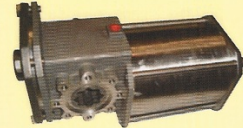


# Maintenance-free plain bearings for the automotive industry

Although polymer plain bearings have been an established, viable alternative in the machine tool industry for many years, they are now also gaining wider acceptance in the automotive sector



Today, almost all new cars on the road utilise some kind of plastic plain bearing. The demands placed on these plain bearings include wear resistance, zero maintenance and thermal stability. iglidur® bearings from igus® possess these characteristics and can often directly replace steel-backed PTFE bushes and roller bearings.

They also offer a cost effective purchase and many technical benefits. Developed under the toughest conditions, they are oil-, maintenance- and lubrication-free, low wear, resistant to dirt and dust, corrosion-free and simple to fit. igus also has the data to precisely predict the life of its bearings within a specific application.

## Virtually all cars use plastic bearings

Nowadays, there are few vehicles that are not equipped with igus' iglidur polymer plain bearings. The spectrum of applications ranges from simple seat systems to under-bonnet applications subject to high thermal stress, gearshift transmission forks, and exhaust gas systems of diesel engines.

In addition to the standard range of plain bearings, igus can offer special iglidur materials developed for a specific application. Results obtained on test benches, specifically developed for this purpose, serve as a basis for material selection.

Every year, more than 4,000 tests are carried out in igus' laboratory and more than 100 new materials are tested. Selecting the relevant iglidur plain bearing for a specific application is always supported with empirical lifetime data. Whenever test data is not available for a particular application, igus can carry out tests on a short-term basis.

This year, igus developed a new plain bearing material for an application with a thermoset shaft for vehicle lighting systems. This took less than eight weeks to complete.

## Seat systems: calibrated bearings

The prime requirement for seat systems is that they are low cost. igus polymer plain bearings can offer considerable cost benefits compared to metal plain bearings.

Often, sheet metal systems, punched holes or widely-tolerated cold extrusion metal pressings are used in seat systems. However, the bearing system must have minimum clearance in order to ensure sufficient reduction of noise. Plastic plain bearings are therefore being used increasingly to provide this.

One option is to install iglidur polymer plain bearings to achieve a transition fit between the bearing and shaft. Following the E-coat paint process, the bearings are re-calibrated by high temperatures up to 220°C. A clip design ensures a secure axial fit in metal fixings and punched components.

## Chassis: high load, temperature resistant materials

The properties of the car chassis directly affect the comfort of the passengers and are important for driving safety. Any materials used must be able to cope with extremely high loads and temperatures. igus has developed a material called 'igidur Z', which can operate at pressures up to 150 MPa and temperatures up to 250°C. The polymer's low modulus of elasticity also provides optimum damping in the event of blows, impacts and vibration. iglidur Z can operate at pressures up to 150 MPa.

## Polymer materials for transmissions

With the introduction of new iglidur H4 plain bearings, igus has unveiled a material that offers a long term operating temperature of 200°C and is resistant to synthetic transmission oils and fuels.

igidur J bearings (below) enable tolerance compensation



In tests carried out by a major German car manufacturer, transmissions with shift forks, usually fitted with roller bearings, were retrofitted with iglidur H4 plain bearings. Although the test drivers did not notice any significantly higher operating force, they praised the improved damping properties.

#### Steering: low friction, high rigidity

Automotive steering column adjustments demand low friction values and a high degree of rigidity, despite wide housing tolerances. Slotted 'igidur J' bearings enable tolerance compensation and substantially reduce the difference between static and dynamic friction.

Lubricated 'igidur F' bearings offer high pressure resistance and low friction values to steering systems.

#### Butterfly valves: low friction and wear

Glass-fibre reinforced PA or PPS materials can be used as shaft materials. Plastic-plastic bearing systems are increasingly important in the automotive sector due to cost and weight considerations. Plastic materials are preferred for their chemical resistance and the economical production of complex design parts.

PA materials have been tested for reliability and efficiency in inlet manifolds for many years. Now, aluminium die-cast housings, for example, in the case of throttle valves, are progressively being replaced with plastic housings. Here, iglidur plain bearings are over moulded with PA or PPS materials at around 340°C. A high thermal stability can be provided using iglidur Z.

#### Plastic brake calliper bearings

Intense vibrations, abrasive dirt, high temperatures and high loads mean that calliper bearings must operate in extreme conditions. iglidur H2/H4 plastic plain bearings from igus achieve a particularly high service life due to their high resistance to alternating stress and wear. This excellent durability is standard with iglidur materials and is achieved by the homogenous blend of base polymer, fibre reinforcement and solid lubricants.

#### Plastic bearings: up to 90% cheaper

Dave Spence, 34, has been working for igus, in Northampton for 11 years. Initially, his work focused on selling the complete igus bearing range, but in the last few years he has become the automotive specialist for igus UK.

As Automotive Project Manager, he is now responsible for selling plastic plain bearings to the automotive sector, providing extensive technical support, from conceptual design right through to full production, whenever necessary. He explained the benefits of plastic bearings: "In addition to the technical benefits that plastic materials have to offer, due to their integrated lubricating capacity, igus can also fall back on

persuasive arguments of cost. Compared to ball bearings, our iglidur bearings are up to 90 per cent cheaper. In most cases, we are currently competing against metal plain bearings with PTFE coatings, which are up to 40 per cent more expensive." □

#### For further information on igus bearings for the automotive industry contact:

**Dave Spence,**  
Automotive Product Manager,  
igus (UK) Ltd.,  
Tel: 01604 490000  
E-mail: dspence@igus.co.uk

**Sales contact: igus (UK) Ltd.,**  
79-83 Tenter Road, Moulton Park,  
Northampton NN3 6AX  
Tel: 01604 490000  
Bearings Fax: 01604 499927  
Chain Fax: 01604 499227  
E-mail: sales\_uk@igus.co.uk  
Web: www.igus.co.uk

igidur Z (below) can operate at pressures up to 150 MPa

