DATA SHEET

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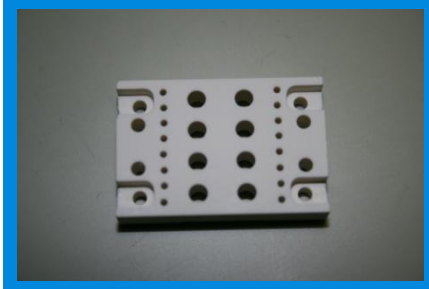

1AS.011
Shapal Hi-M Soft™ Aluminum Nitride

Applications

- Electronic components where electrical insulation and heat dissipation are required
- Components where low dielectric constant and dissipation factor are required
- Fixture parts where a low coefficient of thermal expansion is required
- Vacuum components
- Components where a low coefficient of thermal expansion required
- Heat sinks
- Crucibles for vacuum deposition
- Special refractory parts such as protective tubes

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Overview

Shapal Hi-M Soft™, produced by the Tokuyama Corporation, is an ultra-pure and easily machinable high-performance industrial ceramic. It is a new hybrid composite material consisting of aluminium nitride and boron nitride, blended and sintered together to form a dense ceramic body. It has both high thermal conductivity and mechanical strength.

Shapal Hi-M Soft™ can be easily machined into complex shapes while still keeping many of the advantages of aluminium nitride. It also has a very low coefficient of thermal expansion which makes the material very attractive for harsh environments. Morevever this ceramic ensures full sealing.

Final Advanced Materials machines high-precision ceramic components from blanks obtained by moulding or extrusion. These shaped parts are obtained by a diamond machining process which is specially designed for dense ceramics.

We only work with ceramics of high purity, which are calibrated and certified. Finished parts reproduce the unimpaired physical characteristics of machine-ready blanks, with no impairment or mechanical deterioration.

Intrinsic properties of ceramics, including hardness, abrasion resistance, compression resistance, high-temperature resistance, resistance to thermal impacts and high dielectric strength are maintained and reproduced in finished components.

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Benefits

- Excellent machinability: it can be machined in complex shapes with conventional tools
- Excellent sealing ability to vacuum
- High thermal conductivity: 10 times as much thermal conductivity as that of alumina
- High mechanical and bending strength of 30 kg/mm^2, comparable to that of alumina
- Transparency: it allows visible infra-red light to pass through easily
- Excellent electrical insulation
- Low dielectric loss
- Appropriate properties for vacuum environments
- Heat dissipation properties
- Low thermal expansion
- High-frequency wave properties
- High corrosion resistance
- Unwettable by molten metals
- Ultra high purity

Technical Data

Property		Unit	Shapal Hi-M Soft ™
Item N°			
Composition			
Physical Characteristics			
Density		g/cm^3	2.88
Porosity		%	0
Colour			White/transparent
Mechanical Characteristics at 20 °C			
Bending strength	**-100 °C**	**MPa**	340
	25		300
	500 °C		325
	1.000 °C		350
Compressive Strength		**MPa**	980
Young's Modules		**GPa**	176
Poisson's ratio			0,31
Hardness on Vickers'scale HV, for 300 g		**GPa**	3,8
Thermal Characteristics			
Maximum operating temperature In air	**In air**	**°C**	1.000
	In nonoxidizing atomosphere		1.900
Thermal conductivity	**-100 °C**	**W/(m.K)**	100
	25 °C		92
	500 °C		55
	1 000 °C		35
Thermal expansion coefficient	**From 20 to 400 °C**	**10^{-6}K^{-1}**	4.8
	From 20 to 600 °C		4.9
	From 20 to 800 °C		5.0
Electrical Characteristics			
Electrical Resistivity à 20 °C		**Ω.m**	10^{11}
Dielectric Constant at 20 °C for 1 MHz			6.8
Dielectric loss (tan δ)		**1MHz**	0.0010
Dielectric Strength at 20 °C		**kV/mm**	65

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Dimensions

We machine your parts according to your drawings.

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