

				High Purity Alumina				
		Property	ASTM Method	Units	AL995 99.5%	AL998 NSF51 Certified 99.8%	AL9980 99.8%	AL999 99.9%
General	Crystal Size (Average)	Thin Section	Microns	6	6	6	6	2
	Color	--	--	Ivory-White	Ivory	Ivory	Ivory	Off White/ Blush
	Gas Permeability	--	atms-cc/sec	gas tight <10 <sup>-10</sup>	gas tight <10 <sup>-10</sup>	gas tight <10 <sup>-10</sup>	gas tight <10 <sup>-10</sup>	gas tight <10 <sup>-10</sup>
	Water Absorption	C 20-97	%	0	0	0	0	0
Mechanical	Density	C 20-97	g/cc	3.88	3.91	3.91	3.91	3.93
	Hardness	Vickers 500 gm	GPa (kg/mm <sup>2</sup> )	14.3 (1459)	15 (1530)	15 (1530)	15 (1530)	19.6 (2000)
	Hardness	--	R45N	82	86	86	86	90
	Fracture Toughness	Notched Beam	MPam <sup>1/2</sup>	4 - 5	3 - 4	3 - 4	3 - 4	5 - 6
	Flexural Strength (MOR) (3 point) @ RT°	F417-87	MPa (psi x 10 <sup>3</sup> )	338 (49)	379 (55)	379 (55)	379 (55)	455 (66)
	Tensile Strength @ RT°	--	MPa (psi x 10 <sup>3</sup> )	172 (25)	200 (29)	200 (29)	200 (29)	275 (40)
	Compressive Strength @ RT°	--	MPa (psi x 10 <sup>3</sup> )	2137 (310)	2240 (325)	2240 (325)	2240 (325)	2413 (350)
	Elastic Modulus	C848	GPa (psi x 10 <sup>6</sup> )	379 (55)	379 (55)	379 (55)	379 (55)	393 (57)
	Poisson's Ratio	C848	--	0.23	0.23	0.23	0.23	0.23
Thermal	C.T.E. 25 - 100° C	C 372-96	x 10 <sup>-6</sup> /C	6.3	6.5	6.5	6.5	6.5
	C.T.E. 25 - 300° C	C 372-96	x 10 <sup>-6</sup> /C	6.9	7.9	7.9	7.9	7.9
	C.T.E. 25 - 600° C	C 372-96	x 10 <sup>-6</sup> /C	7.6	8.1	8.1	8.1	8.2
	Thermal Conductivity @ RT°	C 408	W/m K	30	30	30	30	35
	Max Use Temp (non-loading) (at high strength)	--	Fahrenheit (°F)	3047	3047	3047	3047	3100
	--	Celsius (°C)	1675	1675	1675	1675	1700	
Electrical	Dielectric Strength (.125" Thick)	D 149-97A	V/mil	270	290	290	290	422
	Dielectric Constant @ 1 MHz	D 150-98	--	9.8	9.8	9.8	9.8	9.9
	Dielectric Constant @ Gigahertz	D 2520-95	--	9.7	10	10	10	--
	Dielectric Loss @ 1 MHz	D 150-98	--	0.0002	< .0001	< .0001	< .0001	< .0001
	Dielectric Loss @ Gigahertz	D 2520-95	--	< .0001	< .0001	< .0001	< .0001	--
	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>	> 1 x 10 <sup>14</sup>
	Volume Resistivity, 300° C	D 1829	ohms-cm	1 x 10 <sup>12</sup>	3 x 10 <sup>12</sup>	3 x 10 <sup>12</sup>	3 x 10 <sup>12</sup>	1 x 10 <sup>13</sup>
	Volume Resistivity, 500° C	D 1829	ohms-cm	5 x 10 <sup>10</sup>	6 x 10 <sup>10</sup>	6 x 10 <sup>10</sup>	6 x 10 <sup>10</sup>	5 x 10 <sup>12</sup>
	Volume Resistivity, 700° C	D 1829	ohms-cm	2 x 10 <sup>9</sup>	6 x 10 <sup>9</sup>	6 x 10 <sup>9</sup>	6 x 10 <sup>9</sup>	1 x 10 <sup>12</sup>
	Volume Resistivity, 1000° C	D 1829	ohms-cm	--	--	--	--	--

Note: The information in this data sheet is for design guidance only. STC does not warrant this data as absolute values. Forming methods and specific geometry could affect properties. Slight adjustments can be made to some of the properties to accommodate specific customer requirements. Most of the dense materials in the table are resistant to mechanical erosion and chemical attack. STC has performed ASTM testing qualification for certain compositions, in accordance with ASTM D2442. Please consult our technical staff for appropriate material and specific test results.

Note: In addition to the above compositions, STC offers a wide range of alternative materials. Please contact one of our applications engineers for material requirements that may not be shown above.

 STC AL998 is NSF 51 certified as suitable for use in commercial food equipment. US Patent 8679995 Addition of Magnesium Oxide to [Zirconia Toughened Alumina](#)