

SUMIDIA DA1000



Super Hard Grade for Machining of Aluminium-Alloy
Excellent Performance, High Accuracy, High Efficiency



SUMITOMO

CARBIDE - CBN - DIAMOND

SUMIDIA

DA1000



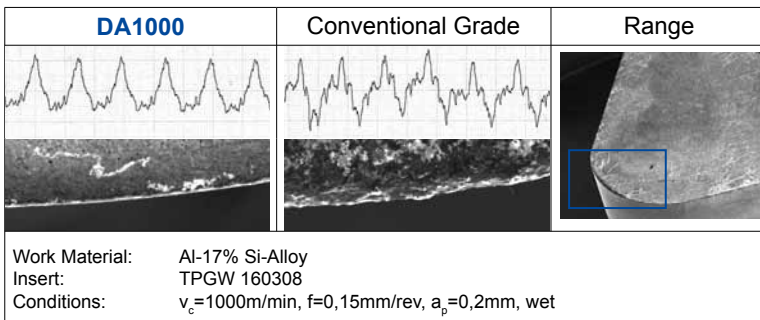
General Features

- SumiDia DA1000 is a high density, ultra-fine grained sintered PCD with high toughness similar to that of carbide.
- Excellent micro cutting edge geometry, optimum wear and fracture resistance facilitate high performance, longer tool life and achieve high efficiency machining especially during milling of all aluminium alloys.
- Significantly improved surface roughness on machined surfaces and minimization of burr formation on workpiece.
- The NF type inserts make it even more cost effective.

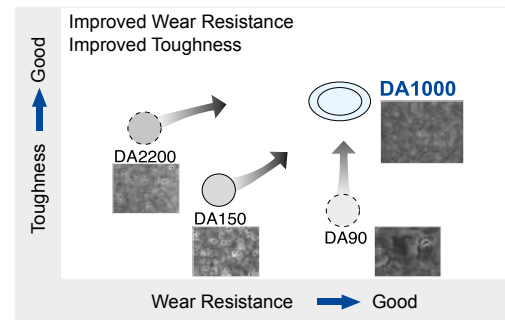
Series - Characteristics - Application

Grade	Characteristics	Application	Grain Size (μm)	Hardness (Hv)	TRS (kg/mm ²)
DA1000	High density sintered material made of ultra-fine diamond particles that demonstrates optimum wear and fracture resistance, and excellent edge sharpness.	- High-Silicon Aluminium Alloy Cutting - Rough, Interrupted and Finishing of Al-Alloy - Wood or Wooden Board Cutting - Non-Ferrous Metal Finishing (Al, Copper Alloy)	~ 0,5	110 ~ 120	≈ 2,6
DA2200	Sintered material made of ultra-fine diamond particles that demonstrates optimum wear and fracture resistance and excellent edge sharpness.	- Rough, Interrupted and Finishing of Al-Alloy - Wood or Wooden Board Cutting	0,5	90 ~ 100	≈ 2,45
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.	- Non-Ferrous Metal finishing (Al, Copper Alloy) - Carbide or Semi-Sintered Carbide&Ceramic Roughing - FRP, Hard Rubber & Carbon Cutting - Wooden or Inorganic Material Board Cutting	5	100 ~ 120	≈ 1,95

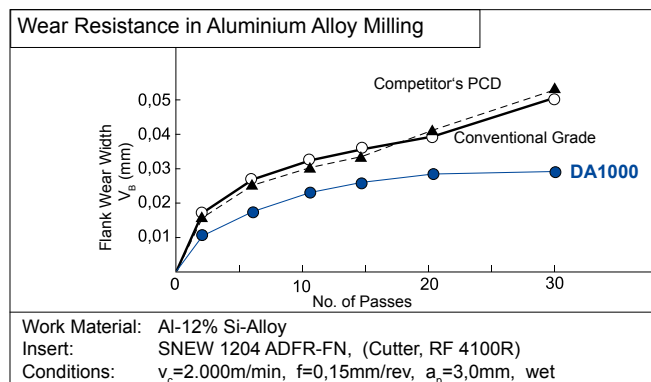
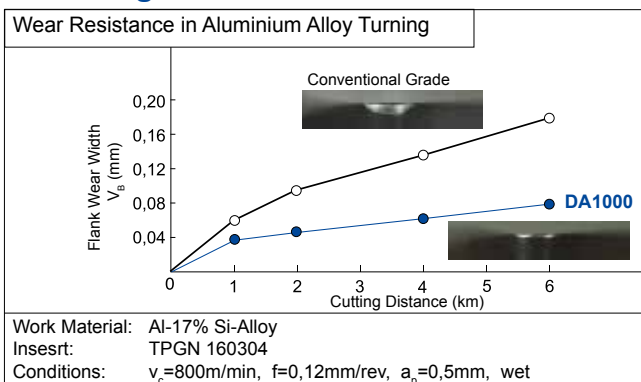
Comparison of Cutt. Edges after Machining Al-Alloy



Position of DA1000



Cutting Performance



Recommended Cutting Conditions

Conditions	Work Material	Aluminium Alloys	Copper Alloys	Reinforced Plastics	Wood or Organic Materials	Carbide	Carbon
Cutting Speed	v_c (m/min)	~ 3.000	~ 1.000	~ 1.000	~ 4.000	10 ~ 30	100 ~ 600
Feed Rate	f (mm/rev)	~ 0,2	~ 0,2	~ 0,4	~ 0,4	~ 0,2	~ 1,0
Depth of Cut	a_p (mm)	~ 3,0	~ 3,0	~ 2,0	-	~ 0,5	~ 2,0

Application Range

Aluminium Alloy

Machinability	Work Material	Turning		Milling	Example Parts
		Roughing	Finishing		
Good ↑ ↓ Difficult	Sintered Aluminium	DA1000 DA2200 DA150			Piston Liner
	Die Cast Aluminium (ADC12)				Transmission Case, Oil Pan, Cylinder Block, Al-Wheel
	Low Silicon (AC2B-T6, AC4C-T6)				Cylinder Head
	High Silicon (T6)				Cylinder Block

Non-Aluminium Alloy

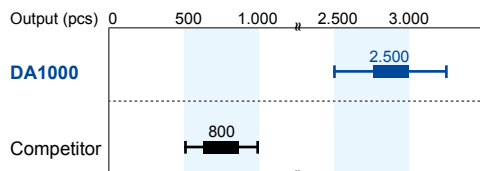
Machinability	Work Material	Turning		Milling	Example Parts
		Roughing	Finishing		
Good ↑ ↓ Difficult	Non-Ferrous Sintered Alloy	DA1000 DA2200			Bush
	Gunmetal Carbon				Connecting Rod
	Carbide				Roll
	Fe Combined			DA150	Cylinder Block, Bearing Cap

Application Example

Bush



Work Material: Copper Alloy
 Insert: TPGN 160308 NF
 Conditions: $v_c=300\text{m/min}$, $f=0,07\text{mm/rev}$, $a_p=0,08\text{mm}$, wet
 Tool life criteria: $Rz=3,2$
 Cutting length: 73m/pcs

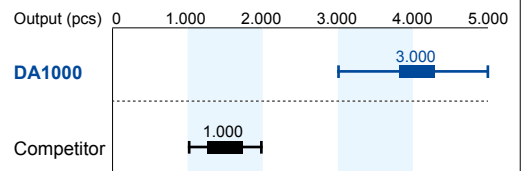


DA1000 achieved 3 times tool life as compared to the competitor's PCD grade without breakage.

Oil Pump Cover



Work Material: ADC12 Aluminium Alloy
 Insert: CNGX 120408 NF
 Conditions: $v_c=1400\text{m/min}$, $f=0,3\text{mm/rev}$, $a_p=0,2\text{mm}$, wet
 Tool life criteria: Burr
 Cutting length: 62m/pcs

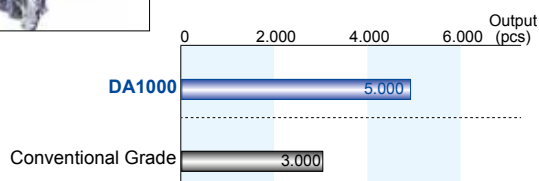


DA1000 achieved 3 times longer tool life than the competitor's PCD grade by restraining the progress of burr.

Cylinder Block



Material: ADC12
 Insert: SNEW 1204 ADFR NF
 Conditions: $v_c=2800\text{m/min}$, $f=0,14\text{mm/rev}$, $a_p=2\text{mm}$, wet
 Tool life criteria: Burr

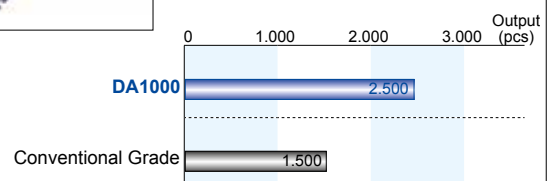


DA1000 achieved 60% longer tool life than the conventional PCD grade without breakage.

Cylinder Head

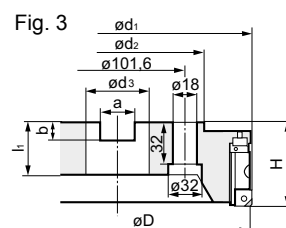
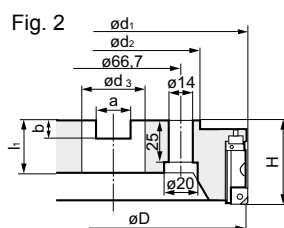
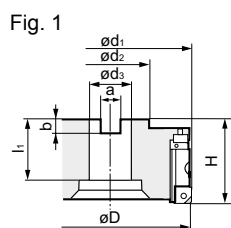


Material: AD2C
 Insert: SNEW 1204 ADFR NF
 Conditions: $v_c=1500\text{m/min}$, $f=0,2\text{mm/rev}$, $a_p=3\text{mm}$, wet
 Tool life criteria: Burr



DA1000 achieved 2,500 pcs tool life without breakage.

High Speed Finishing of Aluminium Alloy



Body

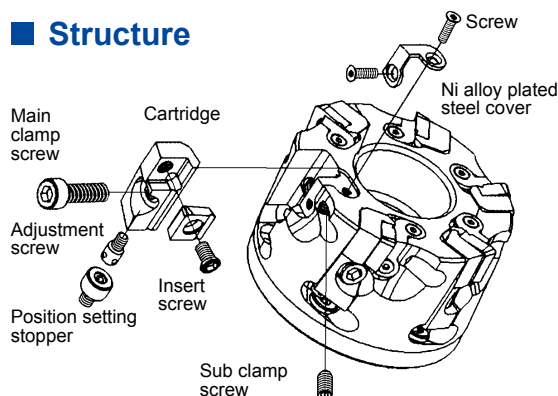
Type	Cat. No.	Stock	Dimensions (mm)				Mounting				Number of Teeth	Max. Depth of Cut	Weight (kg)	Fig.
			ϕD	ϕd_1	ϕd_2	H	ϕd_3	a	b	l_1				
RF 4000	RF 4080 R-S	●	80	82	60	50	27	12,4	7,0	29	6	3,0	0,7	1
	RF4100 R-S	●	100	102	75	50	32	14,4	8,5	29	6		1,0	
	RF 4125 R-S	●	125	127	75	63	40	16,4	9,5	29	8		1,6	
	RF4160 R-S	○	160	162	100	63	40	16,4	9,5	29	10		2,6	2
	RF 4200 R-S		200	202	130	63	60	25,7	14,0	38	12		3,6	
	RF 4250 R-S		250	252	130	63	60	25,7	14,0	38	16		6,0	
	RF 4315 R-S		315	317	240	80	60	25,7	14,0	40	18		11,0	3

Remarks: PCD blades and inserts are not included.

Insert for Roughing and Finishing

Shape	Cat. No.	Grade	Stock
	SDET 1204 ZDFR	H1	●
	SNEW 1204 ADFR-NF	DA1000 DA2200	○ □
	SNEW 1204 ADFR-W-NF	DA1000 DA2200	○ □

Structure



„Sumidia“ Blade

PCD grade	Cat. No.	Stock
DA2200		
	RFB	○
	RFBW	○

Cartridge

Shape	Cat. No.	Stock
	RFR	●
	RFF	●

Cutting Insert Selection

For easy assembling

PCD Blade: RFB
PCD Blade: RFB (Wiper type)

For finishing

Cartridge: RFF
PCD-Blade: SNEW 1204 ADFR-NF (standard type)
SNEW 1204 ADFR-W-NF (wiper-type)
Grade: DA2200

For roughing

Cartridge: RFR
Uncoated carbide insert
SDET 1204 ZDFR, grade: H1

Dummy Blade

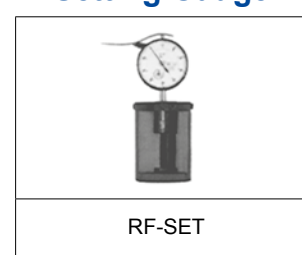
	Cat. No.	Stock
	RFD	○

● Euro stock
○ Japan stock
□ Delivery on request

Spare Parts

Cover	Position setting stopper	Main clamp screw	Sub clamp screw	Cover clamp screw	Adjustment screw	Insert clamp screw	Hex wrench	Torque wrench
RFC	RFS	BX0620	BTD0510	FBUP2-A0-8	RFJ	BFTX0509N	TH015 TH025 TH050	TTX20

Setting Gauge



Dial-gauge is not included.

■ Inserts, Neg.-Pos. Type

Shape	Cat. No.	Dimension (mm)					
		ød (IC)	S	Hole Size	Nose Radius	ℓ	
	NF-CNMX120402	●			0,2	5,7	
	120404	●	12,7	4,76	5,16	0,4	5,7
	120408	●				0,8	5,6
	120412	○				1,2	5,4
	NF-DNMX150402	○			0,2	6,4	
	150404	○	12,7	4,76	5,16	0,4	6,2
	150408	○				0,8	5,8
	150412	○				1,2	5,4
	NF-TNMX160402	○			0,2	3,7	
	160404	○	9,525	4,76	3,81	0,4	3,6
	160408	○				0,8	3,3
	NF-VNMX160402	○			0,2	6,9	
	160404	○	9,525	4,76	3,81	0,4	6,4
	160408	●				0,8	5,6
	160412	○				1,2	4,7

■ Inserts, Positive Type

Shape	Cat. No.	Dimension (mm)					
		ød (IC)	S	Hole Size	Nose Radius	ℓ	
	NF-CCMT060201	●			0,1	2,8	
	060202	●	6,35	2,38	2,8	0,2	2,8
	060204	●				0,4	2,8
	NF-CCMT09T301	●			0,1	2,8	
	09T302	●	9,525	3,97	4,4	0,2	2,8
	09T304	●				0,4	2,8
	09T308	●				0,8	2,7
	NF-CPMT090302	○			0,2	2,8	
	090304	○	9,525	3,18	4,4	0,4	2,8
	090308	●				0,8	2,7
	NF-DCMT070201	●			0,1	3,0	
	070202	●	6,35	2,38	2,8	0,2	3,0
	070204	●				0,4	2,8
	NF-DCMT11T301	●			0,1	3,0	
	11T302	●	9,525	3,97	4,4	0,2	3,0
	11T304	●				0,4	2,8
	11T308	●				0,8	2,4
	NF-SCMT070201	○			0,1	3,0	
	070202	○	7,94	2,38	3,4	0,2	3,0
	070204	○				0,4	3,0
	NF-SEGN090302	○	9,525	3,18	-	0,2	4,8
	120302	○	12,7			0,2	4,8
	NF-SPGN090304	○	9,525	3,18	-	0,4	4,8
	090308	○				0,8	4,8
	NF-SPGN120304	○	12,7	3,18	-	0,4	4,8
	120308	○				0,8	4,8
	NF-TBNG060102	●	3,97	1,59	-	0,2	2,1
	060104	●				0,4	2,0

■ Inserts, Positive Type

Shape	Cat. No.	Dimension (mm)					
		ød (IC)	S	Hole Size	Nose Radius	ℓ	
	NF-TBGW060102	●	3,97	1,59	2,2	0,2	2,3
	060104	●				0,4	2,2
	NF-TCMT090202	●	5,56	2,38	2,5	0,2	2,9
	090204	●				0,4	2,8
	NF-TCMT110201	●				0,1	3,0
	110202	●	6,35	2,38	2,8	0,2	2,9
	110204	●				0,4	2,8
	NF-TEGN110202	○	6,35	2,38	-	0,2	3,1
	110204	○				0,4	2,9
	NF-TEGN110302	○				0,2	3,1
	110304	○	6,35	3,18	-	0,4	2,9
	110308	○				0,8	2,7
	NF-TEGN160302	○	9,525	3,18	-	0,2	3,0
	160304	○				0,4	2,9
	NF-TEGN110304P	○	6,35	3,18	-	0,4	10,4
	110308P	○				0,8	9,8
	NF-TEGN160304P	○	6,35	3,18	-	0,4	15,9
	NF-TPGN090202	○				0,2	3,1
	090204	○	5,56	2,38	-	0,4	3,0
	090208	○				0,8	2,7
	NF-TPGN110302	○				0,2	3,0
	110304	●	6,35	3,18	-	0,4	2,9
	110308	●				0,8	2,7
	NF-TPGN160302	●				0,2	3,0
	160304	●	9,525	3,18	-	0,4	2,9
	160308	●				0,8	2,7
	NF-TPGN110304P	○	6,35	3,18	-	0,4	10,4
	110308P	○				0,8	9,8
	NF-TPGN160304P	●	9,525	3,18	-	0,4	15,9
	NF-TPGW080201	○				0,1	3,1
	080202	●	4,76	2,38	2,4	0,2	3,0
	080204	●				0,4	2,9
	NF-TPGW090202	○	5,56	2,38	2,8	0,2	3,1
	090204	○				0,4	2,9
	NF-TPGW110201	○				0,1	3,1
	110202	●	6,35	2,38	2,8	0,2	3,0
	110204	●				0,4	2,9
	NF-TPGW110301	○				0,1	3,1
	110302	●	6,35	3,18	3,4	0,2	3,0
	110304	●				0,4	2,9
	110308	●				0,8	2,7

● Euro stock

○ Japan stock

■ Inserts, Positive Type

Shape	Cat. No.	Dimension (mm)					
		ød (IC)	S	Hole Size	Nose Radius	ℓ	
	NF-TPGW160302	○			0,2	3,1	
	160304	○	9,525	3,18	4,4	0,4	2,9
	160308	○				0,8	2,7
	NF-TPGW160401	○			0,1	3,1	
	160402	●	9,525	4,76	4,4	0,2	3,0
	160404	●				0,4	2,9
	160408	●				0,8	2,7
	NF-VCMT110301	●			0,1	3,5	
	110302	●	6,35	3,18	2,8	0,2	3,4
	110304	●				0,4	3,0
	NF-VCMT160404	●			0,4	6,5	
	160408	●	9,525	4,76	4,4	0,8	5,6
	160412	●				1,2	4,6
	NF-WBMT060101L	○			0,1	1,8	
	060102L	●	3,97	1,59	2,2	0,2	1,8
	060104L	●				0,4	1,7

- Euro stock
○ Japan stock

■ Inserts for Milling

Shape	Cat. No.	Dimension (mm)					
		ød (IC)	T	Hole Size	ℓ	Applicable Cutter	
	NF-SDC 42R	○	12,7	3,18	-	3,0	APG
	NF-SDKN 42M	○	12,7	3,18	-	3,0	FPG FPE
	NF-SECW13T3AGTN-N	○	12,7	3,97	-	2,1	WGC
	NF-SNEW09T3ADTR	○					
	09T3ADTR-R	○	9,525	3,96	4,4	6	SRF
	09T3ADTR-U	○					
	NF-SNEW1204ADFR	●	12,7	4,76	5,5	4,7	RF
	1204ADTFR-W	●				2,3	
	NF-TEEN22R	○	6,35	3,18	-		
	32R	○	9,525	3,18	-	3,0	CHG CHE
	43R	○	12,7	4,76	-		
	NF-XEEW13T3AGFR-W	○	13,4	3,97	4,4	2,5	WGC



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