Examples of Application Engineering

FAG has developed, in cooperation with the well-known printing press manufacturer König & Bauer, a triple-ring eccentric bearing unit for supporting the blanket and impression cylinders. They are the heart of the printing press and guarantee a high printing quality.

Previously, it was common practice to integrate cylindrical roller bearings, needle roller bearings or other bearing types into a sliding bearing supported sleeve and to fit this unit accurately into the side wall of the machine frame, which required an elaborate technology.

This costly drawback is eliminated by the eccentric bearing unit, as is the reduction of the sliding bearing life due to wear and the risk of the sleeve getting jammed during the "impression on" and "impression off" movements of the cylinders.

The eccentric bearing offers the benefit of absolute zero clearance which is not possible with the conventional unit as the sleeve always requires some clearance.

As another significant advantage, the preload can be adjusted freely via a gear segment; it allows the radial rigidity to be considerably increased compared to bearings with clearance.
**Bearing arrangement**

FAG triple-ring eccentric bearings are ready-to-mount units. They are used as floating bearings and are available both with a cylindrical and with a tapered bearing bore.

The bearing unit is based on an NN cylindrical roller bearing design which is used as a low-friction high-precision bearing in machine tools, and a double-row needle roller bearing which guides the eccentric ring.

Axial guidance of the cylinder is provided by two angular contact ball bearings FAG 7207B in X-arrangement.

**Technical data**

- Roll mass: 1020 kg
- Radial bearing load: 30 kN
- Nominal speed: 250 min\(^{-1}\)
- Maximum output: 15,000 sheets/hr

**Lubrication and sealing**

The inner system of the eccentric unit can be lubricated both with grease and with oil.

Thanks to the favourable ambient conditions, the lubricant is only very slightly stressed so that long grease lubrication intervals and thus a long service life (50,000 to 80,000 h) are possible. A non-rubbing gap-type seal is sufficient with grease lubrication.

The outer needle roller bearing system is lubricated for life with a special grease, Arcanol L260. It is filled with grease nearly to capacity.

With oil lubrication of the inner system a somewhat more elaborate sealing is required. Several collecting grooves, each with its own return hole, have proved to be convenient.

**Machining tolerances**

The inner rings are subjected to circumferential load. A tight fit is obtained by machining the cylinder journal to machining tolerance k4 (k5). With a tapered bearing seat, an interference fit is obtained by axial displacement. The outer ring is mounted with a K5 (K6) fit.

**Triple-ring bearing for a blanket cylinder of the KBA RAPIDA 142**

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