

General Properties

BNP-3 is a boron nitride zirconia composite with outstanding thermal shock resistance and resistance to molten metal wetting.

Applications

- Molten metal side dams.
- Continuous casting break rings.
- Refractories.
- Crucibles.
- Atomizing nozzles.

Physical Properties

Property		Unit	BNP-3
Maximum Use Temperature		°C	850 (oxidizing) 1800 (inert)
Young's Modulus at RT		GPa	70,8 para 70,5 perp
Hardness (Knoop)		kg/mm ²	95 para 105 perp
Shear Modulus		GPa	27,7 para 32,2 perp
Modulus of Elasticity	at 25 °C	GPa	70,8 para 70,5 perp
	at 1000 °C		63,8 para 59,5 perp
	at 3000 °C		43,8 para 44,2 perp
CTE	40 °C to 500 °C	10 ⁻⁶ K ⁻¹	6,40 para 1,98 perp
	600 °C to 1500 °C		15,40 para 5,42 perp
Flexural Strength	at 23 °C	psi	10460 para 20790 perp
	at 1000 °C		4600 para 7040 perp
	at 1500 °C		2120 para 3850 perp
Compressive Strength (23 °C)		ksi	2,95 para 0,87 perp
Density		g/cm ³	2,9
Specific Heat	at 100 °C	J/g °C	0,7222 para 0,705 perp
	at 200 °C		0,850 para 0,835 perp
	at 300 °C		0,938 para 0,910 perp
	at 400 °C		0,979 para 0,965 perp
	at 500 °C		1,055 para 1,029 perp
Compressive Strength		MPa	30 para 48 perp
Density		g/cm ³	1,9–1,95
B ₂ O ₃		%	0.4
O ₂		%	3–5
Ca		%	0.5–3
Others		%	0.03

(continued)

Physical Properties *(continued)*

Property		Unit	BNP-3
Thermal Diffusivity	at 19 °C	cm ² /s	0,22 para 0,12 perp
	at 204 °C		0,13 para 0,08 perp
	at 504 °C		0,08 para 0,05 perp
	at 1005 °C		0,05 para 0,03 perp
	at 1507 °C		0,04 para 0,02 perp
Thermal Conductivity	at 25 °C	W/m*K	22,62 para 40,21 perp
	at 316 °C		15,46 para 29,39 perp
	at 437 °C		13,98 para 27,16 perp
	at 557 °C		13,32 para 24,96 perp
	at 711 °C		12,78 para 23,11 perp
	at 978 °C		11,65 para 21,88 perp
Open Porosity		%	2.4–3.4
Zr		%	30.9
N ₂		%	26.0
B		%	21.7
O ₂		%	14.0
Si		%	4.3
C		%	2.2
B ₂ O ₃		%	1.0

NOTE: This data shows typical values and does not represent a specification.

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General Properties

BNP-4 is a boron nitride silica composite. BNP-4 is completely resistant to moisture and has a MIL-I-10A grade of L542 — a test requiring immersion in water for 48 hours prior to testing at elevated frequencies.

Applications

- Crucibles.
- Refractories for glass making.
- High-temperature electrical insulators and supports.

Physical Properties

Property		Unit	BNP-4
Maximum Use Temperature		°C	1400 (inert) 850 (air)
Volume Resistivity	at RT	Ohm-cm	1,7x10 ¹⁵ para 5,1x10 ¹⁵ perp
	at 150 °C		2,4x10 ¹³ para 3,3x10 ¹³ perp
Surface Resistivity	at RT	Ohms/	8,5x10 ¹⁶
	at 150 °C		1,4x10 ¹⁵
Dielectric Strength (tested up to 25 kV)	10 mil thick	V/mil	1670 para 65748 perp
	25 mil thick		>1000 para >39370 perp
Dielectric Constant (@ 1MHz)	at RT	—	4,21 para 3,87 perp
Microwave Frequency (8.8 GHz)	at RT	—	3,86 para 4,08 perp
Dissipation Factor (Loss Tangent)	1 MHz at RT	—	0,0016 para 0,0035 perp
	1 MHz at 150 °C		0,0017 para 0,0055 perp
	8.8 GHz at RT		0,0011 para 0,0005 perp
Loss Factor	1 MHz at RT	—	0,0067 para 0,0140 perp
	1 MHz at 150 °C		0,0230 para 0,0077 perp
	8.8 GHz at RT		0,0042 para 0,0020 perp
BN		%	<40
SiO ₂		%	<60

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General Properties

BNP-5 is a suitable material for the most severe refractory applications. It exhibits high strength up to 1400 °C and is unparalleled in resistance to thermal shock.

Applications

- Crucibles.
- Refractories.
- High-temperature electrical insulators and supports.

Physical Properties

Property		Unit	BNP-5
Maximum Use Temperature		°C	1400 (inert) 850 (air)
Volume Resistivity	at RT	Ohm-cm	6,4x10 ¹⁴ para 2,9x10 ¹⁵ perp
	at 150 °C		8,5x10 ¹³ para 2,4x10 ¹³ perp
Surface Resistivity	at RT	Ohms/	4,2x10 ¹⁶
	at 150 °C		1,5x10 ¹⁵
Dielectric Strength (tested up to 25 kV)	10 mil thick	V/mil	1690 para 66535 perp
	25 mil thick		>1000 para >39370 perp
Dielectric Constant (@ 1MHz)	at RT	—	4,48 para 3,89 perp
Microwave Frequency (8.8 GHz)	at RT	—	3,89 para 4,28 perp
Dissipation Factor (Loss Tangent)	1 MHz at RT	—	0,0061 para 0,0017 perp
	1 MHz at 150 °C		0,0094 para 0,0062 perp
	8.8 GHz at RT		0,0039 para 0,0006 perp
Loss Factor	1 MHz at RT	—	0,0076 para 0,0230 perp
	1 MHz at 150 °C		0,0440 para 0,0250 perp
	8.8 GHz at RT		0,0150 para 0,0260 perp
BN		%	60
SiO ₂		%	40

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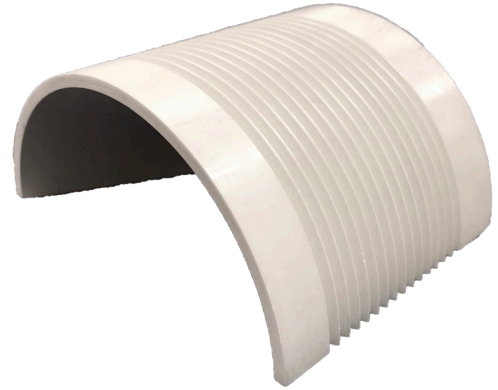
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General Properties

BNP6 is a high purity, hot pressed ceramic composite. This advanced material has excellent thermal shock resistance and very low thermo cycling behaviour combined with low thermal expansion. BNP6 is an electrical insulator with a high dielectric strength and is therefore an appropriate material for corona-related applications



Applications

- Aerospace
- Plasma
- Extreme environments
- PVD: constraint of Plasma arcs
- Extreme corrosion and wear resistance



Physical Properties

Property	Unit	BNP6
Density	g/cm ³	2.1
CTE, RT to 1000 °C (para)	10 ⁻⁶ k ⁻¹	<2.5
CTE, RT to 1000 °C (perp)	10 ⁻⁶ k ⁻¹	<2.0
Flexural Strength (para)	MPa @25 °C	>50
Flexural Strength (perp)	MPa @25 °C	>50
Young Modulus (para)	GPa	35
Young Modulus (perp)	GPa	45
Dielectric Strength	kV/mm	>125
BN	%	43
SiO ₂	%	53
B ₂ O ₃	%	<0.5

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