



**Technical Products, Inc.**

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## High Purity (Al<sub>2</sub>O<sub>3</sub>) Alumina Material Specifications

Alumina Oxide (Al<sub>2</sub>O<sub>3</sub>) is a readily available material with reasonable processing cost, possessing excellent mechanical, electrical, and wear properties. Our fabricated Alumina is used in a wide range of applications not limited to aerospace, automotive, medical and military.

Technical Products processes include cold isostatic pressing of green billets, pre-fired machining, sintering, and post sintered grinding operations.

Physical Properties	Units	Al <sub>2</sub> O <sub>3</sub> -96%	Al <sub>2</sub> O <sub>3</sub> -99.8%	Al <sub>2</sub> O <sub>3</sub> -99.9%
Bulk Density	g/cm <sup>3</sup>	3.72	3.9	3.93
Color	-	white	ivory	ivory
Water Absorption	%	0	0	0
Hardness (Rockwell 45 N)	-	78	83	86
Grain Size	Microns	6	6	3

Mechanical Properties	Units	Al <sub>2</sub> O <sub>3</sub> -96%	Al <sub>2</sub> O <sub>3</sub> -99.8%	Al <sub>2</sub> O <sub>3</sub> -99.9%
Compressive Strength	MPa	2100	2300	2600
Modulus of Elasticity	GPa / psi • 10 <sup>6</sup>	303 / 44	370 / 54	393 / 57
Flexural Strength	MPa /psi • 10 <sup>3</sup>	358 / 52	375 / 54	400 / 58
Poisson's Ratio	-	0.21	0.22	0.22
Fracture Toughness	MPa m <sup>1/2</sup>	4 – 5	4 - 5	5
Gas Permeation	%	0	0	0

Thermal Properties	Units	Al <sub>2</sub> O <sub>3</sub> -96%	Al <sub>2</sub> O <sub>3</sub> -99.8%	Al <sub>2</sub> O <sub>3</sub> -99.9%
Max. Use Temperature (no load)	°C / °F	1600 / 2912	1700 / 3092	1700 / 3092
Thermal Conductivity	W/mK	24.7	30	35
Thermal Expansion 20°C – 1000°C	10 <sup>-6</sup> /°C	8.2	8.2	8.2
Specific Heat	J/kg*K	880	880	870

Electrical Properties	Units	Al <sub>2</sub> O <sub>3</sub> -96%	Al <sub>2</sub> O <sub>3</sub> -99.8%	Al <sub>2</sub> O <sub>3</sub> -99.9%
Dielectric Constant	-	9	9.8	9.7
Dielectric Strength	AC V/mil	250	220	230

\*\*The information provided in this table is a compilation of publicly available data. This information is provided for comparison purposes only, and is not intended to be warrantable. Further, *Technical Products, Inc.* disclaims any and all liability from errors, in accuracies, or omissions.