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SKF's new high-capacity cylindrical roller bearings are specifically designed for wind turbine gearbox applications, offering high performance and improved reliability.

SKF HAS INTRODUCED A NEW VERSION of its high-capacity cylindrical roller bearings in a separable design that enables the separate mounting of inner and outer rings. The new SKF Separable High-capacity Cylindrical Roller Bearing merges the advantages of separate mounting and high load-carrying capacity. In launching this version, SKF builds further on the success of its high-capacity cylindrical roller bearings in wind turbine applications, first introduced in 2006. These bearing designs offer increased radial load-carrying capacity to cope with high load conditions while at the same time has the advantage of being capable of coping with low load conditions.

This new bearing has been developed as a response to the requirements of non-locating positions on high-speed shafts and high-speed intermediate shafts. The bearings offer easy mounting, dismounting and maintainability for high-speed shafts in the spur gear section, coupled with improved reliability and operational safety. The design comprises a one-piece solid brass cage incorporating a high-capacity cage pocket design that is guided on the inner ring. Separate mounting is achieved by a cage design that features a retaining function of the rollers. This retaining function ensures that the rollers can't fall out during mounting and dismounting. The outer ring with roller and cage assembly can be separately mounted into the housing and the shaft, with its mounted inner ring, can easily be fitted afterward.

During mounting, the rolling elements are protected by the cage, reducing the risk of damage. The cage design also features an optimized roller drop, which helps to facilitate mounting. The inner-ring guided cage counteracts the risk of slip damage at high speeds where the bearing may have to cope with minimum load conditions. The rotating inner ring, being in contact with the cage in the adjacent area outside the contact zone of rolling elements and bearing rings, drives the cage, resulting in improved kinematics of the rolling element set.

A significant reduction in a harmful sliding motion of the rolling elements on the raceways, especially under very low load conditions, has been confirmed through various tests. The new bearing can cope with this demand of minimum load requirements. Combined with increased load carrying capacity, it leads to reduced risk of premature bearing failure and increased operational safety.

Turbines are getting larger now, with higher power ratings up to 7.5MW and with 10MW in the planning stages. Coupled with this, wind farms are located offshore or in remote locations and harsh environments, putting added emphasis on reliability. Gearbox failures are regarded as one of the most serious causes of breakdown in wind turbines because of the high cost of repairing or replacing the gearbox and the resulting long downtime.

For bearings in wind turbine gearboxes, these demands require better performance through higher operational reliability to comply with higher loads and to keep the design as compact as possible. The high-capacity cylindrical roller bearing versions offer substantial performance improvements and increased operational safety on the different bearing positions in a wind turbine gearbox. The newly developed separable high-capacity version is suitable for use by original equipment manufacturers in new designs and as a retrofit solution, where turbines suffering gearbox bearing failures could benefit from an improved bearing design. The new bearing conforms to standard ISO dimensions, making replacement straightforward.

The existing SKF family of high-capacity cylindrical roller bearings has been successfully used in planetary stages of wind gearboxes. The new separable bearing meets maintenance and inspection requirements, such as when the dismounting of high-speed shafts needs to be carried out directly on top of the turbine. In this situation, a separable cylindrical roller bearing design facilitates the task.

SKF Separable High-capacity Cylindrical Roller Bearings will be available in two different dimension series for the two different shaft positions. The 22 series is mainly for high-speed shafts, and the 23 series is mainly for high-speed intermediate shafts. Both of the series bearings have been designed to meet the various requirements of higher load-carrying capacity along with reducing slip and risk of wear and having a separable bearing design. Both the 22 and the 23 series will cover bore diameter sizes from 100 millimeters up to 240 millimeters.

The increased load-carrying capacity enables higher operational safety margins by keeping the same geometrical size or by maintaining the current load-carrying capacity safety level built into a smaller and more compact bearing. SKF Separable High-capacity Cylindrical Roller Bearings and high-capacity cylindrical roller bearing versions help customers achieve high reliability, excellent performance, and easy maintainability in their applications.

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