



# CEROBEAR ROLLING BEARINGS FOR THE SEMICONDUCTOR AND SOLAR INDUSTRY

# CEROBEAR ROLLING BEARINGS

CEROBEAR GmbH is the renowned world leader in the design, manufacturing and marketing of bearings that feature highly advanced ceramic material technology. These rolling bearings are used in applications where standard rolling bearings are no longer up to the requirement. In addition to our business sectors: aerospace, food - beverage and medical, processing and machine tools, CEROBEAR also designs and manufactures advanced bearings for the semiconductor, vacuum and solar industries.

With a team of more than 100 highly qualified employees and the most modern manufacturing technology CEROBEAR rolling bearings are produced in Herzogenrath near Aachen, a small city near Cologne in the westernmost part of Germany.

## MANAGEMENT SYSTEM

Our commitment to highest quality standards, not only for our products, but also for our organizational processes, is reflected by our integrated management system. Our strategy and quality management system promote continuous quality improvement, while metrics quantify measurable results.

To maintain continuous achievements we have adopted international quality standards and have earned the following certifications:

- Aerospace quality management system to EN 9100
- Quality management system to DIN EN ISO 9001
- Environmental management system to DIN EN ISO 14001
- Occupational health and safety management system to BS OHSAS 18001



View into CEROBEAR production



CEROBEAR ceramic deep groove ball bearing



Glass coating unit for coating of glass with LowE- and Solar-Control-Coating

(With the friendly consent of Von Ardenne Anlagentechnik GmbH)

## AREAS OF APPLICATION

The extreme conditions and challenging operating requirements that are typical of the vacuum, semiconductor and solar industries result in various scenarios where standard rolling bearings quickly reach the limits of their uses and capabilities.

As an example, rolling bearings used in coating plants are continuously exposed to very high temperatures and operate in the worst lubrication conditions.

In the production of semiconductors, CEROBEAR rolling bearings have a proven track record of succeeding under the most adverse manufacturing environments. Reasons for this are their extreme corrosion resistance in contact with aggressive media, their high rigidity in cases of exact positioning and their electrical isolation with fully non-magnetic qualities for superior performance in powerful magnetic fields.

Whether in the case of handling devices in coating facilities or in the case of handling wafers in direct contact with the media: CEROBEAR rolling bearings are the ideal choice in all areas of application where absolute reliability is a prerequisite. To ensure the highest quality products, our engineers collaborate closely with each customer to create and develop specialized bearing solutions from the first prototyp to final production.

## ADVANTAGES

CEROBEAR's all ceramic bearings and hybrid bearings have several important advantages compared to standard steel bearings:

- The utilization of ceramic in the bearing prevents smearing, welding and fretting effects known from steel bearings.
- The corrosion resistant materials used in CEROBEAR rolling bearings allow the application to be exposed to aggressive media. It even makes it possible to use the media as a lubricant.
- CEROBEAR rolling bearings are applicable under extreme temperatures (-253°C up to 1000°C) and pressure conditions (UHV up to high pressures). In these extreme applications the bearings are used without any lubricant.
- CEROBEAR rolling bearings are electrically isolated due to the very high breakdown voltage of silicon nitride.
- Full ceramic bearings perform in strong magnetic fields due to the proven superior non-magnetic properties of silicon nitride and zirconia.
- Since ceramic, in contrast to steel, has a low friction coefficient, friction and thus wear and tear in rolling bearings are not as strong as in traditional rolling bearings.

## MATERIALS

CEROBEAR bearings are manufactured from the high quality materials which offer distinct operating advantages to the customers:

- **Silicon Nitride (Si<sub>3</sub>N<sub>4</sub>)** is an advanced material for the rolling elements in hybrid bearings and for the races of all-ceramic bearings. This superb material allows Cerobear bearings to operate reliably in extreme applications.
- **Zirconia (ZrO<sub>2</sub>)** is the choice for high quality roller bearing races. By its mechanical and thermal characteristics this material is equivalent to corrosion resistant bearing steel.
- **High Nitrogen Steels** are selected for the production of hybrid bearings. The steels X30 CrMoV 15 1 (1.4108) and X40 CrMoVN 16 2 (1.4123) offer the highest corrosion resistance and prevent bearing wear and tear.
- **PEEK** is an advanced thermoplastic material that is utilized for bearing cages due to its proven reliability and superior mechanical qualities such as low friction and resistance to extreme temperatures. This high performance synthetic material is currently being used in existing semiconductor, vacuum and solar technologies.

## PRODUCTS

CEROBEAR manufactures two different types of bearings:

- **Hybrid Bearings** consisting of races made of premium high nitrogen bearing steels, and ceramic rolling elements that are made of Silicon Nitride utilizing state-of-the-art production technologies.
- **All-Ceramic Rolling Bearings** consisting of races and rolling elements that are made of Silicon Nitride utilizing state-of-the-art production technologies. Alternatively the rings can be made of Zirconia.

Apart from the standard dimensions according to the standard specification, CEROBEAR also produces customized solutions for your specific application in close cooperation with technical designers and developers. This is even possible for low quantity items.



CEROBEAR deep groove ball bearings are made from high technology materials.



CEROBEAR ceramic bearings are customized for the specific needs of the application.



We welcome your enquiries from around the world and look forward to hearing from you.

For more information on CEROBEAR and our unique technology and products, please contact:

CEROBEAR GmbH  
Kaiserstrasse 100  
52134 Herzogenrath  
GERMANY

Phone: +49 - 2407 - 9556 - 0  
Fax: +49 - 2407 - 96224  
Email: [cb-sales@Cerobear.de](mailto:cb-sales@Cerobear.de)  
[www.cerobear.com](http://www.cerobear.com)

**CEROBEAR North American Sales:**

Tony Tagliavore  
North American Sales Manager  
Phone: +1-719-237-6859  
Email: [Tony.Tagliavore@cerobear.com](mailto:Tony.Tagliavore@cerobear.com)

**in Australia & New Zealand:**

Roger Oliver  
Phone: +64-9-438-0555  
Fax: +64-9-438-0555  
Email: [rogeroliver@xtra.co.nz](mailto:rogeroliver@xtra.co.nz)

**in Israel:**

Frank Agencies  
Moshe Frank  
Phone: +972-3-5441-941  
Fax: +972-3-5441-438  
Email: [frank\\_ag@frank.co.il](mailto:frank_ag@frank.co.il)

**in France:**

CTI S.A.R.L  
Olivier Brussaux  
Phone: + 33-1-552107-04  
Fax: +33-1-552107-01  
Email: [obrussaux@cti.fr](mailto:obrussaux@cti.fr)

**in Italy:**

GD Consultants s.r.l  
Raffaello Garbarino  
Phone: +39-0141-538679  
Fax: +39-0141-356329  
Email: [gd@atlink.it](mailto:gd@atlink.it)