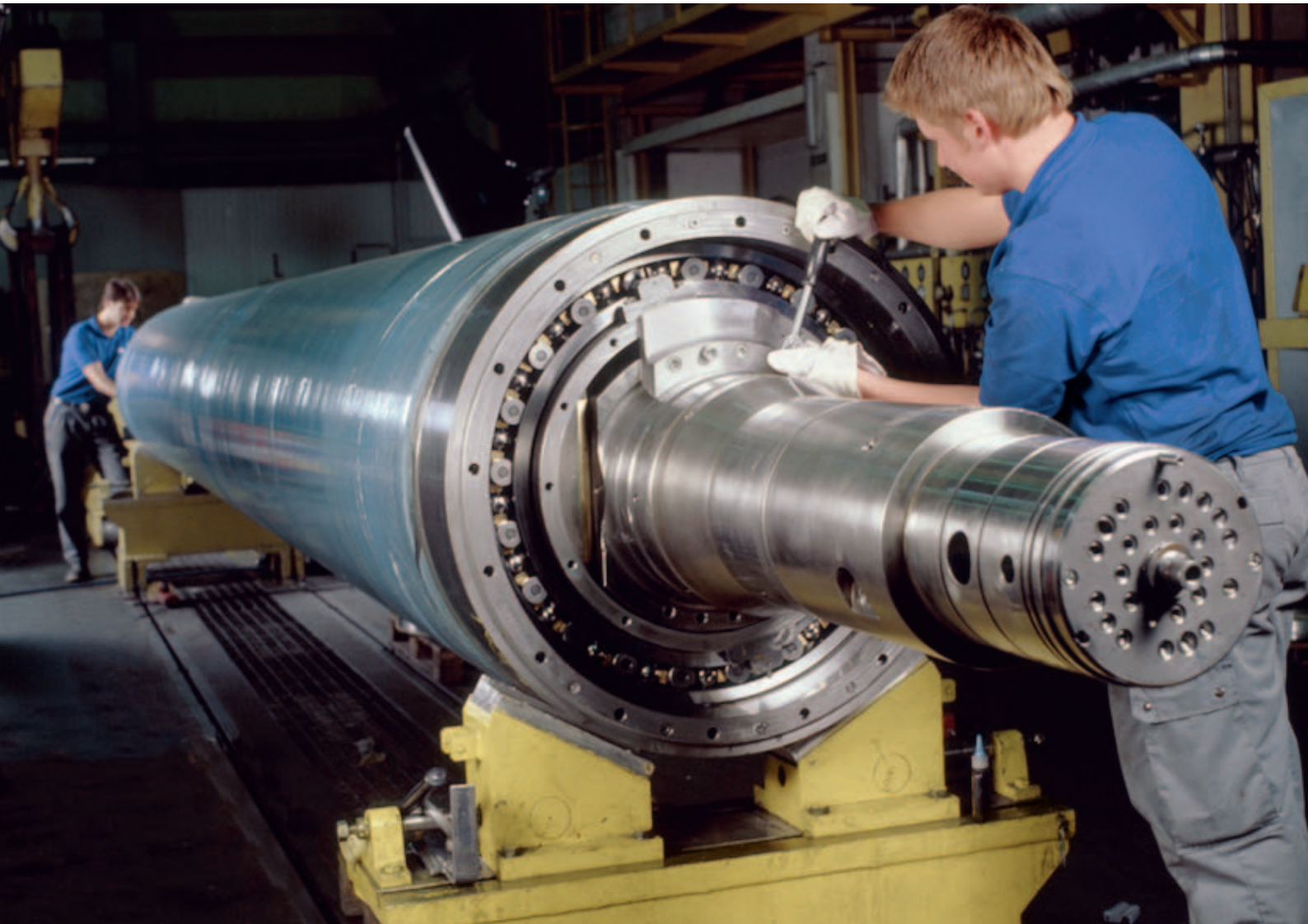


ASSR Bearings for CD-Profile Control Rolls in Paper Machines



Examples of Application Engineering

WL 13 521 EA



ASSR bearings (Anti Slippage Spherical Rolling Bearings) in a CD-profile control roll by Voith, Krefeld

The Palm paper mill in Eltmann produces newsprint and telephone directory paper from 100 % waste paper. On its PM 3, which was started up in 1999, the mill produces newsprint on a working width of 8 350 mm. A calender between dryer section and reel was converted into a soft calender in 2004.

The calender smooths the rough surface of the paper web and eliminates the thickness variations in the web. To this end, the two rolls are pressed together, and the paper web runs through the closed gap between them. This is possible only if the natural deflection of the rolls is eliminated

first and a line force is generated in the gap that is suitable to the thickness profile of the web. This task is done by a NIPCO roll.

Calender, NIPCO roll

The rotating roll shell of the NIPCO roll, is supported in rolling bearings. It rests on a large number of hydrostatic control elements that sit on a stationary beam. The hydraulic control system groups several of these control elements into zones. These zones can be controlled separately so that the distribution of the line force over the machine width can be adjusted as required. During production, the gap between the rolls is closed, i.e. a certain pressure acts between the two rolls. Both the nip load and the weight of the roll shell are taken up by the hydrostatic control elements. In this condition, only very low loads act on the rolling bearings so that they are subjected to slippage, depending on the line force.

The situation is different when the calender is open, e.g. for maintenance reasons and after web breaks. Then the rolling bearings are always sufficiently loaded by the weight of the roll shell.

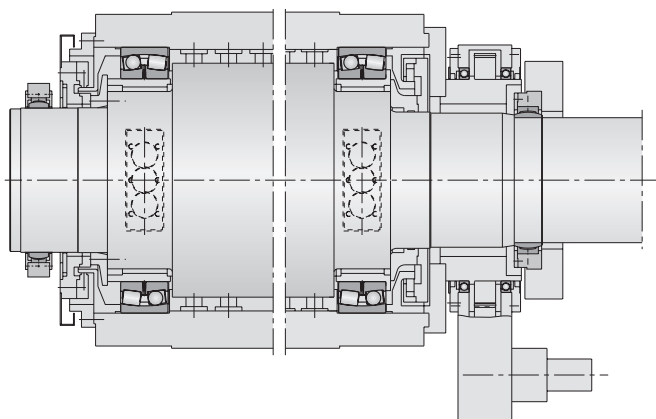
Technical data of the application

Working width	8 350 mm
Roll diameter	965 mm
Line force	15...75 N/mm
Bearing load during production	17 kN (P/C < 2 %)
during production stop	65 kN
Operating speed	1730 m/min; max. 2 000 m/min

Lubrication

An oil circulation system provides the bearings with lubricant (6,5 l/min per bearing). The bearings are lubricated with Mobil DTE Excel 68, as this oil is also used to actuate the hydrostatic control elements.

Mounting sketch



Bearings

In applications like this, the rolling bearings must meet the following requirements:

- Self alignment up to 0,5°
- Low friction
- No slippage under minimal load
- High speed suitability
- High load carrying capacity
- Accommodation of high load peaks

In the past, various measures were developed to meet these requirements. They aimed to prevent or minimise damage caused by slippage.

However, these measures, which are based on conventional bearings, were not sufficient in this application. By contrast, ASSR bearings have been developed with the aim of eliminating not just the damage caused by slippage but slippage itself.

Bearing selection

The NIPCO rolls are now supported in FAG ASSR self-aligning bearings F-808242.01.KOMB – an efficient and elegant solution.

The bearings primarily consist of the rings of a standard spherical roller bearing FAG 239/600. In each of the two rows of rolling elements, each barrel roller is followed by a ball. In the “low-load phase”, the balls ensure slippage-free operation. In the “high load phase”, the barrel rollers take up the loads. The elastic deformation of balls and rollers is matched to the application.



Advantages for the customer

- Prevention of slippage
- Longer service life
- Reduced power consumption
- Very smooth running properties at high speeds
- Interchangeable with standard bearings
- Cost-efficient solution

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