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Advanced Technical Ceramic Solutions

Boron Nitride PCBN5000

General Properties

PCBN5000 is a specific hot-pressed boron nitride, engineered to work in the most demanding applications. It is the combination of properties, along with its machinability, that makes this such a versatile and valuable grade.

This very unique grade of hexagonal Boron Nitride, PCBN5000, is essentially high purity BN crystals bonded in a silica matrix. This gives it a moisture resistance that other BN grades do not possess. It is easily machinable to very tight tolerances and has a unique fracture toughness.

PCBN5000 fracture toughness derives from its ability to deflect/blunt crack propagation. In addition, similar to silica glasses, it can exceed its stated temperature range, for short periods of time. It won't thermal shock. And if brought back down, its shape and properties will be maintained. It can be machined in very large shapes, from billets up to 490 x 490 x 400mm.

PCBN5000 is also an electrical insulator with outstanding dielectric and microwave properties, retaining high dielectric strength and electrical resistivity up to 1000C.

Applications

- Microwave components
- Electrical insulation for high temperatures and high voltages
- Hall Effect Thruster insulators

Typical Properties

Properties	Unit	PCBN5000
Temperature	°C	800-1200C
Density	g/cm ³	>2
CTE, RT to 1000°C	10 ⁻⁶ /k	2-3
Flexural Strength (para)	MPa at 25°C	50
Dielectric Constant	k	<4.0
Dielectric Strength	KV/mm	>40
Thermal Conductivity	W/mk	15-20
Boron Nitride	%	60
SiO ₂	%	40

The values presented are mean and typical of those resulted from test samples. They are provided as an indication only to serve as guidance in the design of ceramic components and are not guaranteed in any way. The actual values can vary according to the shape and size of the designed component.