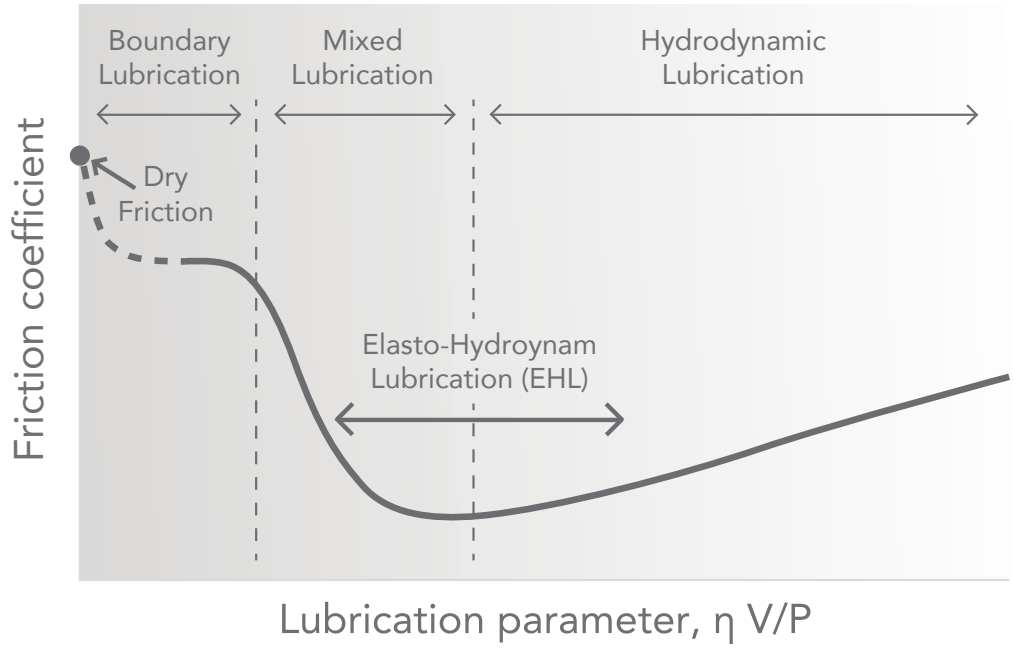
ceratec®
CERAMIC BEARINGS BV

DATASHEET
CERAMIC SLIDING BEARINGS
ENGLISH

WHAT A DESIGNER, DEVELOPER MUST KNOW ABOUT CERAMIC SLIDING BEARINGS

WHAT SLIDING BEARINGS DO

Generally a load is carried while a rotation is guided by the bearing. In case of the ceramic sliding bearings, ceramic elements are used to slide against each other with or even without liquid or gas between the elements. Hydrodynamic radial bearings carry loads radially, often in one direction.



WHY WOULD CERAMIC SLIDING BEARINGS HAVE ADDED VALUE?

Ceramics will have an added value if:

- Hard particles are involved in or around the pump, or medium pumped.
- Pumped medium is used for lubrication of the bearing. (water, ethanol even H2SO4)
- Liquids are corrosive, abrasive or have extreme temperatures or a very low viscosity.
- Common bearing materials fail.

INDUSTRY

STANDARD RADIAL SLIDING BEARINGS FOR PUMPS, MIXERS, OR GENERALLY DIFFICULT OR PROBLEMATIC APPLICATIONS

We believe that every pump manufacturer, designer or developer can benefit from the knowledge of ceramic bearings and their properties. In the basic process of designing a pump, this data should help the designer make the right bearing material choice.

When rubber, carbon, bronze or alloyed conventional bearing materials are expected to fail, ceramic is the alternative that should be considered. Our matrix range bearings have all got metal shrouding inside and outside, so all handling and assembly is made easy and safe. All differences in expansion will be adequately compensated by the Ceratec system.

PUMP

Seals, sliding bearings, roller bearings, wear rings, direct impeller bearings and many other pumps or pump parts can have added value in applications for pumping. Even direct driven ceramic impellors are possible with incorporated bearings.

CHEMISTRY

Generally ceramics are chemically inert as well as bio inert. Applications in almost every chemical surrounding will not affect ceramics. Almost all fluids can be applied as lubricating medium.

FOOD

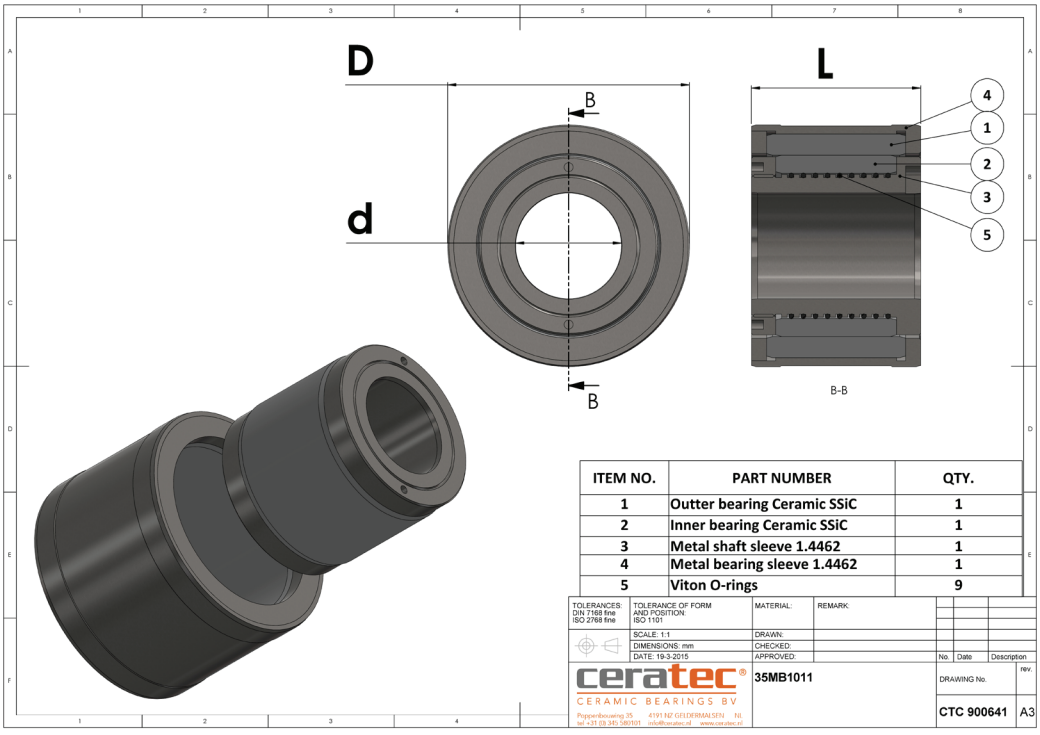
Ceramics have an almost general FDA approval for technical use in food or beverage applications. Bearings can often be lubricated by the product itself without problems.

PROPERTIES

TECHNICAL INFORMATION / USE INFO

Maximum use temperature for these bearings is 150 degrees Celsius.
Optimum condition for these bearings are 3600 rpm for the 20MB89, and 1200 rpm for the 100MB1516, temperatures under 100 degrees Celsius, no misalignment, gentle start up, balanced rotation of the radial load.

Matrix bearing designation	Drawing number	Bearing assembly dimensions [mm]			Allowable Radial Force [N]
		Shaft size (d) [mm]	Outter diameter (D) [mm]	Length (L) [mm]	
20MB89	CTC 900638	20,00	55	24	2000
25MB910	CTC 900639	25,00	67	50	2000
30MB910	CTC 900640	30,00	67	50	2500
35MB1011	CTC 900641	35,00	80	56	2800
40MB1011	CTC 900642	40,00	80	56	3200
50MB1112	CTC 900643	50,00	95	64	4500
60MB1213	CTC 900644	60,00	108	70	5500
70MB1314	CTC 900645	70,00	130	78	7800
80MB1415	CTC 900646	80,00	156	86	9000
90MB1516	CTC 900647	90,00	170	96	10000
100MB1516	CTC 900648	100,00	170	96	10000



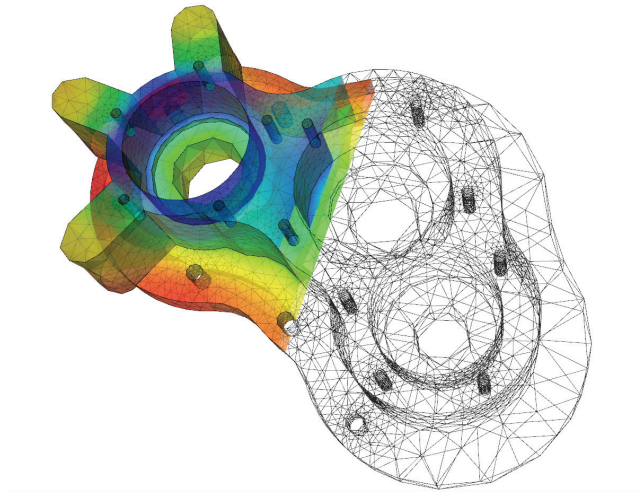
ITEM NO.	PART NUMBER	QTY.
1	Outter bearing Ceramic SSiC	1
2	Inner bearing Ceramic SSiC	1
3	Metal shaft sleeve 1.4462	1
4	Metal bearing sleeve 1.4462	1
5	Viton O-rings	9

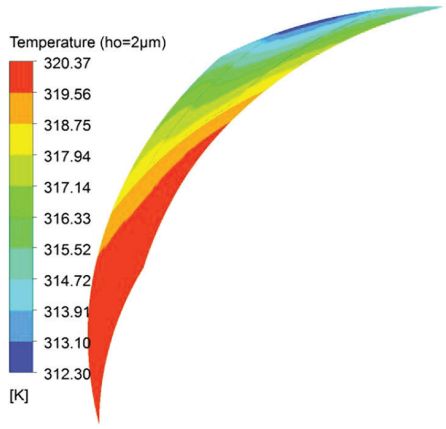
TOLERANCES: DIN 7168 fine ISO 2768 fine
TOLERANCE OF FORM AND POSITION: ISO 1101
MATERIAL:
REMARK:
SCALE: 1:1
DRAWN:
DIMENSIONS: mm
CHECKED:
DATE: 19-3-2015
APPROVED:
No. | Date | Description
ceratec® CERAMIC BEARINGS BV
Poppenbouwing 35 4191 NZ GELDERMALSEN NL
tel +31 (0) 345 580101 info@ceratec.nl www.ceratec.nl
35MB1011
DRAWING No.
rev.
CTC 900641
A3

WHAT ADVANTAGES?

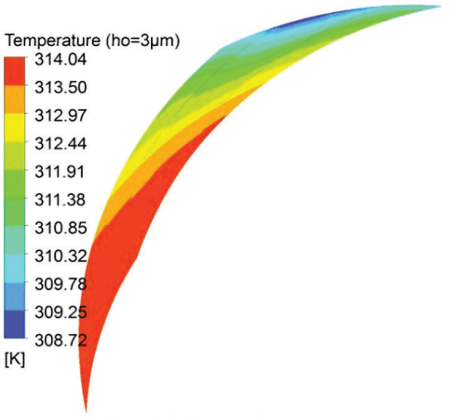
Ceramics generally have material properties that make extreme applications possible. In relation to hydrodynamic bearings the following material properties, make for a successful application in extreme conditions. The typical material to apply In media lubricated sliding bearings is SiC.

- Hardness of 2800 HV, only diamond can scratch the surface of these bearing surfaces.
- Chemically inert material, almost no chemical will corrode the bearing surface. Any liquid can be used for lubricating the bearing.
- High heat conduction, 100 W/mK, when material contact between the rotating elements occurs, all heat generated will quickly be absorbed and transferred, no risk of micro welding.
- High stiffness 400GPa, bearing surfaces will not deform, always maintaining ideal shape, and wedge for hydrodynamic function.

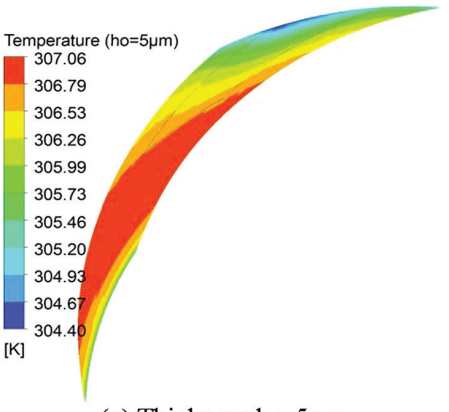




(a) Thickness h_0=2μm



(b) Thickness h_0=3μm



(c) Thickness h_0=5μm

WHAT LIQUIDS CAN ACT AS LUBRICANT?

Generally any liquid that has some viscosity can act as a lubricating and load carrying medium. Due to the extreme hardness and stiffness of the ceramic bushes, any liquid will suffice, even in cases where the flow of the medium is not constant.

Is case of doubt, please contact us bearings@ceratec.nl or dial 0031 345580101.

WHAT TO KEEP IN MIND WHEN CONSTRUCTING / ASSEMBLING OUR BEARINGS?

The matrix bearing range has been designed to be pre tensioned radially and axially for the outer bearing. Outside a light press fit should be used, and axially a pre tension of 500 - 1000N is preferred. For the shaft sleeve one should be able to slide or lightly press the sleeve over the steel shaft. Axial pre tension is preferred 500-1000N.

WHAT OPTIONS ARE THERE TO YOUR SUIT NEEDS OUTSIDE THE STANDARD BEARING RANGE?

When the matrix range does not meet your demands or there are additional functions required. We are very open to develop a specific bearing together with you. We are able to build cartridge design axial-radial combinations in any form and for every pump. There are even alternative bearing materials available for specific applications. Ceramic bearings that withstand 350 Degrees have been developed.

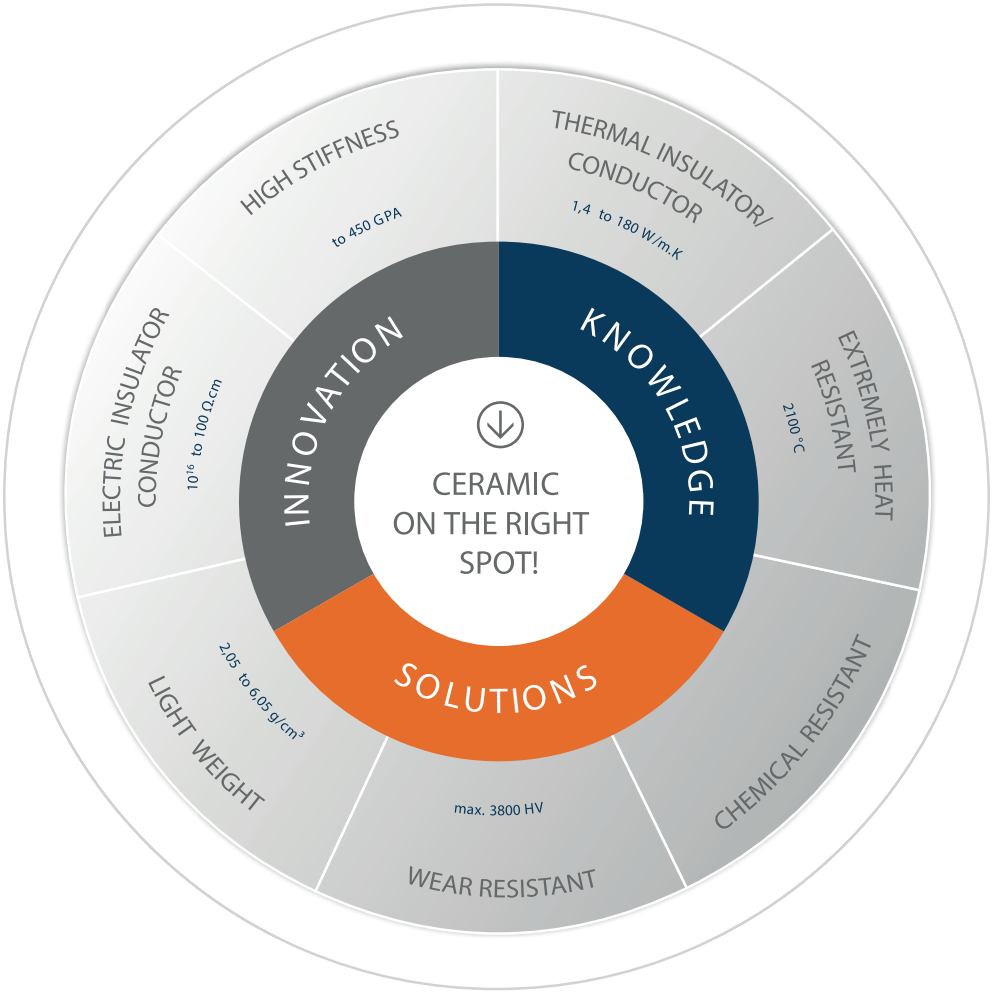
WHO WE ARE

Ceratec has been successfully developing and applying ceramic sliding bearings for over 25 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 satisfy. 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 ON THE RIGHT SPOT!

Datasheet of Ceratec Ceramic Sliding Bearings
Version: 1.1 / April 2015

For technical support and questions contact us through our website.

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