

Press Release

Schaeffler at the InnoTrans 2026 (Hall 21, Booth 430)

High-performance axlebox bearings for higher speed and longer maintenance intervals

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- New solution for high-speed trains: cylindrical roller bearings for 400 km/h and more
- Hybrid bearing version with ceramic rolling elements extends maintenance intervals and reduces life cycle costs
- Friction-optimized internal bearing design reduces grease temperature and extends the operational period

Schweinfurt, Germany | September 17, 2026 | High tech for high speed: Schaeffler is developing a series of innovative high-performance axlebox bearings especially for use in high-speed rail. The bearings set new standards in terms of speed, availability and cost-effectiveness.

Engineers at the Motion Technology Company are looking beyond standard speeds of up to 360 km/h. The new cylindrical roller bearings feature optimized friction behavior, innovative rolling element design and, in the future, will have ceramic rolling elements. Maintenance intervals for bogies equipped with such bearings will more than double, while the total cost of ownership for railway operators will fall considerably.

"These innovative high-speed axlebox bearings underline our proficiency as an engineering partner for high-speed trains. We are combining our decades-long expertise in rolling bearing technology with highly detailed simulation, well-based validation and global manufacturing capability. This results in solutions that not only meet the highest technical requirements but also bring railway operators measurable economic benefits throughout a train's entire lifetime," says Dr. Michael Holzapfel, Global Sector Lead Rail at Schaeffler.

Friction-optimized cylindrical roller bearings

Schaeffler is working in close cooperation with Siemens Mobility in the development of these high-performance axlebox bearings. The axlebox bearings were fitted on a Velaro Novo with an ICE-S high-speed test train for a trial run on the Leipzig – Erfurt line. At speeds of up to 405 km/h, the bearings demonstrated just what they are capable of.

As Dr. Michael Holzapfel emphasizes: "Our goal is to produce an extremely low-friction bearing for extremely high speeds. A friction-optimized internal design helps to reduce the grease temperature and further extend the operational period. Development and deployment of ceramic rolling elements are the next logical step. With these high-performance cylindrical roller bearings, we are making a major contribution to increasing train availability and reducing life cycle costs on a long-term basis."

Cost-effectiveness the top goal of development

Economical operation throughout the entire life cycle was one of the key driving factors in Siemens Mobility's development of the Velaro Novo. The switch to inboard axlebox bearings is a major feature of the high-speed train. The bearing arrangement is essential in achieving significantly improved aerodynamics and weight reduction.

The engineers at Schaeffler and Siemens Mobility wanted to achieve longer operational periods between maintenance sessions for this bearing arrangement. With regard to roller bearings, this period is limited due to the grease operating life. Schaeffler plans to tackle this issue by using bearings with ceramic rolling elements. As a rule, the grease operating life with such hybrid bearings is over twice as long as that of comparable steel bearings. Operators benefit from fewer visits to the depot, lower maintenance costs and improved fleet availability.

Development and validation of the hybrid axlebox bearing

Schaeffler is conducting extensive simulations, friction analyses, examinations of lubricating greases and test rig trials, while its competence center and lead plant for European axlebox bearings in Brasov/Romania is also taking on a key role in this undertaking. The company's long years of expertise with the extremely high quality requirements in the fields of aviation and the wind industry is also being channeled into production of ceramic rolling elements.

Schaeffler Group – We pioneer motion: The Schaeffler Group has been driving forward groundbreaking inventions and developments in the field of motion technology for 80 years. With innovative technologies, products, and services for electric mobility, CO₂-efficient drives, chassis solutions and renewable energies, the company is a reliable partner for making motion more efficient, intelligent, and sustainable – over the entire life cycle. Schaeffler describes its comprehensive range of products and services by means of eight product families: From bearing solutions and all types of linear guidance systems through to repair and monitoring services. Schaeffler is with around 110,000 employees and more than 250 locations in 55 countries, one of the world's largest family-owned companies and one of Germany's most innovative companies.

Hybrid axlebox bearing with ceramic rolling elements (Image:Schaeffler)

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State-of-the art test rig technology from Schaeffler for bearing development: R32 friction torque test rig for grease-lubricated axlebox bearings (Image: Schaeffler)

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State-of-the art test rig technology from Schaeffler for bearing development: axlebox bearing test rig for performance testing in accordance with EN12082 (Image: Schaeffler)

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CONTACT:

Michiyo Kinjo

Manger, Communications

Schaeffler Japan Co., Ltd.

Japan

E-Mail: pr-japan@schaeffler.com