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Advanced Technical Ceramic Solutions

Boron Nitride (BN) Grade HP

Boron Nitride is an advanced synthetic ceramic material available in powder, solid and aerosol spray forms. Its unique properties - from high heat capacity and outstanding thermal conductivity to easy machinability and superior dielectric strength - make boron nitride a truly outstanding material.

Solid Boron Nitride Grade HP is a superior solid grade for formulations of $\leq 1,000^{\circ}\text{C}$. Grade HP has ten times the moisture resistance of Grade A due to the addition of calcium which combines with boric oxide to form calcium borate glass. Commonly used for many light metal applications such as Al, Zn, Ag and Au.

Key Properties

- High corrosion resistance; ten times the moisture resistance of other boron nitride solids.
- Excellent thermal shock resistance and conductivity.
- Low dielectric constant material - also commonly used in many high temperature insulators.
- Like other grades of Boron Nitride, Grade HP can be machined using standard high speed 'tool steel' equipment. Machining by grinding may be used if preferred or stringent tolerances are required.

Applications

- High temperature electrical insulators and vacuum furnace supports which require electrical resistivity, high temperature strength, thermal shock resistance and low chemical reactivity
- Crucibles and containers for high purity molten metals
- Insulators for ion implantation systems which require high temperature purity, thermal shock resistance and electrical insulation
- Radar components and antenna windows which require exacting electrical and thermal properties

- Setter plates for the processing of other advanced materials which require stable, inert surfaces
- Nozzles for powdered metal atomizing

Typical Properties	
Binder	Calcium Borate Glass
Maximum Use Temperature	
Oxidizing (Inert)	850°C (1150°C)
Specific Heat @ 700°C (J/g°C):	1.468
Dielectric Strength (KV/mm):	>40
Hardness-Knoop (kg/mm ²)	14
Pressing Direction Para (Perp)	
Resistivity Ohm-cm RT:	>10 ¹⁴ (>10 ¹⁵)
Loss Tangent @ 8.8 GHz:	.0014 (.0007)
Dielectric Constant @ RT:	4.30 (4.02)
Thermal Conductivity	
(W/m/K) @ 25°C:	28
Thermal Expansion Coefficient	
(RT to 1500°C) (in/in°C x 10 ⁻⁶)	2
Flexural Strength (psi)*	
@25°C:	55 MPa
Compressive Strength	
@25°C:	90 MPa
Density (g/cc minimum):	2
Oxygen (%):	5
B ₂ O ₃ (%):	1
Calcium (%):	2.5
Other Impurities(%):	0.2

*Based on 4pt bend test-Sample size = 51mm x 4mm x 3mm