

## High Purity (Al<sub>2</sub>O<sub>3</sub>) Alumina 99.8% 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> -99.8% |
|--------------------------|-------------------|---------------------------------------|
| Bulk Density             | g/cm <sup>3</sup> | 3.9                                   |
| Color                    | -                 | ivory                                 |
| Water Absorption         | %                 | 0                                     |
| Hardness (Rockwell 45 N) | -                 | 83                                    |
| Grain Size               | Microns           | 6                                     |

| Mechanical Properties | Units                       | Al <sub>2</sub> O <sub>3</sub> -99.8% |
|-----------------------|-----------------------------|---------------------------------------|
| Compressive Strength  | MPa                         | 2300                                  |
| Modulus of Elasticity | GPa / psi • 10 <sup>6</sup> | 370 / 54                              |
| Flexural Strength     | MPa /psi • 10 <sup>3</sup>  | 375 / 54                              |
| Poisson's Ratio       | -                           | 0.22                                  |
| Fracture Toughness    | MPa m <sup>1/2</sup>        | 4 - 5                                 |
| Gas Permeation        | %                           | 0                                     |

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

| Electrical Properties | Units     | Al <sub>2</sub> O <sub>3</sub> -99.8% |
|-----------------------|-----------|---------------------------------------|
| Dielectric Constant   | -         | 9.8                                   |
| Dielectric Strength   | ac V/mils | 220                                   |

\*\*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.