

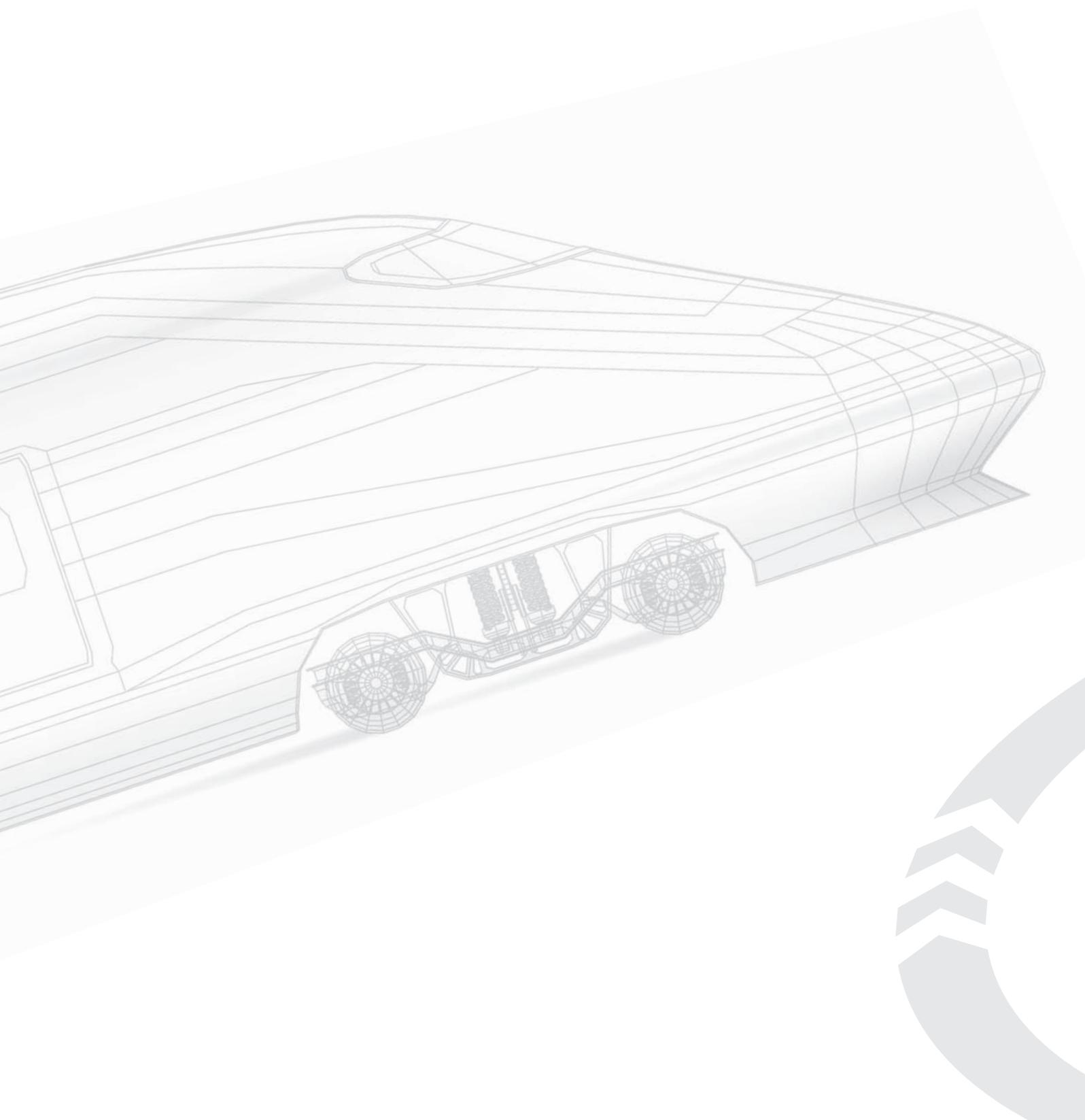


360° Lifecycle Management

From development to reconditioning



SCHAEFFLER





360° Lifecycle Management – Solutions for Mobility for Tomorrow

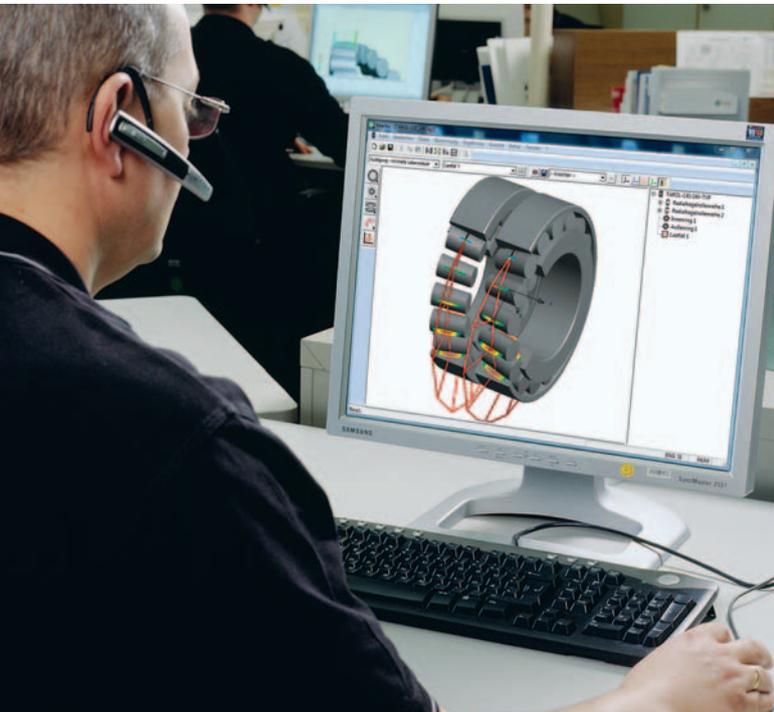
Megatrends such as globalization and urbanization and the growing requirements for affordable mobility are leading to changed, much more dynamic market requirements and business models. In collaboration with customers and business partners, Schaeffler is actively shaping areas of focus, such as environmentally-friendly drives for urban and interurban mobility, by carrying out its own research and development and offers solutions for “Mobility for tomorrow”.

The monitoring of product lifecycle costs is gaining in importance, particularly in the field of railway engineering. During times of limited budgets, it is particularly important that safe, reliable, and durable products are developed and manufactured – products that can then be operated economically throughout their entire operating life.

Schaeffler’s range of products and services provides individual solutions with railway application engineering experts located in close proximity to our customers.

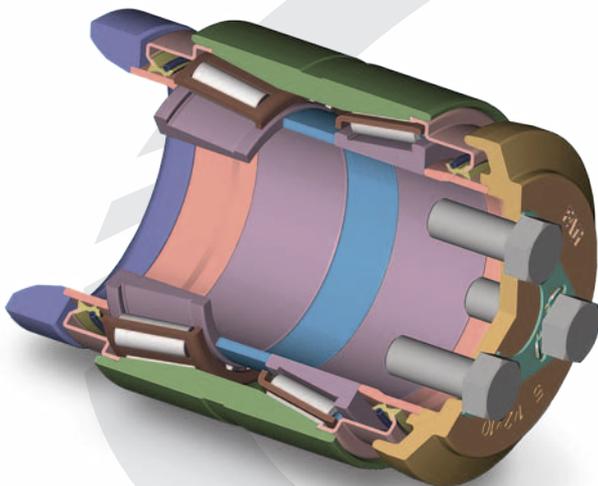


Development



We ensure the quality and reliability of our products by providing expert consultation, precise bearing design – by means of BEARINX® for example (image above) – and performance tests using accredited test stands (images below).

With over 100 years of experience in railway engineering, Schaeffler develops optimum system solutions depending on the application – whether that’s drawn wagons for the transport of goods or passengers, or any of the numerous types of motive power units.



The Schaeffler application engineering experts will help you select from a range of high-performance products and answer any questions regarding the design of the bearings’ surrounding structure or lubrication and seals, and their installation and deinstallation.

Product and system development tools significantly reduce the time and costs needed for development. Some of the tools used include FEM calculations, BEARINX®, a rolling bearing calculation program developed by Schaeffler, as well as Schaeffler’s CABA3D simulation program for the detailed analysis of complex and dynamic operations in the bearing and for the load-based design of bearings.

Schaeffler has its own accredited test laboratories in Germany and China for assessing the performance of axlebox bearings for railway applications. All our test stands enable us to carry out performance tests in accordance with the requirements of European standard EN 12082. These provide verification of the axlebox bearings’ suitability for use under real operating conditions and help to increase their safety in day-to-day operation in addition to minimizing wear and maintenance costs.

The close cooperation between the Industrial and Automotive divisions within the Schaeffler Group allows innovations and expertise from the fields of materials technology, mechatronics, and sensor technology to be adapted to applications in the railway sector. Areas of development focus include innovative new developments in tribology and seal technology.



Production

Railway bearings for traction motors, gearboxes, and wheelsets have to fulfill the highest quality and safety requirements under a wide range of operating conditions. Schaeffler manufactures these products using state-of-the-art production technology according to globally uniform quality standards at 73 locations worldwide.

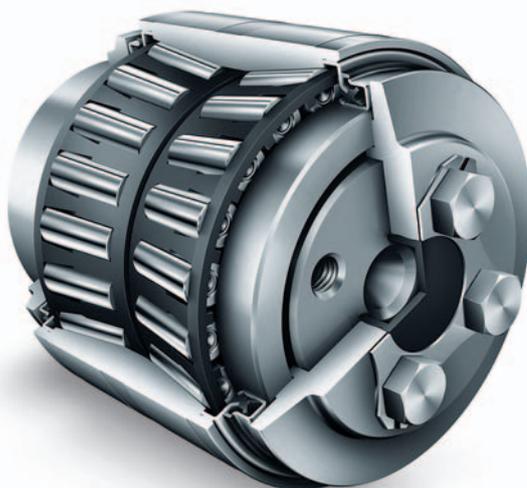
Schaeffler covers all relevant stages in the manufacturing process – from the production of blanks through to final assembly. Integrated inspection and testing procedures safeguard the highest levels of quality throughout the entire value-added chain. The Schaeffler quality management system ensures adherence to both railway-specific standards and the relevant national and international standards.

Schaeffler established itself at an early stage on the Asian railway market with its FAG brand. In India, Schaeffler has been producing different bearing types for axlebox bearing supports and drive unit bearing supports for over 30 years. Schaeffler has also been present in China for over 30 years and has had its own production facility for railway bearings since 2002.

In the future, it will also be possible to deliver directly to railway customers from the Russian Federation. TAROL and cylindrical roller bearing units will be produced in the new plant in Uljanovsk.



Schaeffler's forging (image above) and subsequent turning processes form the backbone of component manufacture. During the assembly process, the various components are paired together (images below).



Operation



Whether it is gearboxes, traction motors, or axlebox bearings, Schaeffler offers individual system solutions for every application (see product images), which ensure safe and reliable operation even under extreme climatic conditions (images below).

Optimizing lifecycle costs requires more than just the development and manufacture of reliable products with a long operating life – solutions are also needed that allow longer maintenance intervals without reducing the product's reliability, that keep costs low, and that make preventive maintenance possible.

To this end, Schaeffler offers solutions that include optimized seals, intelligent relubrication units, and innovative mechatronic systems. Schaeffler's expertise in the field of mechanical components provides a consistently sound basis here.

With its numerous integrated functions, the rolling bearing itself is being further developed into a mechatronic system. Furthermore, thanks to functions such as integrated sensors, it also offers the option of generating data related to operating conditions, which further increases the cost-effectiveness and reliability of rail vehicles.

Axlebox bearing design plays an important role at Schaeffler. The axlebox bearings used in trains and streetcars are much more susceptible to corrosion due to environmental influences such as changing temperatures and moisture. They are protected against premature corrosion by innovative coatings and specially developed combination seals.

Our axlebox bearing housings are made from materials that are highly resistant to low temperatures, so the severe cold of Arctic regions – with temperatures as low as -50°C – is neither a problem for them nor for the seals and axlebox bearing greases that are also specially designed for this type of climate conditions.



Reconditioning

The extensive range of customer-oriented services includes the reconditioning of railway bearings in accordance with Schaeffler quality standards – a service offered by Schaeffler independent of the manufacturer and at various locations worldwide.

The reconditioning of bearings is often an economical alternative to using new bearings, and the delivery times are usually shorter. Another important aspect is the significant saving in terms of CO₂ emissions that is possible in comparison to the manufacture of new bearings.

In addition to detailed information about the assessment and reconditioning measures of the products, customers also receive comprehensive feedback about the detected patterns of product wear and their frequency so that conclusions about the operation and condition of the vehicle as a whole are also possible.

On the whole, a constantly high level of availability can therefore be achieved by preventive and condition-oriented maintenance.

Furthermore, maintenance costs will be reduced by carrying out regular maintenance cycles and ensuring that reconditioning is carried out professionally.



As good as new: Ensuring that reconditioning is carried out professionally and independent of the manufacturer means that axlebox bearings can achieve their maximum operating life.



Further Information



Bearing solutions for railway engineering

www.schaeffler.de/Railway

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Issued: 2014, September

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