



SILICON NITRIDE (Si₃N₄) SPECIFICATIONS

From prototyping to materials design consulting to custom manufacturing, our engineers will work with you to develop unique solutions for your most extreme environmental and technical challenges. We're large enough to have complete in-house capabilities while remaining small enough to provide attentive and timely service.

	Property	ASTM Method	Units	Silicon Nitride (Si ₃ N ₄)
General	Crystal Size (Average)	Thin Section	Microns	4
	Color	--	--	Black
	Gas Permeability	--	atms-cc/sec	gastight <10 ⁻¹⁰
	Water Absorption	C 20-97	%	0
Mechanical	Density	C 20-97	g/cc	3.25
	Hardness	Vickers 500 gm	GPa (kg/mm ²)	15 (1529)
	Hardness	--	R45N	83
	Fracture Toughness	Notched Beam	MPam ^{1/2}	6
	Flexural Strength (MOR) (3 point) @ RT°	F417-87	MPa (psi x 10 ³)	900 (130)
	Tensile Strength @ RT°	--	MPa (psi x 10 ³)	537 (78)
	Compressive Strength @ RT°	--	MPa (psi x 10 ³)	2500 (362)
	Elastic Modulus	C848	GPa (psi x 10 ⁶)	300 (44)
	Poisson's Ratio	C848	--	0.28
Thermal	C.T.E. 25 - 600° C	C 372-96	x 10 ⁻⁶ /C	2.9
	Thermal Conductivity @ RT°	C 408	W/m K	29
	Max Use Temp (non-loading) (at high strength)	--	Fahrenheit (°F)	2552
		--	Celcius (°C)	1400
Electrical	Dielectric Strength (.125" Thick)	D 149-97A	V/mil	330
	Dielectric Constant @ 1 MHz	D 150-98	--	9.2
	Volume Resistivity, 25°C	D 257	ohms-cm	> 1 x 10 ¹⁴

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