



SILICON NITRIDE (Si₃N₄) SPECIFICATIONS

	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 - 100° C	C 372-96	x 10 ⁻⁶ /C	--
	C.T.E. 25 - 300° C	C 372-96	x 10 ⁻⁶ /C	--
	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
	Dielectric Constant @ Gigahertz	D 2520-95	--	--
	Dielectric Loss @ 1 MHz	D 150-98	--	--
	Dielectric Loss @ Gigahertz	D 2520-95	--	--
	Volume Resistivity, 25°C	D 257	ohms-cm	> 1 x 10 ¹⁴
	Volume Resistivity, 300° C	D 1829	ohms-cm	--
	Volume Resistivity, 500° C	D 1829	ohms-cm	--
	Volume Resistivity, 700° C	D 1829	ohms-cm	--
	Volume Resistivity, 1000° C	D 1829	ohms-cm	--

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