PRODUCT APPLICATION

PERMAGLIDE® plain bearings: Stator blades in pumps and turbines

Sector: Power engineering

Products used

PERMAGLIDE® plain bearing bush **design PAP ... P11**

Function

In storage power stations, water is pumped into higher-lying storage reservoirs using cheap night-time electricity. At energy demand peaks, the water is allowed to flow back down to drive a turbine. In the process, the turbine drives a generator to produce electricity. In order to set the optimum operating point in the pump as well as in the turbine operation, swivel-mounted stator blades are fitted between the ring channel and impeller.

Bearing with PERMAGLIDE® P11 plain bearing bushes

The bearing for the stator blades are manufactured with maintenance-free plain bearing bushes made from PERMAGLIDE® P11.
This has eliminated the need for additional lubricant. High static compressions arising from the flowing medium permanently affect the bearing. In addition, there are high-frequency vibrations. The plain bearing has direct contact with the water. The material with bronze backing and PTFE sliding layer does not display any signs of corrosion. Similarly, tribocorrosion does not occur because the sliding metals are separated by the layer of PTFE.

PERMAGLIDE® P11 does not absorb any water, allowing the plain bearing to maintain its dimensions. Moreover, the high wear resistance always provides a constant operating bearing clearance, which would otherwise have a negative influence on the efficiency of the pump or turbine. The service life of bearings made of PERMAGLIDE® P11 is thus exceptionally long, with costly maintenance intervals being reduced.

Turbine Hoover Dam

PERMAGLIDE® plain bearing bush design PAP ... P11

Advantages of PERMAGLIDE® P11 plain bearing bushes:

- Does not absorb water
- Largely resistant to swelling
- High corrosion resistance thanks to bronze backing, no additional corrosion protection required
- Maintenance-free
- Low wear
- Good chemical resistance, especially suitable for use in aggressive media
- Operating temperature range of –200 °C to +280 °C
- Very low stick-slip tendency
- Low friction value

Description of material

PERMAGLIDE® P11 is a leaded, robust bearing material that has the highest levels of tribological performance. The material is designed for maintenance-free, dry-running applications, but can also be used in systems with liquid or grease lubrication. Material P11 is recommended for more stringent requirements in terms of corrosion resistance or for use in aggressive media. The material has some advantages over P10 in this respect:

- Very good thermal conductivity and therefore greater operational safety
- Anti-magnetic
- Higher corrosion resistance thanks to bronze backing

Use in hydrodynamic conditions is possible without problems up to a sliding speed of 3 m/s. In continuous operation above 3 m/s, there is a risk of flow erosion or cavitation. Motorservice offers the calculation of hydrodynamic operating states as a service

Further information on PERMAGLIDE® plain bearings

- PERMAGLIDE® catalogue, item no. 50003863-02
- PERMAGLIDE® online catalogue shop.permaglide.com