

MATERIAL DATA SHEET

Material type: Aluminium Oxide (Al₂O₃)

Alumina F99.7 hf

Properties		Unit	Specific value
Main component		-	α - Al ₂ O ₃
Purity		wt-%	> 99.5
Density		g / cm ³	≥ 3.90
Open Porosity		vol.-%	0
Average Size of Crystallites		µm	10
Bending Strength σ _m	DIN EN 843-1	MPa	350
Weibulls Modulus		-	≥ 10
Toughness K _{Ic}	SEVNB	MPa * m ^{0.5}	3.5
Compressive Strength		MPa	3500
Young's Modulus	static	GPa	380
Poisson's Ratio		-	0.22
Hardness	Knoop, 100 g	GPa	20
Maximum Service Temperature in Air		°C	1950
Linear Coefficient of Expansion	-100 - 20 °C	10 ⁻⁶ / K	3.6
	20 - 500 °C	10 ⁻⁶ / K	7.3
	20 - 1000°C	10 ⁻⁶ / K	8.2
Specific Heat	20 °C	J / (kg * K)	900
Thermal Conductivity	20 °C	W / (m * K)	34.9
	1000 °C	W / (m * K)	6.8
	1500 °C	W / (m * K)	5.3
Resistivity	20 °C	Ω * cm	10 ¹⁴
	1000 °C	Ω * cm	10 ⁷
Dielectric Strength	20 °C	kV / mm	> 30
Relative Permittivity	70 MHz	-	9.8
	180 MHz	-	9.8
	30 - 40 GHz	-	9.8
Dielectric Loss Tangent	70 MHz	-	3.8 * 10 ⁻⁴
	180 MHz	-	2.5 * 10 ⁻⁴
	30 - 40 GHz	-	1.4 * 10 ⁻⁴
Typical Colour		-	ivory

The data indicated on this table are in line with the introductory German Industrial Standard DIN 40680 and relate to test specimens from which they were obtained. They are not unconditionally applicable to other forms of the same material. The data must be regarded as indicative only. All data refer to a temperature of 20 °C, unless otherwise specified.