

CERAMIC SPHERES:

Material	Aluminium oxid	Zirconium oxid	Silicone nitride
Color	White	White	Black
Chemical Composition	Al_2O_3	ZrO_2, Y_2O_3	Si_3N_4
Purety%	99		
Apparent Porosity (%)	< 1	0	
Density g/cm ³	3,85	6,05	3,22
Flexual Strength (MPa) at 20 °C	350	1200	1000
at 1000 °C	250		
Compressive Strength (MPa)at 20 °C	2500	4000	3800
Hardness, Vickers (kg/mm ²)	1800	1100	1600
Coefficient of linear Thermal Expansion (10 ⁻⁶ /°C)	8,1	9,2	3,4
Thermal Conductivity (cal/cm s °C)	0,07	0,004	0,03
Thermal Shock Resistance ΔT (°C)	200	360	650
Modulus of Elasticity (Gla)	400	200	310
Kic MPa√m	1~3	4~9	4~7
Average Crystal size in microns	1-3	1-2	1-2

Except type A99, listed ceramic spheres are made to order, involving an eventual tooling charge and minimum order quantity.