TECHNICAL CERAMICS / MATERIAL DATA SHEET

95% ALUMINA

Aluminium oxide ceramic | Al2O3



Material overview

95% alumina (Al_2O_3) is a versatile technical ceramic combining high hardness, excellent wear resistance, high compressive strength and excellent electrical insulation with good thermal and chemical stability. Its favourable balance of performance and cost makes it suitable for electrical insulators, precision-engineered components, wear-resistant parts and high-temperature industrial applications.

TYPICAL MATERIAL PROPERTIES

Property	Unit	Typical value
MECHANICAL / PHYSICAL		
Density	g/cm³	3.65
Porosity	%	0
Flexural strength	MPa	345
Compressive strength	MPa	2,100
Elastic modulus	GPa	300
Poisson’s ratio	—	0.21
Hardness	kg/mm²	1,100
Fracture toughness (KIC)	MPa·m½	3.5
THERMAL		
Thermal conductivity	W/(m·K)	25
Coefficient of thermal expansion	10^{-6}/K	8.2
Specific heat capacity	J/(kg·K)	880
Thermal shock resistance	°C	250
Maximum use temperature	°C	1,700
ELECTRICAL		
Dielectric strength	kV/mm AC	8.3
Dielectric constant	—	9
Loss tangent	—	0.0011
Volume resistivity	Ω·cm	$>10^{14}$

Values published are reported typical values for the specified material type and do not constitute guaranteed specification limits. Maximum use temperature is application-dependent. Suitability and acceptance criteria should be confirmed for individual applications.