

Schaeffler Global Technology Solutions

Steel and
non-ferrous metals

Integrated Bearing and Service Solution for Converters

The customer is a leading European steel manufacturer with several production plants. Its annual production of crude steel exceeds 10 million tons.

Challenge for Schaeffler

The oxygen steel plant operates two converters. The customer wished to replace converter 1 and – at the same time – increase this vessel's size to a capacity of 400 tons. This application demanded a highly ambitious solution for the trunnion bearing itself as well as for the newly designed ferrocast housing. As the converter is an absolutely critical bottleneck to the downstream inline production processes and the customer had already had excellent experiences with Schaeffler condition monitoring solutions, the customer decided to have the bearings and gears monitored. However, the process made it impossible to employ a standard vibration measurement solution. So a multitude of different monitoring methods had to be combined into an integrated system.

Schaeffler Solution

In cooperation with the converter OEM, Schaeffler developed a custom-tailored solution that stands out due to a new ferrocast housing design for highest durability. Split spherical roller bearings as spare parts ensure bearing replacements within the shortest possible time whereby shutdown cost are reduced significantly.

The accompanying condition monitoring solution comprises the monitoring of the trunnion bearing with acoustic emission (AE) and online grease analysis, force transmission into the floating bearing housing with strain gauges, axial displacement of the floating bearing, vertical deflection of trunnions, and gear-box monitoring with online oil particle analysis. In addition, the service package included the mounting of the trunnion bearings as well as remote monitoring.



Technical Information about the Converter

Converter capacity:

400 tons

Annual production:

approx. 5 Mio. tons

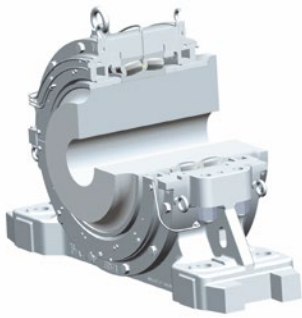
Operating temperature:

max. 1750 °C

Year of manufacture:

2013





A standard KPGZ plummer block housing was modified in accordance with the application requirements



Electronic analysis system and grease sensor



The recorded data is remote-analysed by the Schaeffler remote monitoring service

Customer Benefit

The customer received all-round support in the reconstruction of the converter. This solution included construction, engineering and delivery of a new converter bearing housing of a design that represents an innovative, state of the art solution. Completed by the various condition monitoring solutions, the advantages can be summarised as follows: Longer bearing life due to the innovative housing design. This means lower maintenance and downtime costs for the entire converter.

Saving potential	
Price of crude steel:	€ 250 t
Volume of one batch:	400 t
Price of one batch:	€ 100 000
Production volume per day:	20 batches
Unplanned bearing damage and downtime:	5-7 days
Production loss:	€ 10-14 M

What's special

Thanks to the close cooperation between the OEM and all Schaeffler departments involved, the customer received a solution that was perfectly matched to its needs. This was made possible by a tailor-made housing design, which features ready-to-use mounting points allowing immediate installation of the acoustic emission unit as well as the FAG GreaseCheck.

Technical Information about the Solution

Converter's floating bearing:

Split spherical roller bearing
Z-537284.PRL

Locating bearing:

Spherical roller bearing
Z-541835.249/1120-B

Housing:

- F588998.01.KPGZ/491120-FD-A
- KPGZ/491120-I-D-AC

Converter gear bearings:

Cylindrical roller bearing
F-605486.ZL

Condition monitoring:

- Acoustic emission
- Online grease analysis
- Oil particle analysis
- Force transmission into housing
- Shaft and bearing displacement

Schaeffler services:

- Mounting
- Remote monitoring