SUMIDIA
DA1000

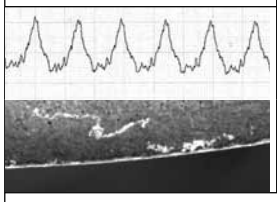
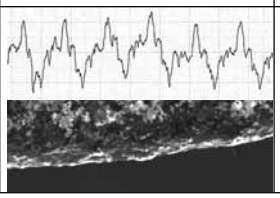
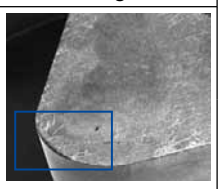
General Features

- 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

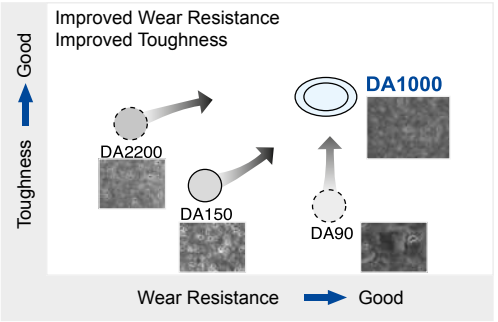
Grade	Characteristics	Application	Grain Size (µm)	Hardness (Hv)	TRS (kg/mm²)
DA1000	High density sintered material made of ultra-fine diamond particles that demonstrates optimum wear and fracture resistance, and excellent edge sharpness.	- High-Silicon Aluminium Alloy Cutting - Rough, Interrupted and 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

DA1000	Conventional Grade	Range
		

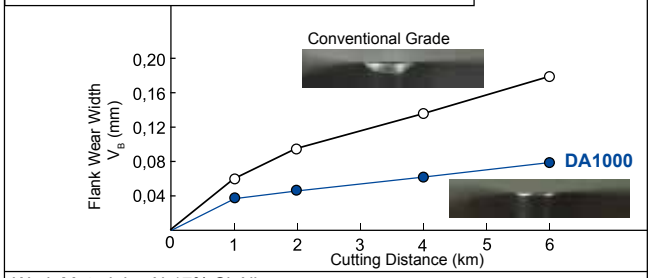
Work Material: Al-17% Si-Alloy
Insert: TPGW 160308
Conditions: v_c=1000m/min, f=0,15mm/rev, a_p=0,2mm, wet

Position of DA1000



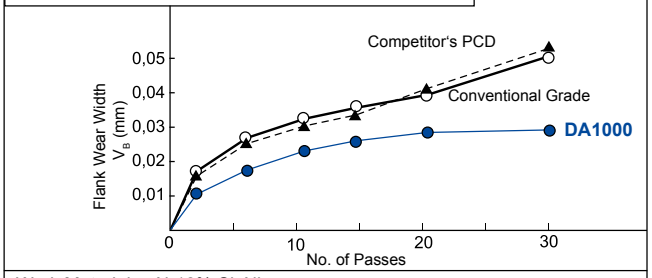
Cutting Performance

Wear Resistance in Aluminium Alloy Turning



Work Material: Al-17% Si-Alloy
Insesrt: TPGN 160304
Conditions: v_c=800m/min, f=0,12mm/rev, a_p=0,5mm, wet

Wear Resistance in Aluminium Alloy Milling



Work Material: Al-12% Si-Alloy
Insert: SNEW 1204 ADFR-FN, (Cutter, RF 4100R)
Conditions: v_c=2.000m/min, f=0,15mm/rev, a_p=3,0mm, wet

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

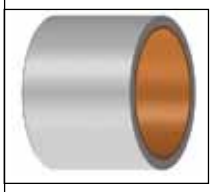
Machinability	Work Material	Turning		Milling	Example Parts
		Roughing	Finishing		
Good ↕ Difficult	Sintered Aluminium	DA1000 / DA2200 / DA150			Piston Liner
	Die Cast Aluminium (ADC12)				Transmission Case, Oil Pan, Cylinder Block, Al-Wheel
	Low Silicon (AC2B-T6, AC4C-T6)				Cylinder Head
	High Silicon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

Non-Aluminium Alloy

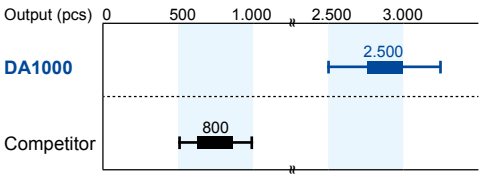
Machinability	Work Material	Turning		Milling	Example Parts
		Roughing	Finishing		
Good ↕ Difficult	Non-Ferrous Sintered Alloy	DA1000 / DA2200			Bush
	Gunmetal Carbon				Connecting Rod
	Carbide				Roll
	Fe Combined	DA150			Cylinder Block, Bearing Cap

Application Example

Bush



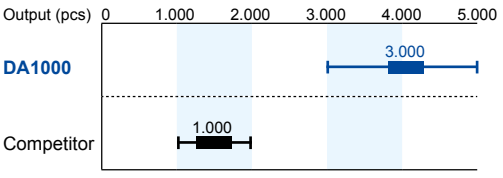
Work Material: Copper Alloy
Insert: TPGN 160308 NF
Conditions: v_c=300m/min, f=0,07mm/rev, a_p=0,08mm, wet
Tool life criteria: Rz=3,2
Cutting length: 73m/pcs



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

Oil Pump Cover

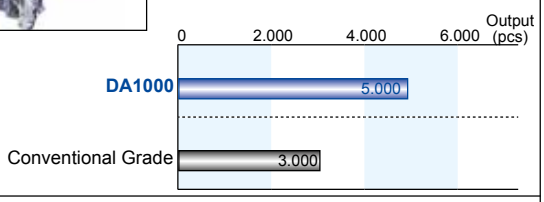
Work Material: ADC12 Aluminium Alloy
Insert: CNGX 120408 NF
Conditions: v_c=1400m/min, f=0,3mm/rev, a_p=0,2mm, wet
Tool life criteria: Burr
Cutting length: 62m/pcs



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

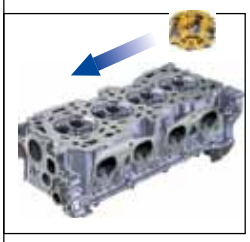
Cylinder Block

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

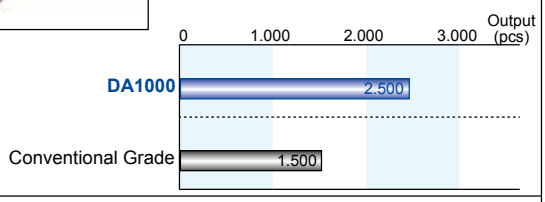


DA1000 achieved 60% longer tool life than the conventional PCD grade without breakage.

Cylinder Head



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



DA1000 achieved 2.500 pcs tool life without breakage.