

99% ALUMINA

EE-C99

DESCRIPTION

Alumina, also known as aluminum oxide (Al_2O_3), is a compound primarily composed of aluminum and oxygen. It is one of the most widely used and important materials in various industries due to its exceptional physical and chemical properties. One specific type of alumina is 99% alumina, which refers to alumina with a purity level of around 99%.

PROS

- High Purity
- Exceptional Hardness and Wear Resistance
- Thermal Stability
- Electrical Insulation
- Chemical Inertness
- Biocompatibility
- Transparent Alumina
- Versatile Applications
- High-Temperature Resistance
- Corrosion Resistance

CONS

- Brittle and Susceptible to Fracture
- Limited Ductility
- High Processing Costs
- Limited Design Flexibility
- Limited Impact Resistance
- Susceptible to Thermal Shock
- Limited Machinability
- Can Be Challenging to Bond or Join

APPLICATIONS:

| APPLICATION AREA | EXAMPLE OF USE |
|--|---|
| ELECTRONICS AND ELECTRICAL ENGINEERING | Ceramic substrates for ICs, insulators, connectors |
| MECHANICAL AND INDUSTRIAL | Cutting tools, wear-resistant components, bearings |
| MEDICAL AND DENTAL TECHNOLOGY | Orthopedic implants, dental prosthetics, surgical tools |
| AUTOMOTIVE INDUSTRY | Spark plug insulators, emission control components |
| AEROSPACE AND AVIATION | High-temperature aerospace components, insulators |
| CHEMICAL AND PROCESS INDUSTRIES | Corrosion-resistant components, catalyst supports |
| OPTICS AND TRANSPARENT CERAMICS | Windows, lenses, optoelectronic components |
| ENERGY INDUSTRY | Electrical components, fuel cells, thermal barriers |
| BIOMEDICAL AND BIOTECHNOLOGY | Biocompatible implants, lab ware, medical research |
| CERAMICS INDUSTRY | Specialty ceramic production, advanced ceramics |

PHYSICAL PROPERTIES:

*Please note that all values quoted are based on test pieces and may vary according to component design. These values are not guaranteed in anyway whatsoever and should only be treated as indicative and for guidance only.

| Property | Unit | Value |
|----------------------------------|-------------------------|-----------------------|
| Melting Point | °C | ~2072 - 2078 |
| Density | g/cm^3 | 3.9 - 3.97 |
| Thermal Conductivity | 20°C $W/(m \cdot K)$ | 20 - 35 |
| Coefficient of Thermal Expansion | $10^{-4}/^{\circ}C$ | 7.1 - 8.0 |
| Specific Heat Capacity | $J/(g \cdot ^{\circ}C)$ | 0.75 - 1.1 |
| Young's Modulus | GPa | 300 - 400 |
| Poisson's Ratio | - | 0.21 - 0.30 |
| Vickers Hardness | Kgf/mm^2 | 1300 - 1700 |
| Mohs Hardness | - | 9 |
| Electrical Resistivity | $\Omega \cdot cm$ | $10^{12} - 10^{16}$ |
| Transparency (Thin Layers) | - | Partially Transparent |