

Rolling bearings in winders from SIEMAG TECBERG



Figure 1 - Winder from SIEMAG TECBERG, Palabora Mining Company, South Africa

Plant photograph: SIEMAG TECBERG

SIEMAG TECBERG is a market leader in the field of winders. Customer-specific complete solutions or individual components, such as those for shaft winders, are used worldwide in deep mines and opencast mines. SIEMAG TECBERG and Schaeffler Technologies GmbH & Co. KG have been working closely together in this field for many years. A description is given here of the bearing arrangement of winders used by the Palabora Mining Company in South Africa, *Figure 1*.

An opencast copper mine is being run there. After the opencast mine reached its maximum usable depth, a deep mine was started below the last opencast mine level.

The twin shaft system, comprising a production shaft and a service shaft, joins the deep mine with the surface of the opencast mine. The bottom depth is approx. 1 400 m.

SIEMAG TECBERG supplies Koepe winders for both shafts:

- two 4-rope winders with an integral drive for the production shaft
- one 6-rope winder with an integral drive for the service shaft
- one 2-rope winder for the personnel hoist.

For these applications, the Schaeffler Group supplies the bearing arrangement, deflection sheaves and other equipment.

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Technical data

■ Drum diameter	6 200 mm
■ Operating load, max.	170 t
■ Motor power, max.	6 400 kW

Bearing arrangement for main shaft

The main shaft of the winder is supported by two spherical roller bearings F-578799.01.PRL with a rotating outer ring, *Figure 2*:

■ Outside diameter	1 600 mm
■ Inside diameter	1 320 mm
■ Width	280 mm

Bearing arrangement for deflection sheaves

Each deflection sheave is supported by two tapered roller bearings F-803738.TR2S in an adjusted arrangement with an intermediate ring set, *Figure 3*:

■ Outside diameter	482,600 mm
■ Inside diameter	355,600 mm
■ Width	60,325 mm

Bearing rating life

The calculated rating life of the spherical roller bearings is:

- 105 000 hours in a 4-rope winder
- 58 000 hours in the 6-rope winder.

This corresponds to the requisite machine service life of 25 years.

The calculated rating life for the tapered roller bearing units in the deflection sheaves is more than 200 000 hours.

Lubrication

The bearings are greased using Arcanol TEMP120, a lithium soap grease with EP additives. Each spherical roller bearing receives an initial greasing of 25,2 kg and is then relubricated each month with 1,3 kg via a circumferential groove and three lubrication holes. If a continuous lubricant supply is present, greasing is carried out at the rate of 22 g/h.

The tapered roller bearing unit receives an initial greasing of 13 kg and is then relubricated every six months with 170 g via a circumferential groove and six lubrication holes in the outer intermediate ring. Continuous lubricant supply is not possible.

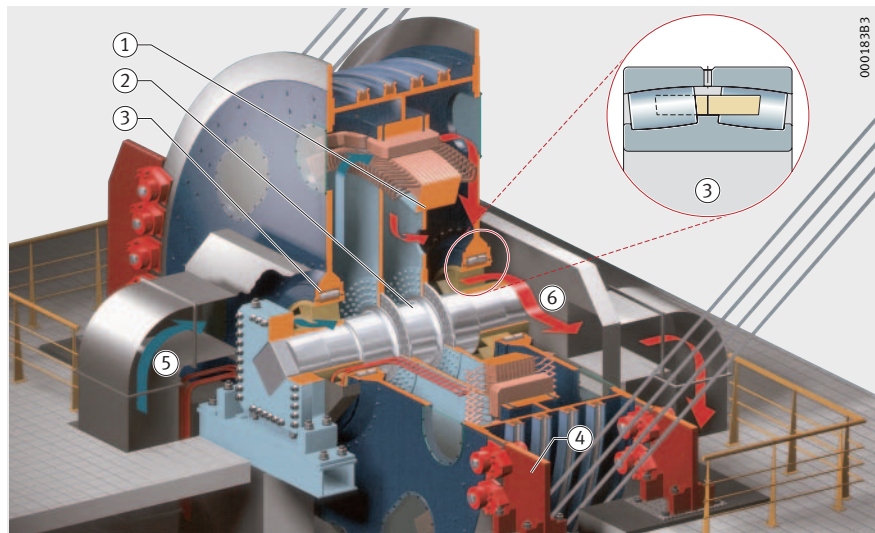


Figure 2 · Structure of winder with integral drive

- ① Motor
- ② Main shaft
- ③ Spherical roller bearing
- ④ Braking unit
- ⑤ Coolant air inlet
- ⑥ Hot air outlet

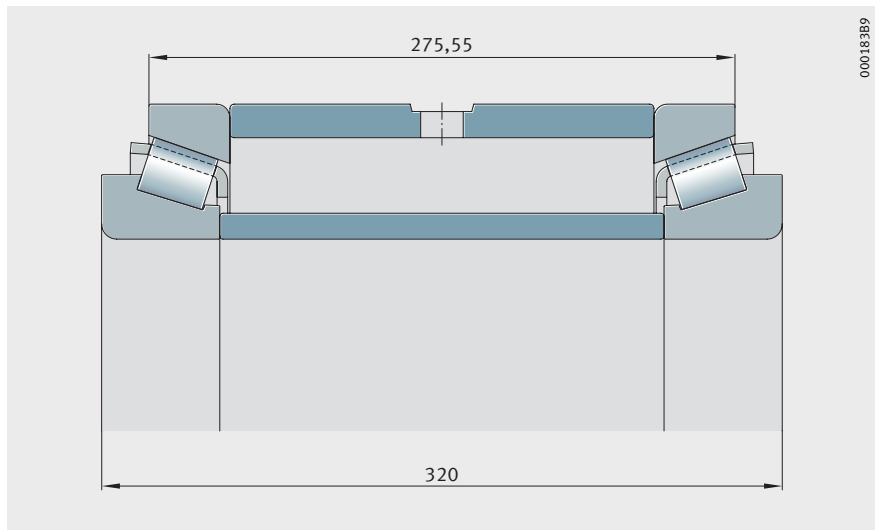


Figure 3 · Adjusted bearing arrangement for deflection sheaves

Schaeffler Technologies AG & Co. KG

Mining & Processing
Postfach 1260
97421 Schweinfurt
Germany

Phone +49 9721 91-0

Fax +49 9721 91-3435

E-Mail mining_processing@schaeffler.com

Internet www.fag.com