

3M™ Sintered Boron Nitride

Typical material property data

Property	Standard	Symbol/Unit	Type HD	Type S		Type CD		Type SO 20		Type SO 43		Type O 40	
Crystalline phases			hex. BN	hex. BN		hex. BN		BN+ZrO ₂ +SiC		BN+ZrO ₂ +SiC		BN+ZrO ₂	
Binder phase / Binder type			<1% B ₂ O ₃	4% B ₂ O ₃		B ₂ O ₃ + CaO						2% B ₂ O ₃	
Directionality			Isotropic	Anisotropic		Anisotropic		Anisotropic		Anisotropic		Anisotropic	
				⊥		⊥		⊥		⊥		⊥	
Density (typical)	ISO 18754	ρ [g/cm ³]	1.96	2.07		1.97		2.3		2.95		2.82	
Total porosity (calculated using theoretical density)	ISO 18754	P [%]	< 13	< 7		< 12		10		< 6		< 6	
Brinell hardness	DIN EN ISO 6506-1	HBW	15	30		13		30		95		63	
Young's modulus	ISO 17561	E [GPa]	23	30	25	30	25	30	20	45	30	45	25
Flexural strength, 4-pt bending	ISO 14704	σ _b [MPa]	25	90	80	40	35	50	40	120	80	120	80
Weibull modulus	ISO 20501		>10	15	15	5	5	>10	>10	>15	>15	>10	>10
Compressive strength	AAW / SSA 302-03	σ _b [MPa]	55	105	125	50	55	100	140	200	200	185	185
Coefficient of thermal expansion	ISO 17562		Non-linear thermal expansion behavior, residual elongation after cooling; specific values for indication only										
		α [10 ⁻⁶ /K]	-1	1	2	-1	-1	0.5	4.6	2	6	2	6
		α [10 ⁻⁶ /K]	0.5	1	2	1.5	2	1.9	6.6	4	9	3.5	9
		α [10 ⁻⁶ /K]	2.5	2	5	3	4	0.5	2.2	-1	-1	1.5	8
Specific heat at 25 °C	DIN EN 821-3	C _p [J/gK]	0.61	0.8		0.58		0.7		0.65		0.5	
Thermal conductivity at 25 °C	ISO 18755	λ [W/mK]	25	30	25	35	35	45	25	40	30	30	20
Specific electrical resistance at 20 °C	DIN EN 50359	ρ [Ω cm]	>10 ¹²	>10 ¹²		>10 ¹²		>10 ¹²		>10 ¹²		>10 ¹²	
Maximum operating temperature (oxidizing/inert atmosphere)		[°C]	900/ 1,800	1,000/ 1,500		1,100/ 1,500		1,100/ 1,800		1,100/ 1,800		1,100/ 1,800	

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