Roller Bearings in SIEMAG Mine Hoist and Sheaves

FAG

Examples of Application Engineering

WL 14 510 EA

SIEMAG Mine Hoist at Palabora, Mining Company, South Africa

Courtesy: SIEMAG

SIEMAG is the international leader for development, planning, design, manufacture, erection and commissioning of complete hoisting and hydrohoisting systems. SIEMAG systems and equipment operate in underground and open pit mines worldwide.

One of the fields, where SIEMAG plays a leading role in the development, are Shaft Hoisting Systems. SIEMAG provides complete tailor made solutions of turnkey systems as well as all individual components. Schaeffler KG has been working closely together with SIEMAG for many years.

One big project was to deliver FAG Special Roller Bearings for mine hoists produced by SIEMAG for the Palabora Mining Company. This company operated primarily an open-cast copper ore mine in South Africa.

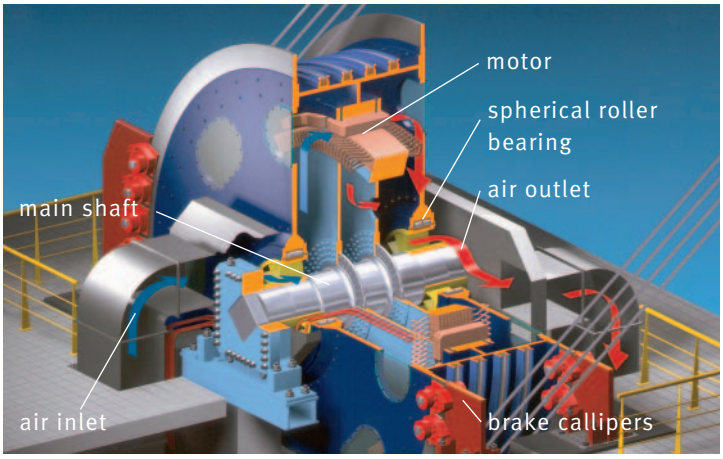
As the maximum useable depth was reached, and because of the extension of the ore body to greater depths, a decision was taken in favour of future underground mining via a twin shaft system with a depth of approx. 1400 m.

SIEMAG supplied the winding equipment for both shafts:

- two 4-rope winders with an - integrated drive for the production shaft.
- additional a 6-rope winder for the service shaft, also with integrated drive and
- 2-rope auxiliary winding engine for man-riding was included.

The scope of supply also included deflection sheaves.

Schema at hoisting with integrated drive



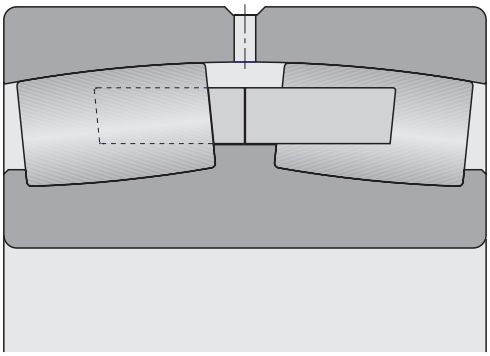
Technical data

pulley diameter	6 200 mm
max. operating rope load	170 t
max. driving power	6 400 kW

Bearing arrangement

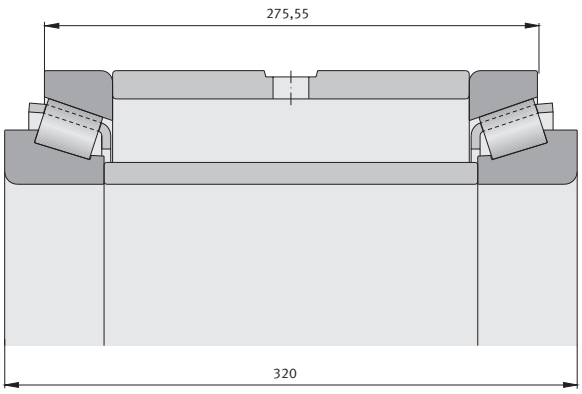
FAG delivered the roller bearings for the winders as well as for the sheaves. The winders are supported by two spherical roller bearings:
248/1320-B-MB-C2 (ø1 320 × ø1 600 × 280 mm)

Main bearing for hoistings



For the sheaves, adjusted FAG tapered roller bearing units with a spacer set were used.
Tapered roller bearing unit **F-803738.TBR** consisting of:
- 2 Tapered roller bearings **Z-505695.TBR** (ø355,6 × ø482,6 × 60,325 mm)
- 2 Spacers

Adjusted bearing for the sheaves



Bearing life

The calculated lifetime for the bearing 248/1320-B-MB-C2 is:
– 105 000 hours for the production winder
– 58 000 hours for the service winder. This conforms the required maschine-life of approximately 25 years.
The calculated life for the tapered roller bearing unit 803738.TBR is for the production and the service winder sheaves more than 200 000 hours.

Lubrication

The bearings are lubricated with grease. FAG has recommended the proven lithium soap base grease Arcanol LOAD 400 (old FAG designation “Arcanol L186V”) with EP additives.
For the spherical roller bearing FAG 248/1320-B-MB-C2, FAG recommended an initial grease quantity of 27,4 kg for each bearing and a relubrication interval of 1 month (corresponding to a grease quantity of 1,5 kg each bearing). Alternatively FAG suggested a continuous relubrication with 22 g/h.
For the tapered roller bearing unit FAG 803738.TBR, FAG recommended an initial grease quantity of 13 kg each bearing unit and a relubrication interval of 6 months (corresponding to a grease quantity of 0,17 kg for each bearing unit).
The relubrication of the bearing should be effected through the circumferential groove and its 6 lubrication holes on the spacer between the two outer rings.

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