



Silicon Nitride Ceramics

Silicon nitride ceramics have the most versatile combination of mechanical, thermal and electrical properties among all technical ceramic materials, with excellent resistance to thermal shock and impact.

Features Of Silicon Nitride Ceramics

- ◆ Very low density;
- ◆ Very high fracture toughness;
- ◆ Good bending strength;
- ◆ Excellent thermal shock resistance;
- ◆ Extremely high operating temperature.

Typical Applications

- ◆ Rotating ball & rollers bearings
- ◆ Engine components
- ◆ valves, rocker arm pads, seal faces
- ◆ Turbine blades, vanes, buckets
- ◆ Welding & brazing jigs
- ◆ Metal tube forming rolls and dies
- ◆ TIG / Plasma welding nozzles
- ◆ Precision shafts and axles in high wear environments
- ◆ Thermocouple sheaths & tubes

Great Ceramic are experts in the production of technical ceramics, we offer ceramic processing, ceramic materials, ceramic casting, ceramic metal packaging and surface metallization services.

[Contact us](#) for more information!

Silicon Nitride Ceramics Properties

- ◆ Gas Pressure Sintered Silicon Nitride (GPSN)
- ◆ Hot Pressed Silicon Nitride (HPSN)
- ◆ Silicon Nitride Ceramic Substrate (SNS)

MECHANICAL

Properties	Unit	GPSN	HPSN	SNS
Colour	—	Gray or black	Gray or black	Gray or black
Density	g/cm ³	3.2	3.3	3.25
Hardness	GPa	15	16	15
Compressive Strength	MPa	2500	3000	2500
Flexural Strength	MPa	700	900	600~800
Fracture Toughness	MPa · m ^{1/2}	5~7	6~8	6~7
Modulus of Elasticity	GPa	300	300	300~320
Poissons Ratio	—	0.25	0.28	0.25

THERMAL

Properties	Unit	GPSN	HPSN	SNS
Maximum Use Temperature	°C(No load)	1100	1300	1100
Thermal Conductivity	20°C, W/(M · K)	15~20	20~25	80~100
Thermal Expansion	40 – 400°C, × 10 ⁻⁶ /°C	3	3.1	3
Specific Heat	J/(kg · K)	660	650	680
Thermal Shock Resistance	°C(Put in water)	550	800	—

ELECTRICAL

Properties	Unit	GPSN	HPSN	SNS
Dielectric Constant	1MHz	6~8	8	7.8
Dielectric Strength	ac-kV/mm	15	17	—
Volume Resistivity	20°C, Ω · cm	> 10 ¹⁴	> 10 ¹⁴	> 10 ¹⁴
Volume Resistivity	500°C, Ω · cm	> 10 ¹⁰	> 10 ¹⁰	> 10 ¹⁰

*The values are typical material properties and may vary according to products configuration and manufacturing process.

Silicon Nitride Ceramics Product Introduction



Silicon Nitride Material

Silicon nitride ceramic materials are known for their excellent mechanical properties, including high strength, hardness and toughness. It is also resistant to heat, corrosion and wear.

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Silicon Nitride Ceramic Rod

The silicon nitride ceramic rod has super hardness, it has lubricity and is very resistant to wear. Except for hydrofluoric acid, it does not react with other inorganic acids and has strong corrosion resistance.

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Silicon Nitride Guide Rollers

Silicon nitride guide rollers have excellent wear resistance and thermal stability, making them ideal for high-speed, high-temperature industrial applications such as papermaking and metal processing.

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Black Zirconia Ceramic

With tight sphericity and surface finish tolerances, our SiN balls are ideal upgrades for hybrid bearings, high-speed spindles, automotive turbochargers, and other precision applications where steel fails.

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Blue Zirconia Ceramic

Great Ceramic offers blue zirconia ceramics that have a blue appearance due to the addition of trace amounts of transition metal dopants.

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Mold Injection Molding

Ceramic injection molding (CIM) has advantages for mass production of ceramic products with high dimensional accuracy and complex shapes.

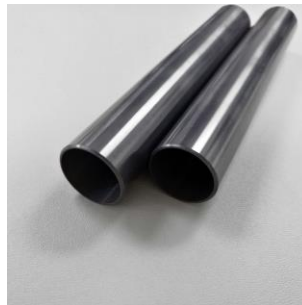
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Custom Machining

Great Ceramic has a wide range of grinding and machining equipment to provide customers with efficient ceramic machining solutions.

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Ceramic Pumps

Designs and manufactures high quality custom ceramic filling pumps for precise fluid transfer in demanding industries.

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Ceramic Knife

Zirconia knives are made of zirconia ceramics, which are sharp and durable, not easy to rust, non-toxic and odorless.

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Ceramic Plunger

Zirconia ceramic plungers are suitable for industrial environments requiring high temperature, high pressure and corrosion resistance.

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