

The Copper Materials Packing for Alignment Work in Dryers for Bearings in Paper Mill

Jitendra Sunte¹, Vinayak Waghmare²

¹Assistant Professor Department of Mechanical Engineering, Lingaraj Appa Engineering College, Bidar, Karnataka, India

²Lecturer, Government Polytechnic College Aurad(B), Bidar, Karnataka, India

ABSTRACT

In erection work it is very important role for alignment of dryers for journal bearings. Which material is suitable for packing and fatigue strength of material, wear strength etc. further increases in service life of plant. There are n numbers of bearing numbers selected for particular bearing of particular shaft dimensions. It is very sensitive for axis of journal shaft and dryers axis. Even small minor tilting or eccentricity leads to failure of materials it may be fatigue and all. To avoid failure of components one can select suitable packing material. This failure occurs while in continuous heavy duty service of operations.

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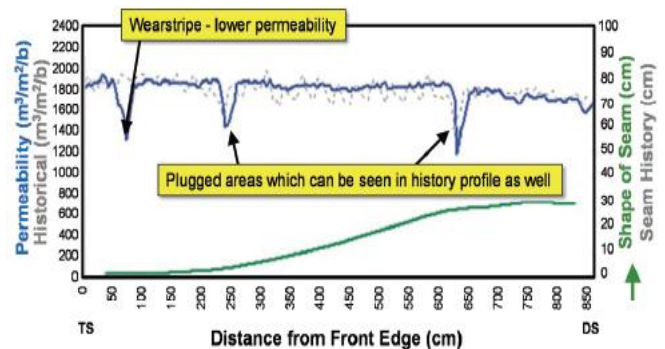
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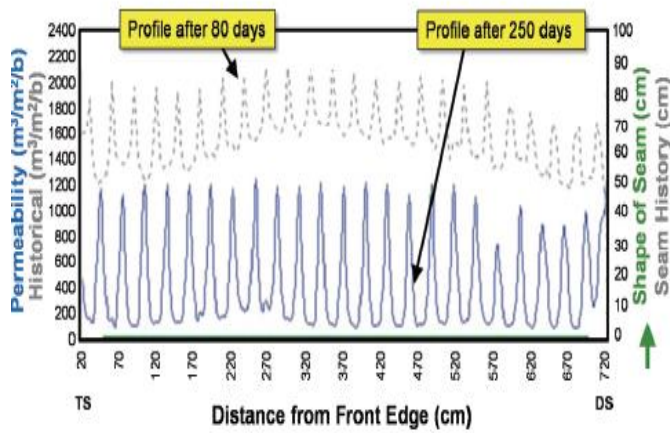
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I. INTRODUCTION

Static lateral misalignment:

The likelihood of seal compression and metal to metal contact on one side increases with static lateral misalignment between the seal housing and the shaft. On the other hand, it minimises seal compression and enhances extrusion gap clearance. The seal is less able to endure shaft deflection and runout due to the locally reduced compression. The seal is less able to bear differential pressure due to the locally increased extrusion gap clearance.





A wear stripe shown in a permeability profile



A plugged dirt stripe shown in an air permeability profile

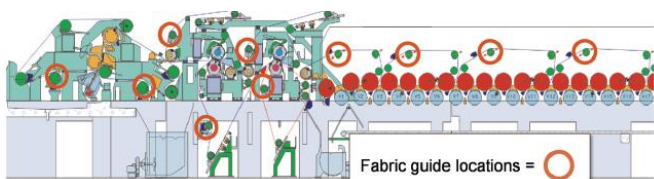
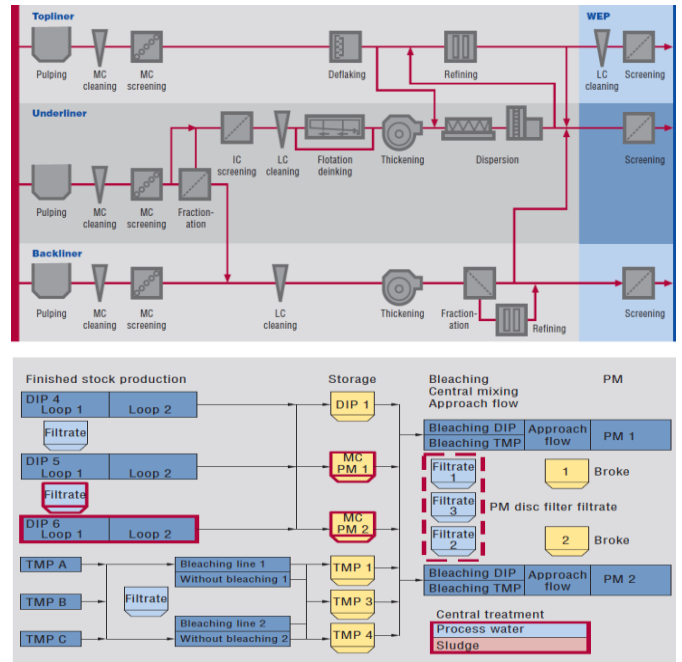


Figure. Fabric guide placement



- Forming section or wet end.
- Variations of the Fourdrinier forming section.
- Press section.
- Dryer section.
- Size Press.
- Calender section.
- Reel section.
- Winder section

Complete Paper Plant

- Yankee Paper plant for kraft Paper
- Paper Plant with Yankee & Dryer for Kraft paper
- Plant Twin wire for Multilayer Hi-BF Paper & Paper Board
- Triple wire Plant for Multilayer HI-BF Paper
- RF former Plant for Multilayer HI-BF Paper
- Combined Paper Plant with Former Paper Machine Equipment

PULP MILL EQUIPMENT

- Pulper with belt Conveyor
- JMC Hi Consistency Pulper
- High Consistency Pulper (HCP) Gear Box Drive

High Density Cleaner (DC - M Motorized.), (HDC - Non Motorized.)
Turbo Separator
Turbo with Extended Cleansing System (TCS)
JMC Medium Consistency Screen (MC)
Kraft Paper Making Machine
Baskets Perforated or Slotted Step Rotor
JMC Low (LC) Consistency Screen »
Baskets Perforated or Slotted Foil Rotor
Centricleaners
Stock Chest Agitators (AG)
Stock Thickener
De-Inking Cell

PAPER MILL MACHINERY

Paper Machine Head Box
Paper machine Foundrinier Part
Paper Machine Press Part
M.G. Cylinder
Paper Machine Dryer Section
Pope Reeler / Drum Reeler
Rewinder
Drive Arrangement for paper Machine
R.F. Cylinder Mould Former for Multilayer Paper board
Size Press and online Coating Station
Calander
Paper Making Machines
Paper Mill Machine

II. Paper Machine Head Box



Salient Features

- Open Head Box for Machine speed up to 350 meters/ minute.
- Slice width up to 3800 mm are regularly manufactured.
- Profile variation across the deckle in maximum ± 3 GSM
- Cylindrical, Tapered and Rectangular Tapered with Polypick diffuser, Manifold are provided depending upon the quality and production EVENERRO capacity.
- Two numbers Properly designed Evener rolls for evening effect and better deflocculation.
- Machined and Ground Top and Bottom Lip for smooth flow of stock.

Paper Machine Fourdrinier Part



Salient Features

- High efficiency wire part with Plain Couch roll
- Drainage elements designed as per the Machine speed, Stock freeness and other properties.
- Auto or manual Wire guiding arrangement
- Cantilever arrangement on framing for quick wire change
- MS fabricated frame with 2 mm S.S. cladding

Paper Machine Press Part



Salient Features

- Press Section is designed considering the quality of the Paper and Paper Board.
- High Efficiency presses with Blind drill coating on top and bottom roll with felting arrangement for high speed. Presses suitable up to 150 Kg / linear cm are available
- Heavy Duty Press up to the finished diameter of 1000 mm are in regular supply
- Heavy Duty framing with Hydraulic or pneumatic lading system

M.G. Cylinder



Salient Features

- MS fabricated M.G.Cylinder up to 16 feet (4.88 meter) diameter.
- Width up to 4.00 mtrs is in regular production.
- SS Coating on surface (Optional).
- Stress relieved for removing stresses developed during bending and fabrication.
- Surface is machined and ground to achieve Mirror finish on the surface -Finish Ra 8 micron.
- Scooping system is provided to remove condensate efficiently.
- Heavy duty framing is provided for vibration free operation.
- Single and double Touch roll is provided ing upon the process requirement.
- Spur Gear and pinion in Cast Iron/ MS Fabrication/ polypick, teeth are geometrically evenly cut on precise Hobbing Machine for noise free operation.
- MG Cylinder is designed to operate on working pressure up to 6.0 Kgs/cm².
- Hydraulically tested to a pressure of 11.0 Kgs/cm² and held for 24 hrs.

Salient Features

- M.S (B.Q. Plate) Fabricated drying Cylinders with high evaporation rate

- Available in 4 feet, 5 feet and 6 feet diameter
- Shell thickness varies from 25 mm to 36 mm
- Operating Pressure up to 4.5 Kgs Cm² and specially designed for higher working pressure up to 6.0 Kgs Cm²
- Suitable heavy duty framing in Graded Cast Iron and Mild Steel fabrication for the maximum coverage of paper at dryer
- Rope feeding system is provided for Machine speed over 200 MPM
- Dryer surface ground finish to Ra micron balanced dynamically to grade of 6.3 (ISO 1940)



Pope Reeler

Salient Features

- Pope Reeler is designed on the principle of friction Winding
- Primary grab Arm is Pneumatically / Hydraulically loaded and tilted Hydraulically mechanically with manual operation.
- Secondary arm is loaded Pneumatically / Hydraulically
- Pope drum is MS Fabricated and designed to with stand required nip pressure and provided with Doctoring arrangement
- Framing is Heavy duty in Cast Iron construction

Rewinder



Vibration Screens are used for screening of all fibers containing impurities. These screens are used for screening of low as well as high consistency pulp. The screen removes large impurities such as film, plastics, wet strength specks, metal particles, wooden splinters etc.

Salient Features

- Heavy Duty Rewinder for trimming and rewinding of Paper Web in required Reel Size.
- Rewinding is done by friction on double drum rolls duly loaded with chrome coated Rider Roll
- Slitting arrangement is provided with pneumatically loaded trimming knives.
- MS fabricated with frame proper stiffeners with Cast Iron Slide rail.
- Rider Roll is pneumatically balanced.
- Pusher roll for dislodging the rewound roll on collecting table.
- Pneumatically operated braking arrangement.
- Trim Handling system is provided with Blower and Dual Ventury
- Maximum operating speed is up to 500 MPM and driven by DC/ AC variable speed drive.

Drive Arrangement for paper Machine



Salient Features

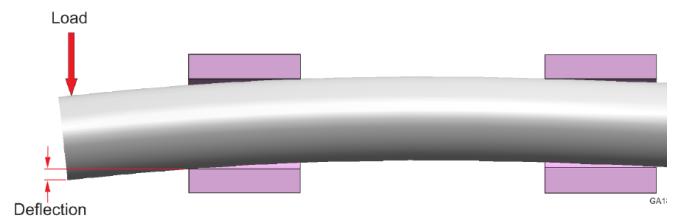
- Line shaft drives as well as sectional drive depending up on the Machine speed.
- Heavy duty Worm Gear Boxes / Bevel Helical gear boxes.
- Pneumatically operated Rubber tube clutches with shoe grips line Shaft drive.
- Cone Pulley for different sizes
- DC variable / AC Variable Frequency drive.
- Sectional drives with DC variable speed drive with digital synchronizing
- Hand operated Belt shifters. Motorized option is also available

Dynamic runout exposes the seal to highly repetitive radial gland and extrusion gap dimensional changes that can:

- Cause accelerated extrusion damage to pressurized rotary seals,
- Cause wear of groove wall (Figure 5) and mating seal surface,
- Eventually exceed the remaining seal compression, accelerating the onset of compression set related lubricant leakage, and

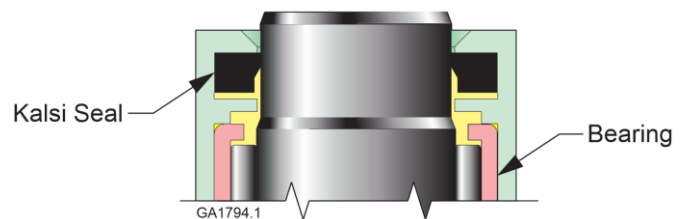
causing accelerated abrasive invasion of the dynamic sealing interface,

- Cause increased seal, shaft, and seal housing wear, due to particle entrapment in the extrusion gap,
- Cause metal-to-metal contact between the rotary shaft and the seal housing, resulting in component damage and seal overheating, and
- In very high rotary speed applications¹ and very low temperature applications, exceed the ability of the seal to follow the radial motion of the shaft, resulting in increased lubricant leakage. High-speed dynamic runout may also have environmental exclusion implications, but the topic is unexplored.



Shaft deflection due to side load

Maximum concentricity can be achieved between the shaft and the seal groove, and between the shaft and the bore that defines the extrusion gap, by incorporating the bearing directly into the seal housing.

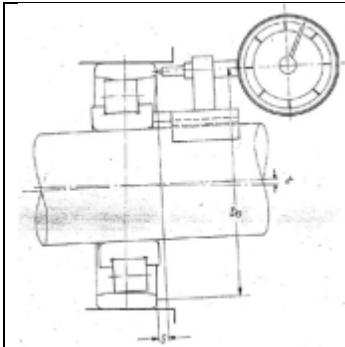


Achieving maximum concentricity

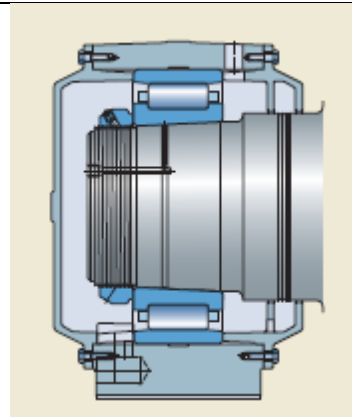
Designing to minimize runout and deflection

- Using suitably spaced radial bearings,
- Positioning the radial loads near a radial bearing, and

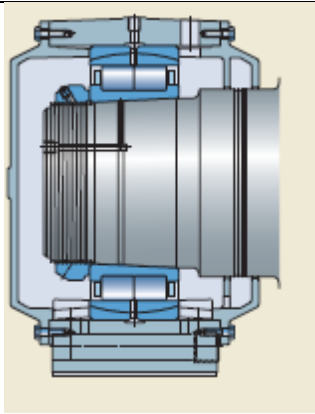
- Making the shaft as stiff (large) as possible through & between the radial bearings.



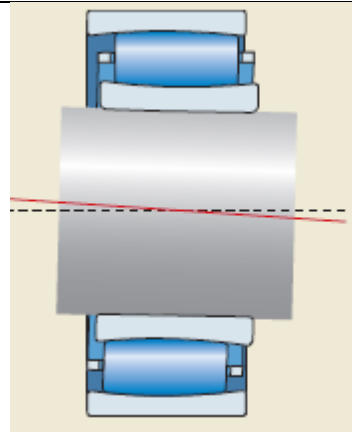
Procedure to check alignment for 342460 or VA701 suffix bearings.



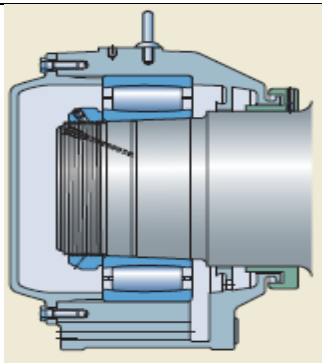
VA701 cylindrical roller bearing used as front side drying cylinder bearing.



Self-aligning double row cylindrical roller bearing assembly.



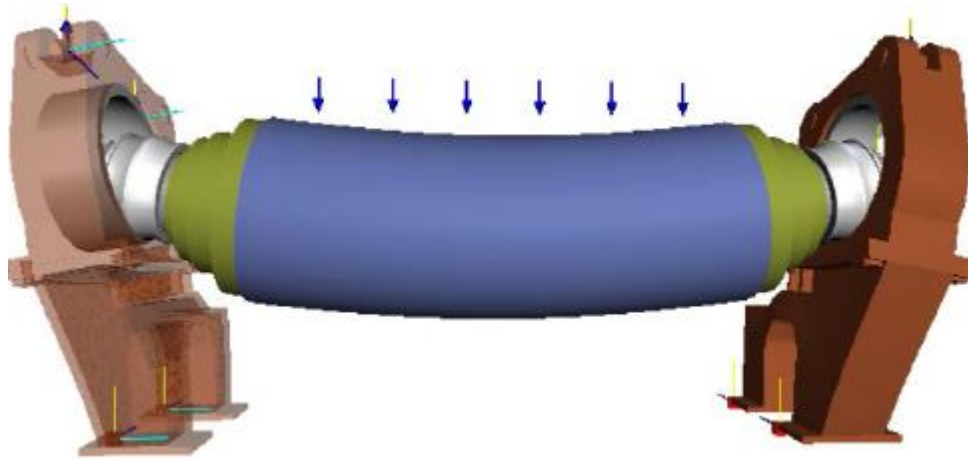
CARB accommodates misalignment and axial displacement.



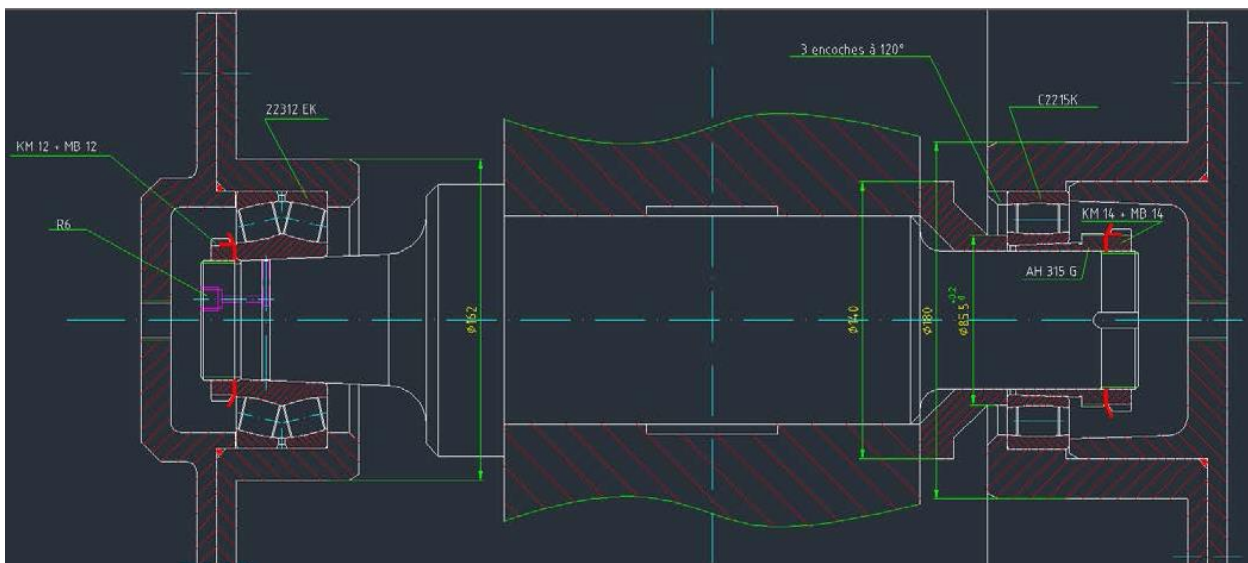
CARB in an SKF SBPN drying cylinder housing.

Cylinder length		Steam temperature	Initial axial displacement
over	incl.		
m		°C	mm
0	4	<160	0±1
0	4	160-200	2-4
4	7	<160	2-4
4	7	160-200	4-6
7	11	<160	4-6
7	11	160-200	6-8

Axial inner ring/outer ring offset when a paper machine is cold.



SKF FEM calculations showing the deformation of the solid roll



wear due to micro displacement and creeping of outer rings in their seats.

Alignment procedure: (solution to misalignment problem)

Initially cut the copper thin sheet material in to rectangular shape pieces of size approximately 4cm 2cm. these thin sheet material thickness will be below 1mm approximately. Nextly insert these thin sheets in between bearing where it lies. Repeat this procedure until both side bearing makes exactly same coincident line i.e, axis of shaft bearing and driers are same . check the axis regularly until it takes concentrically.

III. CONCLUSION

1. Smooth paper finish will obtain from alignment work
2. There are no problems like paper wrapping one over other will occur
3. All dryers will work properly after alignment
4. Cheap packing material will available
5. Less man power and semi-skilled workers will be preferable

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