



FL 1503

For technical personnel only!

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# PRODUCT APPLICATION

## PERMAGLIDE® PLAIN BEARINGS: BEARING OF THE GEAR SHAFTS IN GEAR PUMPS

SECTOR: CHEMICAL INDUSTRY, AGRICULTURAL MACHINERY,  
CONSTRUCTION MACHINERY, MACHINE TOOL MANUFACTURE

### PRODUCT USED

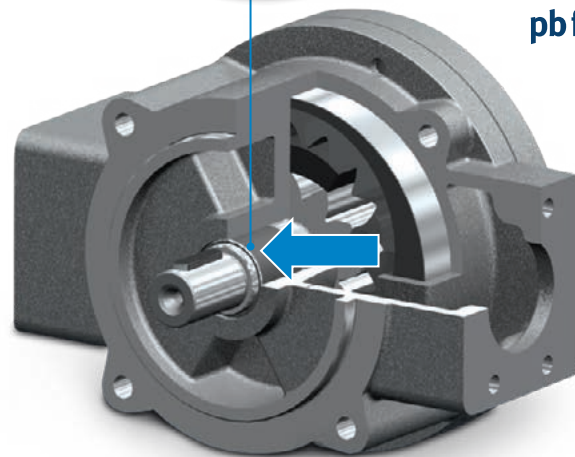
Permaglide® cylindrical plain bearing bush, design PAP ... P180

### Function

Gear pumps are used in many applications to deliver liquids (media) or as a force-transmitting drive for hydraulic motors. The gear pump delivers the medium evenly from the intake side (intake), through the gears and to the thrust side (exhaust). Among other applications, gear pumps are used in vehicles as a fuel pump, oil pump or coolant pump. The chemical industry uses gear pumps to deliver organic and inorganic chemicals. Within construction machinery and agricultural machinery, gear pumps are used as a drive for hydraulic motors, for example.

### Bearing with Permaglide® P180 plain bearing bushes

Permaglide® P180 plain bearings are used as the main bearing for the gear shafts in gear pumps. A low operating bearing clearance is essential for the high build-up of pressure and for low gear-pump leakage. To ensure a fault-free hydrodynamic operating state, the plain bearings must exhibit a bearing clearance tailored to the operating medium. The plain bearings come into direct contact with the operating medium. Aggressive media may be used, depending on the application. The plain bearings must therefore offer high resistance to abrasion, good resistance to erosion, chemical compatibility and low swelling tendency. Permaglide® P180 plain bearings meet these requirements. The excellent dry-running behaviour of Permaglide® P180 plain bearings also ensures a low level of wear in the mixed friction operation that occurs when the pump is switched on and off.



Gear pump application,  
bearing with Permaglide® P180 plain bearings (arrow)



**Technical data for the application applied**

- Application: Central lubrication with stationary combustion engines
- Displacement: Up to 1400 cc/rev
- Engine speed: 2,000 to 2,500 rpm
- $p_{max}$ : 25 bar
- Flow: up to 1,600 l/min

**Advantage: Reliable function of the bearing with Permagliding®****P180 plain bearings**

- Hydrodynamic operation
- Sliding speed up to 10 m/s
- High media compatibility
- Low operating bearing clearance
- High resistance to abrasion
- High resistance to erosion
- Good chemical resistance
- Low swelling tendency
- Low level of wear, even at high engine speeds and mixed friction

**Description of material**

Permagliding® P180 – robust and reliable

- Universal-use bearing material for dry and lubricated applications
- High rigidity
- Durability
- Optimum corrosion protection
- Good emergency running property

The P180 sliding layer system provides sufficient protection even in damp environments. It is chemically inert and prevents fluid ingress into the material. This effectively suppresses the swelling of the material. As a result, the material exhibits high dimensional stability during application.

**Application description**

Among other things, gear pumps comprise a multiple-component housing, gears and gear shafts.

**Gear pumps are used in many applications, including**

- The chemical industry
- The automotive industry
- Agricultural machinery
- Construction machinery
- Foodstuff engineering
- Machine tool manufacture

**Requirements from gear pumps**

- High reliability
- Good durability
- Low noise level
- High build-up of pressure

**Types of gear pump**

- External gear pump
- Internal gear pump
- Screw pump
- Screw-spindle pump
- Screw-type compressor
- Toothed ring pump
- Rotor pump
- Crescent pump



Permagliding® P180  
plain bearing bush

**Further information on Permagliding® P180 plain bearing bushes**

- Permagliding® catalogue Item no. 50003863-02
- Permagliding® OnlineShop shop.permagliding.de