S&S ADVANCE CERAMICS PRIVATE LIMITED

DATA SHEET

Silicon Nitride (SIN)

Description:

Silicon Nitride (Si_3N_4) has good high temperature strength, creep resistance and oxidation resistance. In addition, its low thermal expansion coefficient gives good thermal shock resistance compared with most ceramic materials. Even at temperatures of around 800°C, Si_3N_4 is also still able to transmit very high forces.

Salient Features:

- Good Flexural Strength
- Very High Fracture Toughness
- Low Density
- Very Good Thermal Shock Resistance

Typical Applications:

- Bearing balls and rollers
- Automobile Crankshaft Induction Heating Tips
- Automobile Nut Welding Guide Pins & Fixtures
- Welding nozzles
- Tools for Sheet Forming
- Pump Components
- Engine Components

Physical Properties

PROPERTY	TEST	UNITS	SiN
Colour			Greyish Black
Density	ASTM-C20	g/cc	3.2
Water Absorption	ASTM-373	%	0
Gas Permeability			0
Flexural Strength (20°C)	ASTM-F417	MPa	650
Elastic Modulus (20°C)	ASTM-C848	GPa	290
Poission's Ratio (20°C)	ASTM-C848		0.28
Compressive Strength (20°C)	ASTM-C773	MPa	3000
Hardness	VICKERS ROCKWELL 45 N	Hv R45 N	1500 80
Fracture Toughness K_{IC}	NOTCHED BEAM	MPa $m^{½}$	5
Thermal Conductivity (20°C)	ASTM-C408	W/mK	5
Coefficient of Thermal Expansion (25-1000°C)	ASTM-C372	$1X10^{-6}$/°C	8.8
Specific 100°C	ASTM-E1269	J/Kg K	640
Maximum No Load Temperature		°C	1200
Thermal Shock Resistance T_C		°C	800
Dielelectric Strength	ASTM-D116	Ac-kV/mm	12
Dielctric Constant (1 MHz)	ASTM-D150		8.3
Volume Resistivity @ 20°C	ASTM-D1829	Ohm-cm	$>10^{12}$

Production Capabilities

- Isostatic, uniaxial pressing & Injection Molding
- Lapping & polishing to 2 microinch Ra
- Manual, CNC and high precision machining

Please note that all values quoted are based on test pieces and may vary according to component design. These values are not guaranteed in anyway whatsoever and should only be treated as indicative and for guidance only.