

# Materials Property Chart

				Silicates				
Property		ASTM Method	Units	Steatite L-4	Steatite L-5	Cordierite	Mullite	Lava Grade A Fired
General	Crystal Size (Average)	Thin Section	Microns	7	7	--	7	--
	Color	--	--	Tan	Gray-Green	Orange-Tan	Gray-Tan	Gray-Tan
	Gas Permeability	--	atms-cc/sec	--	--	Porous	--	Porous
	Water Absorption	C 20-97	%	0	0	10	0	3
Mechanical	Density	C 20-97	g/cc	2.65	2.75	2.00	3.00	2.30
	Hardness	Vickers 500 gm	GPa (kg/mm <sup>2</sup> )	4.9 (500)	4.9 (500)	5.8 (590)	10 (1000)	4.4 (450)
	Hardness	--	R45N	57	57	50	78	42
	Fracture Toughness	Notched Beam	MPam <sup>1/2</sup>	--	--	--	3	--
	Flexural Strength (MOR) (3 point) @ RT	F417-87	MPa (psi x 10 <sup>3</sup> )	117 (17)	138 (20)	66 (9.5)	206 (30)	69 (10)
	Tensile Strength @ RT	--	MPa (psi x 10 <sup>3</sup> )	103 (15)	103 (15)	19 (2.7)	138 (20)	21 (3)
	Compressive Strength @ RT	--	MPa (psi x 10 <sup>3</sup> )	551 (80)	586 (85)	165 (24)	1034 (150)	172 (25)
	Elastic Modulus	C848	GPa (psi x 10 <sup>6</sup> )	103 (15)	103 (15)	103 (15)	179 (26)	--
	Poisson's Ratio	C848	--	0.24	0.24	0.31	0.24	--
Thermal	C.T.E. 25 - 100° C	C 372-96	x 10 <sup>-6</sup> /C	7.3	8.5	2.1	3.6	2.9
	C.T.E. 25 - 300° C	C 372-96	x 10 <sup>-6</sup> /C	7.4	8.6	2.5	4.1	3.3
	C.T.E. 25 - 600° C	C 372-96	x 10 <sup>-6</sup> /C	7.5	8.6	3.0	4.8	3.6
	Thermal Conductivity @ RT	C 408	W/m K	3	3	3	4	2
	Max Use Temp	--	Fahrenheit (°F)	2350	2350	2350	3100	2000
--		Celsius (°C)	1290	1290	1290	1700	1100	
Electrical	Dielectric Strength (.125" Thick)	D 149-97A	V/mil	260	270	120	250	100
	Dielectric Constant @ 1 MHz	D 150-98	--	5.6	5.7	5.5	6.7	5.3
	Dielectric Constant @ Gigahertz	D 2520-95	--	5.6	5.8	--	6.7	--
				9.2	12.5	--	11.4	--
	Dielectric Loss @ 1 MHz	D 150-98	--	0.003	0.0014	--	0.003	--
	Dielectric Loss @ Gigahertz	D 2520-95	--	0.005	0.0017	--	0.003	--
				9.2	12.5	--	11.4	--
	Volume Resistivity, 25°C	D 257	ohms-cm	> 1 x 10 <sup>14</sup>	> 1 x 10 <sup>14</sup>	> 1 x 10 <sup>14</sup>	> 1 x 10 <sup>14</sup>	--
	Volume Resistivity, 300° C	D 1829	ohms-cm	2 x 10 <sup>10</sup>	1 x 10 <sup>11</sup>	--	4 x 10 <sup>10</sup>	--
	Volume Resistivity, 500° C	D 1829	ohms-cm	1 x 10 <sup>9</sup>	4 x 10 <sup>10</sup>	--	1 x 10 <sup>9</sup>	--
	Volume Resistivity, 700° C	D 1829	ohms-cm	2 x 10 <sup>8</sup>	1 x 10 <sup>9</sup>	--	--	--
Volume Resistivity, 1000° C	D 1829	ohms-cm	--	--	--	--	--	