BORON CARBIDE (B_4C)

Sizing

Boron Carbide is offered according to FEPA F Available micro grit sizes are: F240, F280, F320, F360, F400, F500, F600, F800, F1000, F1200.

Standard macro grit and custom sizes such as: - 200F and -325 F as well as 12, 25 & 45 micron available upon request.

TYPICAL ANALYSIS

B_4C	96.17% min.
B_2O_3	0.22%
Total Boron	78.55%
Total Carbon	18.5%
Free Boron	0.24%
Free Carbon	1.27%
Al	0.05%
Fe	0.20% max.
pH	7.0
Magnetic Fe	0.0001% max
Specific Gravity	2.50

TYPICAL APPLICATIONS

Reaction Bonded Parts	Body and Vehicle Armor	Lapping
Hot-Pressed Parts	Nuclear Shielding	Refractory
Sintered Parts	Wear Parts	
Technical Ceramics	Abrasives	

TYPICAL PROPERTIES

- High Hardness
- Abrasion / Wear-Resistance
- Abrasives
- Fracture Toughness
- Chemical Inertness
- High Neutron Absorbing Cross Section

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BORON CARBIDE TECHNICAL DATA

PROPERTIES	UNITS	VALUE
Physical		
Chemical Formula	-	B_4C
Density, ρ	g/cm^3	2.51
Color	-	black or dark gray
Crystal Structure	-	hexagonal
Water Absorption	% @R.T.	ng
Hardness	Mohs	36
Hardness	knoop (kg/mm^2)	ng
Mechanical		
Compressive Strength	MPa @ R.T.	2.9
Tensile Strength	MPa @ R.T.	155
Modulus of Elasticity (Young's Modulus)	GPa	445
Flexural Strength (MOR)	MPa @ R.T.	375
Poisson's Ratio, υ		0.19
Fracture Toughness, K_{Ic}	MPa x $m^{1/2}$	ng
Thermal		
Max. Use Temperature (* denotes inert atm.)	°C	2450
Thermal Shock Resistance	ΔT (°C)	ng
Thermal Conductivity	W/m-K @ R.T.	28
Coefficient of Linear Thermal Expansion, α_l	µm/m-°C (~25°C through ±1000°C)	5.54
Specific Heat, c_p	cal/g-°C @ R.T.	945
Electrical		
Dielectric Constant	1MHz @ R.T.	ng
Dielectric Strength	kV/mm	ng
Electrical Resistivity	Ωcm @ R.T.	ng

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NUCLEAR GRADE BORON CARBIDE (B_4C)

Boron Carbide is often used in nuclear applications such as shielding and other protective applications due to its ability to absorb neutrons.

Panadyne offers a nuclear grade enriched Boron Carbide with a High B10 content formulated for use in Nuclear applications. The material is available in straight FEPA sizes as well as custom sizes.

TYPICAL APPLICATIONS

- Nuclear Shielding

TYPICAL PROPERTIES

- High Hardness
- Abrasion / Wear-Resistance
- Fracture Toughness
- Chemical Inertness
- High Neutron Absorbing Cross Section

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