



## 99.6% Alumina Specification Chart

Specifications are offered as assistance to Engineers and Purchasing professionals in the design and procurement of thin and thick film circuit substrates.

Centerline Technologies makes no certification as to the suitability of materials for any application. (Basis for specifications available upon request.)

Properties	Units	Polished High Density 996 Alum. Oxide	As-fired High Density 996 Alum. Oxide Hi-rel Grade
Chemical Composition		Al <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>
Purity	%	99.6	99.6
Color		White	White
Nominal Density	g/cm <sup>3</sup>	3.87	3.87
Surface Finish (Polished)	μ-inches	<1.0	n/a
Surface Finish (Lapped)	μ-inches	8-15*	n/a
Surface Finish (As fired)	μ-inches	n/a	2-3
Camber	inch/inch	.0003/.0005	.002
Thickness	inches	0.004-.040*	0.005-0.025*
Thickness Tolerance	inches	±0.0005	±0.001*
Process Sizes	inches		
(L/W)	1.0/6.0	1.0/6.0	
Coefficient of Thermal Expansion (CTE)	10-6	7.0-8.3 (25-1000°C)	7.0-8.3 (25-1000°C)
Thermal Conductivity	Watts/m <sup>2</sup> K	26.9	26.9
Dielectric Constant	@1 MHz	9.9±0.1	9.9±0.1
Dielectric Constant	@4 MHz	9.9	9.9
Dielectric Constant	@10 MHz	9.7	9.7
Dissipation Factor (Loss Tangent)	@1 MHz	0.0001	0.0001
Dissipation Factor (Loss Tangent)	@10 MHz	0.0002	0.0002
Q	@1 GHz	5000	5000
Hardness	Rockwell	87	87
Flexural Strength	K(10-3) lbs/sq.in.	90	90
Compressive Strength	M(10-3) lbs/sq.in.	54	54