



**DATASHEET**  
LARGE CERAMIC PRECISION BALLS

ENGLISH

## WHO WE ARE

Ceratec Ceramic Bearings has been successfully developing and applying ceramic sliding bearings for over 35 years.

Ceratec Ceramic Bearings is located in Geldermalsen, in the centre of The Netherlands. With 25 employees, Ceratec has a lot of knowledge and experience in the field of technical ceramic materials, engineering, applications and manufacturing.

Many costumers come to Ceratec when the usual materials such as metals and plastics no longer suffice. Ceramics offer many possibilities due to their specific properties such as wear-resistance, high-temperature resistance and chemical resistance.

Together with the customer, our engineers will develop the application. The final product will be designed and manufactured in-house.

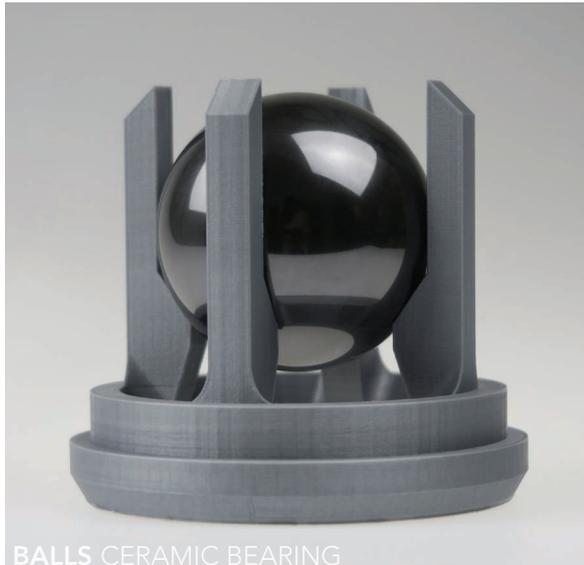
## ↓ CERAMIC PRECISION BALLS

### ADDED VALVUE

Ceratec has developed technology to produce extremely accurate and large precision sphere/balls, with a stem of other shape, completely in ceramic. Sphericity within 0.002 mm has been achieved, on a 120 mm sphere when the sphere has. A surface finish of Ra 0.02 is possible. Materials applicable are silicon nitride, silicon carbide, zirconia and alumina, depending on your application. Whether it's a check valve, unidirectional bearing, ball hinge, bearing pad or a precision intrument, ceramics can make the difference.



BALLS CERAMIC



BALLS CERAMIC BEARING



BALLS CERAMIC VALVE

## SPECIFICATIONS

Size;	Up to 200 mm possible, fully dense.
Ceramic material;	Si <sub>3</sub> N <sub>4</sub> , SiSiC, SiSiC, Al <sub>2</sub> O <sub>3</sub> , ZrO <sub>2</sub> .
Accuracy;	Sphericity within 0.002mm.
Surface finish;	Ra0.02 or lower is possible
Compressive strenght;	3000 Mpa or above, with smooth surface finish.

## MATERIALS

Summary available materials ceramic precision bearings.

Materials	chemical formula	Si <sub>3</sub> N <sub>4</sub>	Al <sub>2</sub> O <sub>3</sub>	ZrO <sub>2</sub> .MgO	Al <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub> +Cr <sub>2</sub> O <sub>3</sub>
	unit	silicon nitride	alumina	zirconia	sapphire	ruby
density	g/cm <sup>3</sup>	3.16	3.90	6.0	3.99	3.99
colour	-	grey/black	white	white	transparent / clear	red
hardness	HV 0,5	1750	1900	1200	2300	2300
flexural strength 4pt	MPa	>750	470	820	390	390
E-Modules	GPa	320	380	205	430	430
compressive strenhth	MPa	>2500	2400	1990	2100	2100
toughness	MPa√m	6.0	4	12	1	1
thermal conductivity	W/m.K	35	29	3	36	36
electrical resistivity	ohm.cm	10 <sup>12</sup>	10 <sup>14</sup>	>10 <sup>8</sup>	10 <sup>16</sup>	10 <sup>16</sup>
thermal expansion	mm/mK	3,5	8	10	5.3/4.5	5.3/4.5
maximum temperature	°C	1000	1800	900	2000	2000

Datasheet of Large Ceramic Precision Balls  
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All data measured at room temperature unless specified. All data obtained from a series of standard test pieces. Actual properties of components may vary from those stated due to the physical nature of ceramic materials.

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For technical support and questions contact us through our website.

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