



# Hybrid Bearings

TOUGH INDUSTRIAL APPLICATIONS REQUIRE SPECIAL BEARINGS

# Experts in bearing solutions

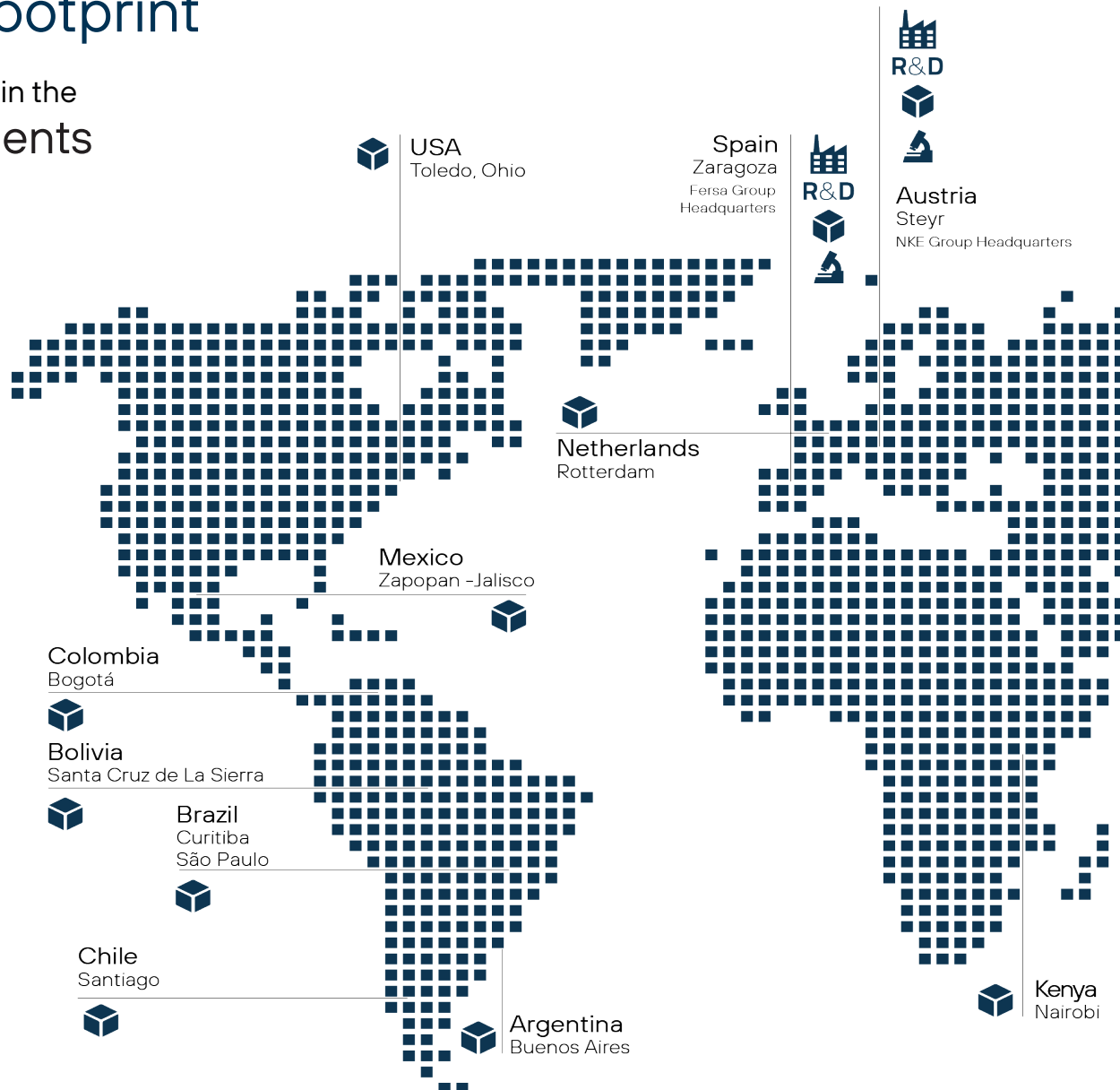
NKE FERSA is a premium bearing manufacturer with headquarters in Steyr, Austria. The company was founded in 1996 by a group of senior staff members of the former Steyr Wälzlager.

NKE FERSA manufactures both standard and special bearings for all industrial applications. Our core competences – engineering, product development, final processing of components, assembly, quality assurance, logistics, sales and marketing – are centralised in Steyr. The site is accredited with ISO 9001:2015 (design, development, manufacturing and distribution of bearings), ISO 14001:2015 and ISO 45001:2018.

Our bearings are distributed through international representative offices and more than 240 distribution outlets in over 60 countries.

## Global footprint

Local presence in the five continents



## We offer:

- **Standard bearings with a comprehensive stock range**
- **Tailor-made bearings for special requirements**
- **Technical service**

## Quality guaranteed at 100%

All NKE bearings are manufactured with state-of-the-art equipment. They undergo stringent and documented quality inspection. By using advanced testing and measuring equipment and applying a rigorous quality policy, we can guarantee that every single batch of bearings delivered is of the highest quality standards.



## Our Figures

Fersa is constantly growing

20% of sales based on the development of new part numbers.

# X5,1

Sales in the last 5 years

# 4,5%

R+D investment

Total sales

# 15%

Investment in the Internet of Things

Total CAPEX

# +1000

FTE

# +3000

New part numbers per year

# Austrian quality combined with advanced technology

Technologies are advancing rapidly and bearings have to meet more sophisticated and varied requirements under increasingly demanding operating conditions.

In response to these special requirements, NKE FERSA is committed to the development and manufacturing of **hybrid bearings**.

Hybrid bearings can be used in new applications where conventional steel bearings have not been practical.

For example, bearings using ceramic rolling elements are especially designed for applications where high grade electrical insulation is necessary and/or high speeds occur.

## Example:

### Bearing designation

6330 \_\* C3 - HYB

Basic bearing designation: TYPE & SIZE

Cage: no suffix, PRESSED STEEL cage

Radial clearance: LARGER THAN NORMAL (C3 clearance)

Rolling element material: SILICON NITRIDE  $\text{Si}_3\text{N}_4$

Other bearing types or special bearing designs can be manufactured on demand.

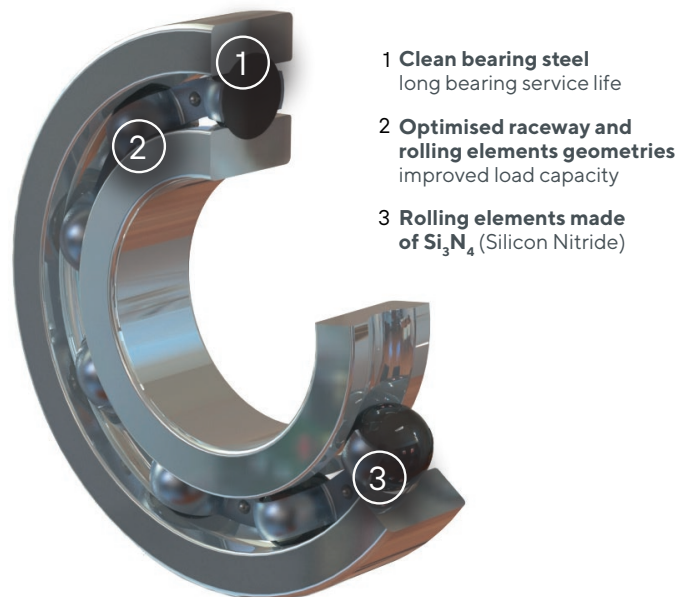
- Electric motors (AC/DC)
- Generators (e.g. in wind turbine generators)
- High speed applications
- Traction motors of railway vehicles

Furthermore our premium hybrid bearings come up with many excellent performance characteristics, like extended service life or reduced friction.

We provide bearings with ceramic rolling elements. Frequently used **Deep Groove Ball Hybrid** and **Cylindrical Roller Hybrid** bearings are available on stock or with short lead times. Other bearing types, special bearing designs etc. are available upon demand.

Our hybrid bearings are identified by the suffix **-HYB** and can replace standard bearings without any modification required.

Our hybrid bearings consist of bearing steel rings and bearing silicon nitride  $\text{Si}_3\text{N}_4$  rolling elements.

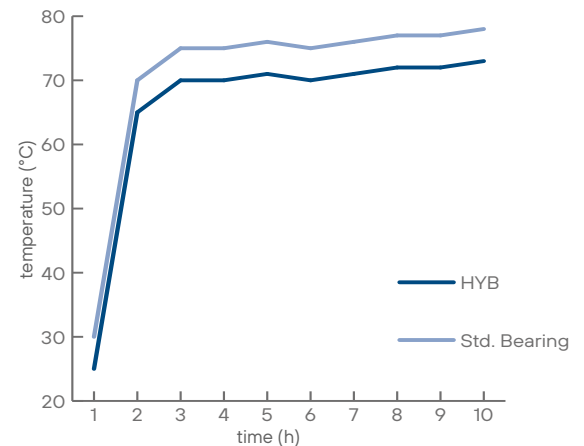


# The perfect solution to industrial applications

## Advantages and benefits

- **Insulation:** highest protection against passage of electric currents.
- **Higher speed suitability:** centrifugal force reduction due to the light rolling elements.
- **Lightweight:** Silicon nitride is 60% lighter than conventional rolling element steel.
- **Extended service life:** longer bearing life and longer re-lubrication intervals.
- **Reduced friction:** less frictional heat, especially at high speeds. Higher RPMs without overheating or degrading.
- **High wear resistance.**
- **Higher rigidity:** less deformation in rolling contact areas.
- **Reduced risk of poor lubrication at high speeds** and fast accelerations, or in the case of insufficient lubricating film.
- **Low running** noise operational bearings.
- Significantly less susceptible to standstill marks known as “false brinelling”.
- Reduced thermal expansion, as our steel rings are thermally stabilized up to +150°C.
- More precise control of preload and bearing clearance.
- Dimensionally interchangeable.

NKE FERSA hybrid bearings display +20% higher speed ratings than conventional bearings.



## Properties of ceramic rolling elements

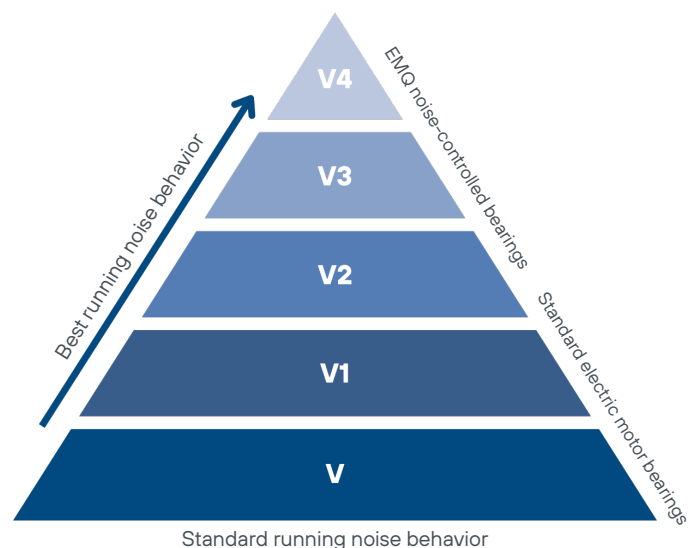
- Electrically isolating
- Low friction coefficient
- Corrosion resistant
- Higher modulus of elasticity
- Dimensions of up to Ø57,15 mm (ceramic balls) or Ø18x18 mm (ceramic rollers)

NKE FERSA hybrid bearings are especially suitable for applications required to operate with low noise.

Bearing noise performance is classified in five different classes (V-V4) according to JB/T 10187.

Vibration classes (V-V4) focus on the physical movement and forces (mechanical vibration) within the bearing. These classes measure the vibration levels of the bearing in mm/s (velocity).

Because of the high-end specifications and the design of NKE bearings – EMQ bearings reveal best running noise behavior and can meet the highest customer requirements. This low noise bearing family feature narrower geometric tolerances, reduced radial run out values, improved surfaces, special cages if needed, etc. Therefore, they have higher component accuracy with less vibration and, subsequently, noise levels.

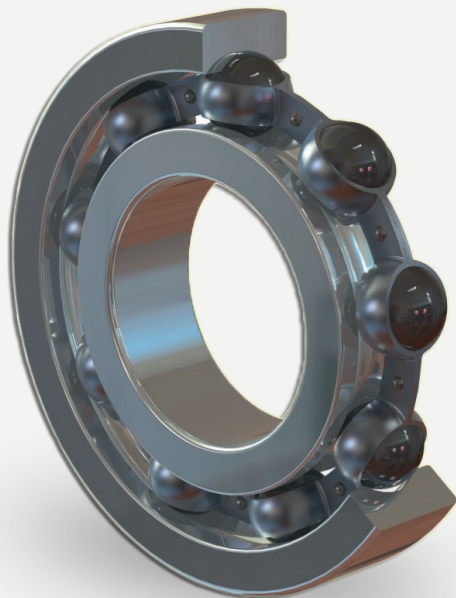




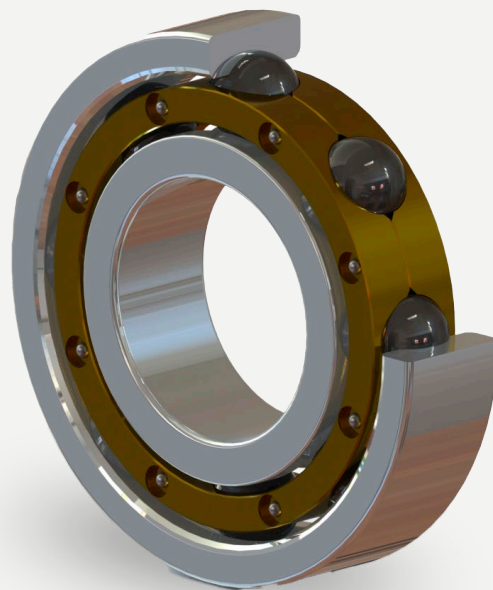
# Hybrid Bearings:

Suitable for a wide range of extreme industrial applications

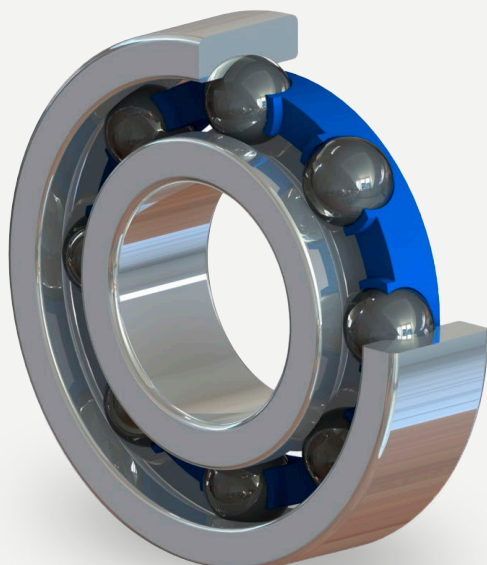
NKE steel sheet cage



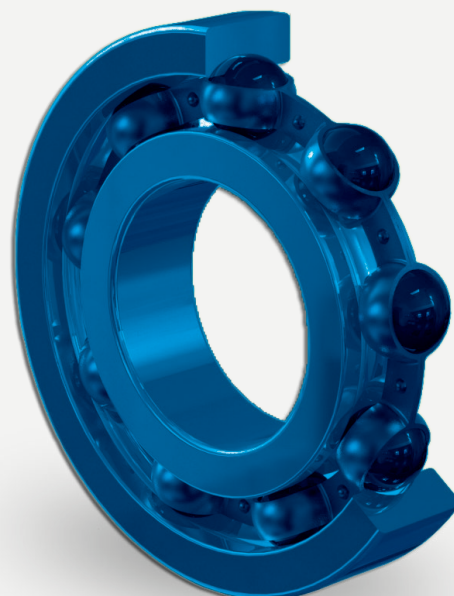
NKE brass cage



NKE polyamide cage



Customized special bearing



# Success stories

## Hybrid bearings in wind turbine generators

- **Application**  
Bearing setup in a wind turbine generator 2,5 MW.
- **Challenge**  
Prevention of the bearing from electric erosion and increase the reliability and machine uptime of the wind turbine.
- **Solution**  
Our hybrid bearing which composes of rings made of conventional bearing steel and rolling elements made of silicium nitride Si3N4.
- **Benefits**  
Our hybrids offer the highest protection class against electric current and are suitable for extreme operating conditions e.g. high operating speeds. In addition, hybrid bearings show a longer service life under hostile conditions and increase re-lubrication intervals.

## Electric Motor Company (USA)

- **Requirements**  
Rewinding workshop  
Application: wind generator 2,5 MW  
Customer trusted on hybrid bearings  
KOYO 3NCH6330-C3  
SKF 6330/HC5C3
- **Solution**  
NKE FERSA has convinced the customer to use NKE hybrid bearing instead of competitor bearings. NKE FERSA is able to manufacture more flexible and offers extensive technical support
- **Product**  
Hybrid bearing: 6330-C3-HYB

## Technical services

At NKE FERSA we specialize in providing superior technical services throughout the entire engineering loop. Our comprehensive offerings include:

- **Design:** Tailored solutions that meet unique specifications and needs.
- **Analytic modeling:** Advanced techniques to ensure accuracy and efficiency in every phase of a project.
- **Virtual modeling:** Cutting-edge simulations to visualize and test design concepts before implementation.
- **Empirical testing:** Rigorous testing procedures to validate designs against real-world conditions.
- **Field validation:** On-site evaluations to confirm practical viability and reliability.

Our technical services consistently exceed industry standard and regardless of the scale of a project, we deliver exceptional results for all businesses, ensuring unmatched quality and precision.

