NCF INDUSTRIAL – Technical Ceramic Specification

Material: AL99-G – High-Purity Alumina (Al_2O_3)

Material Type: Cast Aluminium Oxide (Al_2O_3)

Designation: AL99-G

Chemical Composition

Component	Percentage
Al_2O_3	99.7%

Physical Properties

Melting Point: > 2050 °C

Open Porosity: 0%

Technical Density: 3.90 g/cm^3

Theoretical Density: 3.98 g/cm^3

Crystal Size: Approx. 5 µm

Color: Ivory

Thermal Properties

Linear Expansion Coefficient (20–1000 °C): 8×10^{-6} /°C

Thermal Conductivity at 100 °C: 3.5 W/m·K

Max Use Temperature: 1700 °C

Thermal Shock Resistance: Satisfactory (not suitable for inductive heating)

Mechanical Properties

Hardness (Mohs): 9

Hardness (Vickers): 1900 kg/mm^2

Flexural Strength (20 °C, 3-point): 400 MPa

Modulus of Elasticity: 390 GPa

K_1C Fracture Toughness: 3.5 MPa·$m^{1}/^{2}$

Wear Volume (ASTM C704-76a): 0.03 cm^3

Electrical Properties

Electrical Resistivity @ 20 °C: 10^{14} Ω·cm

Electrical Resistivity @ 500 °C: 10^{10} Ω·cm

Electrical Resistivity @ 1000 °C: 10^{7} Ω·cm

Electrical Resistivity @ 1500 °C: 10^{4} Ω·cm

Applications

- High-temperature insulators
- Precision ceramic components
- Crucibles and furnace linings
- Wear-resistant parts in corrosive or abrasive environments

Advantages

- Exceptional hardness and mechanical strength
- High electrical resistivity across a wide temperature range
- Zero open porosity – excellent sealing and resistance properties
- Dimensional stability at high temperatures