BEARING CW

Your requirements are our standard.

Customized Ball Bearings for E-mobility Drives





E-mobility systems

Electric motors (in battery-powered vehicles or hybrids)

Generators (for example hydrogen-powered fuel cells)

Transmissions

E-axles and **wheel hub drives**

The future drives electrically

Probably the greatest challenge of our time is the protection of the environment. One megatrend that goes hand in hand is the switch to electromobility.

It is being accelerated by laws to reduce CO_2 emissions and the increasing price advantages of electricity over gasoline and diesel. Falling manufacturing costs for rechargeable batteries and a small number of wearable parts, which reduce maintenance and thus also the total cost of ownership, do the rest.

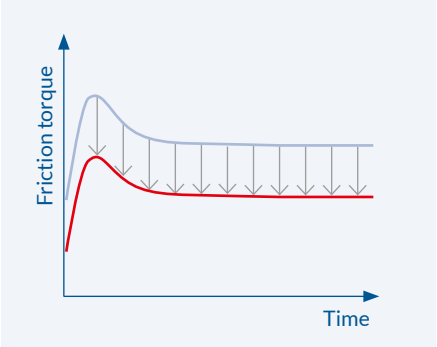
In addition, electric motors run pleasantly quiet and allow the direct acquisition and processing of a wide variety of data. This leads to the megatrends of digitalization and the Internet of Things (IoT). Reasons enough, to further advance electromobility. We are your reliable and experienced partner.

Your requirements are our standard.

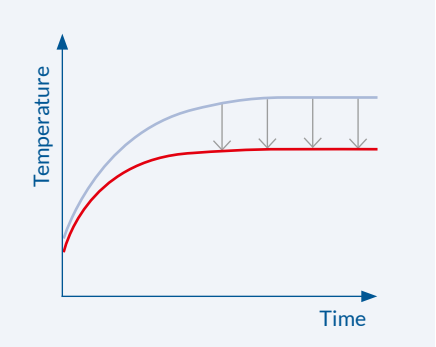
Whether hybrid, battery or fuel cell – everything runs electrically. Your challenge is always to maximize the power density in the powertrain. To do this, on the one hand you minimize the installation space, on the other hand you greatly increase the speed to compensate for the torque deficit. Where the speed limit lies is determined by the kinematics and heat generation of the bearing. Besides centrifugal forces it has to cope with high acceleration and braking forces and braking accelerations.

These are all requirements that no catalogue ball bearing can meet! That's why at CW Bearing you only get e-mobility bearings that are specially designed for the respective application and can withstand high demands for a long time. This is guaranteed by our know-how of electric drive technology, powerful software tools and our CW Bearing engineering team!

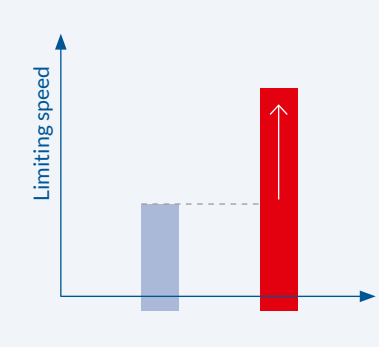
■ Catalogue ball bearing ■ CW e-mobility ball bearing



We optimise our e-mobility bearings and reduce the frictional torque.



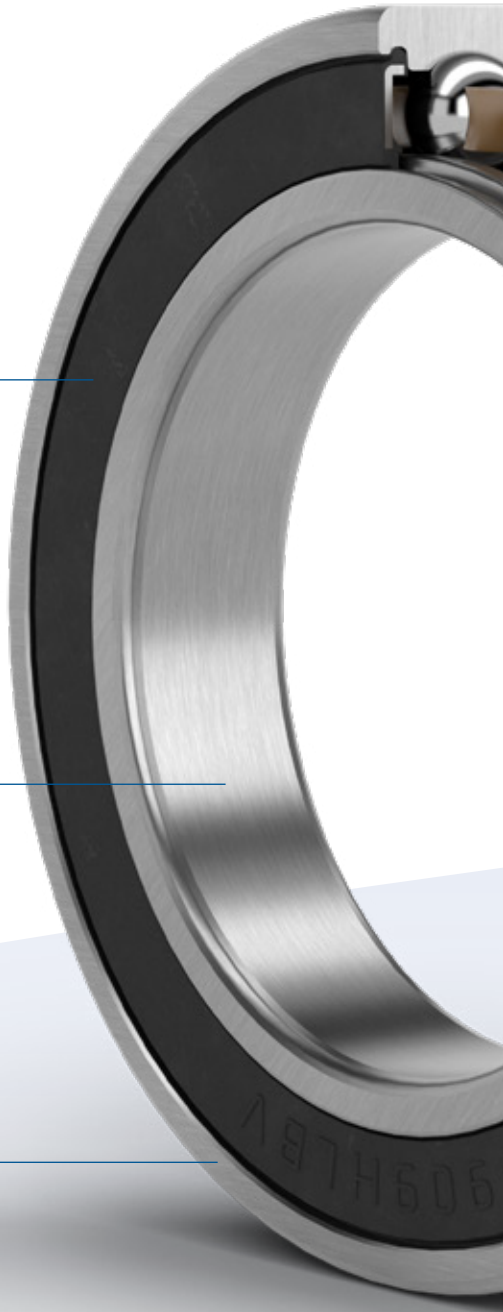
This generates less heat and increases the speed range of your e-drive.



In this way you can achieve a speed index of up to 1.4 million mm/min.

Tailor-made down to the smallest detail: Your e-mobility ball bearing

Your specifications are in good hands with our experts, because they match the raceways, ball set, cage, seals and grease of the e-mobility bearings exactly to your conditions of use. For reliable function and long service life.



Sealing material according to heat generation

For our non-contact lip seal we use HNBR. In case of heat development above 150 °C, we offer alternative materials depending on the temperature range. Optionally our ball bearings are also available with cover disc(s) or open.

Optimised internal geometry

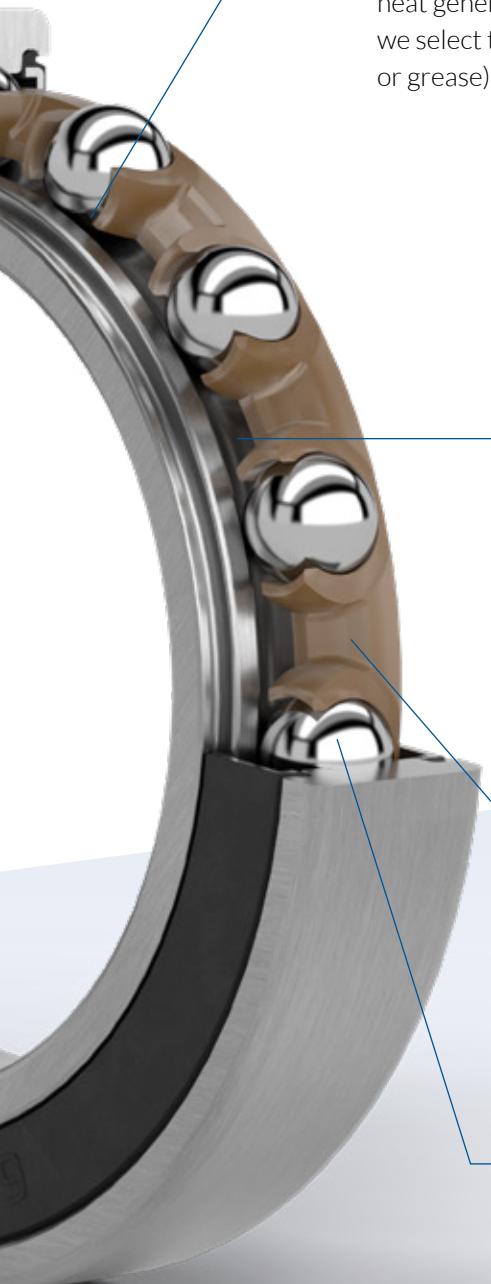
Trimmed to the perfect combination of necessary load capacities and the lowest possible friction torque.

Rings with special heat treatment

The 100Cr6 rings have a higher dimensional stability thanks to a special heat treatment. On request, we can carbonitride your rings to increase the hardness of the raceway and prevent wear.

With these advantages, clearly in the fast lane:

- Very high engine speeds
- Extreme acceleration
- High energy efficiency
- Quiet running
- High temperature resistance
- Long service life
- Best reliability



Suitable lubricant

Depending on your application, heat generation and the speeds we select the best lubricant (oil or grease) for for you.

Perfect raceway quality

Improved running accuracy, waviness and roundness of the extremely “smooth” raceways guarantee the lowest possible vibration and noise development. Narrow manufacturing tolerances underline our high quality standards.

Innovative cage design and improved cage material

The new, especially lightweight design is suitable for high speeds and accelerations. Glass-fibre reinforced polyamide (PA46-GF30) provides greater rigidity. For heat development above 150 °C, we offer alternative high-performance materials.

Special ball set and higher ball quality

For significantly less mass, centrifugal forces and friction, we optimise the number and size of the balls. Better ball quality reduces friction torque and vibrations. For protection against electric current damage, or to reduce centrifugal forces as well as significantly increase service life, we recommend balls made of ceramic (see page 6).

The ultimate for your e-drive: Hybrid bearings with ceramic balls

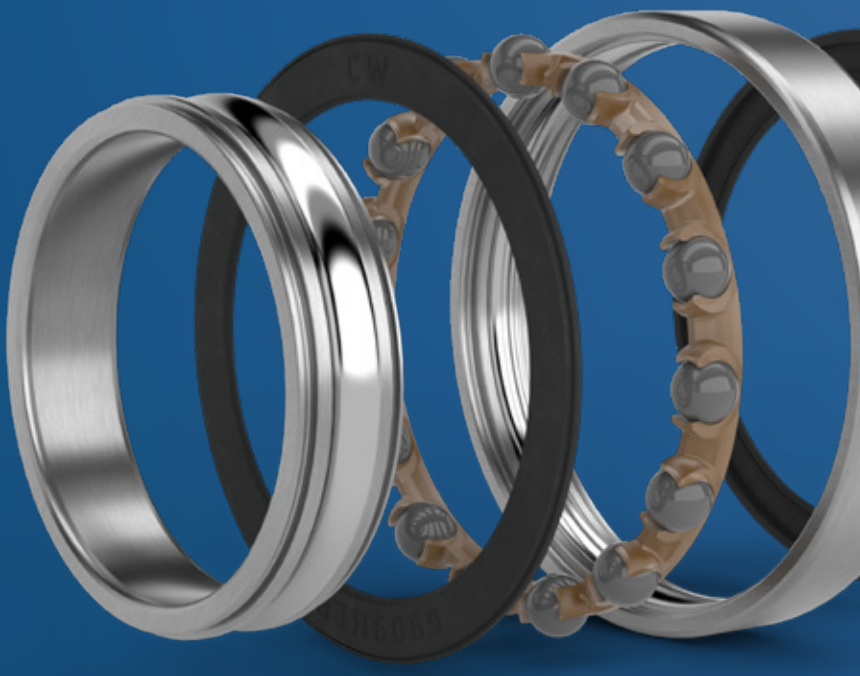
Extreme requirements due to kinematics and friction-related heat development are one thing. The other is the possible passage of current in the bearing. First, a current flow leads to micro sized arcing damage on the raceway. When rolling over, the rolling element vibrates and thus reduces the lubricant film thickness for another current passage. The consequences are patterns of flutting or pitting over the entire ring raceway, which leads to increasingly strong vibrations and finally to total failure of the bearing. Our hybrid deep groove ball bearings offer the best possible protection against this.

Our rings are made of rolling bearing steel, the rolling elements of current-insulating ceramic (Si3N4). Compared to steel balls, they have a higher hardness and lower density. Due to the smaller surface contact and the lower mass, friction and energy requirements or CO_2 emissions are again significantly reduced. In addition, higher limiting speeds are possible and the service life – with both grease and oil lubrication – is more than twice as long as with steel balls.

This pays off compared to current-insulating coatings. Our hybrid bearings with an outer diameter of up to approx. 100 mm are already the most cost-effective solution. If the savings from the total operating costs are taken into account, the economic advantage of hybrid bearings increases even further.

Hard to beat thanks to ceramics:

- Maximum protection against damage caused by current passage
- Lower friction and heat generation
- Higher starting and braking accelerations
- Higher limiting speeds
- Significantly longer service life
- Better emergency running properties
- Less wear



Application engineering advice makes the difference

When choosing either ceramic or steel balls as well as other questions, we can provide you with the right answers. Take advantage of our experience – also in the interaction with hybrid drives and hydrogen-based fuel cells with the following strong services:



100 % individual: development and calculation

Joint development projects start with your requirements. We are happy to provide you with the right ideas. On top of that, you receive the design and calculation of all important details.

Safety first: FE simulation

First, we use CAD data to create an approximate model of your e-mobility bearing, then we simulate the loads using defined boundary conditions. In this way, we detect possible deformations or stresses and can reliably predict whether the bearing will withstand the most extreme requirements.



Knowing what works: test benches and tests

With our test benches, we cover a broad spectrum worldwide: from service life, frictional torque and speeds to noise and vibration to leakage and salt spray tests. These test rigs for prototypes of your rolling bearing applications are located all over the world. On request our laboratory can also carry out a lubricant analysis and measures roundness, noise, roughness, hardness, radial and axial clearance.

Up to date: training courses and in-house exhibitions

In a technical training course you will learn everything you need to know about our products for your application. This includes topics such as bearing fundamentals, load ratings and service life, lubrication, speed limits, preloads, fits and materials. If you wish, we can also organise an in-house exhibition for your employees.

The best thing is to talk to us personally about your requirements and wishes!

BEARING CW

How to reach us?
Very much in person:

Jonathan Synder
Manager Engineering

15200 Technology Drive
Northville, MI 48168

E-Mail: Jonathan.Synder@cwbearing.com
info@cwbearing.com

Regardless of time and place, we are of course there for you online: **cwbearing.com**