

2010-06-08 | 000-002-383 DE-EN

SCHAEFFLER TECHNOLOGIES GMBH & CO. KG, SCHWEINFURT

FAG tube roller bearings

Slippage? – No problem!

Slippage is the natural enemy of bearings. Schaeffler Group Industrial is presenting its first rolling bearing that is not only resistant to the effects of slippage but also prevents slippage from occurring in the first place – the new FAG tube roller bearing. The special feature of this bearing is that it contains three newly developed tube rollers instead of conventional rolling elements. They enable the bearing to rotate without slippage under all load conditions. At the same time, the load rating and rating life are not affected.

Rolling bearings require loads

Contrary to popular belief, a rolling bearing can be negatively influenced not only by overloading but also by underloading. Or, to put it another way – rolling bearings are designed for a minimum load that is necessary for optimum function. If this minimum load is not present, so-called slippage occurs. This means that the rolling elements not only rotate, but sometimes slide on the raceways. This can ultimately lead to surface damage such as increased wear or smearing, especially in critical lubrication conditions.

Rolling bearings in wind turbines must meet special requirements. They must be designed for extremely low and high loads that act on the bearing during calm or strong wind, for example. The risk of damage significantly increases when the roller set of a rolling bearing with high slippage is abruptly subjected to extremely high acceleration forces. This is why Schaeffler Group Industrial has developed a rolling bearing that completely prevents slippage from occurring – the tube roller bearing.

Hollow tube rollers with interference

The tube roller bearing is a conventional cylindrical roller bearing that includes three cylindrical rollers with a slightly increased diameter. These three rollers are designed as hollow tube rollers and supported by a support roller in the inner bore. The rollers with a slightly increased diameter generate preload in the bearing and drive the bearing cage and thus the entire roller set at low loads. The bore in the cylindrical rollers on the other hand ensure sufficient deflection of the enlarged rollers at higher loads so that that they are not subject to overloading. Subsequently, the load is evenly distributed to all rolling elements as in a conventional bearing.

The support roller in the inner bore of the tube roller has a slight clearance to ensure that the roller is less rigid at higher loads. At the same time, it prevents excessive deflection of the tube roller. Tube roller and

support roller form a combination with increased fatigue strength, which gives a rigid rolling element that withstands even peak loads.

The tube roller bearing is not available as a standard catalog product. It is specially designed for a project or application. First prototypes have been manufactured and tested. Pilot applications in wind turbine gearboxes are planned for the end of 2010.

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- Press picture "00016CAE.jpg"  
(Figure: Schaeffler Group)

- Press picture "00016CB6.jpg"  
Three tube rollers instead of conventional rolling elements enable the bearing to rotate without slippage under all load conditions.  
(Figure: Schaeffler Group)

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