



Schaeffler Group Industrial at the HMI 2011

SCHAEFFLER GROUP
INDUSTRIAL

Solutions for Future Trends: Rolling Bearings and Mechatronic Systems for Renewable Energy, E-mobility and More Energy Efficiency

HANOVER/SCHWEINFURT, *March 31, 2011*. Rolling and plain bearing solutions, linear and direct drive technology as well as mechatronic components not only for increasing efficiency and conserving resources but also for higher performance and reliability will be Schaeffler Group Industrial's focus at this year's Hanover Fair (HMI) in Hall 22, Booth A12. Robert Schullan, President of Schaeffler Group Industrial, emphasizes the significance of the MDA as an excellent international platform for the power generation and fluid technology sectors within the Hannover Fair. Schaeffler Group Industrial will use the Hanover Fair to present its excellent strategic and operative position that enables the company to gain more than proportional benefit from further growth in the markets worldwide. "Our wide product range, innovative strength and position in the growth markets are the prerequisites that enable us to shape the big future trends in our sectors – energy and energy efficiency, mechatronics, and electric mobility – and to expand the Schaeffler Group's market position", says Robert Schullan.

Renewable energies: Water, sun and wind

Renewable energies are a strategic growth area where Schaeffler Group Industrial is positioning itself early on in order to secure and expand its market capability and competitiveness in the long term. The Schaeffler Group has been a market and technological leader in the wind energy sector for over 30 years and it provides important impetus for more efficiency and reliability. The Group's expertise in this field comprises almost 30 bearing positions in the drive train and ranges from project management, manufacturing and assembly right up to accompanying services. Once again, the Schaeffler Group will be presenting several innovations at the Hannover Fair, which include components for the bearing support of the rotor shaft as well as for the gearbox and generator and for the adjustment of the nacelle and rotor blades. Newly-developed simulation software enables us to optimize wind turbines as early as the development phase thereby making them even more reliable and cost-effective. In addition, solar power plants, wave and tidal plants as well as classic hydropower are becoming increasingly important. Schaeffler Group Industrial is development partner for various projects in these areas and creates the



prerequisites for advancing the development and economical use of regenerative energies with application-specific expertise and innovative products.

Mechatronic systems in rolling bearings: Electric mobility and optimized condition monitoring

Mechatronics are becoming increasingly important for the development of innovative rolling bearing solutions. They enable the productivity, cost-effectiveness and reliability of machines to be further improved by means of increased functionality. “With the newly developed rolling bearings with integrated sensors and an integrated or adjacent power supply, Schaeffler Group Industrial is offering new solutions for numerous industrial sectors. Examples are e-bikes, rail vehicles, machine tools, or condition monitoring systems for rolling bearings”, says Robert Schullan.

Electric mobility is becoming increasingly important not only in the automotive industry. In the two-wheel vehicle sector, electric bikes or so-called pedelecs are enjoying growing popularity. Schaeffler Group Industrial offers a torque sensor bottom bracket that, for the first time, determines the total torque from the sum of the pedal force from the left and right pedals for the comfortable control of the drive. This enables correct detection of the rider’s requirement for motor assistance depending on the riding situation and corresponding control of the power output. The new FAG torque sensor bottom bracket is characterized by the high-resolution speed signal and the accuracy of the torque sensor system. These characteristics are a prerequisite for the quality of the output signal and rapid response of the motor control system. The rider is thus provided with optimum assistance in every situation. This is associated not only with increased comfort, but also with maximum efficiency, which results in an increase of the range.

In conjunction with Freudenberg Dichtungs- und Schwingungstechnik GmbH & Co. KG and lubrication experts Klüber Lubrication München KG, Schaeffler Group Industrial has developed a grease sensor incorporating an electronic evaluation system that enables the condition of grease in rolling bearings to be analyzed during operation. This enables the schedule for replacing the grease to be precisely planned and any changes in the condition of the grease to be detected, long before any damage occurs to the rolling bearing. This means in future, grease will be replaced while taking actual requirements into consideration and not according to defined time periods. This reduces outlay and costs and is also beneficial to the environment and resources. Downtimes that are attributed to operational



disturbances are reduced as well as costs for lubricants, maintenance and replacement parts. At the same time, the degree of utilization and efficiency of machinery increases.

Needle roller bearings: Downsizing and reduced friction

Schaeffler Group Industrial's efficient rolling bearings with optimized friction are a key component for the entire industry. Rolling bearings make an important contribution to saving energy and conserving resources and, at the same time, increase the performance and competitiveness of machines and plants. An example of the high efficiency potential of rolling bearings is the consistent further development of needle roller bearings in the form of downsizing and friction reduction. Schaeffler Group Industrial is presenting three new INA needle roller bearing designs at the Hanover Fair 2011: the X-life machined needle roller bearing -D with higher performance for downsizing, the X-life machined needle roller bearing with the TWin cage and reduced friction, and the slimline drawn cup needle roller bearing with a radial section height of only 1.5 mm.

The new machined needle roller bearing with the TWin cage made of plastic provides higher efficiency as a result of lower friction. In this bearing, two short needle rollers can be inserted next to each other in one cage pocket instead of the otherwise usual single long needle roller. This completely new combination of cage and rolling elements achieves a significantly lower frictional torque in comparison with conventional needle roller bearings. The power loss due to friction of X-life machined needle roller bearing NK 45/20 with the new TWin cage at 4,000 revolutions per minute is between 25 and 30 watts lower than with a conventional plastic cage. This means using only one needle roller bearing with the TWin cage saves as much energy as is required for operating a light bulb.

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The Industrial Division of the Schaeffler Group supplies rolling bearing and plain bearing solutions, and linear and direct drive technology under the INA and FAG brands for around 60 different industrial sectors via its worldwide organization with market proximity and application support service. The range comprises more than 225,000 products from miniature bearings only a few millimeters wide, e.g. for dental drills, to large size bearings with an outside diameter of many meters, e.g. for wind turbines.



The Schaeffler Group and its 67,500 employees at more than 180 locations worldwide generates group sales of approx. 9.5 billion euros (FY 2010) and ranks amongst the leading rolling bearing manufacturers and suppliers to the automotive industry worldwide.

Pictures: Schaeffler Group



Concepts for utilizing wave and tidal power: Schaeffler Group Industrial is development partner for various projects in these areas and creates the prerequisites for advancing the development and economical use of regenerative energies with application-specific expertise and innovative products.



Using ocean waves as a source of renewable energy: Schaeffler Group Industrial is development partner for the Pelamis wave energy converter. Each individual segment is connected by means of bearing units that are subject to permanently changing loads of up to several hundred tons. (Source: Pelamis Wave Power)



There is a noticeable and significant trend towards single bearing concepts with preloaded moment bearing supports for multi-megawatt turbines. They prevent the transfer of negative axial loads to the drive train and allow a high level of system integration.



The newly developed FAG torque and speed sensor bottom bracket makes e-bikes even more comfortable to ride and more efficient. The bearing determines the total torque from the sum of the pedal force from the left and right pedals.



The Schaeffler Group's new lubricant sensor enables the schedule for replacing grease to be precisely planned. This reduces outlay and costs and is also beneficial to the environment and resources. Downtimes that are attributed to operational disturbances are reduced as well as costs for lubricants, maintenance and replacement parts. At the same time, the degree of utilization and efficiency of machinery increases.



Schaeffler Group Industrial will be presenting three new INA needle roller bearing designs for higher performance and lower friction at the Hanover Fair 2011: For example, the X-life machined needle roller bearing with the TWin cage and reduced friction.

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