



Technical Products, Inc.

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Boron Nitride Material Specifications

Boron Nitride is easily machined into complex shapes. Boron Nitride is typically used in electronic, vacuum, microcircuit and high temperature furnace fixtures.

Physical Properties	Units	A	HP	AX05	M	ZSBN
Crystalline Phase		Hexagonal BN	Hexagonal BN	Hexagonal BN > 99%	BN 40% SiO ₂ 60%	BN 45% ZrO ₂ 45% Borosilicate Glass <10%
Color		White	White	White	White	Grey
Density	g/cc min	2	2	1.9	2.3	2.9

Mechanical Properties	Units	A	HP	AX05	M	ZSBN
Directionality		⊥	⊥	⊥	⊥	⊥
Flexural Strength	MPa	94 65	59 45	22 21	103 76	144 107
Young's Modulus	GPa	47 74	40 60	17 71	94 106	71 71
RT Compression	MPa	143 186	96	25	316.9 289.4	218.7 253.8
Open Porosity	%	2.84		19.3	6.880	1.066
Hardness - Knoop	Kg/mm ²	20	16	4	-	100

Thermal Properties	Units	A	HP	AX05	M	ZSBN
Directionality		⊥	⊥	⊥	⊥	⊥
Coefficient of Thermal Expansion (10-6)	25 – 400°C	3.0 3.0	0.6 0.4	-2.3 -0.7	1.5 0.2	4.1 3.4
	400 – 800°C	2.0 1.4	1.1 0.8	-2.5 1.1	1.2 0.4	5.6 4.3
	800 – 1200°C	1.9 1.8	1.5 0.9	1.6 0.4	1.2 0.8	7.2 5.2
	1200 – 1600°C	5.0 4.8	2.8 2.7	0.9 0.3	- -	4.6 3.4
	1600 – 1900°C	7.2 6.1	- -	0.5 0.9	- -	- -
Max. Use Temperature Oxidizing / Inert	°C	850 - 1200	850 - 1150	850 - 2000	1000+	850 - 1600
Thermal Conductivity @ 25°C	W/mK	30 34	27 29	78 130	12 14	24 34
Specific Heat @ 25°C	J/gK	0.86	0.81	0.81	0.76	0.64

Electrical Properties	Units	A	HP	AX05	M	ZSBN
Directionality		⊥	⊥	⊥	⊥	⊥
Dielectric Strength	KV/mm	88	>10	79	>10	-
Dielectric Constant	@1 MHz	4.6 4.2	4.3 4.0	4.0 4.0	3.4 3.7	- -
Dissipation Factor	@1 MHz	1.2E-03	1.5E-03	1.2E-03	3.0E-03	- -
		3.4E-03	2.1E-03	3.0E-04	3.1E-03	
RT Resistivity (ohm cm)	Ω cm	>10 ¹³	>10 ¹³	>10 ¹³	>10 ¹⁴	- -
		>10 ¹⁴	>10 ¹³	>10 ¹⁴	>10 ¹⁴	

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