FL 1631
For technical personnel only!
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APPLICATION INFO

PERMAGLIDE® PLAIN BEARINGS: BEARING ELEMENT IN SHOCK ABSORBERS

SECTOR:

Industrial technology, damping technology, automotive, utility vehicles, mechanical engineering

PRODUCTS USED

Permaglide® plain bearing bush, design PAP ... P180 / P203 / P141

Application in shock absorber systems

FUNCTION

Shock absorbers absorb mechanical vibrational energy. Shock absorbers, coupled with springs, are installed on the chassis in order to ensure that vibrating masses are damped as quickly as possible. On motor vehicles, they represent a safety-relevant component in the form of hydraulic twin-tube dampers. Damping is carried by means of movement and internal friction of viscous fluids, usually oils, that flow from one working area to the other in the damper in accordance with the direction of movement of the vibration occurring. Mass-spring-damper systems are coordinated with one another, meaning that no undesired high amplitudes or uncontrollable vibrations are to result.

PLAIN BEARING REQUIREMENTS

From the asphalt road to the dirt track, from extremely low to very high temperatures, and, on top of that, load changes, wet conditions, dirt: shock absorber systems must prove themselves to be absolutely reliable under extremely various conditions. Space-saving and optimally coordinated plain bearings play a major role here. In order not to affect the damping characteristics, the friction values of the plain bearings have to be continuously low over the entire lifecycle. The plain bearings also have to be wear resistant, insensitive to edge loads and resistant to flow erosion.

BEARING ELEMENT WITH PERMAGLIDE® P180 PLAIN BEARING BUSHES

To improve comfort and achieve good NVH performance in vehicles (NVH = Noise, Vibration, Harshness), plain bearing bushes made from Permaglide® P180 are used in shock absorbers. Permaglide® P180 is a lead-free, high-performance material with outstanding tribological performance and a temperature range of –200 °C to 280 °C. P180 can be used for all manner of applications and functions well in systems with liquid lubrication as well as in dry-running applications.

The material P180 has lots of benefits for use in shock absorbers, for example:

- very low stick-slip tendency
- constant, low friction throughout the entire service life
- maximum load capacity and wear resistance, especially in the case of edge wear
- high erosion resistance

BEARING ELEMENT WITH PERMAGLIDE® P203 PLAIN BEARING BUSHES

With the material composition Permaglide® P203, a reliable plain bearing material has been created which fulfils the application's requirements. The material is designed as a low-maintenance and lead-free material and is approved for a temperature range from –200 °C to 130 °C. It is compatible with all types of oils and does not have a tendency to undesired swelling. The material has proved itself to be extremely suitable in shock absorbers, even in the case of inadequate lubrication, as well as in use on poor surfaces.

BEARING ELEMENT WITH PERMAGLIDE® P141 PLAIN BEARING BUSHES

In the case of chassis where maximum performance is required, shock absorbers are used with plain bearing bushes made from Permaglide® P141. Permaglide® P141 is a high-performance material with a particularly high resistance to flow erosion and an operating temperature of up to 250 °C. P141 therefore impresses in systems with liquid lubrication as well as – thanks to its self-lubricating PTFE matrix – in dry-running applications.

ADVANTAGES OF PERMAGLIDE® P180 PLAIN BEARINGS

REACh compliant RoHS conform pb free

- Very low stick-slip tendency
- Extremely resilient, especially with edge wear
- Low and constant friction value
- Very good wear resistance in dry running and wet running
- Can be used universally: suitable for rotary, oscillating and axial applications
- Excellent chemical resistance
- High resistance to erosion
- Largely resistant to swelling
- Compatible with all common dry-running steel shafts

MATERIAL DESCRIPTION FOR PERMAGLIDE® P180

P180 is a lead-free high-performance material with outstanding tribological performance. It is designed for maintenance-free applications under dry-running conditions. In addition, it can be used in both grease- and liquid-lubricated systems. P180 is a further development of the tried and tested P14 material with improved resilience and wear resistance whether in dry or lubricated applications. The material can also be used in tribological systems that were previously only operated with materials containing lead, such as P10.

PASSION FOR **TECHNOLOGY.**

RHEINMETALL

ADVANTAGES OF PERMAGLIDE® P203 PLAIN BEARINGS

- Low wear
- Very good emergency running properties
- Insensitive to edge loads
- Insensitive to impact loads
- Good damping characteristics
- Good chemical resistance

MATERIAL DESCRIPTION FOR PERMAGLIDE® P203

Permaglide® P203 is a lead-free, environmentally friendly bearing material with a very high performance. Thanks to a special combination of bulking agents, high wear resistance is achieved while simultaneously maintaining very good emergency running behaviour. The material is therefore ideally suited to low-maintenance, grease or liquid-lubricated applications subject to more stringent requirements. Plain bearing bushes made from P203 are ready to install and have a smooth sliding surface. Plain bearings made from Permaglide® P203 are available on request.

ADVANTAGES OF PERMAGLIDE® P141 PLAIN BEARINGS

- Can be used universally
- Low friction values
- High wear resistance
- Resistant to erosion
- Extremely good performance in dry running as they are self-lubricating

MATERIAL DESCRIPTION FOR PERMAGLIDE® P141

Permaglide® P141 is a lead-free bearing material that is used particularly in systems with liquid lubrication and a high degree of mixed friction. Grease as a lubricant is only recommended conditionally. Furthermore, P141 can also be used in dry running. The material is manufactured in a continuous sinter impregnation process. The bronze sliding layer is sintered in a specially adjusted sintering process on a steel base with an average pore volume of approx. 30%. In these cavities, a solid lubricant mass is impregnated and thermally treated. Plain bearings made from Permaglide® P141 are available on request.