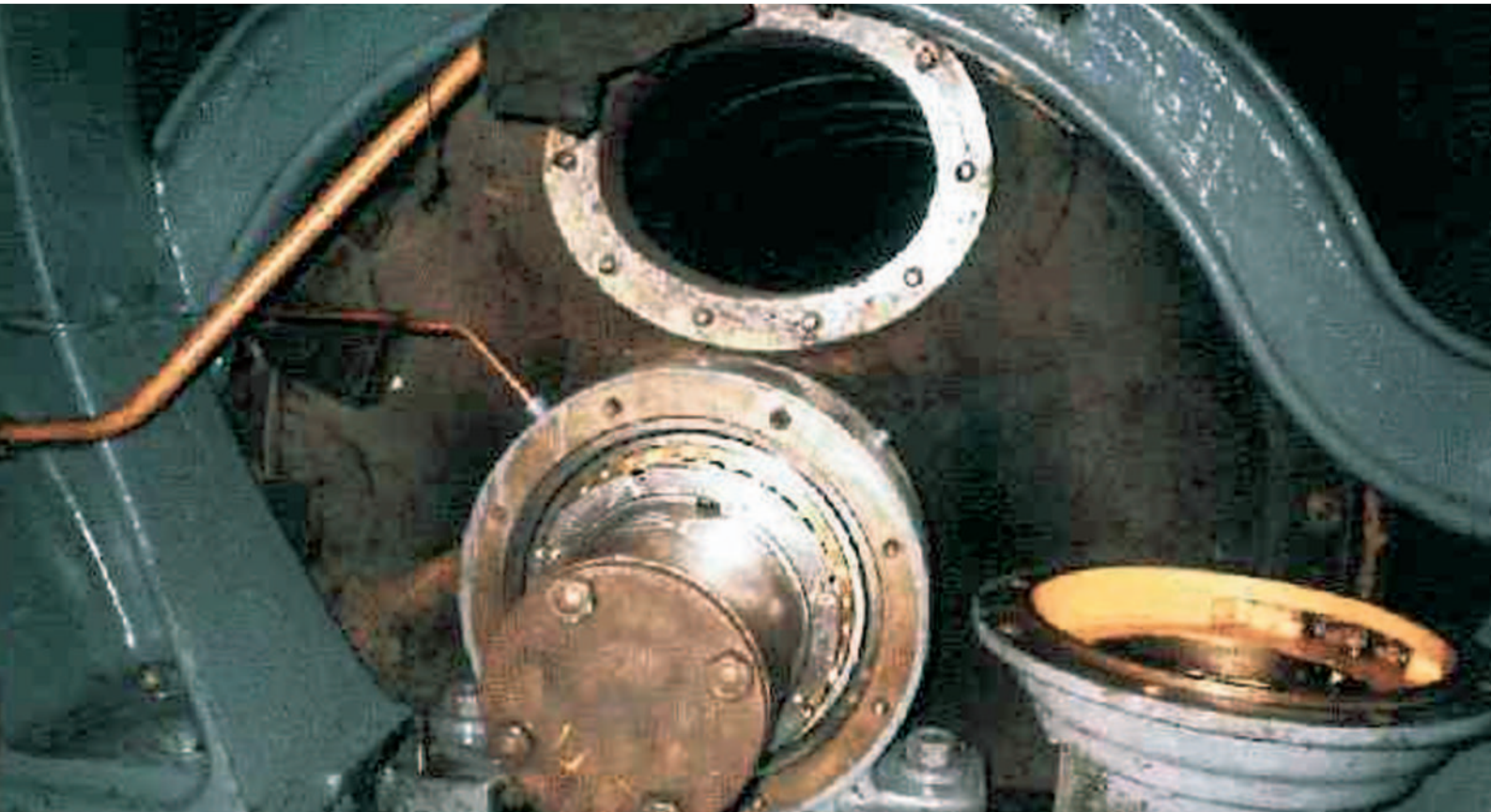


Higher output and easy conversion with the “drop-in solution” from FAG

FAG

Examples of Application Engineering

WL 13 517 EA



Papresa paper machine in Renteria, Spain. Rebuilt by Metso Paper, Maslianico, Italy

Papresa produces newsprint on two paper machines in their plant in Renteria, Spain.

The plant's total production is 160 000 tons per year.

The purpose of the PM4 rebuild was to increase speed from about 800 m/min to 1000 m/min and thus reach a higher production output. Metso Paper, Maslianico was the Main Contractor for the whole turn-key rebuild project. Rebuild areas and scope of supply: approach flow system, vacuum system, broke system, Sym-Flow dilution headbox, Sym-Former top dewatering unit, press section, drying section, dryers and Edge Vac-Rolls, ropeless

tail threading, hood and ventilation, lubricating system, steam and condensate, electric and mech. drives, distributed control system. Since the PM4 is an old machine (the dryer cylinders were made in 1930, and the dryer housings were last rebuilt in 1989), Papresa requested a new, state-of-the-art dryer bearing arrangement as well. Metso's technical department decided to use the FAG self-aligning cylindrical roller bearings for the front side of the dryers because of the preferred central lubrication features compared to other floating bearing designs offered for that position.

With the FAG SACR bearings they didn't have to change the existing housings or the oil circulating system at all.

Metso selected the rolling bearings for the dryer section with the assistance of FAG Italy because no rebuild work was required for the existing housings.

FAG supplied all rolling bearings for the dryer rolls:

- **Self-aligning cylindrical roller bearings with adapter sleeves**
- **Spherical roller bearings with adapter sleeves**

Technical data

Machine type	PM 4
Production	293 t/d news print paper
Paper grade	34–60 g/m ²
Wire width	4 350 mm
Speed	operating speed 1 000 m/min design speed: 1 100 m/min
Dryers and Edge Vac-Rolls	45 pcs; 15 pcs driven
Steam pressure	3 MPa
Non-insulated journals	

Bearings

Great thermal stressing in the dryer section requires rolling bearings with the following properties:

- Compensation of length variations and misalignments
- Isotemp heat treatment (dimensionally stable up to 200 °C)
- Case-hardened inner rings (to technical specification W209B)
- Increased bearing clearance
- Best possible lubrication (central oil supply)

At operator side

Double-row, self-aligning cylindrical roller bearings (SACR) of type **Z-565668.ZL-K-W209B-C5** with **H3048** adapter sleeves serve as floating bearings. They were installed in existing housings. These housings were made in 1989 and were especially designed for dryer roll bearing application.

The bearings easily compensate for length variations between rollers and inner ring raceway. A plain spherical bearing's seating ring with an oil-lubricated sliding surface accommodates any misalignments or deflections.

At drive side

23048-K-MB-W209B-C4 spherical roller bearings with **H3048** adapter sleeves serve as locating bearings. They were installed in existing housings as well.

Machining Tolerances

The bearing inner rings have to accommodate a circumferential load and are pressed directly onto the tapered sleeve by means of the hydraulic method. Journal tolerance h8 (0...–0,072 mm) Bearing seats in the housing bore to G7.

Lubrication

The bearing housings in the dryer section are connected to a central oil circulation lubrication system that constantly supplies the bearings with oil via centrally-arranged feed ducts. In this way the cooler oil reaches the contact areas, contaminants are flushed out, and heat is removed from the bearings. Due to the central feed oil supply, the oil can be carried off at both sides of the bearings so that the risk of oil retention and leakage is considerably reduced. This was the existing situation before the rebuild with spherical roller bearings at the front side and after the rebuild with the FAG self-aligning cylindrical roller bearings as well. The bearings are lubricated with the same oil, an ISO VG 220, that proved to be suitable for the application and conditions.

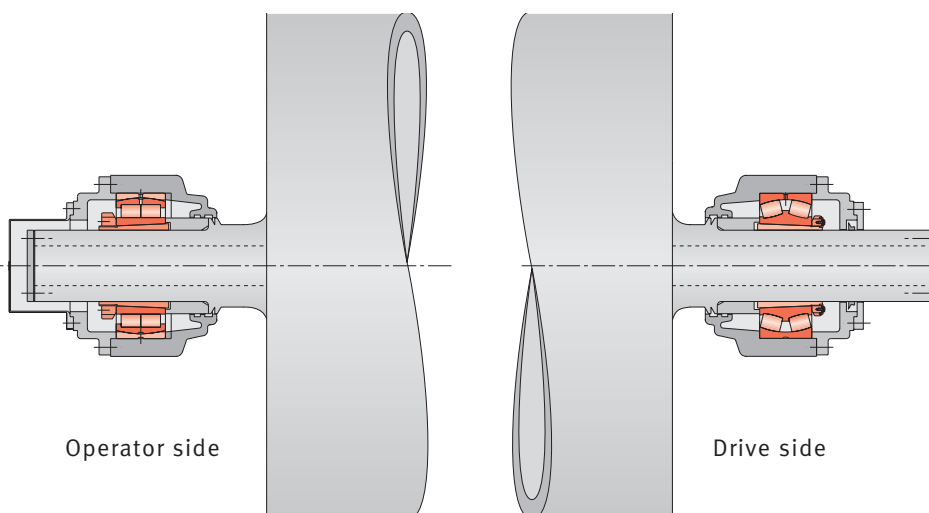
Sealing

Non-contact, maintenance-free gap-type seals prevent oil from escaping through the journal passages and cover passage bores. In the case of the dryer roll bearings, the oil is thrown off via splash grooves or oil flinger rings and flows back through oil collecting chambers and return holes to the two oil cavities at the bottom of the housing.

Result

The PM 4 rebuild was realised with

- a minimum of cost for new state-of-the-art dryer bearings and arrangements and led to:
- increased output of production
- increased product quality



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