The Quick Fix: Rexnord Solves Bearing Installation/ Removal Challenges

At a Midwestern producer of tubular steel products, measures taken to counteract the effects of impact on a quench tank roll made it difficult to remove and replace the conventional pillow block bearings that support the roll's shaft. The bearings were replaced with adapter mount roller bearings that are easier to install and also will be easier to remove. The mill produces oil and gas well casing steel and line pipe in diameters from 7" to 16", with wall thicknesses up to 1/2".

Previously, as the head end of a tube entered the quench tank to be cooled, impact tended to move the shaft that supported the roll to one side because the former bearings did not lock tightly enough to the shaft. To keep the shaft centered, the company welded steel washers to the end of the shaft. This made it difficult to remove and replace the bearings. The company's maintenance planner and supervisor explains, "Any time we changed a bearing, we had to cut the washer off and dress the shaft. If the bearing was there for a long time, the mill scale, dirt and grease would build up, and we couldn't get the bearing off of the shaft."

Rexnord ZA6215F adapter mount roller bearings with Shurlok technology incorporate a tapered locking sleeve to maintain bearing position on this quench tank.

The design of the replacement bearings addresses this common problem by incorporating a withdrawal sleeve into each bearing. As the adapter nut is unthreaded, the design automatically pulls the tapered adapter sleeve from the assembly, releasing the bearing from the shaft without causing damage, which saves both time and repair costs.

Bearing installation also could be problematic for the mill. The company's maintenance planner says, "The bearings we had on previously just had locking collars with no taper at all. Because things didn't work there in the past, we were just buying regular pillow blocks and tapping them in place ourselves."

To address the problem, the company selected Rexnord ZA6215F adapter mount roller bearings with SHURLOK® technology for the application because they incorporate features that eliminate the previous installation and removal problems. These bearings are utilized in industries such as forestry, mining, steel, cement/aggregate and air handling. They come equipped with a positive locking system, tapered mounting sleeve, hourglass rolling elements and super-finished raceways and rollers.

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These features allow for quick and easy installation, reduce shaft damage caused by loose mountings, provide three degrees of static and dynamic misalignment and provide a cool running, quiet, high speed and high load capacity design. An innovative tapered sleeve design maintains mounting tightness during operation, provides 35 percent greater shaft grip than other adapter sleeve bearings, and allows for better shaft grip in the mill's application. To ensure a correct installation, the new bearings incorporate SpyGlass™ Optical Strain Sensing (OSS) technology, which provides visual feedback that tells the installer when the bearings have been correctly tightened to the shaft. The sensor incorporates materials that respond to strain by changing reflected light wavelengths. It is calibrated so that the window stays clear until there is enough strain on the locknut to provide a sufficient load. At that point, the OSS window changes color, showing that the bearing is correctly installed.

Operating conditions for the bearings include the effects of impact, as well as typical mill scale, dirt and grease. The spokesperson says the bearings have performed well since their installation in early 2008. He reports that the company is considering using them on other applications in the mill based on their combination of features and performance.

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(Above) Bearings operate in a difficult environment on this quench tank application. Impact of tubes entering tank caused the roller shaft to move sideways with previous bearings.

(Right) Optical Strain Sensing (OSS) technology in new bearings changes color to tell the installer when the bearings have been correctly tightened to the shaft.

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