

# SAPPHIRE BALLS

High purity monocrystalline aluminum oxide balls, they are transparent and provide high hardness, wear, temperature and corrosion resistance. Balls are manufactured according to A.F.B.M.A. standards.

## Applications

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

Commercial name	Other name	Formula	Oxide %
Monocrystalline Aluminum Trioxide	Sapphire	Al <sub>2</sub> O <sub>3</sub>	99,90-99,99

## Physical / mechanical / thermal / electric / magnetic properties

Property	Symbol	U.o.M.	Type	Notes	Values
Density	$\delta$	g/cm <sup>3</sup>	Physical	Room temp.	3,98
Young's modulus	E	GPa	Mechanical	-	415
Friction coefficient	$\mu$	-	Mechanical	Room temp.	0,15
Specific heat	c	J/kg-K	Thermal	Room temp.	750
Coefficient of linear thermal expansion	$\alpha$	10 <sup>-6</sup> /°C	Thermal	( $\Delta T=0-100^{\circ}C$ )	6,0
Thermal conductivity	$\lambda$	W/(m-K)	Thermal	Room temp.	40,0
Volume resistivity	$\rho$	$\Omega^*m$	Electric	-	> 10 <sup>14</sup>
Relative magnetic permeability	$\mu$	-	Magnetic	Diamagnetic	<-1

## Technical data

Property	Type	U.o.M.	Values	U.o.M.	Values
Hardness	Mechanical	HV	1600 - 2300	-	-
Ultimate compressive strength	Mechanical	MPa	2000 - 2100	psix10 <sup>3</sup>	290 - 304
Service temperature	Thermal	°C	-196 / 1800	°F	-320,8 / 3272

## Range

Diameters (min/max)	U.o.M.	Diameters (min/max)	U.o.M.	Precision Grade (AFBMA)
0,200 - 20,000	mm	1/128 - 25/32	"	G3-5-10-15-25-50-100-200

## 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.