

SCHAEFFLER



METEC 2015
Press Kit



Contents

- 01 The new Performance series for rolling mills:
multi-row tapered roller bearings from FAG**
- 02 Comprehensive online monitoring concept for trunnion
bearings in converters**
- 03 Bearing solutions for continuous casting plants –
the CoCaB range now includes large spherical plain
bearings with plastic plates**

Press Release

Schaeffler at the 2015 METEC in Hall 3, Booth C16

The new Performance series for rolling mills: multi-row tapered roller bearings from FAG

DÜSSELDORF/SCHWEINFURT, *June 16, 2015.* When used in conjunction with carbonitriding heat treatment, Schaeffler's new high-performance steel Mancrodur generates a significant increase in operating life for FAG multi-row tapered roller bearings. These bearings are part of the Performance series and are the new standard for rolling mills. Bearings in rolling mills are subject to high loads caused by forces, high speeds and shocks under extreme environmental conditions. During the carbonitriding process, the bearing surface is enriched both with carbon and nitrogen, which increases the surface hardness and wear resistance of the bearings.

Increase in performance thanks to Mancrodur

Spherical carbonitrides are formed when high-performance steel Mancrodur is enriched with nitrogen during the carbonitriding heat treatment process. A fine and even structure is produced. This increases the tapered roller bearings' surface hardness and wear resistance.

The wear resistance and improved structure ensures a significantly longer operating life during particle overrolling and mixed friction (boundary lubrication conditions). This leads to considerably higher machine efficiency in the application.

Specialist in large bearings

When it comes to large-size bearings, Schaeffler is recognized as an absolute specialist. Standard and special bearings from the INA and FAG brands with outside diameters of 320 mm and above have been leading the way in applications in heavy industry such as the metal and non-ferrous metal industries for several years now. Large-size bearings are machine components, and their quality and reliability is of decisive importance for the function and cost-effectiveness of the application. Schaeffler's wide range of designs and variants combined with our many years of experience ensure comprehensive expertise in large-size bearings that fulfills the special requirements of these applications.

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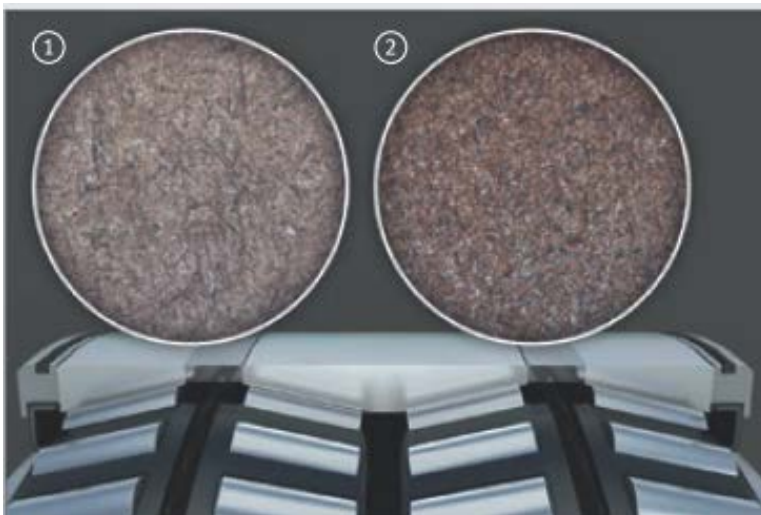
The Schaeffler Group is one of the world's leading integrated automotive and industrial suppliers. The company stands for the highest quality, outstanding technology, and strong innovative ability. The Schaeffler Group makes a decisive contribution to "mobility for tomorrow" with high-precision components and systems in engine, transmission, and chassis applications as well as rolling and plain bearing

solutions for a large number of industrial applications. The company generated sales of approximately 12.1 billion euros in 2014. With more than 82,000 employees worldwide, Schaeffler is one of the world's largest technology companies in family ownership and, with approximately 170 locations in 50 countries, has a worldwide network of manufacturing locations, research and development facilities, and sales companies.

The Industrial division supplies components and systems for around 60 industrial sectors via its worldwide organization with market proximity and its application support service. The range includes miniature bearings only a few millimeters wide through to large-size bearings with an outside diameter of several meters.

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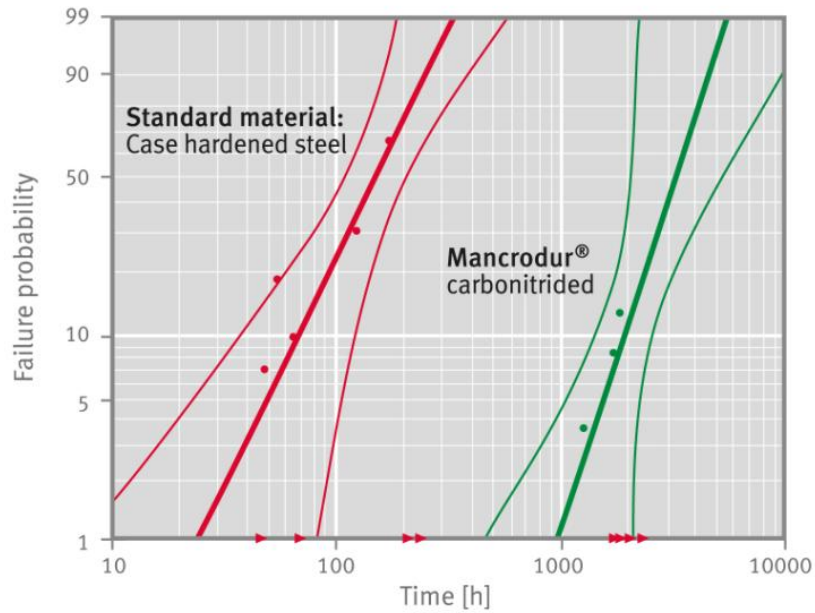
Images: Schaeffler



Spherical carbonitrides are formed when high-performance steel Mancrodur is enriched with nitrogen during the carbonitriding heat treatment process. A fine and even structure is produced.

The following are visible in the material structure:

- (1) Coarse-grained carbide distribution
- (2) Fine distribution of carbonitrides



Carbonitrided Mancrodur: lower wear and longer operating life



Double-row and four-row FAG tapered roller bearings of the Performance series are used as roll bearings in rolling mills.

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Press Release

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Comprehensive online monitoring concept for trunnion bearings in converters

DÜSSELDORF/SCHWEINFURT, *June 16, 2015.* One of the main demands of the steel processing industry is the highest possible availability of the main manufacturing systems. In the case of bottleneck systems such as converters in oxygen steelworks in particular, downtimes can involve costs of up to several millions for the plant operator. Schaeffler offers a solution for issue with its new comprehensive online monitoring concept for the trunnion bearings and gears of converters. We have integrated several monitoring concepts such as acoustic emission measurements, our proven oil particle analysis with the FAG Wear Debris Check, and checking the condition of grease with the FAG GreaseCheck into a unique condition monitoring system. This enables maintenance work to be planned and prevents costly unplanned downtimes caused by damage to bearings. Certified experts provide support with data evaluation and give their recommendations to customers.

With its range of bearings, housings and mounting services, Schaeffler has an integrated approach in addition to condition monitoring that offers operators optimum total cost of ownership (TCO).

Acoustic emission measurements

For the first time, Schaeffler is offering a condition monitoring system that uses the principle of acoustic emission measurement. This method is ideal for use with slowly-rotating trunnion bearings such as those used in converters. The otherwise usual method of measuring vibrations cannot be used reliably here, since the speeds are not high enough to generate sufficient energy to measure the structure-borne noise during overrolling of damaged areas of the bearing. Excessively short processes can also shorten the measuring time so that the resolution is too low.

Acoustic emission measurements, on the other hand, utilize the effect that plastic deformation or breakages occur in materials that are subject to loads beyond the elastic limit. This defect leads to a concentration of stresses followed by the formation of cracks and, ultimately, to a sudden release of the tension in the material. This short process generates an acoustic emission event that moves away from the source in the form of an ultrasonic wave and that can be measured.

Oil particle analysis - FAG Wear Debris Check

Wear in bearings or gearings manifests itself well before impending failure in the form of metal abraded particles. Damage to gearboxes lubricated with oil circulation and plain bearings can be detected at an early stage if this abrasion is measured and monitored. The FAG Wear Debris Check device measures the number of particles in the oil and transmits key values to the upstream monitoring system and records and evaluates the particle concentration according to size and material.

Due to slow speeds in the bull gear of converters, monitoring by means of vibration analysis is not possible. This means permanent oil particle analysis using FAG Wear Debris Check is required.

Grease quality measurement - FAG GreaseCheck

More than half of all rolling bearing failures are directly attributable to lubrication. Lubrication conditions, physical grease aging, or the proportion of solid and liquid contamination such as water in the lubricant have a decisive influence on bearing life.

By using the FAG GreaseCheck grease sensor and the corresponding analysis unit, it is possible to detect any changes in the condition of the grease during operation, long before any damage to the rolling bearing occurs. This means the time the grease is changed can be precisely planned and the operating life of the bearing can be extended. It also enables a switch from scheduled relubrication to relubrication according to requirements. In addition to measurement points for the acoustic emission sensors, FAG spheroidal graphite cast iron housings for converter bearings already include bores to install the FAG GreaseCheck.

Consolidating and evaluating measurement data – FAG ProCheck

Besides the total of over 60 ascertainable key values, the process parameters also need to be recorded as part of the monitoring strategy. The FAG ProCheck monitors representative key values and prepares them for display on the plant visualization system. The alarm function on FAG ProCheck reports any faults and errors that may have occurred. Schaeffler service engineers can then evaluate and analyze these faults via remote access and give detailed recommendations regarding what action needs to be taken.

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Images: Schaeffler



The FAG Wear Debris Check device measures the number of particles in the oil and transmits key values to the upstream monitoring system and records and evaluates the particle concentration according to size and material.



By using the FAG GreaseCheck grease sensor and the corresponding analysis unit, it is possible to detect any changes in the condition of the grease during operation.



The FAG online monitoring system ProCheck monitors representative key values and prepares them for display on the machine.

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Press Release

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Bearing solutions for continuous casting plants – the CoCaB range now includes large spherical plain bearings with plastic plates

DÜSSELDORF/SCHWEINFURT, *June 16, 2015.* For decades, Schaeffler has offered rolling bearing and service solutions for use in plants and applications for producing and forming steel and nonferrous metals. The Continuous Caster Bearing (CoCaB) range is customized to suit the requirements of continuous casting plants and includes ELGES large spherical plain bearings for ladle turret lever arms, full complement FAG cylindrical roller bearings, open and sealed FAG spherical roller bearings for strand guide rolls, and INA needle roller bearings for the rolls used in the upper sections of the continuous casting plant. Split FAG spherical roller bearings and INA cylindrical roller bearings are available for installation in driven rolls. The CoCaB range has now also been expanded by the addition of ELGES large spherical plain bearings with plastic plates. The glass fiber reinforced plastic (GRP) contains PTFE additives and, just like bearings with the proven ELGOGLIDE sliding layer, these bearings provide a very long operating life. Special FAG bearing housings with circulating cooling water complete the CoCaB product range.

ELGES spherical plain bearings for ladle turrets

ELGES spherical plain bearings have been successfully used in ladle turret lever arm steering systems worldwide since 1975. Depending on the turret size, the nominal dimensions range from 180 mm to 600 mm. The bearings, which swivel and are subjected to a unilateral load, can fully demonstrate their advantages under these conditions: They have a high load carrying capacity, a space-saving design, and are maintenance-free. The most important of these advantages – the extremely long bearing operating life – is due to the high-performance sliding materials and the optimum product design.

The maintenance-free ELGOGLIDE sliding layer is made from PTFE fabric with support fibers that is embedded in a resin matrix and bonded with high strength to the steel support body. The advantages of bearings with ELGOGLIDE are their total freedom from maintenance and very high load carrying capacity, especially in the case of very high unilateral loads and swiveling motion. The optional ELGOGLIDE W11 variant allows particularly low-friction sliding even at low pressures.

The ELGES family of large spherical plain bearings has now been expanded to include a design equipped with plastic plates. The glass fiber-reinforced plastic

(GRP) contains PTFE additives and also provides a very long operating life. The bearings have initial lubrication when delivered, an occasional relubrication extends the operating life even further. These bearings are therefore very easy to maintain. Depending on the individual application, both sliding materials – ELGOGLIDE and plastic plates – can be used in ladle turrets. Schaeffler's application engineering specialists are on hand to assist you in selecting and designing the correct bearings. In addition to radial spherical plain bearings, the CoCaB range also includes axial spherical plain bearings. These are used in the bearing supports of the hydraulic cylinders that are responsible for steering the lever arms in ladle turret applications.

The option of reconditioning is also available for both the ELGOGLIDE and glass fiber-reinforced plastic baseplate versions, which allows the bearings to be restored to virtually new condition.

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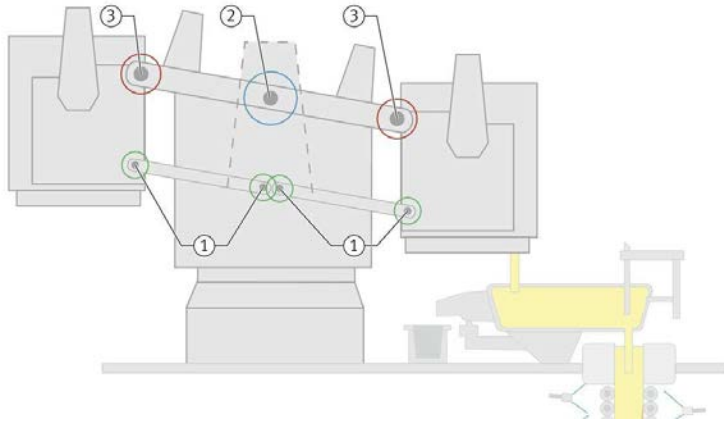
Images: Schaeffler



ELGES large spherical plain bearings with a sliding layer made from glass fiber-reinforced plastic (GRP) and PTFE: The sliding layer (1) of the GE...-DF large spherical plain bearing series can be optimally relubricated, which extends the operating life.



ELGES spherical plain bearings with ELGOGLIDE and seals on both sides: Bearings in the GE...-DW-2RS2 series have a very high load carrying capacity due to their ELGOGLIDE lining.



Example of a spherical plain bearing arrangement in a ladle turret using ELGES spherical plain bearings.

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