Reduce maintenance, increase service life and productivity of continuous casters

Benefits

- Eliminates the problem of induced axial loads created by thermal expansion of the roll
- Increases service life
- High load carrying capacity
- Reduces risk of roll seizure
- Greater reliability
- Reduces segment maintenance
- Increases caster productivity

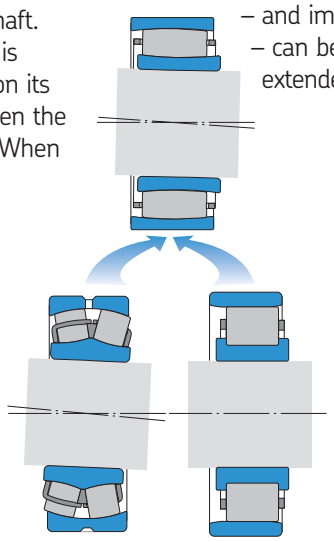
The CARB® solution

In the steel making industry, fluctuating temperature extremes and heavy loads take a daily toll on equipment. In the case of continuous casters, bearing failure can be a common occurrence. Typically, the cause of the failure can be attributed to induced axial loads as a result of thermal elongation of the roll.

To cope with axial expansion and contraction of the rolls in a continuous caster, a self-aligning bearing system consisting of two spherical roller bearings is typically used. One of the bearings is a locating bearing and the other is a non-locating bearing. The locating bearing is secured in the housing and on the shaft. The non-locating bearing is designed to move axially on its seating in the housing when the roll expands or contracts. When this non-locating bearing moves in the housing, it generates a considerable amount of friction, which then induces axial loads and heat – all of which can significantly reduce bearing service life.

The solution to the standard "locating/non-locating" bearing system is the CARB solution available only from SKF®. A CARB bearing is a self-aligning radial bearing, that does enable large internal axial displacement between the inner and outer rings – like a cylindrical roller bearing – enabling the roll to expand smoothly without inducing internal axial loads into the bearing system.

CARB bearings are easily interchangeable with existing spherical roller bearings, so bearing replacement – and improved performance – can be achieved without extended downtime.



Like spherical roller bearings, CARB bearings can accommodate shaft misalignments and heavy loads.

Like cylindrical roller bearings, CARB bearings can accommodate axial displacement.

For more information about SKF products and solutions for the steel industry, contact your SKF Authorized Distributor.

Increase the return on your maintenance investment with SKF

The whole idea behind the SKF 360° Solution programme is to help you get more out of your plant machinery and equipment investment.

This means lowering your maintenance costs, or raising your productivity, or both!
Following is an example of the SKF 360° Solution programme at work in the metals industry.

Steel producer saves millions of euros

Ongoing technical support services available through your local SKF Authorized Distributor provide proactive solutions that go far beyond single problem resolution.

For one steel producer, these support services resulted in continual improvements in machine reliability, productivity and cost savings.

The SKF distributor was first called on some years ago to address problems with segment rolls in two continuous casters. The distributor contacted his SKF support team, which consists of applications engineers – specialists in the metals industry. Together they redesigned the bearing arrangement to convert from triple ring bearings to using SKF spherical roller bearings in both the locating and non-locating positions. The redesign was able to cost-effectively improve the performance of the rolls and increase bearing service life. Over the next two years, all roll positions in the segment were converted to the same bearing arrangement, and the company realized an annual reduction in bearing purchases of approximately €500 000. Add to that the additional savings in reduced maintenance and the added revenue from increased productivity.

Over the next several years, the SKF distributor and his SKF support team were able to identify opportunities for additional improvements, particularly in the most heavily loaded (lower) segments. They saw that overloading was the typical failure mode, partly due to internal axial loads induced on the bearings. The SKF support team recommended the CARB solution and the customer ran a ten-month trial on one segment. The results of that test were excellent and since then, approximately 500 CARB bearings have been installed. Over the next three years, since that first test, not a single bearing failure had occurred, making the CARB solution the benchmark for other segment rolls.

The most recent improvement, installing SKF sealed bearings in the upper segment rolls, has significantly reduced grease consumption, reduced contaminants in the wastewater, and increased the service life of the segment.

Since the first improvements have been made cost of steel slab production has come down by €0,80 per tonne. This amounts yearly to some €1 950 000. The significant attributes to the cost reduction are the continual support from SKF, improved heat treatment of the rolls and improvements to the rotary joints.

The SKF Authorized Distributor and the SKF support team continue to work with this customer to proactively enhance machine reliability. This ongoing technical support is viewed as a critical factor in the success of the mill's efforts to maximize productivity and reduce costs.

Summary*

First conversion from triple ring bearings to standard SKF spherical roller bearings and ongoing bearing cost saving €500 000

Yearly savings from installing SKF solutions, improved heat treatment of rolls and rotary joints in addition to other improvements €1 950 000

* All figures are rounded off and based on customer estimates of labour and production costs. Your particular cost savings results may vary.

Publication **6097 EN** · June 2005