

3M™ Sintered Silicon Nitride

Material properties	Standard	Symbol / Unit	3M™ Sintered Silicon Nitride
Density	DIN EN 623-2	ρ [g/cm ³]	> 3.24
Porosity	DIN EN 623-2	P [%]	< 0.5
Mean grain size		[μ m]	< 2
Aspect ratio (L/D)			3–5
Phase composition			β -Si ₃ N ₄ , Oxide
Vickers hardness	DIN EN 843-4	HV 1 [GPa]	15
Knoop hardness	DIN EN 843-4	HK 0.1 [GPa]	15
Young's modulus	DIN EN 843-2	E [GPa]	300
Weibull modulus	DIN EN 843-5	m	15
Flexural strength, 4-pt bending	DIN EN 843-1	σ_b [MPa]	800
Compressive strength	DIN 51104	σ_c [MPa]	> 2,500
Poisson ratio	DIN EN 843-2	ν	0.28
Fracture toughness (SENB)		K_{Ic} [MPa·m ^{0.5}]	7
Coefficient of thermal expansion	DIN EN 821-1		
25 °C – 500 °C		α [10 ⁻⁶ /K]	2.5
500 °C – 1,000 °C		α [10 ⁻⁶ /K]	3.9
Specific heat at 25 °C	DIN EN 821-3	c_p [J/g K]	0.65
Thermal conductivity at 25 °C	DIN EN 821-2	λ [W/mK]	27
Thermal stress parameters	calculated		
$R_1 = \sigma_b \cdot (1 - \nu) / (\alpha \cdot E)$		[K]	768
$R_2 = R_1 \cdot \lambda$		[W/mm]	21
Specific electrical resistance at 25 °C	DIN EN 50359	ρ [Ω cm]	> 10 ¹¹

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