Use Type

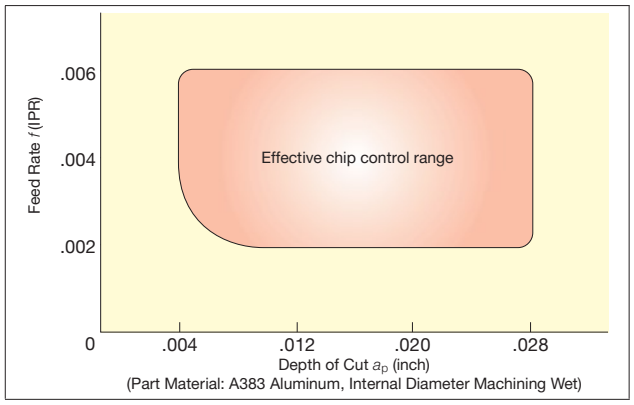
  Familiar to users of CBN - SUMIBORON one-use inserts, now available in PCD - SUMIDIA.

- Cutting Edge with Built-in Chipbreaker for Effective Chip Control

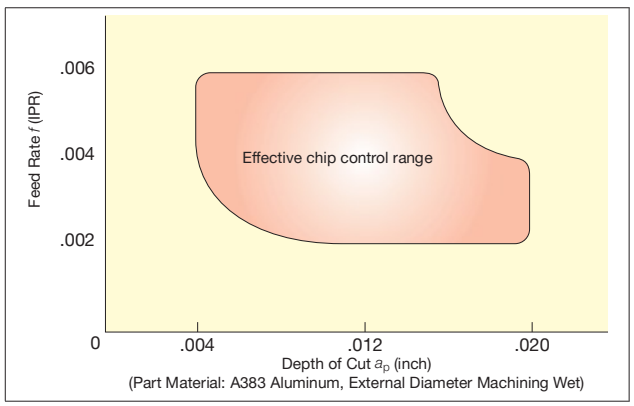
  DM Type chipbreaker solves chip control problems and greatly improves efficiency.

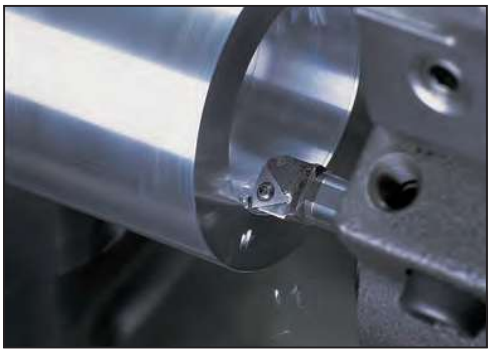
■ Application Range

- For Internal Diameter Machining



- External Turning & Facing (Insert Shape: 55°/80° Diamond Type)





■ Chip Control

- Chips Created by Break Master DM Type

- Chips with No Chipbreaker

■ Application Examples

Machining Details	Cutting Conditions	Results
Internal Boring	Part Material: Aluminum Alloy (AC2A-T6) v_c = 985 SFM f = 0.0024 IPR a_p = 0.014" Wet	With the required finished surface roughness of Ra = 1µm or less, the chips curled at lengths of 2mm or so, and did not remain within the work material.

■ Recommended Cutting Conditions

- Internal Diameter Machining (Insert Shape: Triangular Type)

Feed Rate *f*	Depth of Cut a_p	Coolant
up to .006 IPR	up to 0.028"	Wet

- External Profiling (Insert Shape: 55°/80° Diamond Type)

Feed Rate *f*	Depth of Cut a_p	Coolant
up to .006 IPR	up to 0.0197"	Wet

For facing, depth of cut should be less than 0.016".

■ Series

Machining Details	Internal Diameter Machining	External Turning and Facing
Cartridge Unit	NU-TPMR22	—
	NU-TPMR32	—
Tool Holder	NU-TPMT63	NU-CCMT21.5
	NU-TPMT1.81.5	NU-CCMT32.5
	NU-TPMT21.5	NU-DCMT31.5
	NU-TPMT22	NU-DCMT32.5
	NU-TPMT33	—

ANSI

CNMA 432

ISO

CNMA 120408 B

(1) (2)

Regrindable Type

(1) Insert ISO Code
(ISO Standard Classification) ☞B2, B3

(2) Additional Information
Refer to Table 1

Chart 1 (2) Additional Information

Symbol	Code Description
R	Right Hand
L	Left Hand
B	All-PCD Rake Face Type
-WF	Edge with Special Land for Aluminum Wheel Gloss Finishing
RH	Honing (Edge Treatment)

ANSI

NF - CNMA 432 P

Single Corner Type

NF - CNMA 120408 P

(1) (2) (3)

(1) Type Code
Refer to Table 2

(2) Insert ISO Code
(ISO Standard Classification) ☞B2, B3

(3) Additional Information
Refer to Table 3

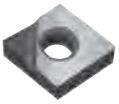
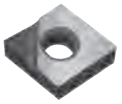
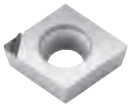
Chart 2 (1) Type Code

Symbol	Code Description
NF	NF Insert ☞M6
NU	Single-Use Insert (Disposable)

Chart 3 (3) Additional Information

Symbol	Code Description
L	Left Hand
P	Full-Length Cutting Edge Type
N-LD	Chipbreaker Type (Neutral) ☞M7
N-GD	
R-DM	Chipbreaker Type (Right Hand) ☞M8
L-DM	Chipbreaker Type (Left Hand) ☞M8

Insert Shape

Full-top PCD Type	Edge with Special Land for Aluminum Wheel Gloss Finishing	NF Insert	Single-Use Insert	Full-Length Cutting Edge Type	Chipbreaker Type
					

C 80° Diamond

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Neg.

CNMA43●

Dimensions (inch)	Inscribed Circle IC	.5000	Hole Dia.	.2031
	Thickness S	.1875		

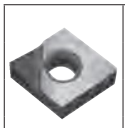
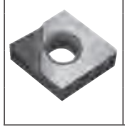
Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
	CNMA432	CNMA120408	.0315	.2205				●
	CNMA432H	CNMA120408H	.0315	.2205				●
	NF-CNMA432	NF-CNMA120408	.0315	.2205			●	●
	NF-CNMA432H	NF-CNMA120408H	.0315	.2205				●

Neg.-Pos.

CNMX43●

Dimensions (inch)	Inscribed Circle IC	.5000	Hole Dia.	.2031
	Thickness S	.1875		

Applicable External Holders ☞ C5 to C10
Applicable Internal Holders ☞ E12 to E14

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert	NF-CNMX430.5	NF-CNMX120402	.0079	.2244			★	★
	NF-CNMX431	NF-CNMX120404	.0157	.2244			●	●
	NF-CNMX432	NF-CNMX120408	.0315	.2205			●	●
	NF-CNMX433	NF-CNMX120412	.0472	.2126			★	★
 Break Master	NF-CNMX431LD	NF-CNMX120404N-LD	.0157	.2244			●	
	NF-CNMX432LD	NF-CNMX120408N-LD	.0315	.2205			●	
	NF-CNMX433LD	NF-CNMX120412N-LD	.0472	.2126			●	
 Break Master	NF-CNMX431GD	NF-CNMX120404N-GD	.0157	.2244			●	
	NF-CNMX432GD	NF-CNMX120408N-GD	.0315	.2205			●	
	NF-CNMX433GD	NF-CNMX120412N-GD	.0472	.2126			●	
	CNMX430.5	CNMX120402	.0079	.2244			★	
	CNMX431	CNMX120404	.0157	.2244			★	●
	CNMX432	CNMX120408	.0315	.2205			★	●
	CNMX433	CNMX120412	.0472	.2205				●

7° Pos.

CCMA03X1●●

Dimensions (inch)	Inscribed Circle IC	.1378	Hole Dia.	.0748
	Thickness S	.0551		

Applicable Internal Holders ☞ E31, E32

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert	NF-CCMA03X102	NF-CCMW03X102	.0079	.0433	●			
	NF-CCMA03X104	NF-CCMW03X104	.0157	.0433	●			

CCMA04X1●●

Dimensions (inch)	Inscribed Circle IC	.1693	Hole Dia.	.0906
	Thickness S	.0709		

Applicable Internal Holders ☞ E31, E32

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert	NF-CCMA04X102	NF-CCMW04X102	.0079	.0591	●			
	NF-CCMA04X104	NF-CCMW04X104	.0157	.0591	●			

C 80° Diamond

7° Pos.

CC■■21.5●

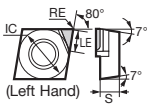
Dimensions (inch)	Inscribed Circle IC	.2500	Hole Dia.	.1102
	Thickness S	.0937		

Applicable External Holders ☞ C34
Applicable Internal Holders ☞ E30 to E33

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Dimensions (inch)

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert		NF-CCMA21.50.5	NF-CCMW060202	.0079	.0945	●			
		NF-CCMA21.51	NF-CCMW060204	.0157	.0945	●			
 NF Insert		NF-CCMX21.50	NF-CCMT060201	.0039	.1102			●	●
		NF-CCMX21.50.5	NF-CCMT060202	.0079	.1102			●	●
		NF-CCMX21.51	NF-CCMT060204	.0157	.1102			●	●
 Break Master		NF-CCMT21.50.5LD	NF-CCMT060202N-LD	.0079	.1142			●	
		NF-CCMT21.51LD	NF-CCMT060204N-LD	.0157	.1142			●	
 Break Master		NF-CCMT21.50.5GD	NF-CCMT060202N-GD	.0079	.1142			●	
		NF-CCMT21.51GD	NF-CCMT060204N-GD	.0157	.1142			●	
 Break Master	 (Left Hand)	NU-CCMT21.50.5R-DM	NU-CCMT060202R-DM	.0079	.0984		★		
		NU-CCMT21.50.5L-DM	NU-CCMT060202L-DM	.0079	.0984		★		
		NU-CCMT21.51R-DM	NU-CCMT060204R-DM	.0157	.0984		★		
		NU-CCMT21.51L-DM	NU-CCMT060204L-DM	.0157	.0984		★		
 NF Insert		NF-CCGA21.50	NF-CCGW060201	.0039	.0945			●	
		NF-CCGA21.50.5	NF-CCGW060202	.0079	.0945			●	
		NF-CCGA21.51	NF-CCGW060204	.0157	.0945			●	

C 80° Diamond

7° Pos.

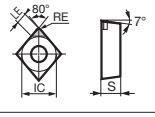
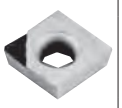
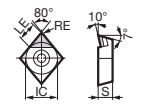
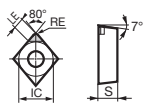
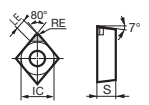
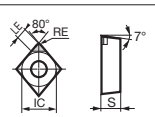
CC■■32.5●

Dimensions (inch)	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1563		

Applicable External Holders ☞ C34
Applicable Internal Holders ☞ E30 to E33

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

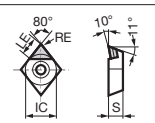
Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch) PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert		NF-CCMA32.50.5	NF-CCMW09T302	.0079	.0945	★			
		NF-CCMA32.51	NF-CCMW09T304	.0157	.0945	★			
		NF-CCMA32.52	NF-CCMW09T308	.0315	.0906	●			
 NF Insert		NF-CCMX32.50	NF-CCMT09T301	.0039	.1102			★	
		NF-CCMX32.50.5	NF-CCMT09T302	.0079	.1102			●	●
		NF-CCMX32.51	NF-CCMT09T304	.0157	.1102			●	●
		NF-CCMX32.52	NF-CCMT09T308	.0315	.1063			●	●
 Break Master		NF-CCMT32.50.5LD	NF-CCMT09T302N-LD	.0079	.1142			●	
		NF-CCMT32.51LD	NF-CCMT09T304N-LD	.0157	.1142			●	
		NF-CCMT32.52LD	NF-CCMT09T308N-LD	.0315	.1102			●	
 Break Master		NF-CCMT32.50.5GD	NF-CCMT09T302N-GD	.0079	.1142			●	
		NF-CCMT32.51GD	NF-CCMT09T304N-GD	.0157	.1142			●	
		NF-CCMT32.52GD	NF-CCMT09T308N-GD	.0315	.1102			●	
 NF Insert		NF-CCGA32.50.5	NF-CCGW09T302	.0079	.0945			●	
		NF-CCGA32.51	NF-CCGW09T304	.0157	.0945			●	
		NF-CCGA32.52	NF-CCGW09T308	.0315	.0906			●	

11° Pos.

CPMX21.5●

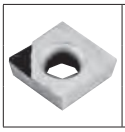
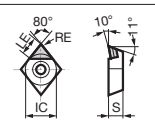
Dimensions (inch)	Inscribed Circle IC	.2500	Hole Dia.	.1102
	Thickness S	.0937		

Applicable Internal Holders ☞ E35 to E37

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch) PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert		NF-CPMX21.51	NF-CPMT060204	.0157	.0945			●	●
		NF-CPMX21.52	NF-CPMT060208	.0315	.0866			●	●

CPMX2.51.5●

Dimensions (inch)	Inscribed Circle IC	.3126	Hole Dia.	.1339
	Thickness S	.0937		

		CPMX2.51.50.5	CPMT080202	.0079	.1654			★	●
		CPMX2.51.51	CPMT080204	.0157	.1654			★	●
		CPMX2.51.52	CPMT080208	.0315	.1614			★	●

C 80° Diamond

11° Pos.

(Legend) General Cutting ●: 1st Recommendation

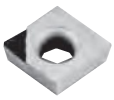
Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Dimensions (inch) | PCD (SUMIDIA)

CPMX32●

Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1250		

Applicable Internal Holders ☞ E35 to E37

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-CPMX320.5	NF-CPMT090302	.0079	.1102			●	
	NF-CPMX321	NF-CPMT090304	.0157	.1102			●	●
	NF-CPMX322	NF-CPMT090308	.0315	.1063			●	●
	CPMX320.5	CPMT090302	.0079	.1102				●
	CPMX321	CPMT090304	.0157	.1102				●

CPGA32●

Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1250		

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-CPGA321	NF-CPGW090304	.0157	.1102			●	
	NF-CPGA322	NF-CPGW090308	.0315	.1063			●	

CP■■32.5●

Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1563		

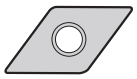
Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
	CPEW32.52PDFR	CPEW09T308PDFR	.0315	.2205				●
 NF Insert	NF-CPMX32.51	NF-CPMT09T304	.0157	.1102			●	●
	NF-CPMX32.52	NF-CPMT09T308	.0315	.1063			●	●

CPG42●

Dimensions (inch)				
	Inscribed Circle IC	.5000	Hole Dia.	—
	Thickness S	.1250		

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
	CPG422	CPGN120308	.0315	.2205				●

D 55° Diamond



Neg.

DNMA43●

Dimensions (inch)	Inscribed Circle IC	.5000	Hole Dia.	.2205
	Thickness S	.1875		

Applicable External Holders ☞ C10 to C12
Applicable Internal Holders ☞ E15 to E19

Neg.-Pos.

DNMX43●

Dimensions (inch)	Inscribed Circle IC	.5000	Hole Dia.	.2031
	Thickness S	.1875		

Applicable External Holders ☞ C10 to C12
Applicable Internal Holders ☞ E15 to E19

7° Pos.

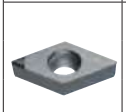
DCM■21●

Dimensions (inch)	Inscribed Circle IC	.2500	Hole Dia.	.1102
	Thickness S	.0937		

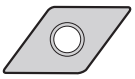
Applicable External Holders ☞ C35
Applicable Internal Holders ☞ E38 to E41

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch) PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
		DNMA432	DNMA150408	.0315	.0787				●
		DNMA432H	DNMA150408H	.0315	.0787				●
 NF Insert		NF-DNMA432	NF-DNMA150408	.0315	.0787	★			●
		NF-DNMA432H	NF-DNMA150408H	.0315	.0787				●
		NF-DNMA433	NF-DNMA150412	.0472	.0787	★			
 NF Insert		NF-DNMX430.5	NF-DNMX150402	.0079	.2520			●	●
		NF-DNMX431	NF-DNMX150404	.0157	.2441			●	●
		NF-DNMX432	NF-DNMX150408	.0315	.2283			●	●
		NF-DNMX433	NF-DNMX150412	.0472	.2126			★	★
		DNMX430.5	DNMX150402	.0079	.2520			★	
		DNMX431	DNMX150404	.0157	.2441		●	★	●
		DNMX432	DNMX150408	.0315	.2283		●	★	●
		DNMX433	DNMX150412	.0472	.2126		●	★	●
 Break Master		NF-DNMX430.5LD	NF-DNMX150402N-LD	.0079	.2520			●	
		NF-DNMX431LD	NF-DNMX150404N-LD	.0157	.2441			●	
		NF-DNMX432LD	NF-DNMX150408N-LD	.0315	.2283			●	
 Break Master		NF-DNMX430.5GD	NF-DNMX150402N-GD	.0079	.2520			●	
		NF-DNMX431GD	NF-DNMX150404N-GD	.0157	.2441			●	
		NF-DNMX432GD	NF-DNMX150408N-GD	.0315	.2283			●	
		NF-DNMX433GD	NF-DNMX150412N-GD	.0472	.2126			●	
 NF Insert		NF-DCMA21.50.5	NF-DCMW070202	.0079	.1024	★			
		NF-DCMA21.51	NF-DCMW070204	.0157	.0945	★			
 NF Insert		NF-DCMX21.50	NF-DCMT070201	.0039	.1181			●	●
		NF-DCMX21.50.5	NF-DCMT070202	.0079	.1181			●	●
		NF-DCMX21.51	NF-DCMT070204	.0157	.1102			●	●
 Break Master		NF-DCMT21.50.5LD	NF-DCMT070202N-LD	.0079	.1220			●	
		NF-DCMT21.51LD	NF-DCMT070204N-LD	.0157	.1142			●	

D 55° Diamond



7° Pos.

DCM■21●

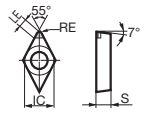
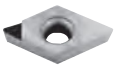
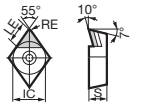
Dimensions (inch)				
	Inscribed Circle IC	.2500	Hole Dia.	.1102
	Thickness S	.0937		

Applicable External Holders ☞ C35
Applicable Internal Holders ☞ E38 to E41

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

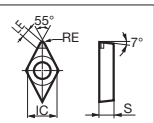
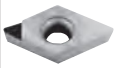
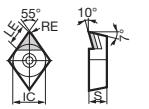
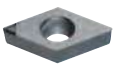
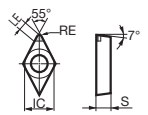
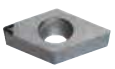
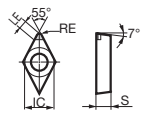
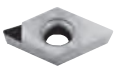
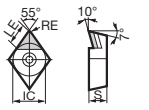
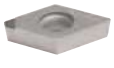
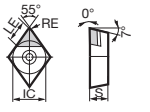
Dimensions (inch) | PCD (SUMIDIA)

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 Break Master		NF-DCMT21.50.5GD	NF-DCMT070202N-GD	.0079	.1220			●	
		NF-DCMT21.51GD	NF-DCMT070204N-GD	.0157	.1142			●	
		DCMX21.50	DCMT070201	.0039	.1693				●
		DCMX21.50.5	DCMT070202	.0079	.1654				●
		DCMX21.51	DCMT070204	.0157	.1575				●

DC■■32.5●

Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1563		

Applicable External Holders ☞ C35
Applicable Internal Holders ☞ E38 to E41

 NF Insert		NF-DCMA32.50.5	NF-DCMW11T302	.0079	.1024	★			
		NF-DCMA32.51	NF-DCMW11T304	.0157	.0945	★			
		NF-DCMA32.52	NF-DCMW11T308	.0315	.0787	★			
 NF Insert		NF-DCMX32.50	NF-DCMT11T301	.0039	.1181			●	●
		NF-DCMX32.50.5	NF-DCMT11T302	.0079	.1181			●	●
		NF-DCMX32.51	NF-DCMT11T304	.0157	.1102			●	●
		NF-DCMX32.52	NF-DCMT11T308	.0315	.0945			●	●
 Break Master		NF-DCMT32.50.5LD	NF-DCMT11T302N-LD	.0079	.1220			●	
		NF-DCMT32.51LD	NF-DCMT11T304N-LD	.0157	.1142			●	
		NF-DCMT32.52LD	NF-DCMT11T308N-LD	.0315	.0984			●	
 Break Master		NF-DCMT32.50.5GD	NF-DCMT11T302N-GD	.0079	.1220			●	
		NF-DCMT32.51GD	NF-DCMT11T304N-GD	.0157	.1142			●	
		NF-DCMT32.52GD	NF-DCMT11T308N-GD	.0315	.0984			●	
		DCMX32.50	DCMT11T301	.0039	.1693				●
		DCMX32.50.5	DCMT11T302	.0079	.1654				●
		DCMX32.51	DCMT11T304	.0157	.1575				●
 NF Insert		NF-DCGA32.50.5	NF-DCGW11T302	.0079	.1024			●	
		NF-DCGA32.51	NF-DCGW11T304	.0157	.0945			●	
		NF-DCGA32.52	NF-DCGW11T308	.0315	.0787			●	

S Square

Neg.

SNMA43●

Dimensions (inch)				
	Inscribed Circle IC	.5000	Hole Dia.	.1875
	Thickness S	.2031		

Applicable External Holders ☞ C14 to C19
Applicable Internal Holders ☞ E20 to E22

7° Pos.

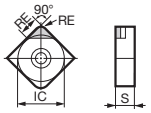
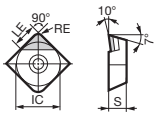
SCM■2.51●

Dimensions (inch)				
	Inscribed Circle IC	.3125	Hole Dia.	.1339
	Thickness S	.0937		

Applicable External Holders ☞ D31

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch) PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert 	NF-SNMA432	NF-SNMA120408	.0315	.0945	★			
	NF-SNMA433	NF-SNMA120412	.0472	.0945	★			
 NF Insert 	NF-SCMX2.51.50	NF-SCMT070201	.0039	.1181			★	
	NF-SCMX2.51.50.5	NF-SCMT070202	.0079	.1181			★	
	NF-SCMX2.51.51	NF-SCMT070204	.0157	.1181			★	

S Square

11° Pos.

SPG32●

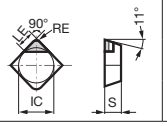
Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	—
	Thickness S	.1250		

Applicable Internal Holders ☞ E45

Applicable Cartridge: CE

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

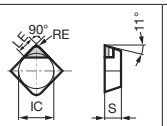
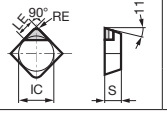
Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch) PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert 	NF-SPG321	NF-SPGN090304	.0157	.1890			★	●
	NF-SPG322	NF-SPGN090308	.0315	.1890			★	★

SPG42●

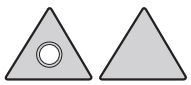
Dimensions (inch)				
	Inscribed Circle IC	.5000	Hole Dia.	—
	Thickness S	.1250		

Applicable External Holders ☞ C52

Applicable Cartridge: CE

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch) PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert 	NF-SPG421	NF-SPGN120304	.0157	.1890			★	
	NF-SPG422	NF-SPGN120308	.0315	.1890			★	●
 	SPG421	SPGN120304	.0157	.1890				●
	SPG422	SPGN120308	.0315	.1890				●

T Triangular



Neg.-Pos.

TNMX33●

Dimensions (inch)	Inscribed Circle IC	.3750	Hole Dia.	.1500
	Thickness S	.1875		

Applicable External Holders ☞ C20 to C26
Applicable Internal Holders ☞ E23 to E25

5° Pos.

TBG■52●

Dimensions (inch)	Inscribed Circle IC	.1563	Hole Dia.	.0866
	Thickness S	.0626		

Applicable Internal Holders ☞ E46, E51, E52

TBGE52●

Dimensions (inch)	Inscribed Circle IC	.1563	Hole Dia.	—
	Thickness S	.0626		

Applicable Internal Holders ☞ E74

7° Pos.

TCMX1.81.5●

Dimensions (inch)	Inscribed Circle IC	.2189	Hole Dia.	.0984
	Thickness S	.0937		

Applicable External Holders ☞ D32

TCMX21.5●

Dimensions (inch)	Inscribed Circle IC	.2500	Hole Dia.	.1102
	Thickness S	.0937		

Applicable External Holders ☞ D32

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert	NF-TNMX330.5	NF-TNMX160402	.0079	.1457			●	●
	NF-TNMX331	NF-TNMX160404	.0157	.1417			●	●
	NF-TNMX332	NF-TNMX160408	.0315	.1299			●	●
	TNMX330.5	TNMX160402	.0079	.1457			★	
	TNMX331	TNMX160404	.0157	.1417			★	★
	TNMX332	TNMX160408	.0315	.1299			★	★
 NF Insert	NF-TBGD520.5	NF-TBGW060102	.0079	.0906			●	●
	NF-TBGD521	NF-TBGW060104	.0157	.0866			●	●
 NF Insert	NF-TBGE520.5	NF-TBGN060102	.0079	.0827			★	●
	NF-TBGE521	NF-TBGN060104	.0157	.0787			★	★
	TBGE520.5B	TBGN060102B	.0079	.2559		●	★	●
	TBGE521B	TBGN060104B	.0157	.2441		★	●	
 NF Insert	NF-TCMX1.81.50.5	NF-TCMT090202	.0079	.1142			●	
	NF-TCMX1.81.51	NF-TCMT090204	.0157	.1102			●	●
	TCMX1.81.50.5	TCMT090202	.0079	.1063				●
	TCMX1.81.51	TCMT090204	.0157	.1024				●
 NF Insert	NF-TCMX21.50	NF-TCMT110201	.0039	.1181			●	
	NF-TCMX21.50.5	NF-TCMT110202	.0079	.1142			●	●
	NF-TCMX21.51	NF-TCMT110204	.0157	.1102			●	●
	TCMX21.50	TCMT110201	.0039	.1102				●
	TCMX21.51	TCMT110204	.0157	.1024				●

T Triangular

11° Pos.

(Legend) General Cutting ●: 1st Recommendation

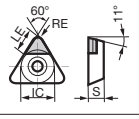
Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Dimensions (inch)

TPG■63●

Dimensions (inch)	Inscribed Circle IC	.1875	Hole Dia.	.0945
	Thickness S	.0937		

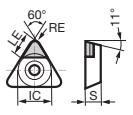
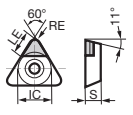
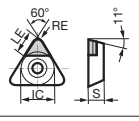
Applicable Internal Holders ☞ E48, E50 to E52

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert		NF-TPGD630	NF-TPGW080201	.0039	.1220			★	★
		NF-TPGD630.5	NF-TPGW080202	.0079	.1181			●	●
		NF-TPGD631	NF-TPGW080204	.0157	.1142			●	

TPM■63●

Dimensions (inch)	Inscribed Circle IC	.1875	Hole Dia.	.0945
	Thickness S	.0937		

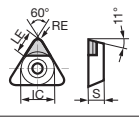
Applicable Internal Holders ☞ E48, E50 to E52

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert		NF-TPMA630.5	NF-TPMW080202	.0079	.0984	★			
		NF-TPMA631	NF-TPMW080204	.0157	.0945	★			
 Break Master		NF-TPMT630.5LD	NF-TPMT080202N-LD	.0079	.1142			●	
		NF-TPMT631LD	NF-TPMT080204N-LD	.0157	.1102			●	
 Break Master		NF-TPMT631GD	NF-TPMT080204N-GD	.0157	.1102			●	

TPGA1.81.5●

Dimensions (inch)	Inscribed Circle IC	.2189	Hole Dia.	.1102
	Thickness S	.0937		

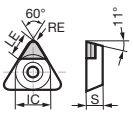
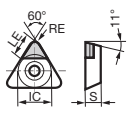
Applicable Internal Holders ☞ E48, E50

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert		NF-TPGA1.81.50.5	NF-TPGW090202	.0079	.1220			●	
		NF-TPGA1.81.51	NF-TPGW090204	.0157	.1142			●	●

TPMT1.81.5●

Dimensions (inch)	Inscribed Circle IC	.2189	Hole Dia.	.1102
	Thickness S	.0937		

Applicable Internal Holders ☞ E48, E50

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 Break Master		NF-TPMT1.81.50.5LD	NF-TPMT 090202N-LD	.0079	.1220			●	
		NF-TPMT1.81.51LD	NF-TPMT 090204N-LD	.0157	.1142			●	
 Break Master		NF-TPMT1.81.50.5GD	NF-TPMT 090202N-GD	.0079	.1220			●	
		NF-TPMT1.81.51GD	NF-TPMT 090204N-GD	.0157	.1142			●	

T Triangular

11° Pos.

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

TPGA21.5●

Dimensions (inch)				
Inscribed Circle IC	.2500	Hole Dia.	.1102
Thickness S	.0937		

Applicable Holder: Special Holder

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch)	PCD (SUMIDIA)			
						DA90	DA150	DA1000	DA2200
 NF Insert	NF-TPGA21.50	NF-TPGW110201	.0039	.1220				●	●
	NF-TPGA21.50.5	NF-TPGW110202	.0079	.1181				●	
	NF-TPGA21.51	NF-TPGW110204	.0157	.1142				●	●

TPMT21.5●

Dimensions (inch)				
Inscribed Circle IC	.2500	Hole Dia.	.1102
Thickness S	.0937		

Applicable Holder: Special Holder

 Break Master	NF-TPMT21.50.5LD	NF-TPMT110202N-LD	.0079	.1220				●	
	NF-TPMT21.51LD	NF-TPMT110204N-LD	.0157	.1142				●	
 Break Master	NF-TPMT21.50.5GD	NF-TPMT110202N-GD	.0079	.1220				●	
	NF-TPMT21.51GD	NF-TPMT110204N-GD	.0157	.1142				●	

TPGA22●

Dimensions (inch)				
Inscribed Circle IC	.2500	Hole Dia.	.1339
Thickness S	.1250		

Applicable Internal Holders ☞ E48 to E52

 NF Insert	NF-TPGA220	NF-TPGW110301	.0039	.1220				★	
	NF-TPGA220.5	NF-TPGW110302	.0079	.1181				●	●
	NF-TPGA221	NF-TPGW110304	.0157	.1142				●	●
	NF-TPGA222	NF-TPGW110308	.0315	.1063				●	●
	TPGA220	TPGW110201	.0039	.1457					●
	TPGA220.5	TPGW110302	.0079	.1457					●
	TPGA221	TPGW110304	.0157	.1417			●		●
	TPGA222	TPGW110308	.0315	.1299			★		●

TPM■22●

Dimensions (inch)				
Inscribed Circle IC	.2500	Hole Dia.	.1339
Thickness S	.1250		

Applicable Internal Holders ☞ E48 to E52

 NF Insert	NF-TPMA220.5	NF-TPMW110302	.0079	.0984	★				
	NF-TPMA221	NF-TPMW110304	.0157	.0945	★				
	NF-TPMA222	NF-TPMW110308	.0315	.0827	★				
 NF Insert	NF-TPMX220	NF-TPMT110301	.0039	.1220				●	
	NF-TPMX220.5	NF-TPMT110302	.0079	.1142				●	●
	NF-TPMX221	NF-TPMT110304	.0157	.1102				●	●
	NF-TPMX222	NF-TPMT110308	.0315	.0984				●	●
 Break Master	NF-TPMT220.5LD	NF-TPMT110302N-LD	.0079	.1220				●	
	NF-TPMT221LD	NF-TPMT110304N-LD	.0157	.1142				●	
	NF-TPMT222LD	NF-TPMT110308N-LD	.0315	.1063				●	
 Break Master	NF-TPMT221GD	NF-TPMT110304N-GD	.0157	.1142				●	
	NF-TPMT222GD	NF-TPMT110308N-GD	.0315	.1063				●	

T Triangular

11° Pos.

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

TPM■22●

Dimensions (inch)				
	Inscribed Circle IC	.2500	Hole Dia.	.1339
	Thickness S	.1250		

Applicable Internal Holders ☞ E48 to E52

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
	TPMX22V	TPMT110300	.0000	.1457				●
	TPMX221	TPMT110304	.0157	.1378				●

TPGA32●

Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1250		

Applicable Internal Holders ☞ E48 & E49

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-TPGA320.5	NF-TPGW160302	.0079	.1220			●	●
	NF-TPGA321	NF-TPGW160304	.0157	.1142			●	●
	NF-TPGA322	NF-TPGW160308	.0315	.1063			●	●

TPGA33●

Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1875		

Applicable Internal Holders ☞ E48, E51 to E52

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-TPGA330	NF-TPGW160401	.0039	.1220			★	●
	NF-TPGA330.5	NF-TPGW160402	.0079	.1181				●
	NF-TPGA331	NF-TPGW160404	.0157	.1142			●	●
	NF-TPGA332	NF-TPGW160408	.0315	.1063			●	
	TPGA331	TPGW160404	.0157	.1378		●		●
	TPGA332	TPGW160408	.0315	.1299				●

TPM■33●

Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1875		

Applicable Internal Holders ☞ E48, E51 to E52

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-TPMA330.5	NF-TPMW160402	.0079	.0984	★			
	NF-TPMA331	NF-TPMW160404	.0157	.0945	★			
	NF-TPMA332	NF-TPMW160408	.0315	.0827	★			
 Break Master	NF-TPMT330.5LD	NF-TPMT160402N-LD	.0079	.1220			●	
	NF-TPMT331LD	NF-TPMT160404N-LD	.0157	.1142			●	
	NF-TPMT332LD	NF-TPMT160408N-LD	.0315	.1063			●	
 Break Master	NF-TPMT330.5GD	NF-TPMT160402N-GD	.0079	.1220			●	
	NF-TPMT331GD	NF-TPMT160404N-GD	.0157	.1142			●	
	NF-TPMT332GD	NF-TPMT160408N-GD	.0315	.1063			●	

T Triangular

11° Pos.

TPG1.81.5●

Dimensions (inch)	Inscribed Circle IC	.2189	Hole Dia.	—
	Thickness S	.0937		

Applicable Cartridge: CP

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch)	PCD (SUMIDIA)			
					DA90	DA150	DA1000	DA2200
 NF Insert	NF-TPG1.81.50.5	NF-TPGN090202	.0079	.1220			★	
	NF-TPG1.81.51	NF-TPGN090204	.0157	.1181			★	●

TPG22●

Dimensions (inch)	Inscribed Circle IC	.2500	Hole Dia.	—
	Thickness S	.1250		

Applicable Internal Holders ☞ E49

 NF Insert	NF-TPG220.5	NF-TPGN110302	.0079	.1181			●	
	NF-TPG221	NF-TPGN110304	.0157	.1142			●	●
	NF-TPG222	NF-TPGN110308	.0315	.1063			●	●
 NF Insert	NF-TPG221P	NF-TPGN110304P	.0157	.4094			★	★
	NF-TPG222P	NF-TPGN110308P	.0315	.3858			★	★
	TPG221	TPGN110304	.0157	.1417		●		●
	TPG222	TPGN110308	.0315	.1299		●		●

Part number suffix P: Full-Length Cutting Edge

TPG32●

Dimensions (inch)	Inscribed Circle IC	.3750	Hole Dia.	—
	Thickness S	.1250		

Applicable External Holders ☞ C53
Applicable Internal Holders ☞ E49 & E52

 NF Insert	NF-TPG320.5	NF-TPGN160302	.0079	.1181			●	●
	NF-TPG321	NF-TPGN160304	.0157	.1142			●	
	NF-TPG322	NF-TPGN160308	.0315	.1063			●	●
 NF Insert	NF-TPG321P	NF-TPGN160304P	.0157	.6260			★	★
	TPG321	TPGN160304	.0157	.1417		●		●
	TPG322	TPGN160308	.0315	.1299		●		●
	TPG323	TPGN160312	.0472	.1181	●			●

T Triangular

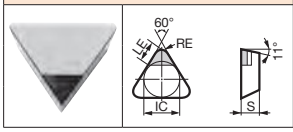
(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

11° Pos.

TPG43●

Dimensions (inch)				
	Inscribed Circle IC	.5000	Hole Dia.	—
	Thickness S	.1875		

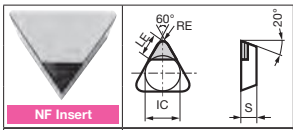
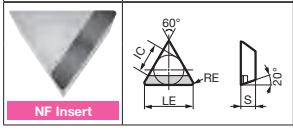
Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
	TPG431	TPGN220404	.0157	.1417				●
	TPG432	TPGN220408	.0315	.1299				●

20° Pos.

TEGN22●

Dimensions (inch)				
	Inscribed Circle IC	.2500	Hole Dia.	—
	Thickness S	.1250		

Applicable Cartridge: CE

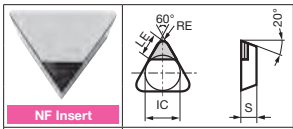
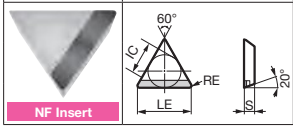
Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-TEGN220.5	NF-TEGN110302	.0079	.1220			★	
	NF-TEGN221	NF-TEGN110304	.0157	.1142			★	
	NF-TEGN222	NF-TEGN110308	.0315	.1063			★	
 NF Insert	NF-TEGN221P	NF-TEGN110304P	.0157	.4094			★	
	NF-TEGN222P	NF-TEGN110308P	.0315	.3858			★	

Part number suffix P: Full-Length Cutting Edge

TEGN32●

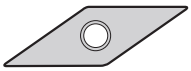
Dimensions (inch)				
	Inscribed Circle IC	.3750	Hole Dia.	—
	Thickness S	.1250		

Applicable Cartridge: CE

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-TEGN320.5	NF-TEGN160302	.0079	.1181			★	
	NF-TEGN321	NF-TEGN160304	.0157	.1142			★	
 NF Insert	NF-TEGN321P	NF-TEGN160304P	.0157	.6260			★	

Part number suffix P: Full-Length Cutting Edge

V 35° Diamond



(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Neg.

VNMA33●

Dimensions (inch)	Inscribed Circle IC	.3750	Hole Dia.	.1500
	Thickness S	.1875		

Applicable External Holders ☞ C29 to C31

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-VNMA332	NF-VNMA160408	.0315	.0748	★		●	●
	NF-VNMA333	NF-VNMA160412	.0472	.0669	●		●	
	NF-VNMA333H	NF-VNMA160412H	.0472	.0669				●
	VNMA333H	VNMA160412H	.0472	.1850	●			●

Neg.-Pos.

VNMX33●

Dimensions (inch)	Inscribed Circle IC	.3750	Hole Dia.	.1500
	Thickness S	.1875		

Applicable External Holders ☞ C29 to C31

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-VNMX330.5	NF-VNMX160402	.0079	.2717			●	●
	NF-VNMX331	NF-VNMX160404	.0157	.2520			●	●
	NF-VNMX332	NF-VNMX160408	.0315	.2205			●	●
	NF-VNMX333	NF-VNMX160412	.0472	.1850			★	●
 Break Master	NF-VNMX330.5LD	NF-VNMX160402N-LD	.0079	.2717			●	
	NF-VNMX331LD	NF-VNMX160404N-LD	.0157	.2520			●	
	NF-VNMX332LD	NF-VNMX160408N-LD	.0315	.2205			●	
 Break Master	NF-VNMX330.5GD	NF-VNMX160402N-GD	.0079	.2717			●	
	NF-VNMX331GD	NF-VNMX160404N-GD	.0157	.2520			●	
	NF-VNMX332GD	NF-VNMX160408N-GD	.0315	.2205			●	
	VNMX330.5	VNMX160402	.0079	.2717		★	★	
	VNMX331	VNMX160404	.0157	.2520		●	★	●
	VNMX332	VNMX160408	.0315	.2205		●	★	●
	VNMX333	VNMX160412	.0472	.1850		●	★	●

7° Pos.

VCMA63●

Dimensions (inch)	Inscribed Circle IC	.1875	Hole Dia.	.0906
	Thickness S	.0937		

Applicable Internal Holders ☞ E59, E60

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-VCMA630.5	NF-VCMW080202	.0079	.1260	★			
	NF-VCMA631	NF-VCMW080204	.0157	.1102	★			

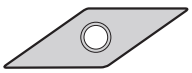
VCM■22●

Dimensions (inch)	Inscribed Circle IC	.2500	Hole Dia.	.1102
	Thickness S	.1252		

Applicable External Holders ☞ C41 & C43
Applicable Internal Holders ☞ E58 to E60

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-VCMA220.5	NF-VCMW110302	.0079	.1260	★			
	NF-VCMA221	NF-VCMW110304	.0157	.1102	★			
 NF Insert	NF-VCMX220	NF-VCMT110301	.0039	.1378			●	●
	NF-VCMX220.5	NF-VCMT110302	.0079	.1339			●	●
	NF-VCMX221	NF-VCMT110304	.0157	.1181			●	●
 Break Master	NF-VCMT220.5LD	NF-VCMT110302N-LD	.0079	.1496			●	
	NF-VCMT221LD	NF-VCMT110304N-LD	.0157	.1339			●	
 Break Master	NF-VCMT220.5GD	NF-VCMT110302N-GD	.0079	.1496			●	
	NF-VCMT221GD	NF-VCMT110304N-GD	.0157	.1339			●	

V 35° Diamond



7° Pos.

VCM■33●

Dimensions (inch)	Inscribed Circle IC	.3750	Hole Dia.	.1732
	Thickness S	.1875		

Applicable External Holders ☞ C41 to C43
Applicable Internal Holders ☞ E58

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Dimensions (inch) | PCD (SUMIDIA)

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert	NF-VCMA330.5	NF-VCMW160402	.0079	.1457	●			
	NF-VCMA331	NF-VCMW160404	.0157	.1299	●			
	NF-VCMA332	NF-VCMW160408	.0315	.0945	★		●	●
	NF-VCMA333	NF-VCMW160412	.0472	.0827	★		●	
	VCMA333	VCMW160412	.0472	.1929				●
 NF Insert	NF-VCMX331	NF-VCMT160404	.0157	.2559			●	●
	NF-VCMX332	NF-VCMT160408	.0315	.2205			●	●
	NF-VCMX333	NF-VCMT160412	.0472	.1811			●	●
 Break Master	NF-VCMT331LD	NF-VCMT160404N-LD	.0157	.2559			●	
	NF-VCMT332LD	NF-VCMT160408N-LD	.0315	.2205			●	
	NF-VCMT333LD	NF-VCMT160412N-LD	.0472	.1890			●	
 Break Master	NF-VCMT331GD	NF-VCMT160404N-GD	.0157	.2559			●	
	NF-VCMT332GD	NF-VCMT160408N-GD	.0315	.2205			●	
	NF-VCMT333GD	NF-VCMT160412N-GD	.0472	.1890			●	
	VCMX332	VCMT160408	.0315	.2283			★	
	VCMX333	VCMT160412	.0472	.1929			★	●
	VCMX333WF	VCMT160412-WF	.0472	.1929			★	●

VCM■2205●

Dimensions (inch)	Inscribed Circle IC	.5000	Hole Dia.	.2165
	Thickness S	.2189		

Applicable External Holders ☞ C59

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
	VCMT220520	VCMT220520	.0787	.1969			★	
	VCMT220530	VCMT220530	.1181	.1969			★	

11° Pos.

VPMA44●

Dimensions (inch)	Inscribed Circle IC	.5000	Hole Dia.	—
	Thickness S	.2500		

Shape	Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
	VPMA443	VPMW220612	.0472	.1929				●
	VPMA443WF	VPMW220612WF	.0472	.1929				●

W Trigon

5° Pos.

WBMX52●

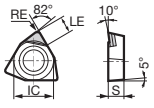
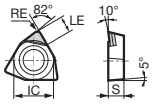
Dimensions (inch)	Inscribed Circle IC	.1563	Hole Dia.	.0866
	Thickness S	.0626		

Applicable Internal Holders ☞ E61, E62

★: Worldwide Warehouse Item

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide / Hard Brittle Material	●			

Shape		Sumitomo Cat. No.	ISO Cat. No.	Nose Radius RE	Effective Cutting Edge Length LE	Dimensions (inch) PCD (SUMIDIA) DA90	DA150	DA1000	DA2200
 NF Insert		**NF-WBMX520L**	**NF-WBMT060101L**	.0039	.0709			★	
		NF-WBMX520.5L	**NF-WBMT060102L**	.0079	.0709			★	
		NF-WBMX521L	**NF-WBMT060104L**	.0157	.0669			★	
		**WBMX520L**	**WBMT060101L**	.0039	.0709				●
		WBMX520.5L	**WBMT060102L**	.0079	.0709				●
		WBMX521L	**WBMT060104L**	.0157	.0669				●

PCD-SUMIDIA Brazed

PCD

DABB-C

Stop-Boring, Through-Boring and Back Chamfering

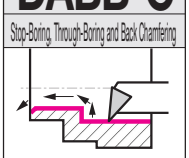
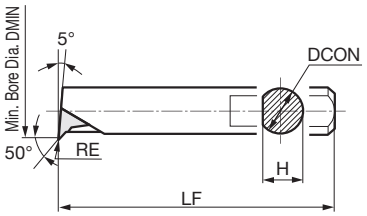


Fig 1



Holder (PCD-SUMIDIA)

Dimensions (*mm*)

Cat. No.	DA2200	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Nose Radius RE	Applicable Sleeve	Fig
DABB025CR	★	***3.0***	*2.5*	*2.2*	*60*	*0.1*	HBB2516	1
DABB035CR	★	***4.0***	*3.5*	*3.2*	*60*	*0.1*	HBB3516	1
DABB045CR	★	***5.0***	*4.5*	*4.1*	*80*	*0.1*	HBB4516	1
DABB060CR	★	***7.0***	*6.0*	*5.2*	*80*	*0.1*	HBB616	1

DABB-N

Stop-Boring, Through-Boring and Necking

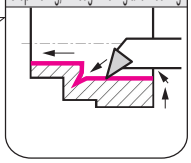
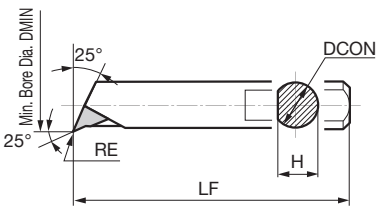


Fig 1



Holder (PCD-SUMIDIA)

Dimensions (*mm*)

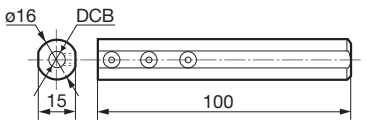
Cat. No.	DA2200	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Nose Radius RE	Applicable Sleeve	Fig
DABB025NR	★	***3.0***	*2.5*	*2.2*	*60*	*0.1*	HBB2516	1
DABB035NR	★	***4.0***	*3.5*	*3.2*	*60*	*0.1*	HBB3516	1
DABB045NR	★	***5.0***	*4.5*	*4.1*	*80*	*0.1*	HBB4516	1
DABB060NR	★	***7.0***	*6.0*	*5.2*	*80*	*0.1*	HBB616	1

Sleeve

Dimensions (*mm*)

Cat. No.	Stock	Bore Dia. DCB	Fig	Set Screw	Wrench (For Hex Socket)
HBB2516	★	*2.5*	1	BT0404	LH020
HBB3516	★	*3.5*	1		
HBB4516	★	*4.5*	1		
HBB616	★	*6.0*	1		

Fig 1



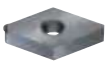
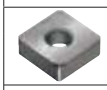
HBX sleeve can also be used.

■ PCD - SUMIDIA Binderless NPD10 Neg.

(Legend) Continuous Cutting ●: 1st Recommendation

Recommended Application: Carbide / Hard Brittle Material ●

Dimensions (*inch*)

Shape	Sumitomo Cat. No.	ISO Cat. No.	NPD10	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Nose Radius RE
	DNMA432RH	DNMA150408RH	★	.071	.500	.187	.203	.032
	DNMA433RH	DNMA150412RH	★	.071				.047
	SNMA432RH	SNMA120408RH	★	.067	.500	.187	.203	.032
	SNMA433RH	SNMA120412RH	★	.067				.047
	VNMA332RH	VNMA160408RH	★	.071	.037	.187	.150	.032
	VNMA333RH	VNMA160412RH	★	.060				.047

■ PCD- SUMIDIA DA90 Neg. NF

(Legend) General Cutting ●: 1st Recommendation

Recommended Application: N Non-Ferrous Metal; Carbide / Hard Brittle Material ●

Dimensions (*inch*)

Shape	Sumitomo Cat. No.	ISO Cat. No.	DA90	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Nose Radius RE
	NF-DNMA432	NF-DNMA150408	★	.079	.500	.187	.203	.031
	NF-DNMA433	NF-DNMA150412	★	.079				.047
	NF-SNMA432	NF-SNMA120408	★	.094	.50	.187	.203	.031
	NF-SNMA433	NF-SNMA120412	★	.094				.047
	NF-VNMA332	NF-VNMA160408	★	.075	.375	.187	.150	.031
	NF-VNMA333	NF-VNMA160412	★	.067				.047

Pos.

(Legend) Continuous Cutting ●: 1st Recommendation

Recommended Application: Carbide / Hard Brittle Material ●

Dimensions (*mm*)

Shape	Relief Angle	Sumitomo Cat. No.	ISO Cat. No.	NPD10	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Nose Radius RE
	7°	CCMW03X102RH	CCMW03X102RH	★	.051	.138	.055	.075	.008
		CCMW03X104RH	CCMW03X104RH	★	.051				.014
		CCMW04X102RH	CCMW04X102RH	★	.067	.169	.071	.091	.008
		CCMW04X104RH	CCMW04X104RH	★	.067				.014
		CCMA21.50.5RH	CCMW060202RH	★	.067	.250	.094	.110	.008
		CCMA21.51RH	CCMW060204RH	★	.067				.014
		CCMA32.50.5RH	CCMW09T302RH	★	.067	.375	.156	.173	.008
		CCMA32.51RH	CCMW09T304RH	★	.067				.014
		CCMA32.52RH	CCMW09T308RH	★	.063				.031
	7°	DCMA21.50.5RH	DCMW070202RH	★	.083	.250	.094	.110	.008
		DCMA21.51RH	DCMW070204RH	★	.079				.014
		DCMA32.50.5RH	DCMW11T302RH	★	.083	.375	.156	.173	.008
		DCMA32.51RH	DCMW11T304RH	★	.075				.014
		DCMA32.52RH	DCMW11T308RH	★	.063				.031
	11°	TPMA630.5RH	TPMW080202RH	★	.047	.188	.094	.091	.008
		TPMA631RH	TPMW080204RH	★	.039				.014
		TPMA220.5RH	TPMW110302RH	★	.059	.250	.125	.134	.008
		TPMA221RH	TPMW110304RH	★	.051				.014
		TPMA222RH	TPMW110308RH	★	.039				.031
		TPMA330.5RH	TPMW160402RH	★	.087	.375	.188	.173	.008
		TPMA331RH	TPMW160404RH	★	.079				.014
		TPMA332RH	TPMW160408RH	★	.063				.031
	7°	VCMA630RH	VCMW080201RH	★	.087	.188	.094	.091	.004
		VCMA630.5RH	VCMW080202RH	★	.075				.008
		VCMA631RH	VCMW080204RH	★	.059				.014
		VCMA220.5RH	VCMW110302RH	★	.083	.250	.125	.110	.008
		VCMA221RH	VCMW110304RH	★	.067				.014
		VCMA330.5RH	VCMW160402RH	★	.083	.375	.188	.173	.008
		VCMA331RH	VCMW160404RH	★	.067				.014
		VCMA332RH	VCMW160408RH	★	.071				.031
		VCMA333RH	VCMW160412RH	★	.059				.047

The R portion of the cutting edge is cylindrical shaped.

Pos. NF

(Legend) General Cutting ●: 1st Recommendation

Recommended Application: N Non-Ferrous Metal; Carbide / Hard Brittle Material ●

Dimensions (*mm*)

Shape	Relief Angle	Cat. No.		DA90	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Nose Radius RE
	7°	NF-CCMA03X102	NF-CCMW03X102	★	.043	.138	.055	.075	.008
		NF-CCMA03X104	NF-CCMW03X104	★	.043				.014
		NF-CCMA04X102	NF-CCMW04X102	★	.059	.169	.071	.091	.008
		NF-CCMA04X104	NF-CCMW04X104	★	.059				.014
		NF-CCMA21.50.5	NF-CCMW060202	★	.094	.250	.094	.110	.008
		NF-CCMA21.51	NF-CCMW060204	★	.094				.014
		NF-CCMA32.50.5	NF-CCMW09T302	★	.094	.375	.156	.173	.008
		NF-CCMA32.51	NF-CCMW09T304	★	.094				.014
		NF-CCMA32.52	NF-CCMW09T308	★	.091				.031
	7°	NF-DCMA21.50.5	NF-DCMW070202	★	.102	.250	.094	.110	.008
		NF-DCMA21.51	NF-DCMW070204	★	.094				.014
		NF-DCMA32.50.5	NF-DCMW11T302	★	.102	.375	.156	.173	.008
		NF-DCMA32.51	NF-DCMW11T304	★	.094				.014
		NF-DCMA32.52	NF-DCMW11T308	★	.079				.031
	11°	NF-TPMA630.5	NF-TPMW080202	★	.098	.188	.094	.091	.008
		NF-TPMA631	NF-TPMW080204	★	.094				.014
		NF-TPMA220.5	NF-TPMW110302	★	.098	.250	.125	.134	.008
		NF-TPMA221	NF-TPMW110304	★	.094				.014
		NF-TPMA222	NF-TPMW110308	★	.083				.031
		NF-TPMA330.5	NF-TPMW160402	★	.098	.375	.188	.173	.008
		NF-TPMA331	NF-TPMW160404	★	.094				.014
		NF-TPMA332	NF-TPMW160408	★	.083				.031
	7°	NF-VCMA630.5	NF-VCMW080202	★	.126	.188	.094	.091	.008
		NF-VCMA0631	NF-VCMW080204	★	.110				.014
		NF-VCMA220.5	NF-VCMW110302	★	.126	.250	.125	.110	.008
		NF-VCMA221	NF-VCMW110304	★	.110				.014
		NF-VCMA330.5	NF-VCMW160402	★	.146	.375	.188	.173	.008
		NF-VCMA331	NF-VCMW160404	★	.130				.014
		NF-VCMA332	NF-VCMW160408	★	.094				.031
		NF-VCMA333	NF-VCMW160412	★	.083				.047

The R portion of the cutting edge is cylindrical shaped.

★: Worldwide Warehouse Item

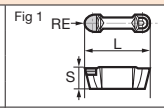
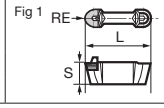
For Turning

Round Insert

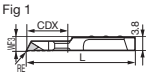
Dimensions (inch)

Shape	Sumitomo Cat. No.	ISO Cat. No.	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200	Inscribed Circle IC	Thickness S	Cutting Edge Length LE	Nose Radius RE	Hole Dia.	Fig	Applicable Holder
 Fig1 	**RPGW0803M0**	**RPGW0803M0**			★		.3150	.1252	—	—	.1299	1	SEC-RP Profiling Tool Holders for Aluminum Wheel Machining (RP02 (Made-to-order item))

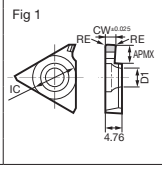
Dogbone Insert

Shape	Sumitomo Cat. No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200	Overall Length L	Thickness S	Nose Radius RE			Fig	Applicable Holder
 Fig 1 	**MDE3RN7**	**MDE3RN7**				★	1.0236	.3346	.1181			1	SEC-GD Profiling Tool Holders for Aluminum Wheel Machining (GDE) →C60 to C61
	MDE4R	**MDE4R**				★	1.1811	.3346	.1575			1	
 Fig 1 	**MDE3RN7-AW**	**MDE3RN7-AW**				★	1.0236	.3346	.1181			1	
	MDE4R-AW	**MDE4R-AW**				★	1.1811	.3346	.1575			1	

Very Small Dia. Boring Insert

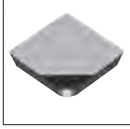
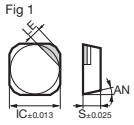
Shape	Sumitomo Cat. No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200	Min. Bore Dia. DMIN	WF3	Nose Radius RE	L	CDX	Fig	Applicable Holder
 Fig 1 	**KBMXR0311-10**	**KBMXR0311-10**				★	.1181	.1614	.0039	1.1220	.4331	1	Very Small Dia. Boring Bar (CKB) →E66
	KBMXR0411-10	**KBMXR0411-10**				★	.1575	.1693	.0039	1.1220	.4331	1	
	KBMXR0511-10	**KBMXR0511-10**				★	.1969	.1772	.0039	1.1220	.4331	1	

Grooving Insert

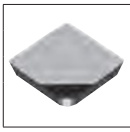
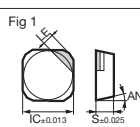
Shape	Sumitomo Cat. No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200	Inscribed Circle IC	Width of Cut CW	Nose Radius RE	Max. Groove Depth APMX	Hole Dia. D1	Fig	Applicable Holder
 Fig 1 	**TGAR4125**	**TGAR4125**				★	.5000	.0492	.0039	.0787	.2165	1	Grooving Tools (GWC, GWCS, GWCI) →F43
	TGAR4150	**TGAR4150**				★	.5000	.0591	.0039	.1378	.2165	1	
	TGAR4200	**TGAR4200**				★	.5000	.0787	.0039	.1378	.2165	1	
	TGAR4250	**TGAR4250**				★	.5000	.0984	.0039	.1575	.2165	1	
	TGAR4300	**TGAR4300**				★	.5000	.1181	.0039	.1575	.2165	1	
	TGAR4350	**TGAR4350**				★	.5000	.1378	.0039	.1969	.2165	1	
	TGAR4400	**TGAR4400**				★	.5000	.1575	.0039	.1969	.2165	1	

For Milling

For ACE MILL APG

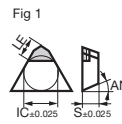
Shape	Sumitomo Cat. No.	ISO Cat. No.	PCD (SUMIDIA) DA90	DA150	DA1000	DA2200	Inscribed Circle IC	Thickness S	Cutting Edge Length LE	Relief Angle AN	Fig	Applicable Cutter / Endmill
 Fig 1 	**NF-SDC42R**	**NF-SDC42R**			★	★	.5000	.1252	.1181	.5906	1	APG →H256
	SDC42R	**SDCN1203R**			★	●	.5000	.1252	.1181	.5906	1	

For ACE MILL FPG / Multi Use Endmill FPE

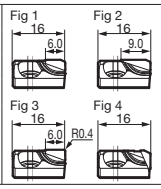
Shape	Sumitomo Cat. No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200	Inscribed Circle IC	Thickness S	Cutting Edge Length LE	Relief Angle AN	Fig	Applicable Cutter / Endmill
 Fig 1 	**NF-SDKN42M**	**NF-SDKN42M**			★		.5000	.1252	.1181	.5906	1	FPG →H259 FPE
	SDKN42M	**SDKN1203M**		★			.5000	.1252	.1181	.5906	1	

For Milling

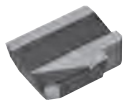
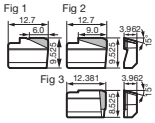
For ACE MILL CHG / Multi Use Endmill CHE

Shape	Sumitomo Cat. No.	ISO Cat. No.	DA90	DA150	DA1000	DA2200	Inscribed Circle IC	Thickness S	Cutting Edge Length LE	Relief Angle AN	Fig	Applicable Cutter / Endmill
 	**NF-TEEN22R**	**NF-TEEN22R**			★		.2500	.1252	.1929			CHG →H257 CHE →H255
	NF-TEEN32R	**NF-TEEN32R**			●	●	.3750	.1252	.1929	.7874	1	
	NF-TEEN43R	**NF-TEEN43R**				●	.5000	.1874	.1890			
	TEEN22R	**TEEN22R**			★		.2500	.1252	.1929			
	TEEN32R	**TEEN32R**				●	.3750	.1252	.1929	.7874	1	
	TEEN43R	**TEEN43R**		★			.5000	.1874	.1890			

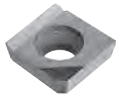
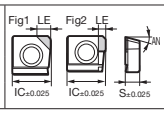
For High-Efficiency Cutter for Aluminum Alloys ALNEX ANX

 	**ANB1600R-L**	**ANB1600R-L**			●				.2362			ANX →H213 - H220
	ANB1600R-G	**ANB1600R-G**			●				.2362		1	
	ANB1600R-H	**ANB1600R-H**			●				.2362			
	ANB1600R-GX	**ANB1600R-GX**			★				.3543		2	
	ANB1604R	**ANB1604R**			●				.2362		3	
	ANB1608R	**ANB1608R**			★				.2362		3	
	ANB1600R-W	**ANB1600R-W**			●				—		4	

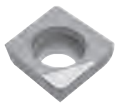
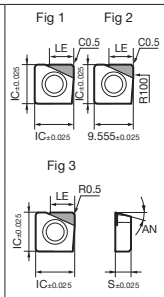
For High-Efficiency Cutter for Aluminum Alloys HF

 	**NF-LDEN12T3ZDFR-L**	**NF-LDEN12T3ZDFR-L**			●							HF →H221 - H226
	NF-LDEN12T3ZDFR-G	**NF-LDEN12T3ZDFR-G**			●		—	—	.2362	—	1	
	NF-LDEN12T3ZDTR-H	**NF-LDEN12T3ZDTR-H**			●							
	NF-LDEN12T3ZDFR-GX	**NF-LDEN12T3ZDFR-GX**			●		—	—	.3543	—	2	
	NF-LDEN12T3ZDFR-W	**NF-LDEN12T3ZDFR-W**			●		—	—	—	—	3	

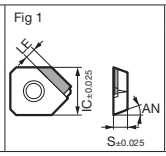
For High-Speed Cutter for Aluminum Alloys RF (Insert)

 	**NF-SNEW1204ADFR**	**NF-SNEW1204ADFR**			●	●	.5000	.1874	.1850	.5906	1	RF →H227-228
	NF-SNEW120404ADFR-H	**NF-SNEW120404ADFR-H**			★				.3740			
	NF-SNEW1204ADFR-W	**NF-SNEW1204ADFR-W**			●	●	.5000	.1874	.0906	.5906	2	

For Small Diameter Cutter for Aluminum Alloys SRF

 	**NF-SNEW09T3ADTR**	**NF-SNEW09T3ADTR**			●	●	.3750	.1559	.2362	.5906	1	SRF →H229 - H230
	NF-SNEW09T3ADTR-U	**NF-SNEW09T3ADTR-U**			●		.3750	.1559	.2362	.5906	2	
	NF-SNEW09T3ADTR-R	**NF-SNEW09T3ADTR-R**			●		.3750	.1559	.2362	.5906	3	

For WaveMill WGC & WGX

 	**NF-XEEW13T3AGFRW**	**NF-XEEW13T3AGFR-W**			●		.5276	.1563	.0984	.7874	1	WGC →H254

■ General Features

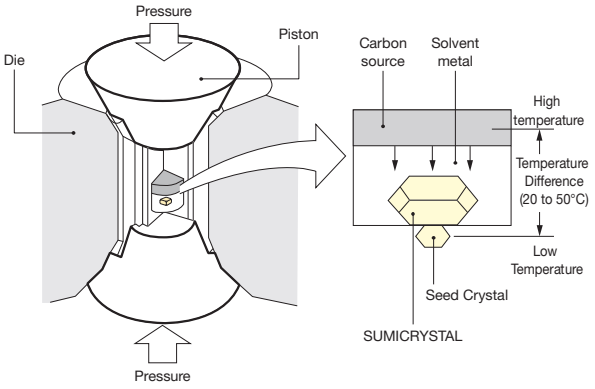
SUMICRYSTAL is the world's first commercially available large-grained high-purity single-crystal diamond, developed by Sumitomo.
Thorough quality control has achieved stable quality, making SUMICRYSTAL ideal as an industrial material.

■ Production Method

The synthetic single-crystal diamond SUMICRYSTAL is synthesized in a super high pressure chamber from 5 to 6GPa and high temperatures from 1,300 to 1,600°C. The temperature difference between the raw carbon and the seed crystal is used to grow the diamond on the seed crystal. Through this stringent control of pressures and temperatures, a more stable structure with minimal impurities can be obtained.

● Inside a super high pressure chamber

Synthetic Conditions
Pressure: 5 to 6GPa
Temperature: 1,300 to 1,600°C

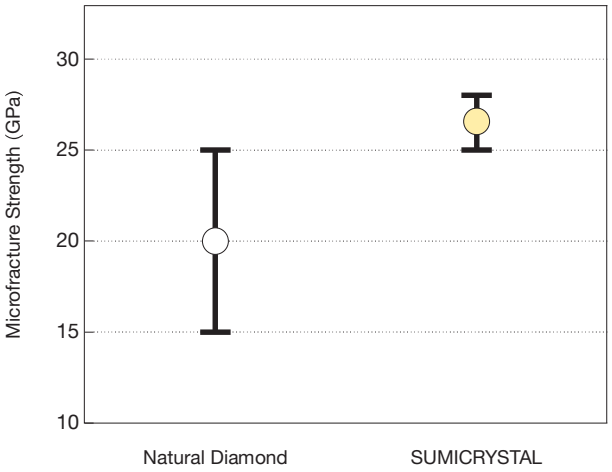


■ Properties

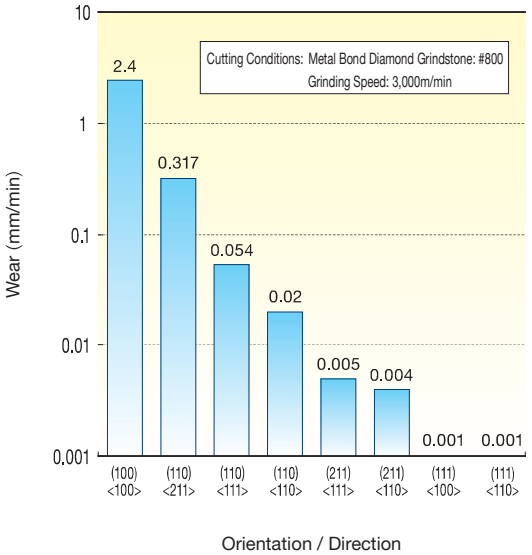
SUMICRYSTAL has 4 main advantages over natural diamond.

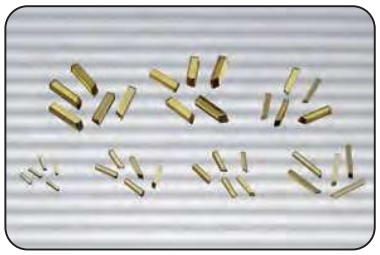
1) Structural advantage: Natural diamond is rounded and the crystal orientation is difficult to determine with the naked eye. SUMICRYSTAL, however, has a distinct crystal face which makes the identification much easier.
2) Uniformity: Due to the strictly controlled conditions in which the crystals are grown, uniform quality is obtained consistently.
3) Availability: Unlike the limited supply of natural diamonds, SUMICRYSTAL can be mass produced.
4) SUMICRYSTAL diamond type Ib, which is used for tools, has mechanical and thermal properties equal to or even greater than natural diamond, while containing trace amounts of nitrogen impurities.

● Microfracture Strength of Synthetic Diamond



● Orientation and Wear Resistance





■ General Features

SUMICRYSTAL PD and PDX are single-crystal synthetic diamonds processed into thin prism shapes for use as dresser blanks. Their stable performance and long tool life improve dressing precision.

SUMICRYSTAL PD

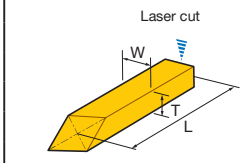
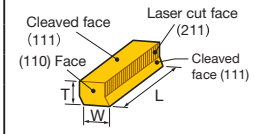
■ Features

● Revolutionary Elongated Shape

(1) Improved retention strength prevents diamonds from falling out.
(2) Consistent cross-section prevents deterioration.
(3) Uniform crystal orientation promotes stable tool life.

■ Standard Cat. No. (PD)

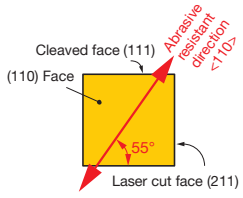
Dimensions (mm)

Shape	Cat. No.	Stock	T	W	L
 · 'L' is the distance between the centre points of both ends. · Both upper and lower (111) faces are cleaved.	PD 0220	●	$0.2^{\pm0.05}$	$0.2^{\pm0.05}$	2.0 to 2.5
	PD 0420	●	$0.4^{\pm0.05}$	$0.4^{\pm0.05}$	2.0 to 2.5
	PD 0630K	●	$0.6^{\pm0.1}$	$0.6^{\pm0.1}$	3.0 to 4.0
	PD 0640K	●			4.0 to 5.0
	PD 0650K	●			5.0 up
	PD 0830K	●	$0.8^{\pm0.1}$	$0.8^{\pm0.1}$	3.0 to 4.0
	PD 0840K	●			4.0 to 5.0
	PD 0850K	●			5.0 up
	PD 1130K	●	$1.1^{\pm0.1}$	$1.1^{\pm0.1}$	3.0 to 4.0
	PD 1140K	●			4.0 to 5.0
 Single cleaved side face with pre-determined abrasive resistant direction.	PD 0630TK	●	$0.6^{\pm0.1}$	$0.6^{\pm0.1}$	3.0 to 4.0
	PD 0640TK	●			4.0 to 5.0
	PD 0830TK	●	$0.8^{\pm0.1}$	$0.8^{\pm0.1}$	3.0 to 4.0
	PD 0840TK	●			4.0 to 5.0
	PD 1130TK	●	$1.1^{\pm0.1}$	$1.1^{\pm0.1}$	3.0 to 4.0
	PD 1140TK	●			4.0 to 5.0

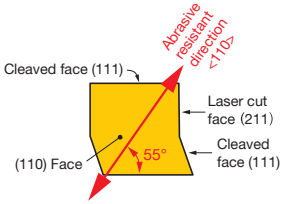
* 1 Sizes other than those indicated above can be ordered. ● mark: Standard stocked item
* 2 These products may have fine impurities within Sumitomo's prescribed range.
* 3 The laser cut faces among other product areas may have chipping within Sumitomo's prescribed range.

■ PD Crystal Orientation

PD

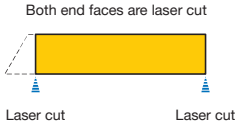


PD-T



■ KK Type

Apart from the standard items listed above, PD is also available in the KK type with both end faces laser-cut.



· When ordering, include "K" after the standard catalogue number.
(Example: PD○○○○KK,
PD○○○○TKK)

· PD0220 and 0420 are not available in the KK type.

SUMICRYSTAL PDX

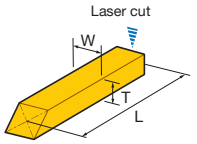
■ Features

● Compared to conventional tools (PD), the product has different face crystal orientation.

(1) Crystal orientation (211) provides better tool life than conventional PD blanks.
(2) Parallel abrasive resistant faces (111) facilitate blank setting during manufacturing of dressers.

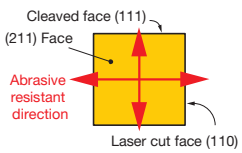
■ Standard Cat. No. (PDX)

Dimensions (mm)

Shape	Cat. No.	Stock	T	W	L
 · 'L' is the distance between the centre points of both ends. · Both upper and lower (111) faces are cleaved.	PDX 0220	●	$0.2^{\pm0.05}$	$0.2^{\pm0.05}$	$2.0^{\pm0.1}$
	PDX 0320	●	$0.3^{\pm0.05}$	$0.3^{\pm0.05}$	
	PDX 0420	●	$0.4^{\pm0.05}$	$0.4^{\pm0.05}$	
	PDX 0630	●	$0.6^{\pm0.1}$	$0.6^{\pm0.1}$	$3.0^{\pm0.5}$
	PDX 0640	●			$4.0^{\pm0.5}$
	PDX 0830	●	$0.8^{\pm0.1}$	$0.8^{\pm0.1}$	$3.0^{\pm0.5}$
	PDX 0840	●			$4.0^{\pm0.5}$
	PDX 1130	●	$1.1^{\pm0.1}$	$1.1^{\pm0.1}$	$3.0^{\pm0.5}$
	PDX 1140	●			$4.0^{\pm0.5}$

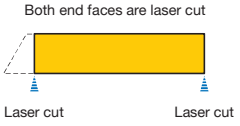
* 1 Sizes other than those indicated above can be ordered. ● mark: Standard stocked item
* 2 These products may have fine impurities within Sumitomo's prescribed range.
* 3 The laser cut faces among other product areas may have chipping within Sumitomo's prescribed range.

■ PDX Crystal Orientation



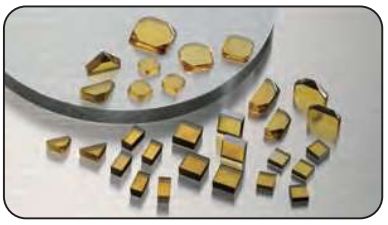
■ K Type

Apart from the standard items listed above, PDX is also available in the K type with both end faces laser-cut.



· When ordering, include "K" after the standard catalogue number.
(Example: PDX○○○○K)

· PDX0220, 0320 and 0420 are not available in the K type.



■ General Features

Of today's sophisticated cutting-edge technologies, ultra-precision machining processes such as those used for optical element molds are seeing particularly rapid development.
SUMICRYSTAL UP blanks have high performance and reliability, making them optimally suited to these applications.

■ Features

(1) High quality with very low variance.
Stable wear resistance with excellent resistance to cutting edge chipping.
(2) Minimal stock removal during cutting edge formation.
Uniform shape facilitates cutting edge formation.

■ Standard Type

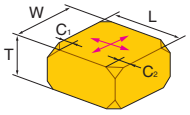
Rectangular parallel type with 6 (100) faces.

■ Economy Type

Peripheral growth faces and top are not cut. Benefits include large volume and low cost.

■ Standard Cat. No. (Standard Type)

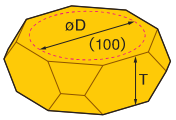
Dimensions (mm)

Shape	Cat. No.	Stock	L	W	C_1,C_2	T
 The red arrows indicate the direction for easy grinding. Crystal face orientations are all (100) except the corners.	**UP 282512**		2.8 to 3.5	2.5 to 3.5	up to 0.8	1.2±0.1
	UP 282515		2.8 to 3.5	2.5 to 3.5	up to 0.8	1.5±0.1
	UP 303015		3.0 to 3.5	3.0 to 3.5	up to 0.3	1.5±0.1
	UP 301415		3.0 to 3.5	1.4 to 1.7	up to 0.3	1.5±0.1
	UP 333014		3.3 to 4.0	3.0 to 4.0	up to 0.9	1.4±0.1
	UP 333017		3.3 to 4.0	3.0 to 4.0	up to 0.9	1.7±0.1
	UP 353514		3.5 to 4.0	3.5 to 4.0	up to 0.4	1.4±0.1
	UP 353517		3.5 to 4.0	3.5 to 4.0	up to 0.4	1.7±0.1
	UP 351717		3.5 to 4.0	1.7 to 2.0	up to 0.4	1.7±0.1

*1 Sizes other than those indicated above can be ordered. Blank: Made-to-order item
*2 These products may have fine impurities, chipping, etc. within Sumitomo's prescribed range.

■ Standard Cat. No. (Economy Type)

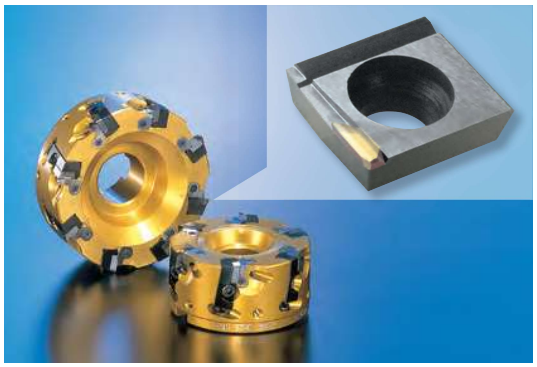
Dimensions (mm)

Shape	Cat. No.	Stock	øD Minimum guaranteed dimensions	T
	**UP 2010**		2.0	1.0
	UP 2012			1.2
	UP 2510		2.5	1.0
	UP 2512			1.2
	UP 2515			1.5
	UP 3010		3.0	1.0
	UP 3012			1.2
	UP 3015			1.5
	UP 3510		3.5	1.0
	UP 3512			1.2
	UP 3515			1.5
	UP 4010		4.0	1.0
	UP 4012			1.2
	UP 4015			1.5
	UP 4020			2.0
	UP 4510		4.5	1.0
	UP 4512			1.2
	UP 4515			1.5
	UP 4520			2.0
	UP 5010		5.0	1.0
	UP 5012			1.2
	UP 5015			1.5
	UP 5020			2.0

*1 Sizes other than those indicated above can be ordered. Blank: Made-to-order item
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present in the minimum guaranteed dimensions of these products.
*3 Impurities, chipping, etc. outside the inspection range may be present outside the minimum guaranteed dimensions of these products.
*4 Some products have ground top surfaces.

● Cutting Tools Using SUMICRYSTAL UP

Wiper Insert for High-Efficiency Cutter for Aluminum Alloy RF Type →M46



* This product was jointly developed with A.L.M.T. Corp.

SUMICRYSTAL SC10 (Wiper Insert)

- SUMICRYSTAL, a single-crystal diamond produced with SEH's original super-high pressure technology, is used for the cutting edge.
- Edge sharpness is retained better than sintered diamonds, greatly reducing burr formation.

SUMICRYSTAL (Single-Crystal Diamond) Surface machined with SC10 wiper insert

Surface machined with SUMIDIA (Sintered Diamond) wiper insert

UP (Half-Cut Product)

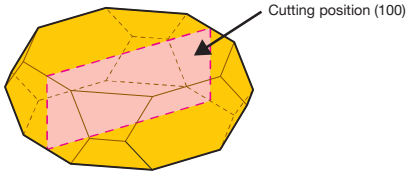
■ General Features

SUMICRYSTAL UP Half Cut products are materials for holders consisting of the UP Economy type material cut in half along the (100) or (110) faces.

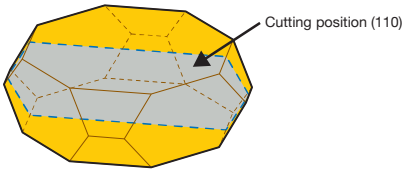
■ Features

(1) Grinding during tool production minimizes the volume removed, reducing machining loss.
(2) Similar shape to the completed tool, reducing material costs.
(3) The cut surface is a smooth laser surface.

■ Type cut along (100) face

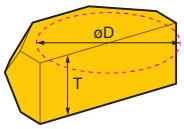


■ Type cut along (110) face



■ Standard Cat. No. (Type Cut Along (100) Face)

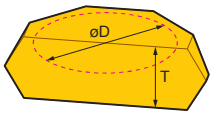
Dimensions (mm)

Shape	Cat. No.	Stock	øD Minimum guaranteed dimensions	T
	UP 2010 (100) 1/2		2.0	1.0
	UP 2012 (100) 1/2			1.2
	UP 2510 (100) 1/2		2.5	1.0
	UP 2512 (100) 1/2			1.2
	UP 2515 (100) 1/2			1.5
	UP 3010 (100) 1/2		3.0	1.0
	UP 3012 (100) 1/2			1.2
	UP 3015 (100) 1/2			1.5
	UP 3510 (100) 1/2		3.5	1.0
	UP 3512 (100) 1/2			1.2
	UP 3515 (100) 1/2			1.5
	UP 4010 (100) 1/2		4.0	1.0
	UP 4012 (100) 1/2			1.2
	UP 4015 (100) 1/2			1.5
	UP 4020 (100) 1/2			2.0
	UP 4510 (100) 1/2		4.5	1.0
	UP 4512 (100) 1/2			1.2
	UP 4515 (100) 1/2			1.5
	UP 4520 (100) 1/2			2.0
	UP 5010 (100) 1/2		5.0	1.0
	UP 5012 (100) 1/2			1.2
	UP 5015 (100) 1/2			1.5
	UP 5020 (100) 1/2			2.0

*1 Sizes other than those indicated above can be ordered. Blank: Made-to-order item
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present in the minimum guaranteed dimensions of these products.
*3 Impurities, chipping, etc. outside the inspection range may be present outside the minimum guaranteed dimensions of these products.
*4 Some products have ground top surfaces.

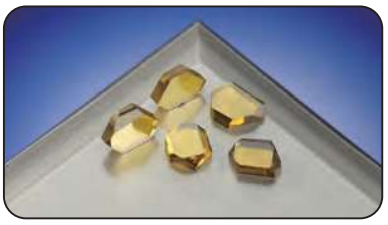
■ Standard Cat. No. (Type Cut Along (110) Face)

Dimensions (mm)

Shape	Cat. No.	Stock	øD Minimum guaranteed dimensions	T
	UP 2010 (110) 1/2		2.0	1.0
	UP 2012 (110) 1/2			1.2
	UP 2510 (110) 1/2		2.5	1.0
	UP 2512 (110) 1/2			1.2
	UP 2515 (110) 1/2			1.5
	UP 3010 (110) 1/2		3.0	1.0
	UP 3012 (110) 1/2			1.2
	UP 3015 (110) 1/2			1.5
	UP 3510 (110) 1/2		3.5	1.0
	UP 3512 (110) 1/2			1.2
	UP 3515 (110) 1/2			1.5
	UP 4010 (110) 1/2		4.0	1.0
	UP 4012 (110) 1/2			1.2
	UP 4015 (110) 1/2			1.5
	UP 4020 (110) 1/2			2.0
	UP 4510 (110) 1/2		4.5	1.0
	UP 4512 (110) 1/2			1.2
	UP 4515 (110) 1/2			1.5
	UP 4520 (110) 1/2			2.0
	UP 5010 (110) 1/2		5.0	1.0
	UP 5012 (110) 1/2			1.2
	UP 5015 (110) 1/2			1.5
	UP 5020 (110) 1/2			2.0

*1 Sizes other than those indicated above can be ordered. Blank: Made-to-order item
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present in the minimum guaranteed dimensions of these products.
*3 Impurities, chipping, etc. outside the inspection range may be present outside the minimum guaranteed dimensions of these products.
*4 Some products have ground top surfaces.

UPT



■ General Features

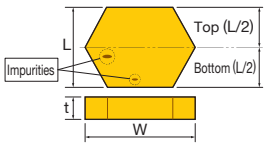
SUMICRYSTAL UPT is a material for holders with a 2-point surface ((110) face) as the main surface.

■ Features

(1) 2-point surface ((110) face) enables use for the same applications as with holders using conventional natural diamonds.
(2) Distinctive shape minimizes the volume removed to make the cutting edge, enabling efficient machining.

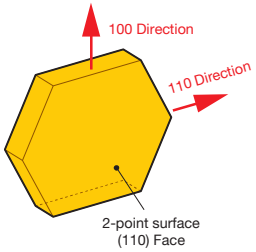
■ Standard Items

Dimensions (mm)

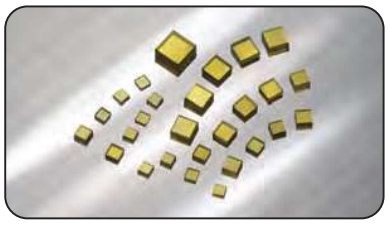
Shape	Cat. No.	Stock	W	L	T
	**UPT 3010**		3.0	2.5	1.0$^{\pm0.1}$
	UPT 3012				1.2$^{\pm0.1}$
	UPT 4010		4.0	3.0	1.0$^{\pm0.1}$
	UPT 4012				1.2$^{\pm0.1}$

*1 Sizes other than those indicated above can be ordered. Blank: Made-to-order item
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present at the top (1/2).
*3 Impurities, chipping, etc. outside the inspection range may be present at the bottom (L/2).

■ UPT Crystal Orientation



CD



■ General Features

SUMICRYSTAL CD has optimized crystal orientation and shape as a material for wire drawing dies. Realizing excellent performance through high quality and stability.

■ Features

(1) High quality with very low variance.
High-quality crystal with minimal impurities, chipping and distortion is used to achieve high, stable wear resistance. It also eliminates the need for inspection and selection of raw stones required for natural diamond.

(2) High fracture strength
Resistant to fracture and cracking during wire drawing.

(3) Accurate crystal orientation
(111) is used on the top and bottom surface, limiting crystal misorientation, which causes variance in tool life, to within 1°.

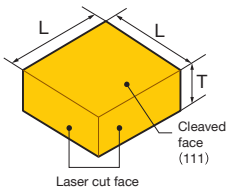
(4) No grinding needed for top and bottom surface
The top and bottom surface are cleaved to form parallel surfaces, eliminating the need for grinding of the top and bottom surface.

■ Standard Type

The outside is machined by laser, achieving a consistent shape for easy setting. Mounting pressure is applied evenly, ensuring sufficient strength even for small volume. Ideal for applications with limited dimensions, such as nozzles and wire guides.

■ Standard Items

Dimensions (mm)

Shape	Cat. No.	Stock	L	T
	**CD 1006(111)**		$1.0^{\pm0.1}$	$0.6^{\pm0.1}$
	CD 1008(111)		$1.0^{\pm0.1}$	$0.8^{\pm0.1}$
	CD 1210(111)		$1.2^{\pm0.1}$	$1.0^{\pm0.1}$
	CD 1411(111)		$1.4^{\pm0.1}$	$1.1^{\pm0.1}$
	CD 1512(111)		$1.5^{\pm0.1}$	$1.2^{\pm0.1}$
	CD 1814(111)		$1.8^{\pm0.1}$	$1.4^{\pm0.1}$
	CD 2016(111)		$2.0^{\pm0.1}$	$1.6^{\pm0.1}$
	CD 2318(111)		$2.3^{\pm0.1}$	$1.8^{\pm0.1}$
	CD 2520(111)		$2.5^{\pm0.1}$	$2.0^{\pm0.1}$

Blank: Made-to-order item

*1 Sizes other than those indicated above can be ordered.
*2 These products may have fine impurities, chipping, etc. within Sumitomo's prescribed range.