

FRIALIT F99,7

2021.06.29

Material Type: Aluminium oxide ($\alpha\text{-Al}_2\text{O}_3$)

MECHANICAL & PHYSICAL CHARACTERISTICS (TYP.)

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 HV1		[-]	1760
Maximum service temperature in air		[°C]	1950
Linear coefficient of expansion	-100 - 20 °C	[10 ⁻⁶ /K]	5.5
	20 - 500 °C		7.3
	20 - 1000°C		8.2
Specific heat 20 °C		[J/(kg*K)]	900
Thermal conductivity	20 °C	[W/(m*K)]	34.9
	1000 °C		6.8
	1500° C		5.3
Resistivity	20 °C	[Ω*cm]	10 ¹⁵
	1000 °C		10 ⁷
Dielectric strength		[kV/mm]	>30
Relative permittivity	70 MHz	[-]	10
	180 MHz		9.9
	30 - 40 GHz		9.8
Dielectric loss tangent	70 MHz	[*10 ⁻⁴]	270*10 ⁻⁴
	180 MHz		150*10 ⁻⁴
	30 - 40 GHz		20*10 ⁻⁴
Typical colour		[-]	ivory

The data indicated on this table are in line with the introductory German Industrial Standard DIN 60672-2 and relate to test specimens from which they were obtained. They are not unconditionally applicable to other forms if the same material. The data must be regarded as indicative only. All data refer to a temperature of 20 °C, unless otherwise specified.