

Press release

Bearings for conveyor belt rollers in adverse operating conditions – Support and tensioning rollers are critically important for conveyor belts

Steyr, Austria, July 2020. Roller bearings are some of the most important components of support and tensioning rollers in conveyor belts. To enable conveyor belt rollers to operate in extreme conditions such as transporting sand or rock for mining, NKE Austria GmbH has developed single-row deep groove ball bearings. They have optimised performance capabilities and longer service life compared with standard bearings, reducing downtime for the entire conveyor system.

The primary purposes of the support and tensioning rollers in a conveyor belt are to shape the belt, serve as a support element for the material that is to be transported, and reduce resistance to movement. When the material is transported with minimal friction, the overall energy required for transportation is reduced, thereby also reducing the operating costs. In an open-cast mining environment the conveyor belt rollers are exposed to harsh operating conditions and environments: heavy loads, vibration and shaft deflection stresses, high rotating speeds, increasing load from external contamination, and demanding weather conditions such as high humidity, rain or snow. The tremendous pollution in the mining environment creates conditions for impurities to infiltrate the bearing point and can lead to premature equipment failure. This not only shortens the service life of the bearing, but it also has negative consequences for the performance and reliability of the other components of the conveyor system.

After extensive analyses, NKE has developed single-row deep groove ball bearings especially for conveyor belt rollers that operate in harsh conditions. With a completely re-engineered design, it has succeeded in making targeted improvements that optimise performance capability and service life compared with standard bearings. These bearings have a special cage construction of low-friction synthetic material, improved raceway geometry, adjusted radial internal clearance, special low friction seals and a selected lubricant for use in a broad operating temperature range.

The new design from NKE is able to sustain operating demands to which conveyor rollers are exposed even where conventional bearings fail. When contaminants infiltrate the interior of the bearing, standard bearings often suffer from a sudden, uncontrolled rise in temperature. The increased temperature impairs the positive lubricant properties, destroys the steel cages and ultimately causes the bearing to seize up. When bearings seize, they in turn block the rollers, the conveyor belt is damaged, and the risk of fire increases significantly.

Despite relatively high contamination levels, NKE roller bearings for conveyor belt rollers maintain their function even under heavy loads and without increased frictional torque. The new bearing concept from NKE, designed especially to withstand the requirements of conveyor belt rollers, offers a range of advantages: it reduces the risk of fire, prolongs the service life of the roller bearings in the harshest conditions, reduces energy consumption, increases the conveyor system's reliability and lowers overall operating costs.

"NKE has tremendous expertise in mining applications," says Michael Rößl, Applications Engineer with NKE in Steyr. "This is an extremely complex engineering achievement in response to the wish expressed by many customers for improving the functional capability of conveyor belts. Our new roller bearing system will help to substantially lower outage times in material transportation." The new bearing design ensures frictionless rolling processes, thus helping to minimise friction throughout the entire system, and makes it possible to run the transport system more cost-efficiently and more reliably. "In order to achieve the best possible results, measures to prevent particulate contaminants from penetrating the bearing and the bearing interior as completely as possible must begin with the plant developer or the plant operator installing external sealing systems," adds Michael Rößl.

Images:

Image 1: Conveyor belt rollers in a conveyor belt system (*Image source: NKE*)

Image 2: Bearing concept for conveyor belt rollers (*Image source: NKE*)

Image 3: Conveyer belt for transporting rock in mining applications (*Image source: AdobeStock/NKE*)

Link to product brochure:

https://www.nke.at/images/brochures/english/NKE_Conveyor_EN.pdf

Company information:

NKE Austria GmbH is a bearing manufacturer with headquarters in Steyr, Austria. The company was founded in 1996 by a group of senior staff members of former company Steyr Wälzlager. Spanish bearing manufacturer Fersa Bearings, which is specialised in the automotive sector, acquired 49 percent in NKE in 2016 and completed the acquisition with 100 percent at the end of 2018. NKE offers both standard and special bearings for all industrial applications. Engineering, product development, production and final processing of components, assembly, quality assurance, logistics, and sales and marketing are centralised at its Steyr headquarters. The factory in Steyr is certified to ISO 9001:2008, ISO 14001:2004 and OHSAS 18001. A wide range of standard bearings is available from stock or at short production lead-times. NKE also provides customized products and solutions. In addition to product development and application engineering NKE provides a full range of technical services, consulting, documentation and training. NKE's products are distributed through 12 international offices and more than 240 distribution outlets in 60 countries.

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