

Alumina ceramic fasteners offer a combination of excellent thermal protection combined with outstanding chemical resistance. Usable to 3000°F / 1650°C, alumina screws often used in extreme temperature environments. Alumina provides outstanding resistance to most acids, salts, solvents and organics. In addition, Alumina fasteners are non-conductive and used for electrical insulation as well.

### Properties & Data

Property	ASTM or UL Test	Alumina	Zirconia
<b>PHYSICAL</b>			
Density (lb/in <sup>3</sup> ) (g/cm <sup>3</sup> )	D792	0.141 (3.89)	0.220 (6.1)
Water Absorption, 24 hrs (%)	D570	0	0
<b>MECHANICAL</b>			
Strength/Weight Ratio	Tensile Strength / Density (g/cc)	7700	12300
Tensile Strength (psi)	D638	30,000	75,000
Tensile Modulus (psi)	D638	43,500,000	30,000,000
Tensile Elongation at Break (%)	D638	0	-
Flexural Strength (psi)	D790	55,000	100,000
Flexural Modulus (psi)	D790	54,000,000	-
Hardness, Rockwell, R/M Scale	D785	A88	A80
IZOD Impact Notched (ft-lb/in)	D256	-	-
<b>THERMAL</b>			
Coefficient of Linear Thermal Expansion (x 10 <sup>-5</sup> in./in./°F)	D696	0.5	0.6
Heat Deflection Temp (°F / °C) at 264 psi	D648	none	none
Melting Temp (°F / °C)	D3418	-	-
Max Operating Temp (°F / °C)	-	3000/1650	4350/2400
Thermal Conductivity (BTU-in/ft <sup>2</sup> -hr-°F)	C177	242.0	15.0
Flammability Rating	UL94	non-flammable	non-flammable
<b>ELECTRICAL</b>			
Dielectric Strength (V/mil) short time, 1/8" thick	D149	230	50
Dielectric Constant at 1 MHz	D150	10	28
Dissipation Factor at 1 MHz	D150	0	-
Volume Resistivity (ohm-cm) at 50% RH	D257	1x10 <sup>14</sup>	> 10 <sup>12</sup>

### Key Benefits

- Extreme high usability to 3000°F / 1650°C
- Outstanding corrosion resistance to acids, solvents, salts, and organics
- Excellent electrical & thermal insulator
- High purity

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