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Ceramic materials

Material	Al2O3	Rubin	Saphir	SiC	Si3N4	ZrO2
Name	Dialuminium trioxide	Monocrystalline dialuminum trioxide	Monocrystalline dialuminum trioxide	Silicon carbide	Silicon nitride	Zirkonium dioxide
Alternative name(s)	Aluminium oxide			Carborundum	Nierit	Zirconia
Hardness HV	1250 - 1700 HV	1570 - 2170 HV	1600 - 2300 HV	1250 - 1700 HV	1400 - 1600 HV	87 - 91 HRa
Density g/cm³	3,90	3,98	3,98	3,15	3,26	6
Operating temperature °C	-100 - 1600	-196 - 1750	-196 - 1800	-100 - 1600	0 - 1200	0 - 1350
Beak load in traktion MPa	2100 - 2600	2030 - 2130	2000 - 2100	2100 - 2600	2300 - 2400	1750 - 2500
Available with						
Diameter (mm)	0,3 - 100	0,127 - 14,986	0,2 - 20	1 - 50	0,4 - 200	0,3 - 101,6
Diameter (in)	1/64 - 4	0,005 - 0,59	1/128 - 25/32	3/64 - 2	1/64 - 8	1/64 - 4
Precision grade	G10 - G100	G3 - G25	G3 - G25	G10 - G100	G3 - G100	G10 - G100

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Description	Spheres made of oxide with polycrystalline structure. Good mechanical properties and good resistance to corrosion, abrasion and heat. Self-lubricating, lightweight, electrical insulators.	They have excellent hardness and corrosion and temperature resistance. Good wear resistance and dimensional stability. Self-lubricating, easy to polish.	Ceramic ball made of monocrystalline aluminum oxide with very high purity. Transparent, very hard, high resistance to wear, temperature and corrosion.	Ceramic ball with good mechanical properties and rigidity, good corrosion and wear resistance. Electrical conductor. Suitable for high temperature applications.	Lightweight ball made of ceramic material with very good mechanical properties and high toughness and corrosion resistance. Function as electrical insulators; self-lubricating. They have excellent resistance to temperature fluctuations.	Ball made of refractory ceramic material with very high resistance to corrosion, abrasion and heat. They are characterized by the fact that the toughness is increased as a result of impact.
Field of application	Special bearings, control valves, pumps and valves for operation in corrosive environments, pumps for petroleum equipment, flow meters, measuring instruments, medical equipment.	Bearings, special pumps and valves (chemical pumps, safety valves), measuring instruments, balls for pens and tips for probes, optical applications, flow meters, styli.	Special bearings, chemical, medical and safety valves, flow meters, balls for pens and tips for tactile probes, measuring instruments, bar code readers, connectors made of optical fibers.	Special bearings and pumps, electrical switches and sensors, medical equipment; automotive, aerospace and marine, petroleum, chemical and electronics industries.	Special bearings, high speed bearings, vacuum pumps, compressors, mechanical centrifuges, shafts/pins, ball screws, flow meters, measuring instruments. They are used in the aerospace and military industries.	Special bearings, control valves, pumps and valves for operation in corrosive environments, pumps for petroleum plants, flow meters, measuring instruments, in the medical sector (high reliability in terms of low impurities of the material). Applications in grinding processes.
Resistant to	Water, salt solutions, acids. Also solid in aggressive environments	Good corrosion resistance in contact with (even strong) acids, alkalis and halogens, even at high temperatures.	Balls made of sapphire have excellent corrosion resistance in (even strong) acidic and basic environments, exceeding that of ruby.	Good corrosion resistance in dilute and concentrated acids, moderate strength in alkalis and halogens. Unstable in contact with molten metals. Resistant to hydrofluoric and sulfuric acids and sodium hydroxide. Satisfactory strength in nitric and ideo-chloric acids.	Excellent corrosion resistance in virtually all environments except acidic solutions (sulfuric acid excluded) and basic solutions at high concentrations.	In molten metal, organic solutions, caustic and most acids.
Unresistant to	Contact with hydrofluoric acid, hydrochloric acid, warm sulfuric acid and strong alkaline solutions.		Molten Li-, B-, F-, Na-, K-base compounds			Hydrochloric acid and strong alkaline solutions

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