

Datenblatt | Data sheet

Sapphire

High purity monocrystalline aluminum oxide balls, they are transparent and provide high hardness, wear, temperature and corrosion resistance.

Field of application

Special bearings, chemical, medical and check valves, flowmeters, pens and styli tips, measurement instruments, bar code readers, fiber optical connectors.

Corrosion resistance

Sapphire balls provide excellent corrosion resistance both in acid and basic environments, even in severe conditions, better than ruby balls. They are attacked only by melt substances containing Li, B, F, Na and K elements.

Material

Technical name	Alternative Name	% Oxide
Monocrystalline dialuminum trioxide	Sapphire	99,9 - 99,99

Physical / mechanical / thermal / electrical / magnetic characteristics

Characteristic	Symbol	Unit	Type	Note	Value
Density	δ	g/cm ³	Physical	Environmental temp.	3,98
Modulus of Elasticity	E	GPa	Mechanical		415
Friction coefficient	μ	-	Mechanical	Environmental temp.	0,15
Spezifische heat	C	J/kg*K	Thermal	Environmental temp.	750
coefficient of linear thermal expansion	α	10 ⁻⁶ /°C	Thermal	($\Delta T = 0 - 100$ °C)	6,0
Thermal conductivity	λ	W/(m*K)	Thermal	Environmental temp.	40,0
Volume resistivity	ρ	Ω *m	Electrical	-	> 10 ¹⁴
Relative magnetic permeability	μ	-	Mechanical	Diamagnetic	<~1

Technical characteristics

Characteristic	Type	Unit	Value	Unit	Value
Hardness	Mechanical	HV	1600 - 2300	-	-
Ultimate compressive strength	Mechanical	MPa	2000 - 2100	psi * 10 ³	290 - 304
Operating temperature	Thermal	°C	-196 - 1800	°F	-320,8 - 3272

Available with

Diameter min/max (mm)	Diameter min/max (in)	Precision grade
0,200 - 20,000	1/128 - 25/32	G 3 / 5 / 6 / 10 / 25