JADE CHEMICALS

Hexagonal Boron Nitride (hBN) Powder

Hexagonal Boron Nitride (hBN) is also known as 'White Graphite', has similar (hexagonal) crystal structure as of Graphite. This crystal structure provides excellent lubricating properties. hBN is much superior to Graphite and has following characteristics:

Physical Properties of Hexagonal Boron Nitride

CAS Number	10043-11-5
Chemical Formula	BN
Crystal Structure	Hexagonal
Color	White
Density (gm/cm^3)	2.3
Melting Point	3000°C Dissociates
Coefficient of Friction (COF)	0.15 to 0.70
Dielectric Constant (MHz)	4
Dielectric Breakdown strength	35 KV/mm
Youngs Modulus (MPa)	20-102
Thermal Expansion Coefficient @ 25°C-1000°C	1 x 10^{-6}/°C (Parallel to press dir.) 4 x 10^{-6}/°C (Perpendicular to press dir.)
Thermal Conductivity (at 293 K, directional average)	0.08 cal/ cm.sec.K
Temperature Stability	1000° C in Air 1400° C in Vacuum 1800° C in Inert atmosphere

- Excellent Lubricating Properties due to low Coefficient of Friction at 0.15 to 0.70

- Good Chemical Inertness
- Electrical Insulator
- Thermal Conductor (result: better heat dissipation)
- High Temperature Stability, 1000^{o} C in Air, 1400^{o} C in Vacuum and 1800^{o} C in Inert gas
- Low Thermal Expansion
- Low Dielectric Constant
- High Load bearing properties
- Non-Wetting: hBN is not wetted by Glasses, Salts and (most) metals, therefore it provides strong resistance to chemical attack
- Easy Machineability (in hot pressed state). Complex shapes can be machined from hot pressed structure.

Uses of Hexagonal Boron Nitride (hBN)

- Lubricant Additive: Dispersed in oils, greases, water, and solvents; also applied as a lubricity coating.
- High-Temperature Lubrication: Ideal for extreme heat conditions, such as forging and aluminum extrusion.
- Dry Lubricant: Sprayed or sprinkled on hot surfaces for friction reduction.
- Electrical Insulator: Used in electronics, semiconductors, microwave windows, seals, and fuel cells due to high dielectric strength.
- Thermal Conductor: Enhances heat dissipation in composites and insulation materials.
- Chemically Inert: Fabrication of crucibles, pipes, pumps, sheaths, and reaction vessel linings.
- Mold Release Agent: Coating for plastic, metal, glass, and titanium molds.
- Non-Wetting Agent: Widely applied in glass manufacturing processes.
- Self-Lubricating Filler: Blended with ceramics, resins, plastics, and rubbers.
- Consumer Products: Used in cosmetics, paints, dental cements, and pencil leads.
- Aerospace Applications: Chosen for high thermal stability in space and aviation systems.

hBN powders are available in following particle sizes: 70 nm, 150 nm, 0.5 micron, 1.5 micron, 5 microns and Aerosol Spray

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