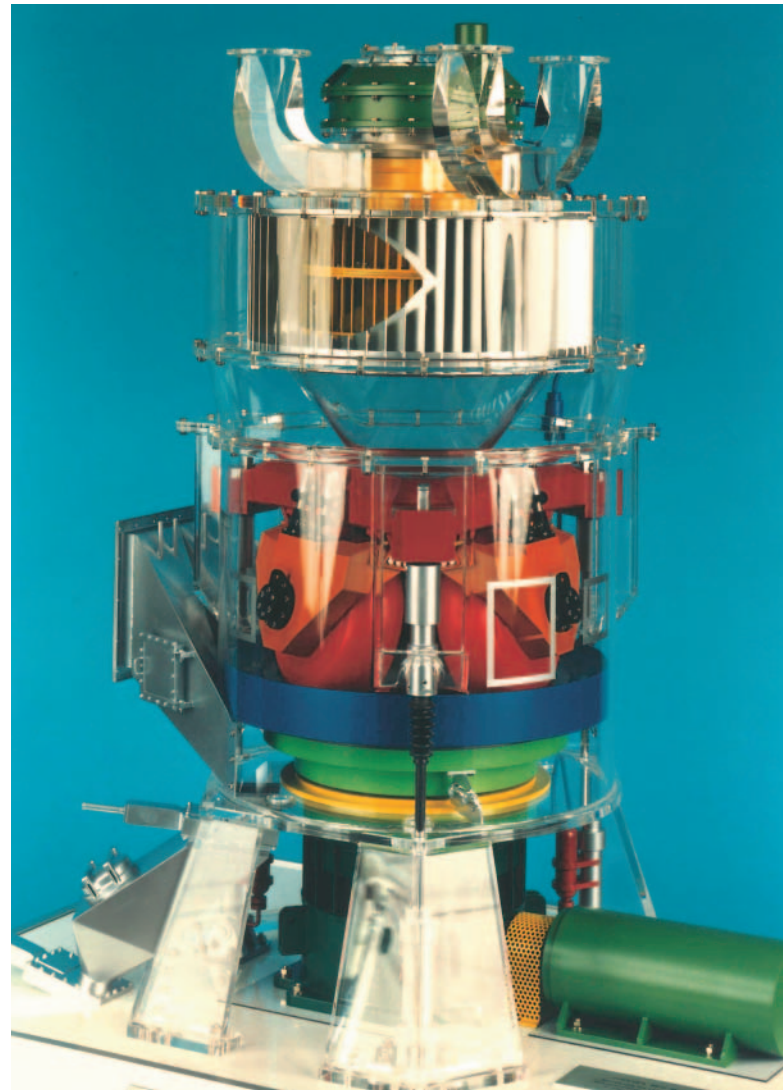
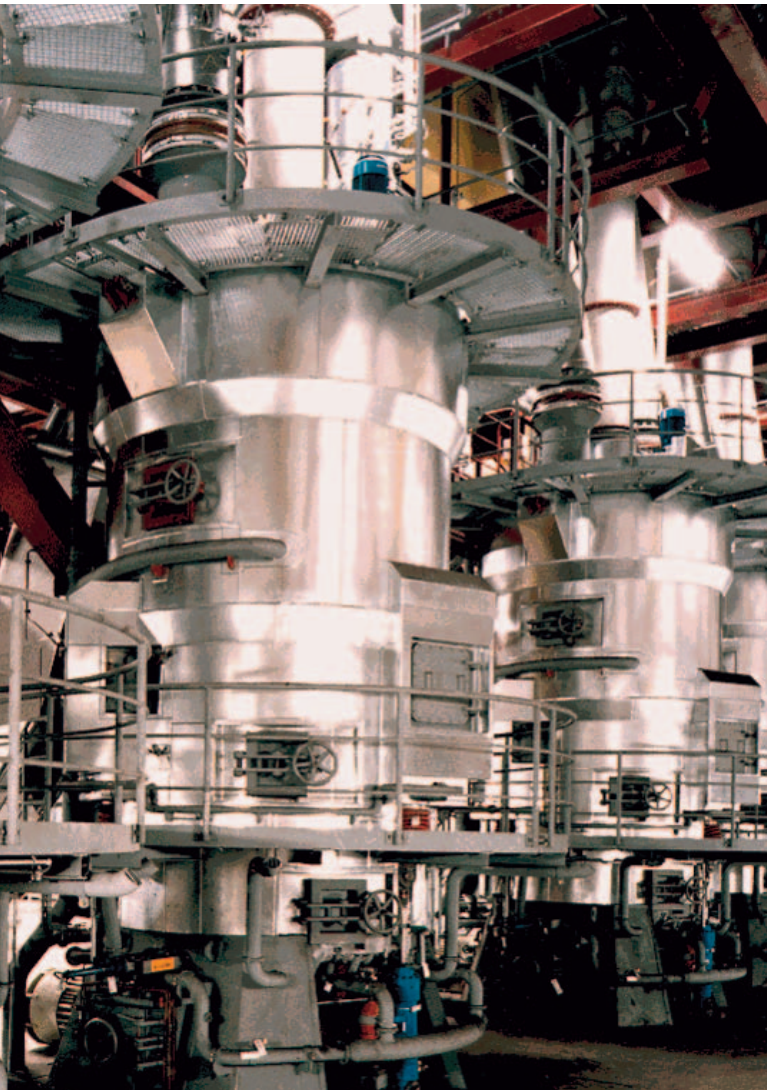


Rolling Bearings in Air Separators of Vertical Grinding Mills



Examples of Application Engineering

WL 21 511 EA



Vertical grinding mill MPS200 and model built by Babcock Hitachi Europe (BHE)

Photos: Courtesy of BHE

The MPS vertical grinding mills built by Babcock Hitachi Europe are designed for maximum productivity and are in use in numerous coal-fired power plants.

As a rule, these mills are used to pulverise, dry, separate and distribute bituminous coal as well as difficult-to-grind lignites with relatively low water contents for direct injection into the furnace.

Even extremely hard coal can be pulverised very finely in these mills in all load conditions without problems.

The MPS vertical grinding roller mills now built by the Babcock Hitachi (BHE) Group were first built in 1958 by the German manufacturer Pfeiffer for crushing and pulverising cement. In early 1960, the bowl and roller mills were modified by Babcock.

The air separators of the mills have to meet high requirements with regard to process technology and operational safety.

To date, the dynamic air separators (type SLS) were driven via a pinion gear.

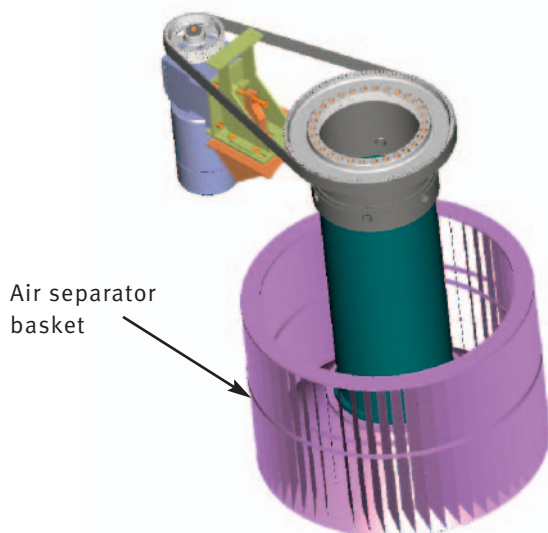
These required four point bearings with a toothed outer ring.

Requirements on bearing arrangement and bearing design

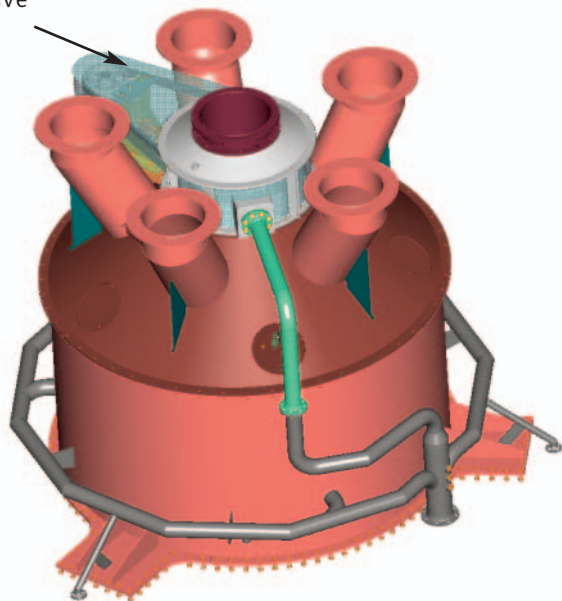
- Accommodation of the radial loads (belt pull and imbalance)
- Low-maintenance grease lubrication
- Bearing life demanded by the operator
 $L_{h10} > 100\,000$ hours
- Operating temperatures up to 120 °C

The air separator's drive system has now been modified, and FAG experts from the Mining & Processing department, in cooperation with BHE design engineers, have redesigned the air separator bearing arrangement in such a way that more favourably priced lowmaintenance FAG standard bearings can be used and the air separator can be driven via a belt drive.

Drive system



Belt drive



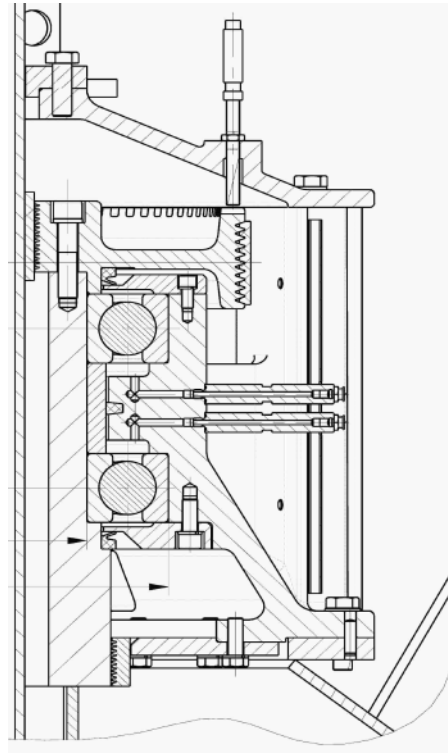
Drawing courtesy of Babcock – Hitachi – Europe

Air separator bearing arrangement

The bearings have to meet high requirements. In order to safely accommodate the stresses caused by external loads and the air separator's imbalance, the original bearing (toothed four point bearing) has been replaced with two standard deep groove ball bearings

618/750-MA.

The bearings have an outside diameter of 920 mm, a mass of 114 kg and a dyn. load rating of $C_r = 510$ kN.



In order to evenly distribute the alternating axial load on both bearings, the deep groove ball bearings were mounted in tandem (N13EA).

Lubrication

The air separator bearings of the MPS200 are lubricated with Arcanol LOAD400, a lithium soap base grease of consistency class 2 with EP additives.

With this FAG grease, no relubrication is required during operation. This means that the grease is replaced during regular inspections.

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