

# PERMAGLIDE® plain bearings: surrounding structure in rolling mills

Sector: engineering, plant engineering

## Product used

PERMAGLIDE® plain bearing flange liner **design PAF ... P11**

### Function

Surrounding structures are used to accelerate and brake the metal bands in rolling mills. In the surrounding structure, 2 carriage chains press on the metal bands, which stretches and aligns the metal bands.

The two chain carriages are connected with connecting pieces. The bearings of the connecting pieces are constantly carrying out small swivel movements. The surrounding structures causes high pressures to act on the bearings. The bearings are also subject to dirt and high temperatures.

### Requirements for the bearings in the surrounding structures of rolling mills

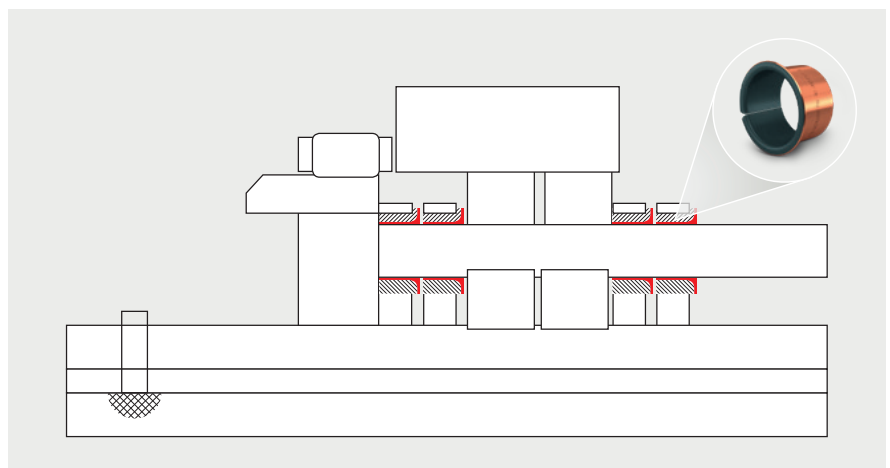
- constant operating bearing clearance, as a metal band is pulled crookedly in the event of bearing clearance
- simple design
- quick installation
- low maintenance requirements
- high pressure resistance for safe force transmission from the frame to the chain
- insensitivity to dirt and high temperatures

### Bearing with PERMAGLIDE® P11 lange liners

In the application, the bearings in the chain carriage of the surrounding structure were achieved with maintenance-free flange liners made from the material PERMAGLIDE® P11. The flange liners were pressed in to the connecting pieces between the chain carriages. The flange liners are fixed in place using press fit and require no additional fixing. This guarantees reliable, clearance-free function of the chain carriage.



*Rolling mill in steel plant*

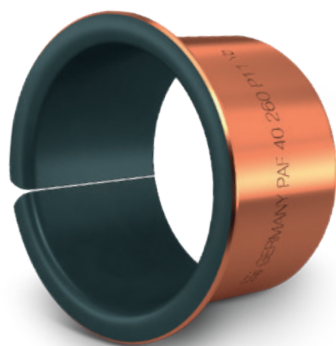


*Bearings in a chain carriage with PERMAGLIDE® lange liner in design PAF... P11*



### Advantages of the PERMAGLIDE® P11 flange liners for use in surrounding structures

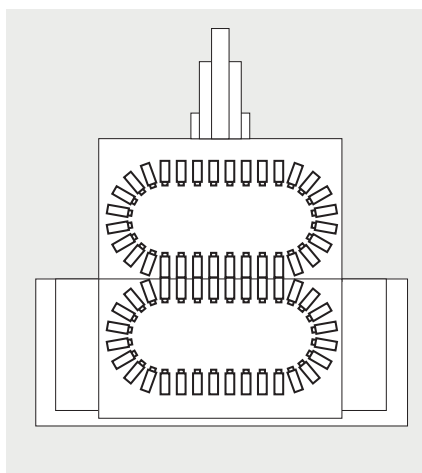
- maintenance-free
- low wear
- practically constant operating bearing clearance
- high corrosion resistance thanks to bronze backing
- extremely good thermal conductivity
- simple design and easy mounting
- no hardened interacting sliding surface required
- high pressure resistance
- insensitive to dirt, meaning that no gaskets are required
- can be used at high temperatures (up to +280 °C)



PERMAGLIDE® lange liner design  
PAF ... P11

### Further advantages of the material PERMAGLIDE® P11

- no additional corrosion protection required
- good chemical resistance, including in environments with aggressive media
- operating temperature range of -200 °C to +280 °C
- largely resistant to swelling
- does not absorb water
- very low stick-slip tendency
- low friction value
- no tendency to fuse with metal



Surrounding structure chain carriage

### 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 lubrication. The use of grease as a lubricant with P11 is only possible to a limited extent, and is not recommended.

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 <http://shop.permaglide.com>