

Rolling Bearings in Vertical Mills Built by Gebr. Pfeiffer AG, Germany

FAG

Examples of Application Engineering

WL 21 509/2 EA



MPS vertical roller mill built by Gebr. Pfeiffer AG, Germany

Gebr. Pfeiffer MPS mills have been used successfully for decades for grinding, classifying and drying mineral bulk material.

This type of mill offers the following advantages:

- low specific pressure level,
- optimal utilisation of the waste heat from rotary kilns and cooling systems,
- accurate control,
- low noise,
- only one mill is needed for grinding, drying and classifying.

Photo: Gebr. Pfeiffer

The cement industry uses MPS mills for grinding cement raw meal, coal, cement additives as well as cement clinker. Vertical roller mills for grinding cement raw meal and coal are the standard today in numerous cement plants.

Various improvements have been

achieved in the past few years in the areas of maintenance, wear protection, classifying efficiency of classifiers and pressure losses in mills.

With the exception of coal mills, MPS mills are equipped with an

external material feed system to reduce pressure losses. Thanks to the optimal design of the nozzle ring, a fluidized bed above the nozzle ring is still used for high-efficiency drying of the raw material, even at reduced gas speeds of 40–50 m/s.

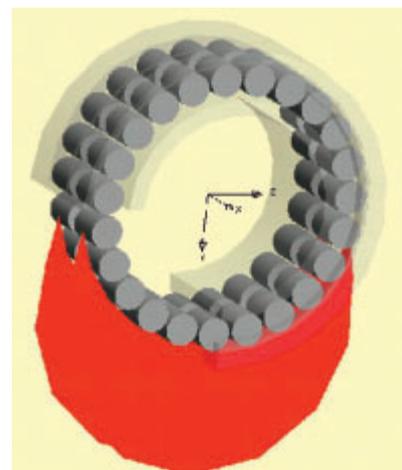
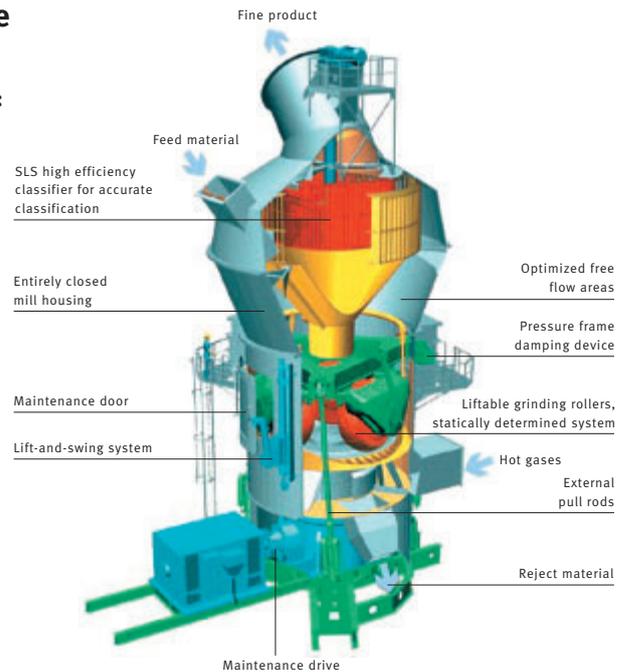
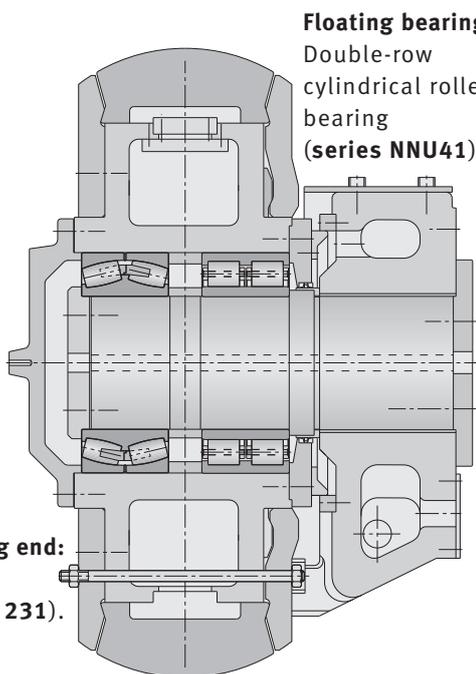
High radial load carrying capacity

Double-row FAG cylindrical roller bearings with through-bored rollers and pin-type cages at the floating bearing end incorporate the largest possible number of rolling elements per row and guarantee a high radial load carrying capacity.

Locating bearing/floating bearing function

The cylindrical roller bearing design selected for this application compensates freely for length variations because the rollers can freely shift on the inner ring. The spherical roller bearing serves as the locating bearing and transmits the axial forces from the grinding process.

Bearings supporting the grinding rollers in the vertical mill



Long bearing life

A calculation of the “attainable life” L_{hmr} using the FAG calculation method yielded values of ca 1,5 times the rating life L_{h10} . This calculation method takes into account the influence of loads and operating conditions such as temperature, lubrication (lubricant, viscosity, additives) and the cleanliness in the lubricating gap. The results show that the bearings selected for this application are a suitable bearing concept for modern vertical mills.

Lubrication, sealing

The MPS mills built by Pfeiffer are lubricated by means of an oil sump or oil circulation system, in accordance with the operating conditions. Synthetic lubricants (ISO VG 680 or VG 1000) and a special sealing concept ensure the high operational reliability of the mills and their rolling bearings.

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