



# CEROBEAR HYBRID BEARINGS FOR MOTORSPORT APPLICATIONS

# CEROBEAR HYBRID BEARINGS

## INTRODUCTION

CEROBEAR is the renowned world leader in the design, manufacturing and marketing of bearings that feature highly advanced ceramic technology.

CEROBEAR GmbH was founded in 1990 as a spin-off from the Fraunhofer-Institute of Production Technology at the Technical University of Aachen, Germany.

The foundation for further growth was laid when CEROBEAR moved into its new facility in Herzogenrath near Aachen in 1997.



CEROBEAR operates an impeccable facility with state-of-the-art equipment, and we have a staff of more than 100 highly skilled technical employees.

Our primary product lines include:

**Ceramic Bearings**  
**Hybrid Bearings**

## MOTORSPORTS APPLICATIONS

CEROBEAR's advanced ceramic bearing technology addresses "extreme" requirements and applications:

- low friction,
- low weight,
- high temperatures,
- extreme speeds,
- minimum lubrication,
- superior load capacity and
- highest reliability.

From the beginning, CEROBEAR has been intently focused on delivering superb products and offering the best quality available – anywhere in the world.

Our wide product range of motorsports bearings includes engine, clutch, gearbox, differential, wheel and suspension bearings.



CEROBEAR's customised Hybrid Bearings with integrated design elements lead to a compact arrangement

We supply our custom-designed ceramic and hybrid bearing products to some of the most sophisticated companies in the world.

CEROBEAR's customers include not only Formula One, NASCAR, Indy Car, WRC and LeMans racing teams, but also NASA, Pratt & Whitney, DuPont and DOW.

## CEROBEAR SILICON NITRIDE

At CEROBEAR, we only utilize high strength HIP silicon nitride ( $\text{Si}_3\text{N}_4$ ), the best quality ceramic raw material available on the market, for the production of our ceramic rings and rollers.



CEROBEAR Hybrid Engine Bearings feature silicon nitride rolling elements in a split PEEK cage and a two-piece hardened bearing shell. This advanced bearing technology significantly reduces friction losses and leads to an increased power output of up to 8%

## VERY HIGH TEMPERATURES & EXTREME SPEED

Compared to all available bearing steels, silicon nitride has superior heat resistance, there is no measurable decrease in hardness up to 1500 °F.

The friction coefficient between silicon nitride paired with steel is 40% less than that of steel paired with steel. The reason for this is the stable nature of the silicon nitride material.

Its specific weight is 60% less than that of steel and at the same time it is twice as hard in comparison. These characteristics enable silicon nitride bearings to achieve very high speeds.

CEROBEAR's high speed technology is successfully applied not only in motor-sports applications but also in the aerospace industry, machine tools, production of man-made fibres and electric and internal combustion engines.

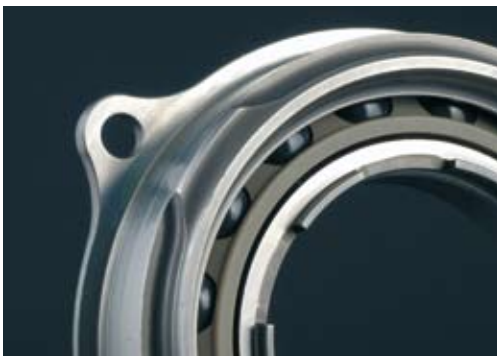
## INCREASED BEARING LIFE

CEROBEAR ceramic and hybrid bearings serve to significantly increase the lifetime of bearing use – which substantially lowers the cost of ownership.

The lifetime of our bearings increases even when lubrication requirements drop significantly. In many applications, oil lubrication is substituted by a life-time grease package – which CEROBEAR supplies with our custom-designed sealed bearings.



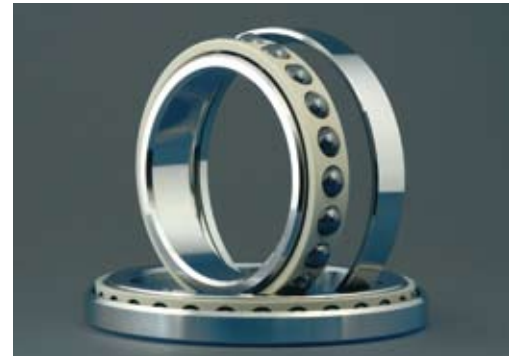
CEROBEAR's customised Hybrid Bearings are designed to meet your engineering requirements to perfection



CEROBEAR Formula 1 mainshaft pinion bearing



CEROBEAR Hybrid Constant Section Bearings provide superior load capacity and stiffness while reducing friction losses at the same time



CEROBEAR Angular Contact Ball Bearings replace standard tapered roller bearings in a multitude of applications

## CEROBEAR'S CORE COMPETENCES

CEROBEAR specializes in design, engineering and production of advanced ball and roller bearings.

Our key competencies also include:

- **analysis, calculation and lifetime-prediction for bearings with ceramic components,**
- **computer-aided machining of advanced materials,**
- **non-destructive testing and computer-aided inspection of ceramic bearing components and**
- **customized bearing solutions from prototype to serial production.**



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 us:

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