

# 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 ... P10

### 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® P10 plain bearing bushes

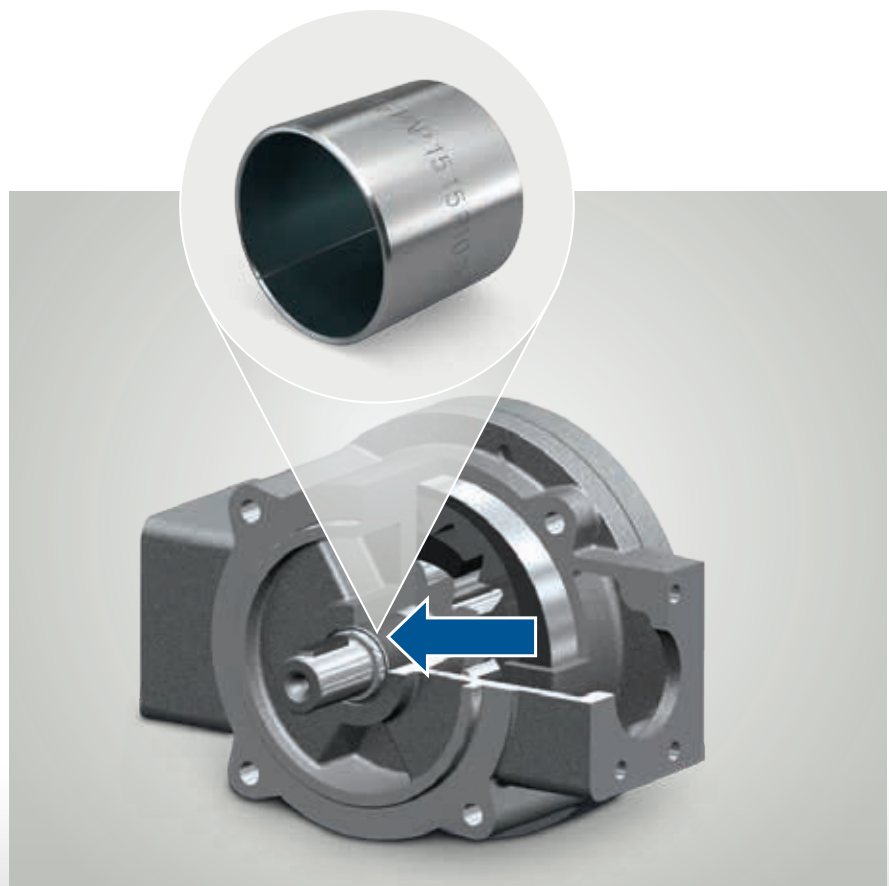
PERMAGLIDE® P10 plain bearings are used as the main bearing for the gear shafts in gear pumps.

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.

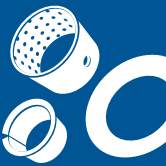
PERMAGLIDE® P10 plain bearings meet these requirements. The excellent dry-running behaviour of PERMAGLIDE® P10 plain bearings also ensures a low level of wear in the mixed friction operation that occurs when the pump is switched on and off.

### 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



*Gear pump application, bearing with PERMAGLIDE® P10 plain bearings (arrow)*



**Advantage: Reliable function of the bearing with PERMAGLIDE® P10 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**

PERMAGLIDE® P10 – robust and reliable

- Universal-use bearing material for dry and lubricated applications
- Material: lead bronze sintered onto a steel base, friction-minimising additives PTFE and lead.
- High rigidity
- Durability
- Optimum corrosion protection
- Good emergency running property

In damp environments in particular, this sliding layer system provides outstanding protection against corrosion.

Moreover, lead and PTFE have an extremely low absorption tendency. Absorption of the surrounding fluids, swelling of the materials and chemical damage to interacting sliding partners are prevented. The result is dimensional stability and optimum corrosion protection during use.

**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

**Note for the food and automotive industry:**

The material P10 contains lead and must not be used in the food sector.

According to the end of Life Vehicle Directive, it must also not be used in the automotive industry. The material P14/ P147 (unleaded) can be used for these applications.

**Further information on PERMAGLIDE® P10 plain bearing bushes**

- PERMAGLIDE® catalogue item no. 50003863-02
- PERMAGLIDE® online catalogue [www.permaglide.com/onlineshop](http://www.permaglide.com/onlineshop)



PERMAGLIDE® P10 plain bearing bush