

Press Release

Schaeffler at WindEnergy Hamburg 2022 (Hall B5, Booth 333)

## **Schaeffler develops hydrodynamic plain bearings for wind turbine gearboxes further**

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- Hydrodynamic plain bearings open up a new chapter in development of wind turbines
- Additive manufacturing of plain bearing layer and finish machining ready for industrial-scale mass production
- Bearing design based on a comprehensive system approach

Schaeffler is solidifying its leading position in the market for bearing solutions for wind turbine gearboxes with a plain bearing arrangement for supporting planetary gears. Modern high-performance wind turbine gearboxes operate with numerous planets to be able to handle the constantly increasing torques. At WindEnergy Hamburg, Schaeffler is presenting advanced hydrodynamic plain bearings that make this increase in power density possible in extremely small installation spaces. The bronze sliding layer, which is just a few millimeters thick, is applied directly on the planetary gear journal using an additive manufacturing technique. The chemical bonding between the journal and the sliding layer ensures a decades-long operating time.

### **Design with a comprehensive system approach**

To supplement the FEM simulation of the overall bearing system, Schaeffler uses so-called elastohydrodynamic (EHD) simulations for designing these plain bearings. The aim is to achieve the minimum thickness of the lubricating film as well as complete separation of the surfaces. To ensure this wear-free operating condition, Schaeffler offers its customers a detailed technical design process.

### **Trend in the development of wind turbine gearboxes**

One of the ways gearbox manufacturers are addressing increasing torque density within a gearbox is by increasing the number of planets per stage. This allows higher torques to be transmitted in the same installation space. However, rolling bearing solutions come up against geometric limits here, as there is no longer enough space in ever smaller planetary gears. The plain bearing solution with its smaller diameter offers a decisive advantage here.

Bronze bushings pressed onto the planetary gear journals represent the current state of the art. The consistent further development of this plain bearing is the direct coating of the pin by modern additive manufacturing.

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Schaeffler Group – We pioneer motion The Schaeffler Group has been driving forward groundbreaking inventions and developments in the field of motion technology for over 75 years. With innovative technologies, products, and services for electric mobility, CO<sub>2</sub>-efficient drives, chassis solutions, Industry 4.0, digitalization, and renewable energies, the company is a reliable partner for making motion more efficient, intelligent, and sustainable – over the entire life cycle. The Motion Technology Company manufactures high-precision components and systems for drive train and chassis applications as well as rolling and plain bearing solutions for a large number of industrial applications. The Schaeffler Group generated sales of EUR 16.3 billion in 2023. With around 83,400 employees, Schaeffler is one of the world's largest family-owned companies and one of Germany's most innovative companies.

Hydrodynamic plain bearing with bronze sliding layer produced by additive manufacturing: a new chapter in the development of wind turbine gearboxes - Photo: Schaeffler

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Installation example for planetary gear pins with bronze sliding layers from Schaeffler - Photo: Schaeffler

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State of the art in plain bearing arrangements for supporting planetary gears in wind turbines: shrink-fit plain bearing bushing - Photo:Schaeffler

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