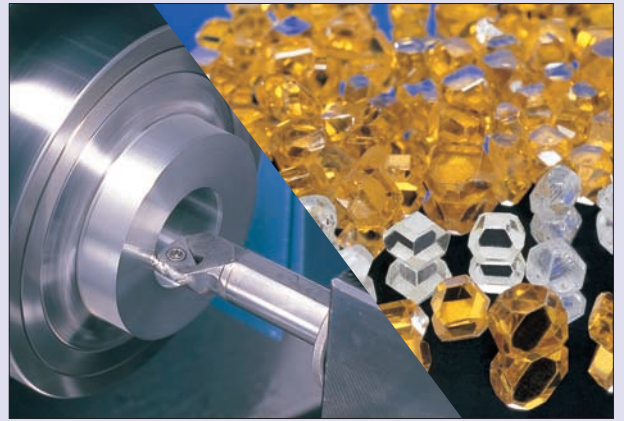


SUMIDIA SUMICRYSTAL

M



M1 ~ M30



Grades	SUMIDIA Series	M2
	SUMIDIA DA2200	M3
Inserts	SUMIDIA NF Type Inserts	M4
	SUMIDIA BreakMaster DM Type	M5
	SUMIDIA Indexable Inserts	M6
Holders	SUMIDIA Mini Boring Tools CKB Type	M18
	SUMIDIA Small Hole Boring Bar DABB Type	M19
Cutters, Endmills	Aluminum Body Cutter RF Type	M20
	SUMIDIA Cutter For Aluminum SRF Type	M21
	SUMIDIA Cutter FAM Type/SAM Type	M22
	SUMIDIA Endmill SAM-E Type	M23
	SUMIDIA Mini-Cutter DFE Type	M24
	SUMIDIA Endmill DFE Type	M25
	SUMIDIA Endmill DAE Type	M25
Drills	SUMIDIA Drill DAL Type	M26
	SUMIDIA Drill DDL Type	M26
	SUMIDIA Drill DML Type	M27
SumiCrystal	SUMICRYSTAL	M28
	SUMICRYSTAL UP	M29
	SUMICRYSTAL PD/PDX	M30

SUMIDIA Series



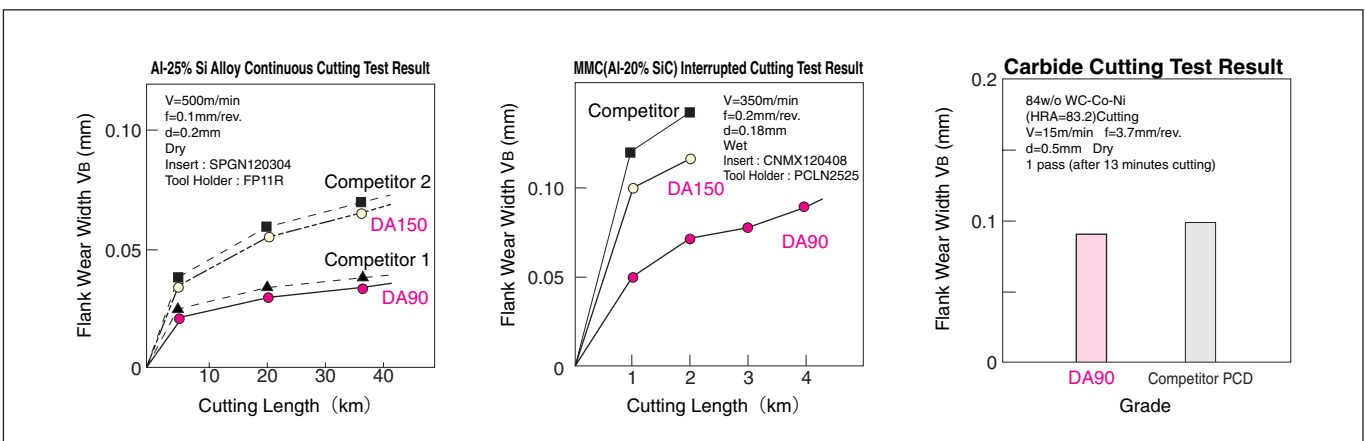
■ General Description

SUMIDIA is a unique series of sintered polycrystalline diamond grades namely; DA2200, DA200, DA150 and DA90.

■ Series • Features • Application

Grade	Features	Application	Average size of Diamond grains (μm)	Hardness Hv (GPa)	Transverse Rupture Strength (GPa)
DA2200	High density sintered material made of ultra-fine diamond particles. Superior hardness and wear resistance with sharp edge.	<ul style="list-style-type: none"> Rough, Interrupted and Finishing of Al-alloy Wood or Wooden Board Cutting 	0.5	90 ~ 100	\cong 2.45
DA200	Tough, ultra-fine grained sintered diamond material with a sharp edge that is suitable for the machining of non-ferrous materials.	<ul style="list-style-type: none"> Non-Ferrous Metal Interrupted Cutting Plastic Material Cutting 	0.5	80 ~ 100	\cong 2.15
DA150	Micro-grained sintered diamond grade with strong diamond-to-diamond bonding. It is suitable for the machining of non-ferrous metals and other very hard materials.	<ul style="list-style-type: none"> Non-Ferrous Metal finishing (Aluminum, Copper Alloy) Green or Semi-Sintered Carbide & Ceramic Roughing FRP, Hard Rubber & Carbon Cutting Wooden or Inorganic Material Board Cutting 	5	100 ~ 120	\cong 1.95
DA90	Contains coarser diamond grains than other grades. Therefore, it has good wear resistance suitable for the machining of carbides and high silicon aluminum.	<ul style="list-style-type: none"> Sintered Carbide Cutting Green or Semi-Sintered Carbide & Ceramic Roughing High-Silicon aluminum Alloy Cutting Sintered Ceramic Cutting Stone or Rock Cutting 	~ 50	100 ~ 120	\cong 1.10

■ Performance



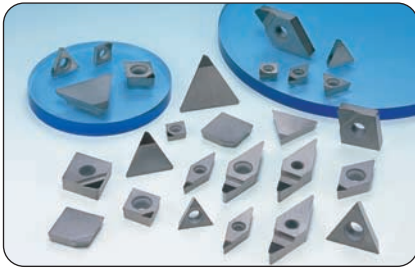
■ Recommended Conditions

Work Materials	Cutting Speed V(m/min)	Feedrate f(mm/rev)	Depth-of-cut d(mm)
Aluminium Alloys	~ 3,000	~ 0.2	~ 3
Copper Alloys	~ 1,000	~ 0.2	~ 3
Reinforced Plastics	~ 1,000	~ 0.4	~ 2
Wood or Organic Materials	~ 4,000	~ 0.4	—
Carbide	10 ~ 30	~ 0.2	~ 0.5
Carbon	100 ~ 600	1	~ 2

■ SUMIDIA Grinding Method

Items	Guidance
Grinding Machine	— A rigid, special-purpose grinding machine that is capable of wet grinding operations.
Grinding Wheel	Abrasive Grain Diamond
	Grain Size Rough Grinding: 400mesh Finish Grinding: 800~1,500mesh
	Bond Special Purpose Metal Bond for Diamond Sintered Tool or Vetrified
	Concentration 100~125
Grinding Conditions	Dressing Use a WA stick of about 400mesh
	Peripheral Speed 800~1,000 m/min
	Table Rocking 30~60 cycle/min
Coolant	Water Soluble Grinding Coolant (Solution Type)
	Others

SUMIDIA DA2200



Achieving both excellent wear and fracture resistance.

The next chapter in Polycrystalline Diamond (PCD), DA2200! Series expansion now include NF type inserts

**Great Improvements In Fracture Resistance !!
Economical NF Type inserts!!**

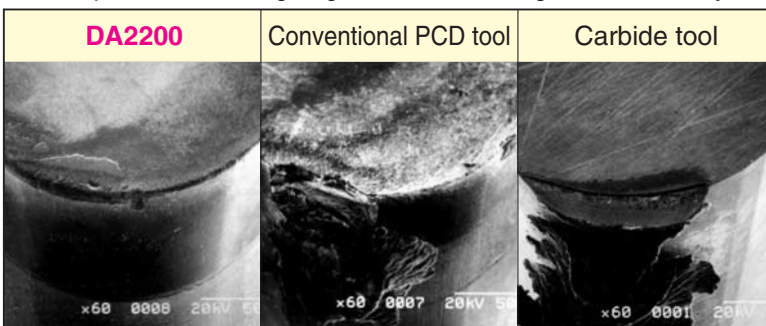


■ General Features

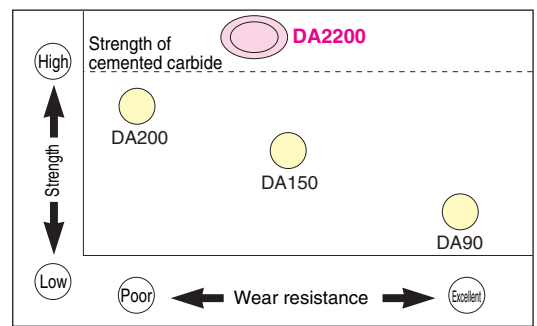
SUMIDIA DA2200 is a high density, ultra fine grained sintered PCD with high toughness similar to that of cemented carbides.

SUMIDIA Da2200, with its great improvement in fracture resistance, eliminates the breakage problems faced by conventional PCD tools especially during the milling of Aluminum alloys and achieves a longer and more stable tool life. Furthermore, the NF type inserts makes it even more cost effective.

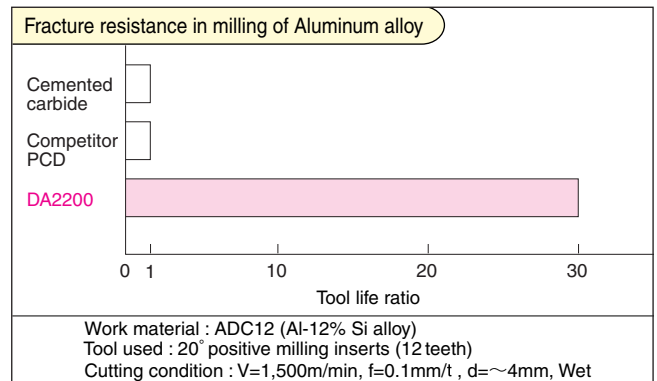
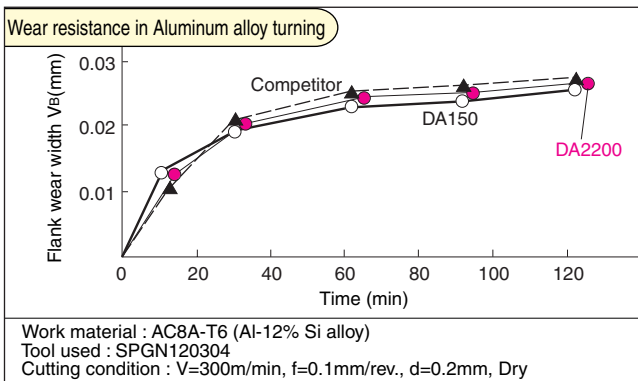
■ Comparison of cutting edges after machining Aluminum alloy



■ Position of DA2200

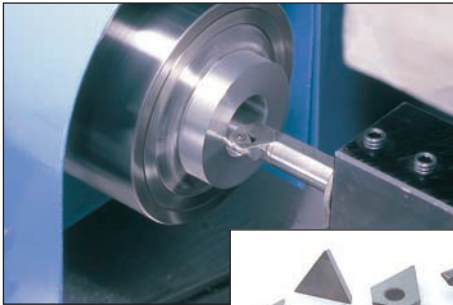


■ Cutting Performance



Application	Workpiece (material)	Cutting condition	Tool no.	Result				
Aluminum alloy rough milling	Transmission case (ADC10)	V=1,570 m/min f=0.1 mm/t d=4 mm	20° positive milling insert	<table border="1"> <tr> <td>Cemented carbide</td> <td>~1</td> </tr> <tr> <td>DA2200</td> <td>~20</td> </tr> </table> <ul style="list-style-type: none"> No fractures even when roughing. Cutting performance is more than 20 times that cemented carbides. 	Cemented carbide	~1	DA2200	~20
Cemented carbide	~1							
DA2200	~20							
Aluminum alloy rough milling	Cylinder head (ADC12)	V=1,500 m/min f=0.25 mm/t d=1.5 mm	20° positive milling insert	<table border="1"> <tr> <td>Cemented carbide</td> <td>~1</td> </tr> <tr> <td>DA2200</td> <td>~2</td> </tr> </table> <ul style="list-style-type: none"> More than 2 times tool life with very little chipping. Regrinding is possible. 	Cemented carbide	~1	DA2200	~2
Cemented carbide	~1							
DA2200	~2							
Aluminum alloy rough turning	Transmission parts (ADC12)	V=2,000 m/min f=0.4 mm/rev. d=2 mm	CCMT090308	<table border="1"> <tr> <td>Cemented carbide</td> <td>~1</td> </tr> <tr> <td>DA2200</td> <td>~2</td> </tr> </table> <ul style="list-style-type: none"> Very little chipping. 2 to 4 times tool life. 	Cemented carbide	~1	DA2200	~2
Cemented carbide	~1							
DA2200	~2							

SUMIDIA Inserts NF Type



■ General Features

● Total Cost Effectiveness with High Performance and Lower Price

- Long, stable tool life and good fracture resistance with high toughness grade DA2200.
- Optimum design utilizing improved mass production techniques provides a relatively lower cost.
- Regrindable type results in huge total cost reduction.

● Wide Application Range

- Wide range of stocked items for small hole boring, OD turning to milling processes.
- Nega-posi type inserts that are applicable on standard lever-lock, pin-lock type holders.

■ Efficiency

SUMIDIA NF-type inserts uses improved mass production techniques, which maintain the usual good performance yet offering a higher cost efficiency. Coupled with SUMIDIA DA2200 grade, its exhibits strong cutting edges which gives excellent surfaces finishes.

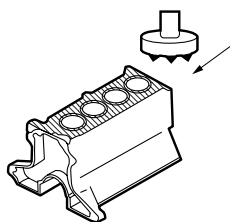
● SEM Image of NF-Type Edge



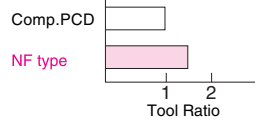
(NF-type is precision ground just like conventional inserts.)

■ Application Examples

● Milling of Aluminum Cylinder Block

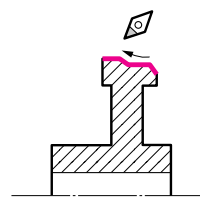


Results:
Burr's are not formed due to the edge sharpness of DA2200.
1.5 times longer tool life than competitor's.

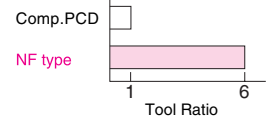


Work : ADC12
Insert : 15° Positive Milling Insert
Cutting condition : V=1,000m/min, f=0.025mm/t, d=1.2mm, Wet

● OD Turning of Aluminum Alloy Electronics Part

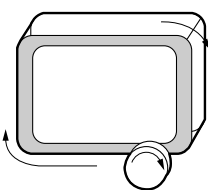


Results:
6 times tool life with relatively no chipping.

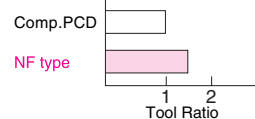


Work : ADC12
Insert : NF-VCMT110301
Cutting condition : V=800m/min, f=0.1mm/rev., d=0.02mm, Wet

● Milling of Aluminum Oil Pump Cover

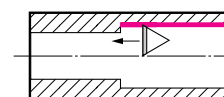


Results:
1.5 times longer tool life than competitor's with higher cost effectiveness.

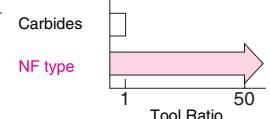


Work : ADC12
Insert : NF-TEEN32R
Cutting condition : V=3,000m/min, f=0.06mm/t, d=0.2mm, Wet

● Boring of Aluminum Valve Bore

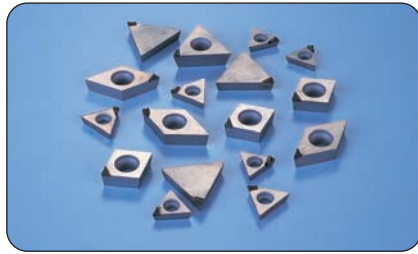


Results:
No initial chipping, tool life is more than 50 times that of carbides.



Work : ADC12
Insert : NF-TPGN110304P
Cutting condition : V=530m/min, f=0.05mm/rev., d=0.2mm, Wet

SUMIDIA One-Use Inserts Break Master DM Type



■ General Features

● Economy One-Use Insert

- Similar to SUMIBORON One-Use type inserts

● With Built-in Chipbreaker for Effective Chip Removal

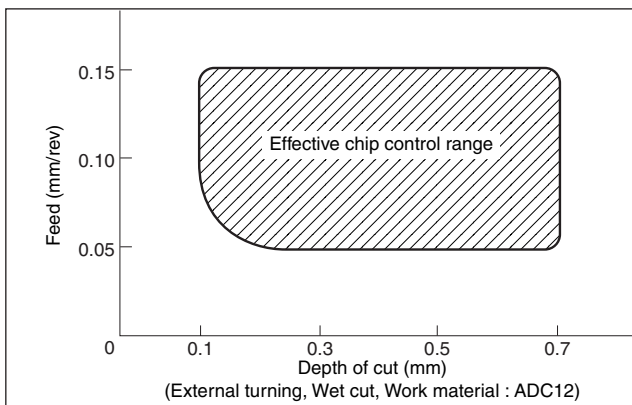
- Solving chip control problems and improving efficiency with DM-type chipbreaker.

● Extensive Insert Range for External and Facing Operation

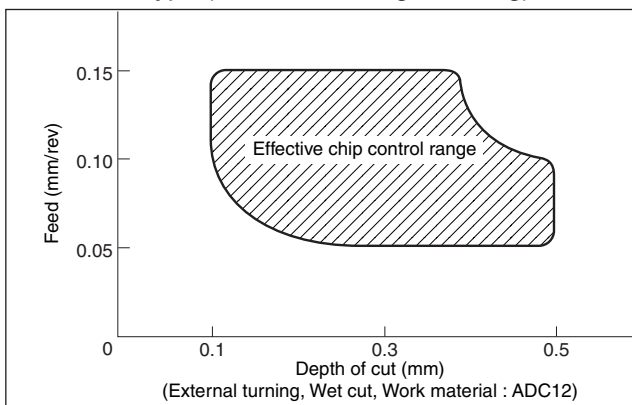
- 80° and 55° diamond shaped inserts are added to expand the application range of this series.

■ Application Range

● T Type (Boring)



● DC&CC Type (External Turning & Facing)



■ Recommended Conditions

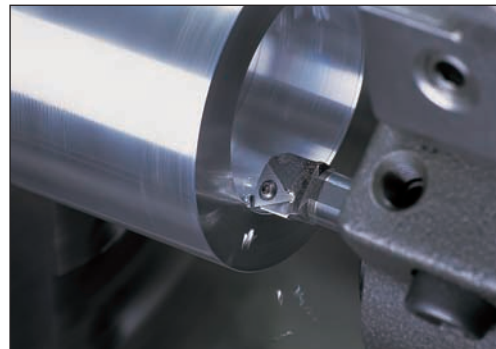
● Boring (Triangular Insert)

Feed Rate	D.O.C. (mm)	Type
~ 0.15 mm/rev.	~ 0.7 mm	Wet cut

● External Copying (55°, 80° Diamond Shaped Inserts)

Feed Rate	D.O.C. (mm)	Type
~ 0.15 mm/rev.	~ 0.5 mm	Wet cut

● For facing process, D.O.C. should be less than 0.4mm



■ Chip Control

● Break Master



● No Chipbreaker



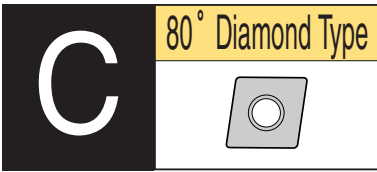
■ Application

Types of holder	Cutting Conditions	Results
Operation: Internal Boring	V=300 m/min f=0.06 mm/rev.	Surface finish of the bore hole was less than Ra=1 μm.
Work Material: AC2A – T6	d=0.35 mm Wet cut	Chips formed was of a uniform curl of about 2mm in length. There was almost no chips left inside the bore hole.

■ Series

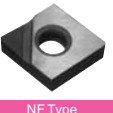
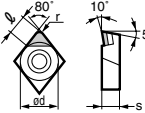
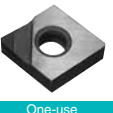
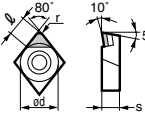
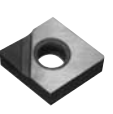
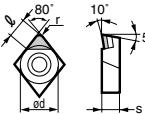
Types of holder	Boring	External Turning & Facing
Cartridge unit	NU-TPMR1103 Type	
	NU-TPMR1603 Type	
Tool holder	NU-TPMT0802 Type	NU-CCMT0602 Type
	NU-TPMT0902 Type	NU-CCMT09T3 Type
	NU-TPMT1102 Type	NU-DCMT0702 Type
	NU-TPMT1103 Type	NU-DCMT11T3 Type
	NU-TPMT1604 Type	

SUMIDIA Indexable Inserts




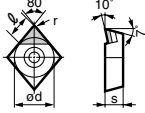

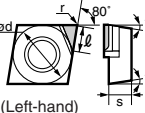
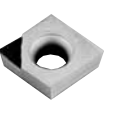
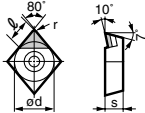
Negative




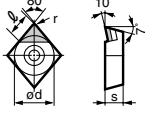

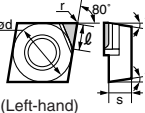
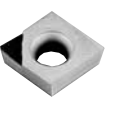
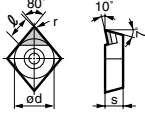
Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (ℓ)	
 NF Type		NF-CNMX 120402 120404 120408 120412	—	—	—	●	0.2 5.7 0.4 5.7 0.8 5.6 1.2 5.4	External Holders C9 C10 Boring Bars D42
 One-use		NU-CNMX 120402 <i>New</i> 120404 <i>New</i> 120408 <i>New</i> 120412 <i>New</i>	—	—	—	○	0.2 2.8 0.4 2.8 0.8 2.7 1.2 2.6	
		CNMX 120404 120408 120412	●	●	●	●	0.4 5.7 0.8 5.6 1.2 5.6	

7° Positive

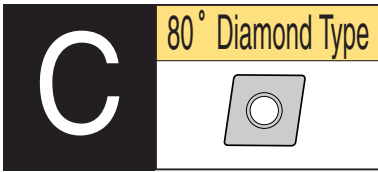


 NF Type		NF-CCMT 060201 060202 060204	—	—	—	●	0.1 2.8 0.2 2.8 0.4 2.8	External Holders C47 C51 C56 Boring Bars D21 D22
 Break Master	 (Left-hand)	NU-CCMT 060202R-DM 060202L-DM 060204R-DM 060204L-DM	—	●	—	—	0.2 2.5 0.2 2.5 0.4 2.5 0.4 2.5	
		CCMT 060201 060202 060204	●	●	●	▲	0.1 3.3 0.2 3.2 0.4 3.1	



 NF Type		NF-CCMT 09T301 09T302 09T304 09T308	—	—	—	●	0.1 2.8 0.2 2.8 0.4 2.8 0.8 2.7	External Holders C47 C51 C56 Boring Bars D21 D22
 Break Master	 (Left-hand)	NU-CCMT 09T302R-DM 09T302L-DM 09T304R-DM 09T304L-DM	—	●	—	—	0.2 2.5 0.2 2.5 0.4 2.5 0.4 2.5	
		CCMT 09T301 09T302 09T304	●	●	●	▲	0.1 3.3 0.2 3.2 0.4 3.1	

SUMIDIA Indexable Inserts



11° Positive

CPMT 0802 ●●

I.C. ød : 7.94 Thickness s : 2.38 Hole : 3.4

CPMT 0903 ●●

I.C. ød : 9.525 Thickness s : 3.18 Hole : 4.4

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (ℓ)	
		CPMT 080202 080204 080208				● 0.2	4.2	Boring Bars D26
						● 0.4	4.2	
						● 0.8	4.1	
		NF-CPMT 090302 090304 090308	—	—	—	● 0.2	2.8	Boring Bars D26
			—	—	—	● 0.4	2.8	
			—	—	—	● 0.8	2.7	
		CPMT 090302 090304 090308				▲ 0.2	4.2	
						▲ 0.4	4.2	
						▲ 0.8	4.1	

▲ mark : To be replaced by new item (Please confirm stock availability)

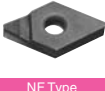
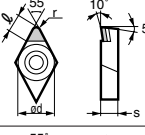

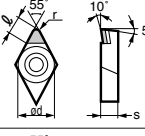
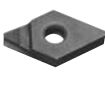
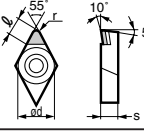
SUMIDIA Indexable Inserts

D 55° Diamond Type

Negative

DNMX 1504


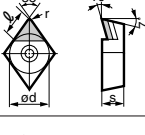

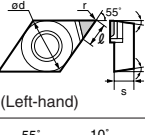
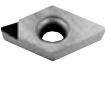
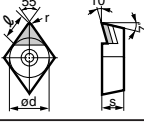
I.C. ød : 12.70 Thickness s : 4.76 Hole : 5.16

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (ℓ)	
 NF Type		NF-DNMX 150402 150404 150408 150412	—	—	●	0.2	6.4	External Holders C11 C12 Boring Bars D43 D44
 One-use		NU-DNMX 150402 150404 150408 150412 <i>New</i>	—	—	○	0.2	3.0	
		DNMX 150404 150408 150412	●	●	●	0.4	6.2	
			●	●	●	0.8	5.8	
			●	●	●	1.2	5.4	
			—	—	○	0.2	3.0	
			—	—	○	0.4	2.8	
			—	—	○	0.8	2.5	
			—	—	○	1.2	2.1	

7° Positive


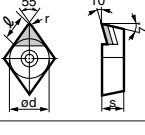

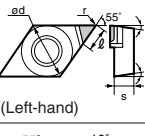
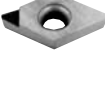
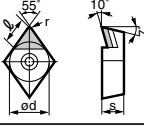
DCMT 0702

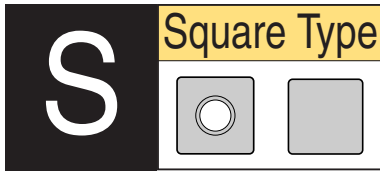
I.C. ød : 6.35 Thickness s : 2.38 Hole : 2.8

 NF Type		NF-DCMT 070201 070202 070204	—	—	●	0.1	3.0	External Holders C48 C50 C52 Boring Bars D30 D31
 Break Master	 (Left-hand)	NU-DCMT 070202R-DM 070202L-DM 070204R-DM 070204L-DM	—	●	—	0.2	3.0	
		DCMT 070201 070202 070204	●	●	▲	0.1	4.3	
			●	●	▲	0.2	4.2	
			●	●	▲	0.4	4.0	
			—	●	—	0.2	3.0	
			—	●	—	0.2	3.0	
			—	●	—	0.4	3.0	
			—	●	—	0.4	3.0	

DCMT 11T3

I.C. ød : 9.525 Thickness s : 3.97 Hole : 4.4

 NF Type		NF-DCMT 11T301 11T302 11T304 11T308	—	—	●	0.1	3.0	External Holders C48 C50 C52 Boring Bars D30 D31
 Break Master	 (Left-hand)	NU-DCMT 11T302R-DM 11T302L-DM 11T304R-DM 11T304L-DM	—	●	—	0.2	3.0	
		DCMT 11T301 11T302 11T304	●	●	▲	0.1	4.3	
			●	●	▲	0.2	4.2	
			●	●	▲	0.4	4.0	
			—	●	—	0.2	3.0	
			—	●	—	0.2	3.0	
			—	●	—	0.4	3.3	
			—	●	—	0.4	3.3	



7° Positive

SCMT 0702 ●●
I.C. ød : 7.94 Thickness s : 2.38 Hole : 3.4

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page (Ex.)
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (ℓ)	
		SCMT 070201 070202 070204	●	●	●	0.1	3.0	External Holders C59
			●			0.2	3.0	
			●			0.4	3.0	

SCMT 09T3 ●●
I.C. ød : 9.525 Thickness s : 3.97 Hole : 4.4

		SCMT 09T301 09T302 09T304	▲			0.1	3.0	External Holders C59 Boring Bars D29
			▲			0.2	3.0	
			▲			0.4	3.0	

11° Positive

SPGW 0903 ●●
I.C. ød : 9.525 Thickness s : 3.18 Hole : 3.4

		SPGW 090302 090304 090308	▲	▲		0.2	4.8	Boring Bars D28
			▲	▲		0.4	4.8	
			▲	▲		0.8	4.8	

SPGN 0903 ●●
I.C. ød : 9.525 Thickness s : 3.18 Hole : -

		NF-SPGN 090304 090308	-	-	-	●	0.4	4.8	Boring Bars D40
NF Type			-	-	-	●	0.8	4.8	
		SPGN 090302 090304 090308	●	▲		0.2	4.8		
			▲	▲		0.4	4.8		
			▲	▲		0.8	4.8		
						1.2	4.8		

SPGN 1203 ●●
I.C. ød : 12.70 Thickness s : 3.18 Hole : -

		NF-SPGN 120304 120308	-	-	-	●	0.4	4.8	External Holders C29 Boring Bars D40
NF Type			-	-	-	●	0.8	4.8	
		SPGN 120304 120308 120312	●	▲		0.4	4.8		
			▲	▲		0.8	4.8		
						1.2	4.8		

20° Positive

SEGN 0702 ●●
I.C. ød : 7.94 Thickness s : 2.38 Hole : -

		SEGN 070202 070204 070208	▲			0.2	4.8	(Cartridge) CE Type
						0.4	4.8	
						0.8	4.8	

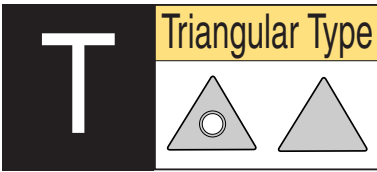
SEGN 0903 ●●
I.C. ød : 9.525 Thickness s : 3.18 Hole : -

		SEGN 090302 090304 090308	●			0.2	4.8	(Cartridge) CE Type
						0.4	4.8	
						0.8	4.8	

SEGN 1203 ●●
I.C. ød : 12.70 Thickness s : 3.18 Hole : -

		SEGN 120302 120304 120308	●			0.2	4.8	(Cartridge) CE Type
						0.4	4.8	
						0.8	4.8	

SUMIDIA Indexable Inserts



Negative

TNMX 1604 ●●
I.C. ϕ d : 9.525 Thickness s : 4.76 Hole : 3.81

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
		NF-TNMX 160402 160404 160408	—	—	—	●	0.2 3.7 0.4 3.6 0.8 3.3	External Holders C17~C21 C49 C51 Boring Bars D47
		NU-TNMX 160402 <i>New</i> 160404 <i>New</i> 160408 <i>New</i>	—	—	—	○	0.2 3.0 0.4 2.9 0.8 2.6	
		TNMX 160404 160408 160412	●	●	●	●	0.4 3.6 0.8 3.3 1.2 3.0	

5° Positive

TBGW 0601 ●●
I.C. ϕ d : 3.97 Thickness s : 1.59 Hole : 2.2

		NF-TBGW 060102 060104	—	—	—	●	0.2 2.3 0.4 2.2	Boring Bars D16 D17
		TBGW 060102 060104	●	●	●	●	0.2 2.3 0.4 2.2	

TBGN 0601 ●●
I.C. ϕ d : 3.97 Thickness s : 1.59 Hole : —

		NF-TBGN 060102 060104	—	—	—	●	0.2 2.1 0.4 2.0	Boring Bars L52
		TBGN 060102B 060104B 060108B	●	●	●	●	0.2 6.5 0.4 6.2 0.8 5.7	

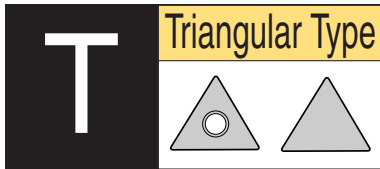
7° Positive

TCMT 0902 ●●
I.C. ϕ d : 5.56 Thickness s : 2.38 Hole : 2.5

		NF-TCMT 090202 090204	—	—	—	●	0.2 2.9 0.4 2.8	External Holders C60
		TCMT 090201 090202 090204	●	●	●	▲	0.1 2.8 0.2 2.7 0.4 2.6	

TCMT 1102 ●●
I.C. ϕ d : 6.35 Thickness s : 2.38 Hole : 2.8


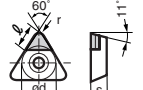

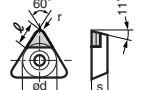
		NF-TCMT 110201 110202 110204	—	—	—	●	0.1 3.0 0.2 2.9 0.4 2.8	External Holders C60
		TCMT 110201 110202 110204	●	●	●	▲	0.1 2.8 0.2 2.7 0.4 2.6	



11° Positive


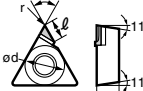
TPGW 0802

I.C. ϕ d : 4.76 Thickness s : 2.38 Hole : 2.4

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page (Ex.)
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (ℓ)	
		NF-TPGW 080201 080202 080204	—	—	—	● 0.1	3.1	Boring Bars D16 D17
			—	—	—	● 0.2	3.0	
			—	—	—	● 0.4	2.9	
		TPGW 080202 080204 080208	—	●	—	● 0.2	2.9	
			—	●	—	● 0.4	2.7	
			—	—	—	● 0.8	2.4	

TPMT 0802

I.C. ϕ d : 4.76 Thickness s : 2.38 Hole : 2.4

		NU-TPMT 080202R-DM 080202L-DM 080204R-DM 080204L-DM	—	—	—	● 0.2	2.5	Boring Bars D16 D17
			—	●	—	● 0.2	2.5	
			—	—	—	● 0.4	2.3	
			—	●	—	● 0.4	2.3	



TPGW 0902

I.C. ϕ d : 5.56 Thickness s : 2.38 Hole : 2.8

		NF-TPGW 090202 090204	—	—	—	● 0.2	3.1	(Special Holder)
			—	—	—	● 0.4	2.9	


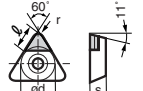

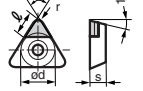
TPMT 0902

I.C. ϕ d : 5.56 Thickness s : 2.38 Hole : 2.8

		NU-TPMT 090202R-DM 090202L-DM 090204R-DM 090204L-DM	—	—	—	● 0.2	2.5	(Special Holder)
			—	●	—	● 0.2	2.5	
			—	—	—	● 0.4	2.3	
			—	●	—	● 0.4	2.3	


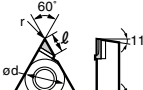
TPGW 1102

I.C. ϕ d : 6.35 Thickness s : 2.38 Hole : 2.8

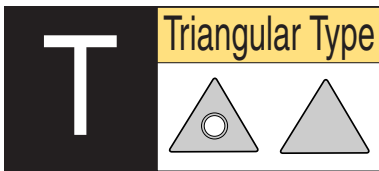
		NF-TPGW 110201 110202 110204	—	—	—	● 0.1	3.1	(SEC-Boring Bar STUP Type)
			—	—	—	● 0.2	3.0	
			—	—	—	● 0.4	2.9	
		TPGW 110202 110204 110208	—	●	—	● 0.2	3.7	
			—	●	—	● 0.4	3.6	
			—	—	—	● 0.8	3.3	

TPMT 1102

I.C. ϕ d : 6.35 Thickness s : 2.38 Hole : 2.8

		NU-TPMT 110202R-DM 110202L-DM 110204R-DM 110204L-DM	—	—	—	● 0.2	2.5	(SEC-Boring Bar STUP Type)
			—	●	—	● 0.2	2.5	
			—	—	—	● 0.4	2.3	
			—	●	—	● 0.4	2.3	

SUMIDIA Indexable Inserts



11° Positive

TPGW 1103

I.C. ød : 6.35 Thickness s : 3.18 Hole : 3.4

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page (Ex.)
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
		NF-TPGW 110301 110302 110304 110308	-	-	-	●	0.1 3.1 0.2 3.0 0.4 2.9 0.8 2.7	Boring Bars D16 D17
		TPGW 110300 110302 110304 110308	-	●	▲	0.05 3.8 0.2 3.7 0.4 3.6 0.8 3.3		

TPMT 1103

I.C. ød : 6.35 Thickness s : 3.18 Hole : 3.4

		NF-TPMT 110301 110302 110304 110308	-	-	-	●	0.1 3.1 0.2 2.9 0.4 2.8 0.8 2.5	Boring Bars D16 D17
		NU-TPMT 110302R-DM 110302L-DM 110304R-DM 110304L-DM	-	●	-	0.2 2.5 0.2 2.5 0.4 2.3 0.4 2.3		
		TPMT 110300 110302 110304 110308	-	-	▲	0.05 3.7 0.2 3.6 0.4 3.5 0.8 3.2		

TPGW 1603

I.C. ød : 9.525 Thickness s : 3.18 Hole : 4.4

		NF-TPGW 160302 160304 160308	-	-	-	●	0.2 3.1 0.4 2.9 0.8 2.7	(Special Holder)
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TPGW 1604

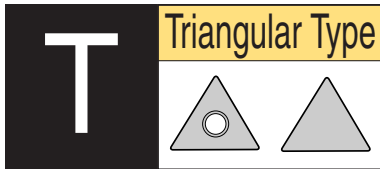
I.C. ød : 9.525 Thickness s : 4.76 Hole : 4.4

		NF-TPGW 160401 160402 160404 160408	-	-	-	●	0.1 3.1 0.2 3.0 0.4 2.9 0.8 2.7	Boring Bars D16 D17
		TPGW 160402 160404 160408 160412	-	●	▲	0.2 3.7 0.4 3.6 0.8 3.3 1.2 3.0		

TPMT 1604

I.C. ød : 9.525 Thickness s : 4.76 Hole : 4.4

		NU-TPMT 160402R-DM 160402L-DM 160404R-DM 160404L-DM	-	▲	-	0.2 2.5 0.2 2.5 0.4 2.3 0.4 2.3	Boring Bars D16 D17
--	--	---	---	---	---	--	---



11° Positive

TPGN 0902

I.C. ϕ d : 5.56 Thickness s : 2.38 Hole : -

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page (Ex.)
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (ϕ)	
		NF-TPGN 090202 090204	-	-	-	● 0.2	3.1	(Cartridge) CP Type
		TPGN 090202 090204 090208	●	▲	●	0.2	3.7	
						● 0.4	3.0	
						● 0.4	3.6	
						● 0.8	3.3	

TPGN 1103

I.C. ϕ d : 6.35 Thickness s : 3.18 Hole : -

		NF-TPGN 110302 110304 110308	-	-	-	● 0.2	3.0	Boring Bars D38
		NF-TPGN 110304P 110308P	-	-	-	● 0.4	10.4	
		TPGN 110300 110302 110304 110308	●	▲	●	0.05	3.8	
			●	▲	●	0.2	3.7	
			●	▲	●	0.4	3.6	
			●	▲	●	0.8	3.3	

TPMR 1103

I.C. ϕ d : 6.35 Thickness s : 3.18 Hole : -

		NU-TPMR 110302R-DM 110302L-DM 110304R-DM 110304L-DM	-	-	-	● 0.2	2.5	Boring Bars D38
			●	-	-	0.2	2.5	
			-	-	-	0.4	2.3	
			●	-	-	0.4	2.3	

TPGN 1603

I.C. ϕ d : 9.525 Thickness s : 3.18 Hole : -

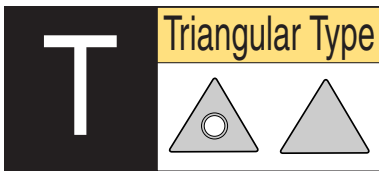
		NF-TPGN 160302 160304 160308	-	-	-	● 0.2	3.0	External Holders C30 Boring Bars D38
		NF-TPGN 160304P	-	-	-	● 0.4	15.9	
		TPGN 160302 160304 160308 160312	●	▲	●	0.2	3.7	
			●	▲	●	0.4	3.6	
			●	▲	●	0.8	3.3	
			●	▲	●	1.2	3.0	

TPMR 1603

I.C. ϕ d : 9.525 Thickness s : 3.18 Hole : -


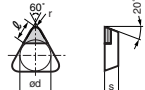

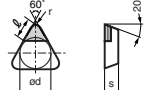
		NU-TPMR 160302R-DM 160302L-DM 160304R-DM 160304L-DM	-	-	-	● 0.2	2.5	External Holders C30 Boring Bars D38
			●	-	-	0.2	2.5	
			-	-	-	0.4	2.3	
			●	-	-	0.4	2.3	

SUMIDIA Indexable Inserts


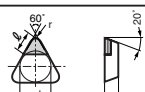

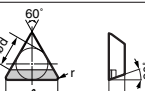

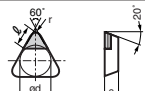


20° Positive


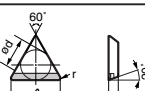

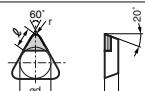
TEGN 1102 ●●
I.C. ød : 6.35 Thickness s : 2.38 Hole : -

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page (Ex.)
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
 NF Type		NF-TEGN 110202 110204	-	-	●	0.2 3.1	0.4 2.9	(Cartridge) (CE Type)
		TEGN 110202 110204 110208	●	●		0.2 3.7	0.4 3.6 0.8 3.3	


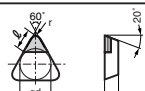
TEGN 1103 ●●
I.C. ød : 6.35 Thickness s : 3.18 Hole : -

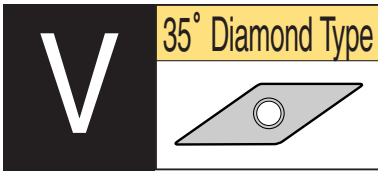
 NF Type		NF-TEGN 110302 110304 110308	-	-	●	0.2 3.1	0.4 2.9	(Cartridge) (CE Type)
 NF Type		NF-TEGN 110304P 110308P	-	-	●	0.4 10.4	0.8 9.8	
		TEGN 110302 110304 110308	●	●		0.2 3.7	0.4 3.6 0.8 3.3	

TEGN 1603 ●●
I.C. ød : 9.525 Thickness s : 3.18 Hole : -

 NF Type		NF-TEGN 160304P	-	-	●	0.4 15.9		(Cartridge) (CE Type)
		TEGN 160302 160304 160308	●	●	●	0.2 3.7	0.4 3.6 0.8 3.3	


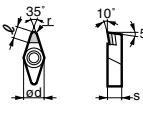

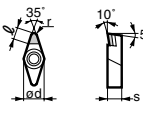
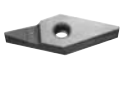
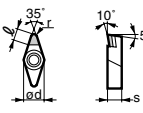
TEGN 2204 ●●
I.C. ød : 12.70 Thickness s : 4.76 Hole : -

		TEGN 220404 220408	●			0.4 3.6	0.8 3.3	(Cartridge) (CE Type)
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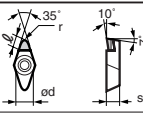

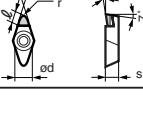
Negative

VNMX 1604 ●●
I.C. ød : 9.525 Thickness s : 4.76 Hole : 3.81


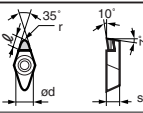

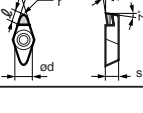
Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
 NF Type		NF-VNMX 160402 160404 160408 160412	—	—	—	● 0.2	6.9	External Holders C23 C24
 One-use		NU-VNMX 160402 <i>New</i> 160404 <i>New</i> 160408 <i>New</i> 160412 <i>New</i>	—	—	—	○ 0.2	3.6	
 VNMX		VNMX 160402 160404 160408 160412	●	●	●	● 0.2	6.9	
			●	●	●	● 0.4	6.4	
			●	●	●	● 0.8	5.6	
			●	●	●	● 1.2	4.7	

7° Positive


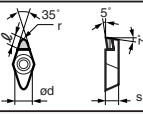
VCMT 1103 ●●
I.C. ød : 6.35 Thickness s : 3.18 Hole : 2.8

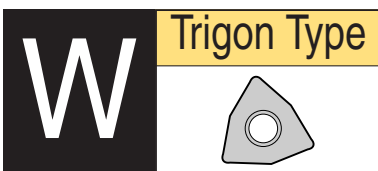
Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
 NF Type		NF-VCMT 110301 110302 110304	—	—	—	● 0.1	3.5	External Holders C49 C51 C62
 VCMT		VCMT 110301 110302 110304				▲ 0.1	3.7	
						▲ 0.2	3.5	
						▲ 0.4	3.0	

VCMT 1604 ●●
I.C. ød : 9.525 Thickness s : 4.76 Hole : 4.4

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
 NF Type		NF-VCMT 160404 160408 160412	—	—	—	● 0.4	6.5	External Holders C28 Boring Bars D36
 VCMT		VCMT 160408 160412 160412-WF				● 0.8	5.8	
						● 1.2	4.9	
						● 1.2	4.9	


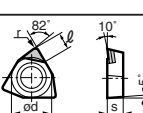
VCMT 2205 ●●
I.C. ød : 12.70 Thickness s : 5.56 Hole : 5.5

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
 VCMT		VCMT 220520 220530				● 2.0	5.0	External Holders C32
						● 3.0	5.0	



5° Positive


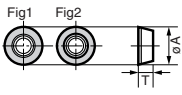
WBMT 0601 ●●
I.C. ød : 3.97 Thickness s : 1.59 Hole : 2.2

Appearance	Figure	ISO Cat. No.	Stock			Dimensions (mm)		Applicable Holder Ref. Page
			DA90	DA150	DA200	Nose Radius (r)	Cutting Edge Length (L)	
 WBMT		WBMT 060101L 060102L 060104L	—	—	—	● 0.1	1.8	Boring Bars D14
						● 0.2	1.8	
						● 0.4	1.7	


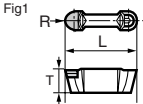

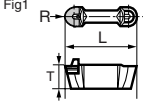
SUMIDIA Indexable Inserts

Turning Insert

● Round Insert

Appearance	Figure	ISO Cat. No.	Stock				Dimensions (mm)					Fig	Applicable Holder
			DA90	DA150	DA200	DA2200	Inscribed Circle (A)	Thickness (T)	Cutting Edge Length (ℓ)	Nose Radius (R)	Hole		
		RPGW 0803M0 RPGT 0803M0-WF				●	8.0	3.18	-	-	3.3	1 2	Al. Wheel Turning Holder SEC-RP Copy Holder (RP02 Type)


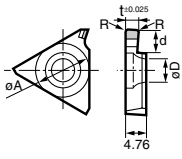
● Dog-bone Insert

Appearance	Figure	ISO Cat. No.	Stock				Dimensions (mm)				Fig	Applicable Holder	
			DA90	DA150	DA200	DA2200	Total Length (L)	Thickness (T)	Nose Radius (R)				
		MDE 3R MDE 4R				●	26 30	8.5	3.0 4.0			1	Al. Wheel Turning Holder SEC-GD Copy Holder (GDE Type) → C33
		MDE 3R-AW MDE 4R-AW				●	26 30	8.5	3.0 4.0				

● Small Dia. Boring Bar Insert

Appearance	Figure	ISO Cat. No.	Stock				Min. Bore	Dimensions (mm)				Fig	Applicable Holder
			DA2200					S	Nose Radius (R)	L	ℓ		
		KBMXR0311-10 KBMXR0411-10 KBMXR0511-10	●				3.0 4.0 5.0	4.1 4.3 4.5	0.1 0.1 0.1	28.5	11.0	1	Small Dia. Boring Bar CKB Type → M18

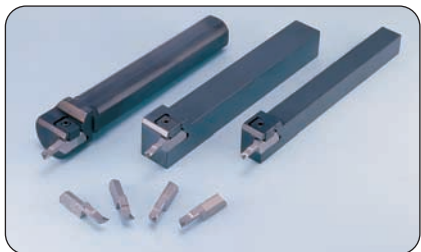
● Grooving Insert

Appearance	Figure	ISO Cat. No.	Stock				Dimensions (mm)					Fig	Applicable Holder
			R	L			Inscribed Circle (A)	Groove Width (t)	Nose Radius (R)	Max. Grooving Depth (d)	Hole (D)		
		TGA R/L4125 TGA R/L4150 TGA R/L4200 TGA R/L4250 TGA R/L4300 TGA R/L4350 TGA R/L4400	●				12.7	1.25 1.50 2.00 2.50 3.00 3.50 4.00	0.1	2.0 3.5 3.5 4.0 4.0 5.0 5.0	5.5	1	SEC-Grooving Holder (GWC, GWCS, GWCI Types) → E4 ~ E5

Milling Insert

Appearance	Figure	ISO Cat. No.	Stock				Dimensions (mm)				Fig	Applicable Cutter
			DA150	DA200	DA2200	SC10	Inscribed Circle (A)	Thickness (T)	Cutting Edge Length (ℓ)	Flank angle (θ)		
● For SEC-ACE MILL APG Type												
	Fig1	APW 4R	●	●	—	12.70	3.18	—	15	1	APG Type → G19	
		APW 5R	▲	—	—	15.875	4.76	—	—			
	Fig1	NF-SDC 42R	—	—	●	12.70	3.18	3.0	15	1		
		SDC 42R	●	▲	—	12.70	3.18	3.0				
		SDC 53R	—	—	—	15.88	4.76	3.0				
● For SEC-ACE MILL FPG Type / SEC-Multi Use Endmill FPE Type												
	Fig1	NF-SDKN 42M	—	—	●	12.70	3.18	3.0	15	1	FPG Type → G25	
		SDKN 42M	●	—	—	12.70	3.18	3.0				
		SDKN 53M	—	—	—	15.88	4.76	3.0			FPE Type → H23	
● For SUMIDIA Cutter FAM Type /SAM Type												
	Fig1	FABR	●	—	—	—	7.9	(5.7)	15	1	FAM Type → M22	
		FABL	—	—	—	—	—	—	—			
	Fig2	SABR	●	●	—	—	7.9	(5.7)	15	2	SAM Type → M22, M23	
		SABL	—	—	—	—	—	—	—			
		—	—	—	—	—	—	—	—			
● For SEC-ACE MILL CHG Type / SEC-Multi Use Endmill CHE Type												
	Fig1	NF-TEEN 22R	—	—	●	6.35	3.18	4.9	20	1	CHG Type → G14 CHE Type → H25, H26	
		NF-TEEN 32R	—	—	●	9.525		4.9				
		NF-TEEN 43R	—	—	●	12.70		4.8				
		TEEN 22R	●	—	—	6.35	3.18	4.9				
		TEEN 32R	●	—	—	9.525	4.9	20				
		TEEN 43R	●	▲	—	12.70	4.76	4.8				
		● For Aluminum Body Cutter RF Type (Insert Type)										
	Fig1	NF-SNEW 1204ADFR	—	—	●	12.70	4.76	4.7	15	1	RF Type → M20	
		NF-SNEW 1204ADFR-W	—	—	●			2.3				
	Fig2	SNEW 1204ADFR-WS	—	—	●			1.0				
		—	—	—	—			—				
● For Aluminum Body Cutter RF Type (Blade Type)												
	Fig1	RFB	—	—	●	—	—	6.5	—	1	RF Type → M20	
		RFBW	—	—	●			4.5				
● For Small Diameter Cutter for Aluminum Machining SRF Type												
	Fig1	NF-SNEW09T3ADTR	—	—	●	9.525	3.962	4.962	15	1	SRF Type → M21	
		NF-SNEW09T3ADTR-U	—	—	●							
		NF-SNEW09T3ADTR-R	—	—	●							
	Fig2	—	—	—	—							—
Fig3	—	—	—	—	—	—	—	—	—	—		
	● For SEC-WaveMill WGC Type											
	Fig1	NF-SECW13T3AGTN-N	—	—	●	13.40	3.97	2.1	20	1	WGC Type → G11, H14	
		NF-XEEW13T3AGFR-W	—	—	●	13.40	3.97	2.5	20			

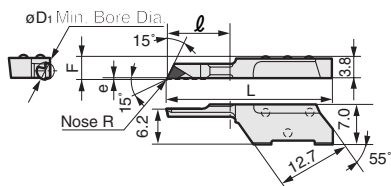
SUMIDIA SEC-Mini-Boring Tools CKB Type



General Features

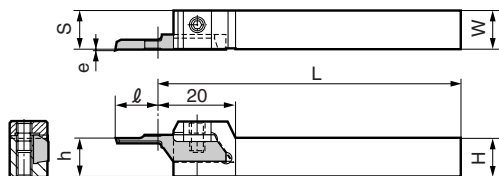
- High index precision with simple structure design and one-touch clamping.
- Utilises DA2200 grade with excellent edge sharpness.

Insert



Cat. No.	Grade	Min. Bore	Dimensions (mm)				
	DA2200	ϕD_1	F	e	R	L	ℓ
KBMXR0311-10	●	3.0	4.1	0.3	0.1	28.5	11
KBMXR0411-10	●	4.0	4.3	0.5	0.1	28.5	11
KBMXR0511-10	●	5.0	4.5	0.7	0.1	28.5	11

Square Shank

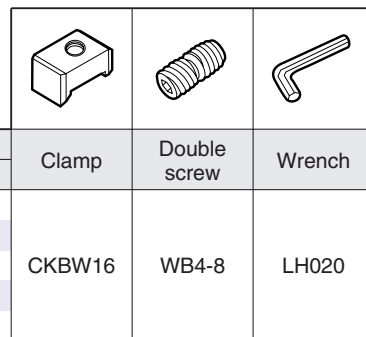


Holder

See insert for e, ℓ dimensions

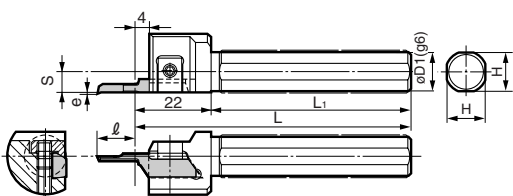
Cat. No.	Stock	Dimensions (mm)					Clamp	Double screw	Wrench
		H	W	L	S	h			
CKBR1010-16	●	10	10	100	10	10	CKBW16	WB4-8	LH020
CKBR1212-16	●	12	12	125	12	12			
CKBR1616-16	●	16	16	125	16	16			
CKBR2020-16	●	20	20	125	20	20			
CKBR2525-16	●	25	25	150	25	25			

Parts



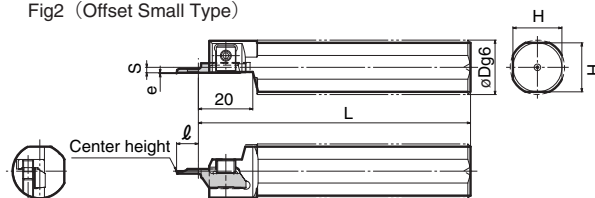
* Inserts are sold separately

Round Shank Fig1

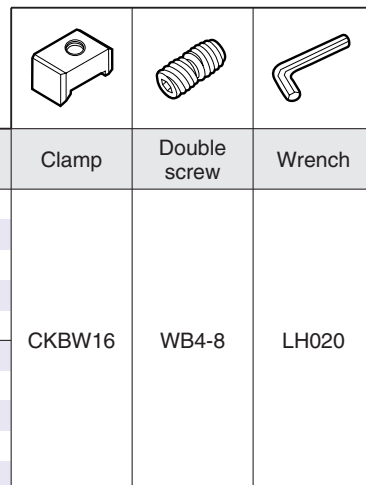


See insert for e, ℓ dimensions

Fig2 (Offset Small Type)



Parts



Holder

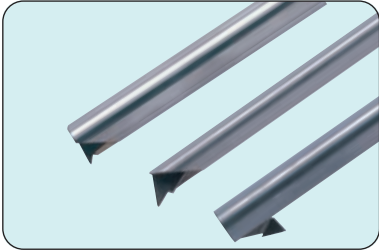
Cat. No.	Stock	Dimensions (mm)					Figure	Clamp	Double screw	Wrench
		ϕD	H	L	L_1	S				
S10F-CKBR-16	●	10	9	80	58	5	Fig1	CKBW16	WB4-8	LH020
S12F-CKBR-16	●	12	11	80	58	6	Fig1			
S16H-CKBR-16	●	16	15	100	78	8	Fig1			
S20K-CKBR-16	●	20	18	125	103	10	Fig1			
S19K-CKBR-16	●	19.05	17	125	103	8	Fig1			
S1905H-CKBRS-16	●	19.05	17	100	—	2	Fig2			
S20H-CKBRS-16	●	20	18	100	—	2	Fig2			
S22K-CKBRS-16	●	22	19	125	—	2	Fig2			
S25K-CKBRS-16	●	25	23	125	—	2	Fig2			
S254K-CKBRS-16	●	25.4	23	125	—	2	Fig2			

* Inserts are sold separately

Recommended Conditions

Spindle Speed	Depth of cut	Feedrate	Coolant
above 2,000min ⁻¹	below 0.1mm	below 0.1mm/rev.	Wet cut

SUMIDIA Small Hole Boring Bars DABB Type



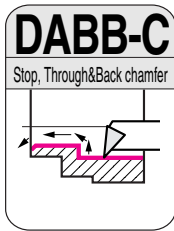
● Small Hole Boring of Aluminum Alloy

3 series ranges to cover general boring, necking and back-turning processes. 3mm minimum bore diameter!

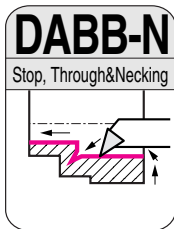
● Utilising High Toughness PCD Grade, SUMIDIA DA2200

For small hole general boring of f10~f22mm range, use Small hole boring bar BNB Type + SUMIDIA Insert (Refer to page L52 for holder and insert selection)

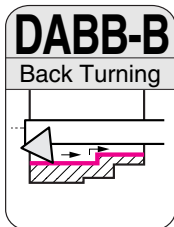
■ Tool



Cat. No.	Stock DA2200	Min. Bore	Dimensions (mm)				Applicable Sleeve
			øD	H	L	R	
DABB 025CR	●	3.0	2.5	2.2	60	0.1	HBB 2516
DABB 035CR	●	4.0	3.5	3.2	60	0.1	HBB 3516
DABB 045CR	●	5.0	4.5	4.1	80	0.1	HBB 4516
DABB 060CR	●	7.0	6.0	5.2	80	0.1	HBB 616



Cat. No.	Stock DA2200	Min. Bore	Dimensions (mm)				Applicable Sleeve
			øD	H	L	R	
DABB 025NR	●	3.0	2.5	2.2	60	0.1	HBB 2516
DABB 035NR	●	4.0	3.5	3.2	60	0.1	HBB 3516
DABB 045NR	●	5.0	4.5	4.1	80	0.1	HBB 4516
DABB 060NR	●	7.0	6.0	5.2	80	0.1	HBB 616

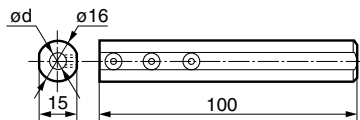


Cat. No.	Stock DA2200	Min. Bore	Dimensions (mm)				Applicable Sleeve
			øD	H	L	R	
DABB 045BR	▲	7.0	4.5	4.0	80	0.1	HBB 4516
DABB 060BR	▲	9.0	6.0	5.5	80	0.1	HBB 616

■ Parts

■ Sleeve

Cat. No.	Stock	ød (mm)	Parts	
			Set screw	Wrench
HBB 2516	●	2.5	BT 0404	TH 020
HBB 3516	●	3.5		
HBB 4516	●	4.5		
HBB 616	●	6.0		



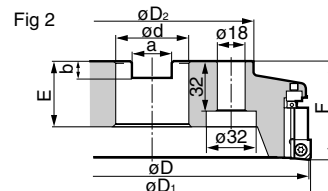
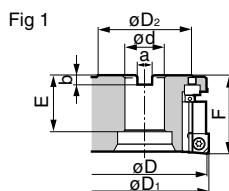
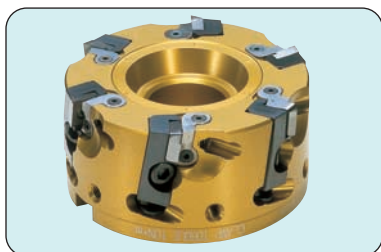
■ Recommended Conditions

Spindle speed	Depth	Feedrate	Conditions
above 2,000min ⁻¹	below 0.1mm	below 0.1mm/rev.	Wet cut

Aluminum Machining Cutter RF Type

High-speed Finishing for Nonferrous Metal

Rake Angle	Radial	+4°
	Axial	+10°



Body

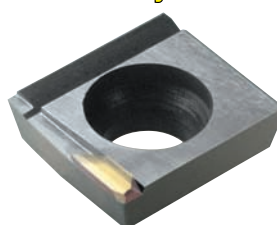
Cat. No.	Stock	Dimensions (mm)								No. of teeth	Weight (kg)	Shape
		ϕD	ϕD_1	ϕD_2	F	ϕd	a	b	E			
RF 4080R	●	80	82	60	50	25.40	9.5	6	30	6	0.7	Fig 1
RF 4100R	●	100	102	75	50	31.75	12.7	8	38	6	1.0	Fig 1
RF 4125R	●	125	127	75	63	38.10	15.9	10	38	8	1.6	Fig 1
RF 4160R	●	160	162	100	63	50.80	19.0	11	38	10	2.6	Fig 1
RF 4200R	●	200	202	130	63	47.625	25.4	14	42	12	3.6	Fig 2
RF 4250R		250	252	130	63	47.625	25.4	14	42	16	6.0	Fig 2
RF 4315R		315	317	240	80	47.625	25.4	14	42	18	11.0	Fig 2

* Inserts, blade and cartridges are sold separately
* Use collar bolts for attaching to the arbor.

Blade

Description	Cat. No.	SUMIDIA DA2200	Shape
SUMIDIA Blade	RFB	●	
SUMIDIA Wiper Blade	RFBW	●	

SumiCrystal SC10 Wiper Insert



- Utilizing Sumitomo Electric's SumiCrystal as a cutting edge. SumiCrystal is a single-crystal diamond, which is produced using an unique super-high pressure technology.
- SumiCrystal can maintain its edge sharpness better than sintered diamonds, this greatly reduces burr formation.

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

Cartridge

Description	Cat. No.	Stock	Shape
SUMIDIA Insert	RFF	●	

Insert

Description	Cat. No.	SUMIDIA DA2200	SUMICRYSTAL SC10	Shape
SUMIDIA Insert	NF-SNEW1204ADFR	●	—	
Wiper Insert	NF-SNEW1204ADFR-W	●	—	
Wiper Insert	SNEW1204ADFR-WS	—	●	

* Refer to page G22 for carbide inserts.

Recommended Conditions

Work		Aluminum Alloy	
Si content		less than 13%	13% and above
Cutting Speed V(m/min)	SumiDia	2,000 ~ 5,000	400 ~ 800
	Carbide	1,000 ~ 2,500	200 ~ 400
Feedrate f (mm/t)		0.05 ~ 0.2	0.05 ~ 0.2
Depth of cut d (mm)		below 3mm	below 3mm

Surface Finish

Condition	Process: Finishing	Machine: Machining Center	Arbor: HSK63A	Work: Si10 ~ 12% Al.alloy	Cutter: RF4100R, 6 teeth	Grade: SumiDia DA2200	V = 4,990m/min	S = 15,900min ⁻¹	F = 11,400mm/min	f = 0.12mm/t	d = 0.5mm, wiper-d = 0.03mm	Dry
Results							Ry : 0.69μm	Ra : 0.092μm				

Aluminum Machining Cutter SRF Type

High-speed Finishing for Nonferrous Metal

Rake Angle	Radial	-2°~+4°	5mm	0°
	Axial	+6°		



Fig 1

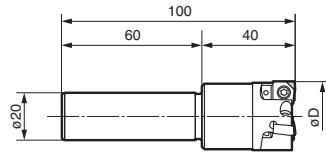


Fig 2

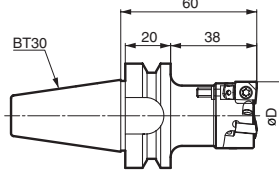


Fig 3

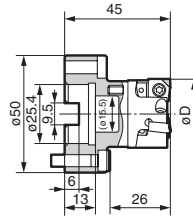
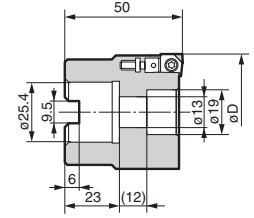


Fig 4



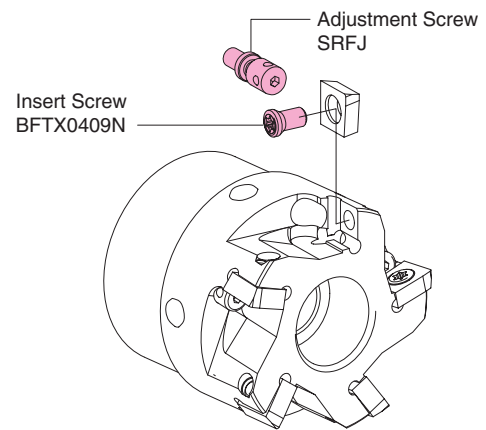
(Distance from insert tip to top of cap screw)

Milling Cutter body

Cat. No.	Stock	ϕD (mm)	No. of teeth	Shape	Weight (kg)
SRF30R-ST	●	30	3	Fig 1	0.34
SRF40R-ST	●	40	4	Fig 1	0.50
SRF30R-BT30	●	30	3	Fig 2	0.57
SRF40R-BT30	●	40	4	Fig 2	0.72
SRF30R	●	30	3	Fig 3	0.27
SRF40R	●	40	4	Fig 3	0.35
SRF50R	●	50	5	Fig 4	0.59
SRF63R	●	63	6	Fig 4	0.67

Inserts are sold separately

Parts



Insert

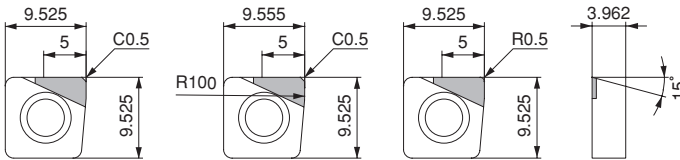


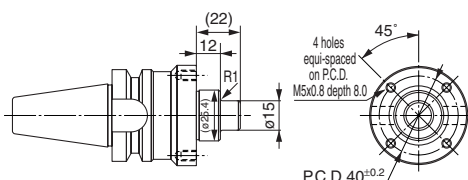
Fig. 4

Fig. 5

Fig. 6

Cat. No.	Cutting Edge	SUMIDIA DA2200	Shape
NF-SNEW09T3ADTR	Standard	●	Fig 4
NF-SNEW09T3ADTR-U	Wiper	●	Fig 5
NF-SNEW09T3ADTR-R	Nose Radius	●	Fig 6

- Standard inserts and Wiper inserts can be used on the same cutter body.
- Standard inserts with nose radius should be used where vibration is present. As such, Wiper-inserts will not be applicable.
- Inserts can be regrind 3 times (up to minimum IC diameter 9.225mm)
- When using reground inserts, it is advisable to re-confirm insert height and cutting diameter with a tool pre-setter.
- Do not mix new and reground inserts, or even inserts with different regrind amount on the same cutter.
- Arbor for SRF30R and SRF40R



When using SRF30R or SRF40R cutters, there is a requirement to modify the arbor as shown above.

1. Reduce part of the arbor's adaptor shaft from $\phi 25.4$ mm to $\phi 15$ mm.
2. Add 4 tap holes for M5 cap screws.

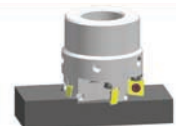
Maximum D.O.C. Guide (SRF50R, 5 teeth)

The contains guidelines on the maximum D.O.C., determined from internal tests. 'O' mark indicates the possible application range. Actual cutting conditions should be set, based on actual machine and work characteristics.

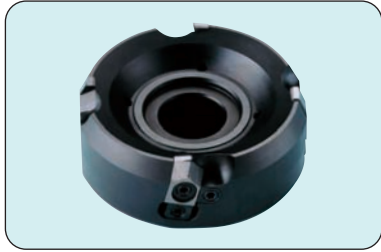
D.O.C. d (mm)	Feed	Feedrate, F (mm/min)		
		2,500	4,000	5,000
		Feed per tooth, f (mm/tooth)		
		0.05	0.08	0.10
0.5		○	○	○
1.0		○	○	○
1.5		○	○	○
2.0		○	○	○
2.5		○	○	○
3.0		○	○	○
3.5		○	○	—
4.0		○	—	—
4.5		○	—	—
5.0		○	—	—

Cutting Conditions

Cutter : SRF50R
 Insert : NF-SNEW09T3ADTR (DA2200)
 S = 10,000min⁻¹
 Arbor : BT30 FMA25.4-45
 Work : A-5052
 Width : 35mm at D.O.C. indicated above



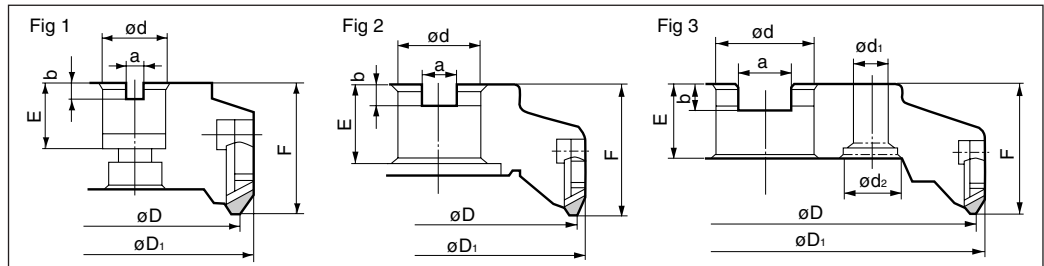
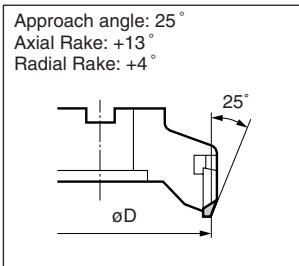
SUMIDIA Facemills FAM/SAM Type



- Special cutting edge design makes it suitable for mirror finishing of Aluminum alloys and non-ferrous metals
- Uniquely designed clamping system enable fine adjustment for precise run-out.
- Rigid body and excellent clamping force design permits high speed milling even for roughing process.

■ Body (FAM Type)

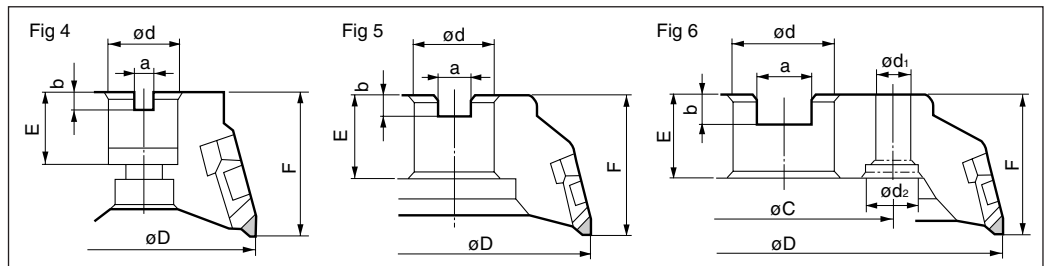
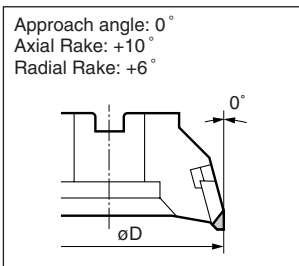
Inserts are sold separately



Cat. No.	Stock		Dimensions (mm)									No. of teeth	Shape
	R	L	øD	øD ₁	F	ød	ød ₁	ød ₂	E	a	b		
FAM 080R/L	●		80	92	50	25.4	—	—	25	9.5	6	4	Fig 1
FAM 100R/L	●		100	112	50	31.75	—	—	32	12.7	8	4	Fig 2
FAM 125R/L	●		125	137	63	38.1	—	—	38	15.9	10	5	Fig 2
FAM 160R/L	●		160	171	63	50.8	—	—	38	19.0	11	6	Fig 2
FAM 200R/L	●		200	210	63	47.625	18	26	38	25.4	14	8	Fig 3
FAM 250R/L			250	260	63	47.625	18	26	40	25.4	14	10	Fig 3
FAM 315R/L			315	325	63	47.625	18	26	40	25.4	14	12	Fig 3

■ Body (SAM Type)

Inserts are sold separately



Cat. No.	Stock		Dimensions (mm)									No. of teeth	Shape
	R	L	øD	øC	F	ød	ød ₁	ød ₂	E	a	b		
SAM 080R/L	●		80	—	50	25.4	—	—	25	9.5	6	4	Fig 4
SAM 100R/L	●		100	—	50	31.75	—	—	32	12.7	8	4	Fig 5
SAM 125R/L			125	—	63	38.1	—	—	38	15.9	10	5	Fig 5
SAM 160R/L			160	—	63	50.8	—	—	38	19.0	11	6	Fig 5
SAM 200R/L			200	101.6	63	47.625	18	26	38	25.4	14	8	Fig 6
SAM 250R/L			250	101.6	63	47.625	18	26	40	25.4	14	10	Fig 6
SAM 315R/L			315	101.6	63	47.625	18	26	40	25.4	14	12	Fig 6

● Refer to next page for blade, parts and cutting conditions

It is possible to design the FAM/SAM cutters in 2 teeth/inch or multi-teeth configurations.

SUMIDIA Endmills SAM-E Type

SUMIDIA Cutter Range Expansion



● Special Design Edge

· Strong cutting edge improves performance.

● High Precision

● High Speed Machining

· Strong clamp improves rigidity and enhances precision.

■ Body (SAM-E Type)

Cat. No.	Stock		Dimensions (mm)		No. of teeth	Axial rake angle	Radial rake angle
	R	L	øD	ød			
SAM 050ER/L	●		50	32	3	10°	0°
SAM 063ER/L	●		63	32	3	10°	1°
SAM 080ER/L	●		80	32	4	10°	2°

Inserts are sold separately

■ Insert

Cat. No.	DA150		DA2200		Shape	Applicable Cutter
	R	L	R	L		
FAB R/L	●		●		Fig 1	FAM
SAB R/L	●		●		Fig 2	SAM

■ Parts

						Applicable Cutter
Blade Clamp	Blade Side Clamp	Adjuster Wedge	Clamp Screw	Adjuster Screw	Wrench	
FADR	FAWR	FAAR*	WB7-15T	WB7F-15T	TT25	FAM Type SAM Type

* Adjuster Wedge for SAM050ER/L and SAM063ER/L is SAAR.

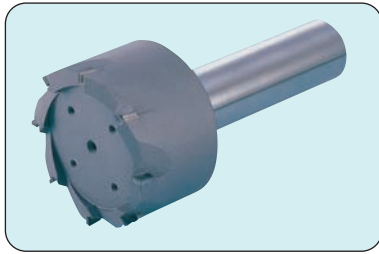
■ Recommended Conditions

Work Material	Type	Process	Cutting Speed	Feed Rate	D.O.C	Recommended Tool
Aluminum Alloy	AC	Roughing	400 ~ 3,000 m/min	~ 0.2 mm/t	~ 3mm	FAM Type SAM Type
	ADC	Finishing	400 ~ 3,000 m/min	~ 0.15 mm/t	~ 0.5mm	
	A390	Finishing	300 ~ 600 m/min	~ 0.15 mm/t	~ 0.5mm	

■ Performance

● Finishing Surface Roughness	● Finishing Surface Roughness
<p>Work : AC2C V=1,500m/min d=0.5mm f=0.04~0.15mm/t Dry</p>	<p>Work : AC2C V=1,000m/min Ad=5.0mm Rd=0.1mm f=0.06mm/t Dry</p>

SUMIDIA Endmills DFE Type



General Features

- Multiple brazed teeth for high feed milling.
- Using DA2200, with excellent fracture toughness and sharpness, for milling of aluminum and non-ferrous metals.
- Excellent for small machines with small diameter endmills.
- Through-tool oil holes for high speed machining.

Endmill Shape

Fig 1



Fig 2

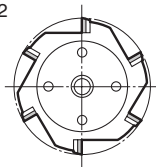
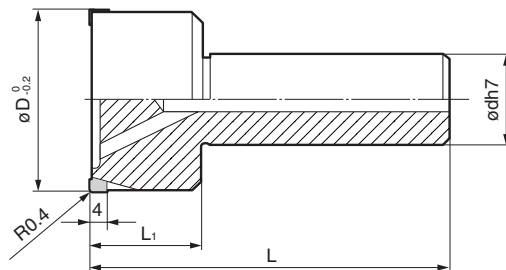
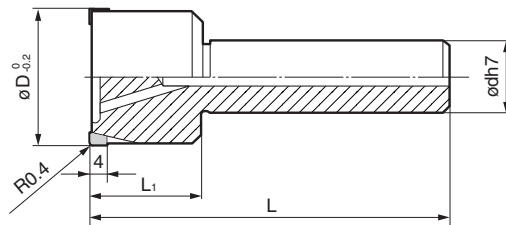
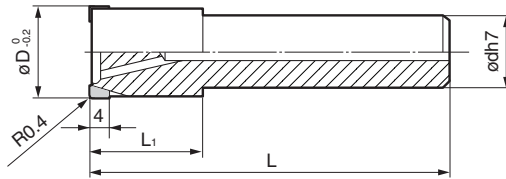
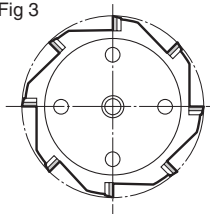


Fig 3



Cat. No.	Stock	Dimensions (mm)				No. of teeth	Shape
	DA2200	ϕD	L	L_1	ϕd		
DFE4200GS	●	20	80	25	16	4	Fig 1
DFE6250GS	●	25	80	25	16	6	Fig 2
DFE6300GS	●	30	80	25	16	6	Fig 2
DFE8400GS	●	40	80	25	16	8	Fig 3
DFE8500GS	●	50	80	25	20	8	Fig 3

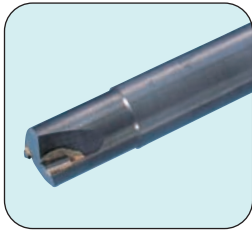
Recommended Conditions

Process	Work	Cutting Conditions	
	Aluminum Alloy	Cutting Speed V(m/min)	200 - 800 - 2000
	Copper Alloy	Feed f(mm/t)	0.02 - 0.05 - 0.1
		Depth of cut Ad(mm)	0.05 - 1.0 - 1.5

Application Example

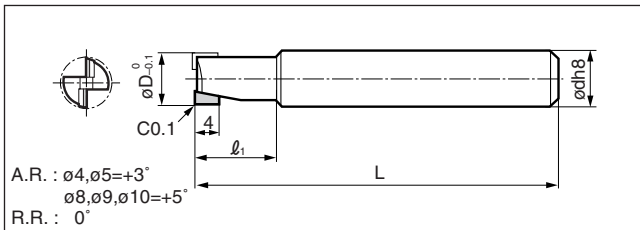
Work	Cutting Conditions	Results
ADC12 Al. alloy	Tool: DFE8400GS	· Good machined surface because burrs do not occur.
Motor Casing part	Conditions: V = 1,500m/min N = 11,940min ⁻¹ f = 0.03mm/t F = 2,865mm/min d = 0.5mm Wet	· More cutting teeth than indexable type cutters · Cycle time is much shorter

SUMIDIA Endmills DFE Type



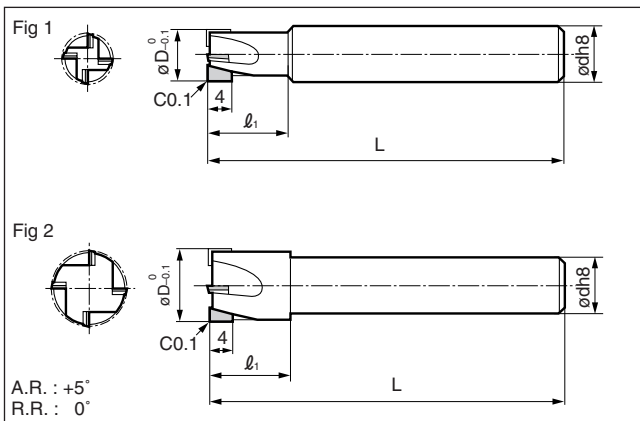
- High rake cutting edge with DA2200 grade.
- For face milling of Al-alloy, such as computer parts.

Endmill Shape (2 Flutes)



Cat. No.	Stock	Dimensions (mm)			
	DA2200	ϕD	l_1	L	ϕd
DFE 2040S	●	4.0	15	50	6
DFE 2050S	●	5.0	15	50	6
DFE 2080S	●	8.0	15	60	10
DFE 2090S	●	9.0	15	70	10
DFE 2100S	●	10.0	15	70	10

Endmill Shape (4 Flutes)



Cat. No.	Stock	Dimensions (mm)				Shape
	DA2200	ϕD	l_1	L	ϕd	
DFE 4090S	●	9.0	15	70	10	Fig 1
DFE 4100S	●	10.0	15	70	10	Fig 1
DFE 4130GS	●	13.0	15	70	10	Fig 2

Recommended Conditions

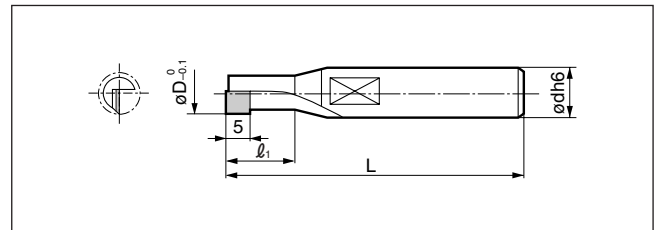
Tooling	Work Material	Condition	
		Parameter	Value
	Aluminium Alloy Copper Alloy	Cutting Speed $V = (\text{m/min})$	200 - 500 - 800
		Feed $f = (\text{mm/t})$	0.02 - 0.05 - 0.1
		Depth of cut $Ad (\text{mm})$	0.05 - 0.4 - 0.7

SUMIDIA Endmills DAE Type



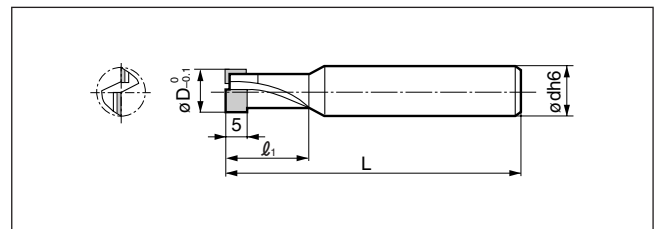
- Long tool life with excellent surface finish
- Finishing of Aluminum and Copper alloys
- Machining of reinforced plastics such as GFRP and CFRP

Endmill Shape (1 Flute)



Cat. No.	Stock	Dimensions (mm)			
	DA200	ϕD	l_1	L	ϕd
DAE 1040	●	4.0	10	45	6
DAE 1050	●	5.0	12	50	6

Endmill Shape (2 Flutes)

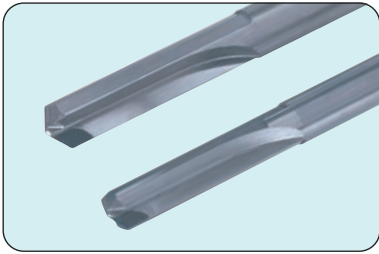


Cat. No.	Stock	Dimensions (mm)			
	DA200	ϕD	l_1	L	ϕd
DAE 2060	●	6.0	20	50	6
DAE 2070	●	7.0	20	60	8
DAE 2080	●	8.0	20	60	8
DAE 2090	●	9.0	25	71	10
DAE 2100	●	10.0	25	71	10
DAE 2110	●	11.0	25	75	12
DAE 2120	●	12.0	25	75	12

Recommended Conditions

Work Material	Condition	Endmill diameter (mm)				
		4	6	8	10	12
Aluminium Alloy Copper Alloy	Cutting Speed $V = (\text{m/min})$	30 ~ 120		60 ~ 300		
	Spindle Speed $N (\text{min}^{-1})$	2,000 ~ 10,000		2,000 ~ 12,000		
	Feed $f = (\text{mm/t})$	0.02 ~ 0.05		0.02 ~ 0.07		

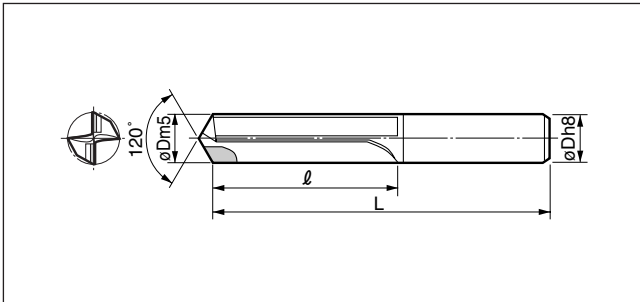
SUMIDIA Drills DAL/DDL/DML Type



From general to High Precision Drilling of Aluminum Alloys!

- High precision DAL type is able to produce holes of IT Class of 7~8.
- General DDL type is able to produce holes of IT class of 11~12, mainly for drilling of pre-tap holes.
- DML type is DDL type with a chamfer edge, incorporating 2 processes in one operation.

■ DAL Type



Cat. No.	Stock DA2200	ϕD	L	ℓ
DAL 0500H ~ 0600H		$\phi 5 \leq D \leq \phi 6$	80	30
DAL 0601H ~ 0700H		$\phi 6 < D \leq \phi 7$	90	35
DAL 0701H ~ 0800H		$\phi 7 < D \leq \phi 8$	90	35
DAL 0801H ~ 0900H		$\phi 8 < D \leq \phi 9$	100	40
DAL 0901H ~ 1000H		$\phi 9 < D \leq \phi 10$	100	40
DAL 1001H ~ 1100H		$\phi 10 < D \leq \phi 11$	110	50
DAL 1101H ~ 1200H		$\phi 11 < D \leq \phi 12$	110	50

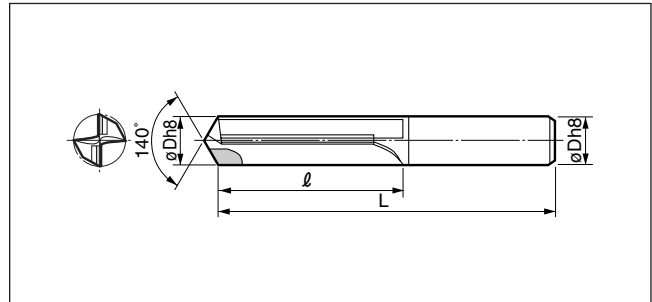
■ Recommended Conditions

Diameter	Cutting Speed	Feed	Depth	Oil
$\phi D < 8$	80 ~ 250 m/min	0.05 ~ 0.2 mm/rev.	L/D=Below 3	Water soluble
$\phi D \geq 8$		0.1 ~ 0.3 mm/rev.		

■ Application Examples (DAL Type)

Work Shape	Work	Conditions	Results
	A390 High silicon Aluminum One pass finished hole	$V=100\text{m/min}$ $f=0.1\text{mm/rev.}$	<ul style="list-style-type: none"> • Holes by carbide drill was out of specifications after 2,000 holes/reg. • SumiDia drill could drill up to 30,000 holes/reg. • 15 times tool life that of carbide drills.
	A390 High silicon Aluminum (pre-cast hole of $\phi 10$)	$V=120\text{m/min}$ $f=0.12\text{mm/rev.}$	<ul style="list-style-type: none"> • Average 40,000 holes/reg (1,600m) • Surface roughness $Ry1 \mu\text{m}$
	ADC10 Aluminum Die Cast One pass finished hole	$V=90\text{m/min}$ $f=0.08\text{mm/rev.}$	<ul style="list-style-type: none"> • More than 50,000 holes and still running

■ DDL Type



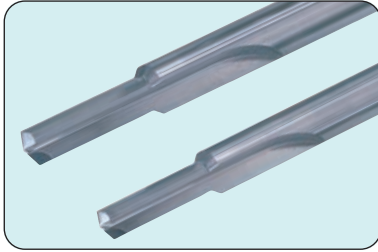
Cat. No.	Stock DA2200	ϕD	L	ℓ
DDL 050V ~ 060V		$\phi 5 \leq D \leq \phi 6$	80	30
DDL 061V ~ 070V		$\phi 6 < D \leq \phi 7$	90	35
DDL 071V ~ 080V		$\phi 7 < D \leq \phi 8$	90	35
DDL 081V ~ 090V		$\phi 8 < D \leq \phi 9$	100	40
DDL 091V ~ 100V		$\phi 9 < D \leq \phi 10$	100	40
DDL 101V ~ 110V		$\phi 10 < D \leq \phi 11$	110	50
DDL 111V ~ 120V		$\phi 11 < D \leq \phi 12$	110	50

■ Important notes

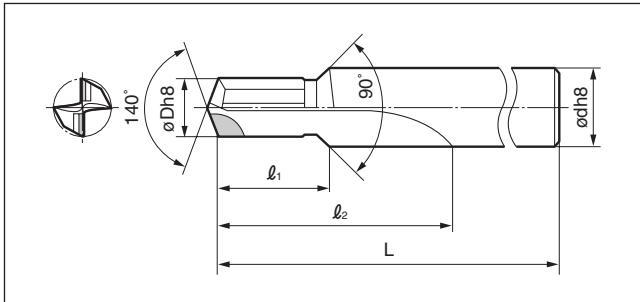
- Select a high rigidity machine and high precision tool holder.
- Enough coolant to drilled hole.

■ Application Examples (DDL Type)

Work Shape	Work	Conditions	Results
	ADC12 Aluminum Die Cast M8 Pre-tap holes	$V=214\text{m/min}$ $f=0.14\text{mm/rev.}$	<ul style="list-style-type: none"> • Regrind after 100,000 holes
	ADC12 Aluminum Die Cast	$V=200\text{m/min}$ $f=0.17\text{mm/rev.}$	<ul style="list-style-type: none"> • Regrind after 74,000 holes (2,000m) (Preset tool change)
	AC2A Aluminum Casting	$V=234\text{m/min}$ $f=0.28\text{mm/rev.}$	<ul style="list-style-type: none"> • Regrind after 80,000 holes (Preset tool change)



■ DML Type



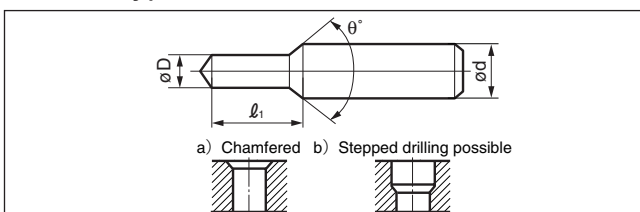
Applicable Tap Size	Cat. No.	Stock DA2200	ϕD	ϕd	L	l_1	l_2
M6	DML 050V	▲	5	8	90	18	36
M8	DML 068V	▲	6.8	10	104	24	48
M10	DML 085V	▲	8.5	12	122	30	60
M12	DML 103V	▲	10.3	14	136	36	72

Chamfering position is usually just carbide but PCD edges can be incorporated.

■ Application Examples (DML Type)

Work Shape	Work	Conditions	Results
	AC4C-T6 Aluminum Casting M6 Pre-tap holes	$V=100\text{m/min}$ $f=0.1\text{mm/rev.}$ $m/c=6$ spindles	<ul style="list-style-type: none"> • Re grind after 150,000 holes • Tool life for carbide drill is 500 holes. • 30 times tool life that of carbide drills
	AC2C-T2 Aluminum Casting M8 Pre-tap holes	$V=210\text{m/min}$ $f=0.15\text{mm/rev.}$	<ul style="list-style-type: none"> • 100,000 holes/reg (2,000m) and still running. • Drilling and chamfering in the same process
	AC4C-T6 Aluminum Casting M10 Pre-tap holes	$V=250\text{m/min}$ $f=0.2\text{mm/rev.}$	<ul style="list-style-type: none"> • 80,000 holes/reg (1,840m) and still running. • Drilling and chamfering in the same process

■ DML Type Possible Profiles



- ① l_1 tolerance for dimension L is more than 0.2mm
- ② θ° is less than 180°
- ③ a) Chamfering b) Stepped drilling possible

Synthetic Single Crystal Diamond SUMICRYSTAL

General Features

SUMICRYSTAL, the world's first commercially available large crystal synthetic diamond developed by Sumitomo.

In the past, the use of natural diamond was severely restricted due to its limited supply and unpredictable nature. Now with SUMICRYSTAL, consistency in quality, stability and supply can be assured.

Production Method

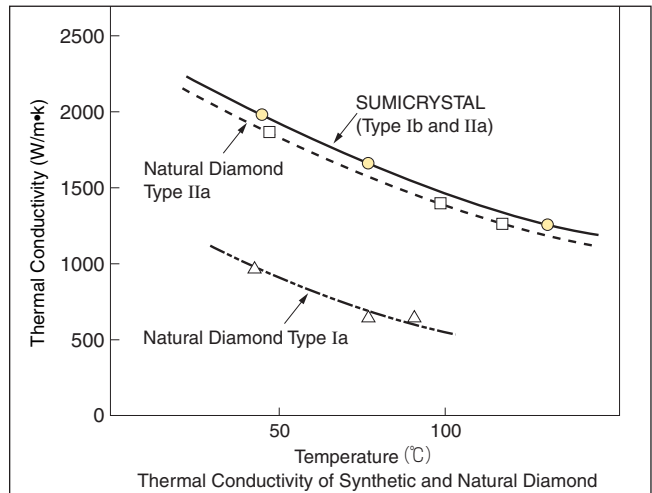
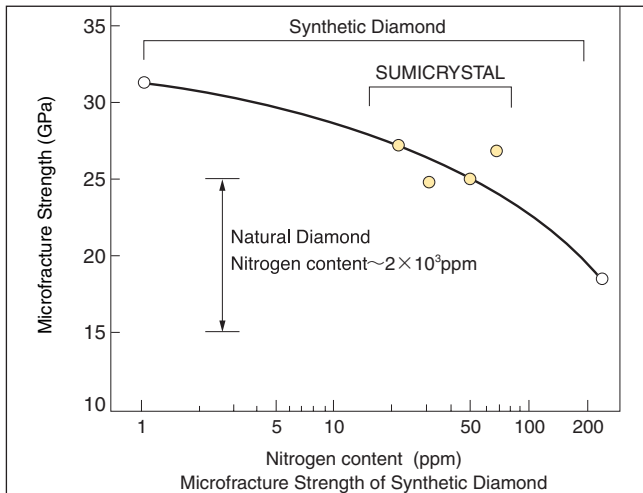
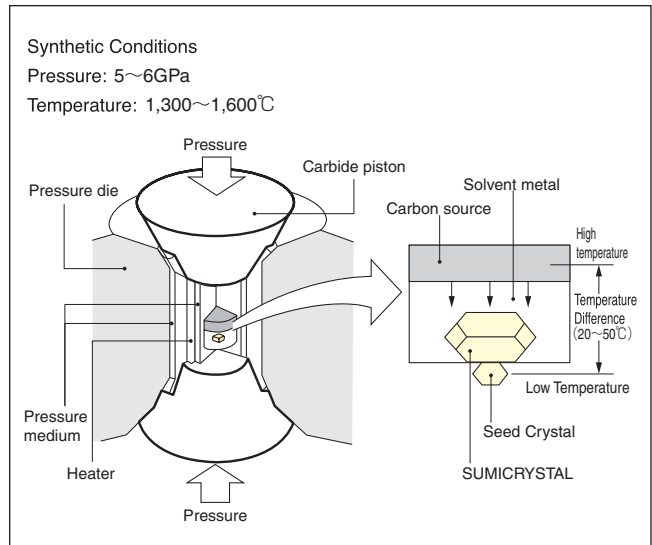
SUMICRYSTAL is synthesized under ultra-high pressures from 5~6GPa and high temperatures from 1,300~1,600°C.

A temperature gradient is created and used to melt the carbon source into molten solvent metal which allows the diamond to grow on a seed crystal. Through this stringent control of pressures and temperatures, a more stable structure with minimal impurities can be obtained.

Characteristics

SUMICRYSTAL has 4 main advantages against natural diamond.

- 1) Structural advantage: Natural diamond is rounded and the direction of lattice is difficult to determine with the naked eye. However, SUMICRYSTAL has a distinct crystal face which makes the identification much easier.
- 2) Uniform quality: Due to the strict controlled conditions in which the crystals are grown, uniform quality can be obtained consistently.
- 3) Availability: Unlike the limited supply of natural diamonds, SUMICRYSTAL can be mass produced.
- 4) Better Characteristics: SUMICRYSTAL type Ib, which is used for cutting tools, have the best thermal conductivity as compared to any other materials; This characteristic is very similar to the rare natural diamond type IIa (*) (refer to bottom right graph) despite SUMICRYSTAL having minute amounts of nitrogen. The bottom left graph shows that SUMICRYSTAL has similar or even better microfracture strength as compared to the natural diamond. (*) Presently, synthetic single crystal diamond type IIa, also known as "SUMICRYSTAL type II" is already available for optical components.



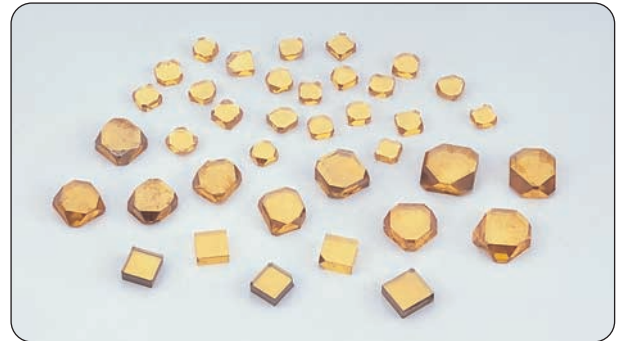
SUMICRYSTAL Up

■ General Features

With today's advancement in technology, there has been an astounding growth in demand for ultra-precision machining processes. To meet this growing need, SUMICRYSTAL UP blanks have the best characteristics to provide high performance and reliability.

■ Characteristics

- 1) Very low variance in quality, high microfracture strength.
- 2) Minimum grinding of cutting edge due to accurate crystal surface.



■ Standard Type

Rectangular parallelepiped type with 6 (100) faces.
Face orientation of machined surface is finished within 3°.

■ Economy Type

Peripheral and upper growth faces are not cut. Features include having large sizes and low cost.
Face orientation of growth surface is maintained within 3°.

■ Standard Items

Shape	Standard Type					Economy Type			
	Cat. No.	L	W	C ₁ , C ₂	T	Shape	Cat. No.	D	T
<p>The arrows indicate the direction for easy polishing. (Facing orientations are all (100) except the corners.)</p>	UP282512	2.8~3.5	2.5~3.5	~0.8	1.2±0.1		UP1510	1.5	1.0
	UP282515	2.8~3.5	2.5~3.5	~0.8	1.5±0.1		UP1512	1.5	1.2
	UP303015	3.0~3.5	3.0~3.5	~0.3	1.5±0.1		UP2010	2.0	1.0
	UP301415	3.0~3.5	1.4~1.7	~0.3	1.5±0.1		UP2012	2.0	1.2
	UP333014	3.3~4.0	3.0~4.0	~0.9	1.4±0.1		UP2510	2.5	1.0
	UP333017	3.3~4.0	3.0~4.0	~0.9	1.7±0.1		UP2512	2.5	1.2
	UP353514	3.5~4.0	3.5~4.0	~0.4	1.4±0.1		UP2515	2.5	1.5
	UP353517	3.5~4.0	3.5~4.0	~0.4	1.7±0.1		UP3012	3.0	1.2
	UP351717	3.5~4.0	1.7~2.0	~0.4	1.7±0.1		UP3015	3.0	1.5
							UP3512	3.5	1.2
					UP3515	3.5	1.5		
					UP4015	4.0	1.5		
					UP4020	4.0	2.0		
					UP4515	4.5	1.5		
					UP4520	4.5	2.0		
					UP5015	5.0	1.5		
					UP5020	5.0	2.0		

Dresser Blank SUMICRYSTAL PD/PDX



SUMICRYSTAL PD and PDX are synthetic diamonds processed into thin prism shapes for use as dressers. These dressers can be used in automated, high precision dressing providing reliable performance and longer tool life, as compared to natural diamonds.

SUMICRYSTAL PD

Characteristics

- Revolutionary Elongated Shape
- ① Improved clamp strength prevents diamond pull out.
- ② Consistent cross-section prevents deterioration.
- ③ Uniform face orientation promotes stable tool life.

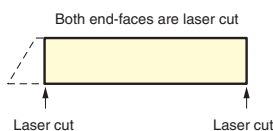
Standard Items

Laser cut	Units (mm)				
	Cat. No.	Stock	T	W	L
<p>· 'L' is the distance between the center points of both ends. · Both upper and lower (111) faces are cleaved.</p>	PD0220	●	0.2±0.05	0.2±0.05	2~2.5
	PD0420	●	0.4±0.05	0.4±0.05	2~2.5
	PD0630K	●	0.6±0.1	0.6±0.1	3~4
	PD0640K	●	0.6±0.1	0.6±0.1	4~5
	PD0650K	●	0.6±0.1	0.6±0.1	5~
	PD0830K	●	0.8±0.1	0.8±0.1	3~4
	PD0840K	●	0.8±0.1	0.8±0.1	4~5
	PD0850K	●	0.8±0.1	0.8±0.1	5~
	PD1130K	●	1.1±0.1	1.1±0.1	3~4
	PD1140K	●	1.1±0.1	1.1±0.1	4~5

Laser cut face (211) Cleaved face (111)	Units (mm)				
	Cat. No.	Stock	T	W	L
<p>Single cleaved side face with pre-determined abrasive resistant direction.</p>	PD0630TK	●	0.6±0.1	0.6±0.1	3~4
	PD0640TK	●	0.6±0.1	0.6±0.1	4~5
	PD0830TK	●	0.8±0.1	0.8±0.1	3~4
	PD0840TK	●	0.8±0.1	0.8±0.1	4~5
	PD1130TK	●	1.1±0.1	1.1±0.1	3~4
	PD1140TK	●	1.1±0.1	1.1±0.1	4~5

KK Type

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



· When ordering, please include "KK" behind the standard catalogue no. (ex. PD○○○○KK, PD○○○○TKK)

· PD0220, 0420 are not available in "KK Type".

SUMICRYSTAL PDX

Characteristics

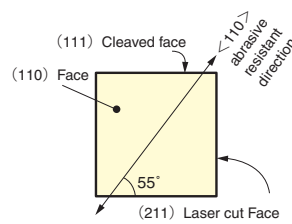
- New Product With Modified Face Orientation
- ① Face orientation (211) increases abrasive resistance.
- ② Parallel abrasive resistant faces (111) facilitate blank setting during manufacturing of dressers.

Standard Items

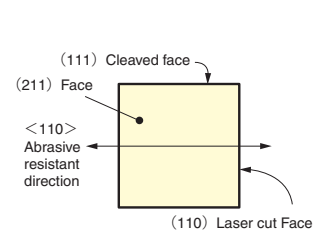
Laser cut	Units (mm)				
	Cat. No.	Stock	T	W	L
<p>· 'L' is the distance between the center points of both ends. · Both upper and lower (111) faces are cleaved.</p>	PDX0220	●	0.2±0.05	0.2±0.05	2±0.1
	PDX0320	●	0.3±0.05	0.3±0.05	2±0.1
	PDX0420	●	0.4±0.05	0.4±0.05	2±0.1
	PDX0630	●	0.6±0.1	0.6±0.1	3±0.5
	PDX0640	●	0.6±0.1	0.6±0.1	4±0.5
	PDX0830	●	0.8±0.1	0.8±0.1	3±0.5
	PDX0840	●	0.8±0.1	0.8±0.1	4±0.5
	PDX1130	●	1.1±0.1	1.1±0.1	3±0.5
	PDX1140	●	1.1±0.1	1.1±0.1	4±0.5

Orientation PDX

<Conv. type PD>

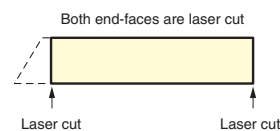


<PDX>



K Type

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



· When ordering, please include "K" behind the standard catalogue no. (ex. PDX○○○○K)

· PDX0220, 0320 and 0420 are not available in "K Type".