



## Increasing fan reliability and speed in vertical grinding mills

### Benefits

- Increased mean time between failure
- Reduced operating temperatures
- Reduced vibration
- Reduced maintenance costs
- Reduced unplanned downtime
- Extended planned shutdown intervals

### Typical application

- Fans

### Production increases can strain vertical mill equipment

For cement manufacturing facilities, maximizing uptime of the vertical grinding mills, where a number of secondary applications are working together, is critical to productivity and profitability. Typically, the maintenance department is focused on keeping the reliability of this equipment above a certain level and, if possible, increasing it, as unplanned stops are costly in operations producing 100 tonnes or more per hour. This can be especially challenging when production goals are increased, impacting the performance of critical equipment including fans.

### SKF solutions can improve fan reliability to prevent unplanned downtime

Premature failure of fan systems is the result of a variety of factors, from high temperatures and high vibration levels, to inadequate lubrication, shaft misalignment and, in some cases, poor quality or unsuitable types of bearings.

The total fan shaft solution from SKF takes all of these factors into consideration, combining a number of proven SKF products and services to help increase mean time between failure to meet goals for production tonnes and equipment availability.



### Typical components of the solution include:

- **SKF self-aligning bearing systems comprising SKF Explorer spherical roller bearings or a combination of CARB toroidal and SKF Explorer spherical roller bearings** – designed to accommodate shaft misalignment for extended service life
- **SKF SNL / SE housings** – designed to dissipate heat better than conventional solutions
- **SKF seals** – for superior bearing protection and higher speeds
- **SKF automatic lubricators** – for improved lubrication conditions and reduced manual maintenance

By combining these solutions into a single, integrated system, SKF is able to help manufacturers improve reliability of fans operating in demanding conditions. Cost savings can be significant.





## Increase the return on your maintenance investment with SKF

The whole idea behind the SKF 360° Solution is to help you get more out of your plant machinery and equipment investment. This may mean lowering your maintenance costs, raising your productivity, or both! Here's an example of the SKF 360° Solution at work in the mining and mineral processing industry.

### SKF helps cement manufacturer extend fan bearing service life

#### The challenge

A major cement producer in Chile was experiencing frequent reliability problems in its vertical grinding mill. Specifically, the mill's fans evidenced signs of poor performance with high temperatures and high vibration levels.

With average Mean Time Between Failures (MTBF) of one month, unplanned and planned stops involved five and two hours of downtime, respectively. In an operation where 100% production amounts to 115 tonnes per hour, this downtime resulted in significant and unacceptable costs.

#### The SKF solution

SKF engineers were brought in to perform an application analysis. Taking into consideration every contributor to the performance failure, SKF recommended an integrated solution for the fan comprised of:

- SKF Explorer spherical roller bearings
- SNL housings
- Adapter sleeves
- SKF TSN seals
- SKF SYSTEM 24 single point automatic lubricator filled with SKF LGHP 2 bearing grease



#### The result

The solution resulted in an eight-months increase in MTBF, compared to the previous period of just one month. This enabled the customer to achieve higher efficiency and large annual savings.

### Summary of annual savings

Unplanned downtime savings. . . . .	\$290 000
Planned downtime savings. . . . .	\$18 000
<b>Total savings . . . . .</b>	<b>\$308 000</b>
Investment in the SKF solution. . . . .	\$450
<b>Net savings . . . . .</b>	<b>\$307 550</b>

\*All numbers are rounded off and based on customer estimates. Your particular cost savings may vary.

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