

Expertise in Maintenance-Free Large-Scale Spherical Plain Bearings



Maintenance-free large-scale spherical plain bearings in action ...

How large does the diameter of an ELGES spherical plain bearing have to be in order to be classified as a “large-scale bearing”? The answer is simple: The nominal diameter of these bearings is 320 mm or greater. More important than their size, however, is the high capacity of our maintenance-free spherical plain bearings. A key factor here is the highly efficient, state-of-the-art sliding contact of a PTFE fabric to hard chrome-plated rolling-bearing steel.

After 40 years of extensive research and development, we can ensure that the PTFE sliding layer makes our bearings

absolutely maintenance-free. This means extremely low friction values and no relubrication. As a matter of fact, any extra lubricant would interfere with the self-lubrication system and actually reduce the service life of the bearing.

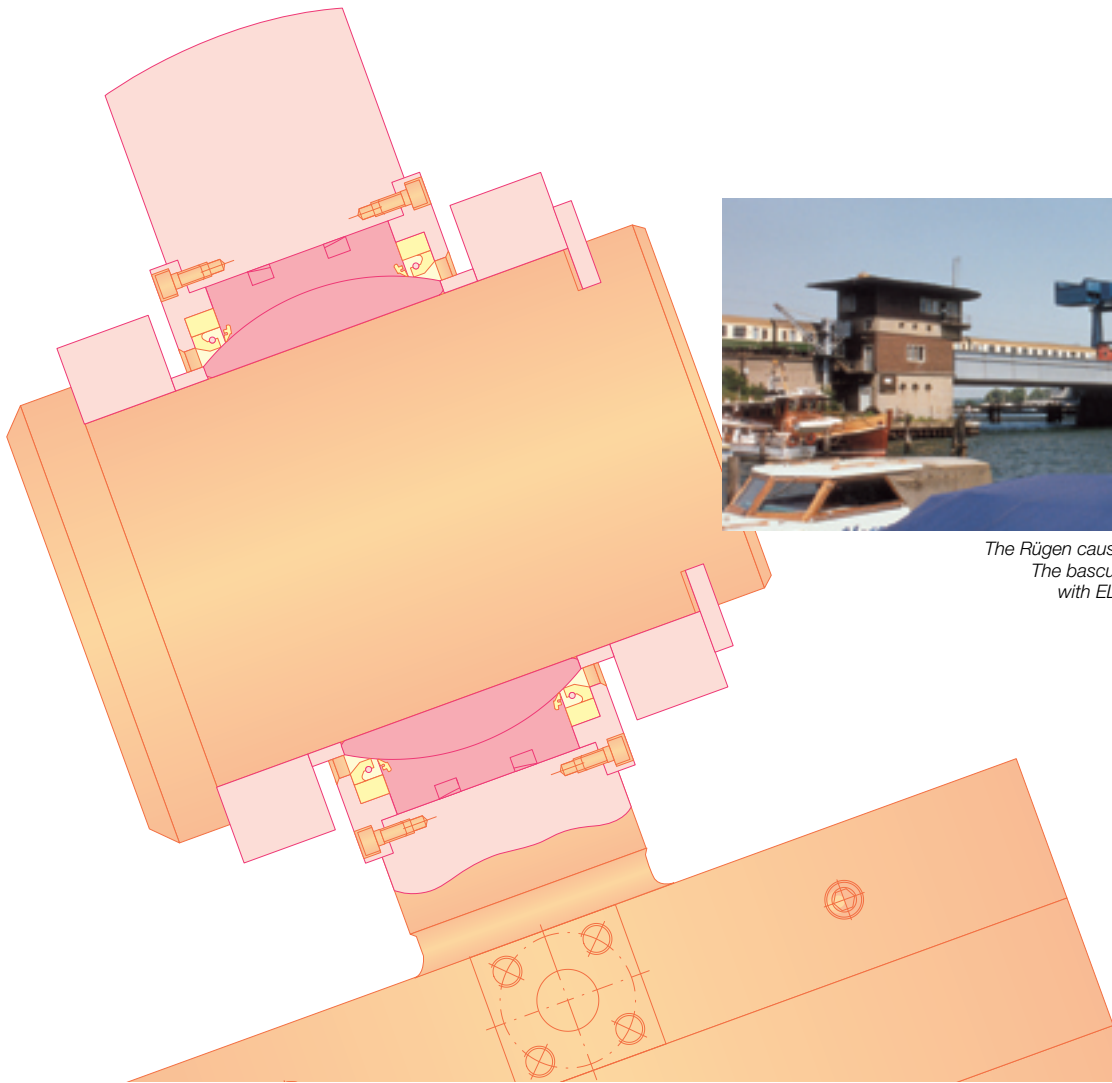
High performance without lubrication – here our radial spherical plain bearings, with optimum performance mass and all dimensions per DIN 648, are top quality. If you compare the ratio of dynamic load rating “C” to bearing mass, you’ll see that you save on mass, drive power, and, ultimately, cost.

Incidentally, our maintenance-free bearings come in a wide variety of designs. But whether it’s radial, thrust, or angular-contact spherical plain bearings, one thing is sure: ELGES maintenance-free spherical plain bearings provide our customers with modern,

reliable designs and a clear competitive edge in all industrial sectors worldwide.

One example here is bridge construction, such as the Ziegelgraben Bridge in Stralsund (in northeast Germany). This main traffic artery between the island of Rügen and the mainland must be opened at least five times a day to accommodate ship traffic. This means hard work for all the bascule bridge’s bearing positions: severe stresses and high corrosion risk due to the aggressive ocean air, and, of course, there’s no time for maintenance.

This is a typical application for ELGES spherical plain bearings. They are not only maintenance-free, but also wear-resistant due to the additives in the PTFE fabric. This allows our spherical plain bearings to last for decades. This is good news for bridge builders, don’t you think?



*The Rügen causeway in Stralsund, Germany:
The bascule bridge section is equipped
with ELGES spherical plain bearings*

... on land

Hong Kong is a major hub of southeast Asia – and an earthquake area. The modern headquarters of HongKong-Bank has an earthquake-resistant framework of eight stable steel columns with five levels of trusses. Maintenance-free ELGES large-scale spherical plain bearings provide moment-free support at nodal points. This is probably one of the most spectacular applications in ELGES's 30 year history of successful large-scale spherical plain bearing manufacture.

But this is by no means the only example of what our maintenance-free bearings can withstand. For instance, contact pressures of up to 200 N/mm² for dynamic loads and 400 N/mm² for static loads are possible.

Another example – not quite as spectacular but all the more delicate instead – is the sliding-roof design of the Gerry Weber Tennis Stadium in Halle (Westphalia, Germany). What makes it so delicate? Well, just imagine the famous "Three Tenors" performing in the rain

because the roof-closing mechanism doesn't work. This would be unthinkable.

In the event of rain, it takes only 90 seconds for the 7000 m² transparent roof to close to protect the space inside. The concept here is a complicated annular roof design whose load-carrying elements are free of bending stress and enclosed within maintenance-free, ELGES spherical plain bearings sealed on both sides.

You see, we don't leave anyone out in the rain, and tennis players and the Three Tenors aren't the only ones who appreciate that. Just check with us when you're planning your next design.



*Stable but with flexible joints:
roof design of the Gerry Weber Stadium
in Halle (Westphalia, Germany)*



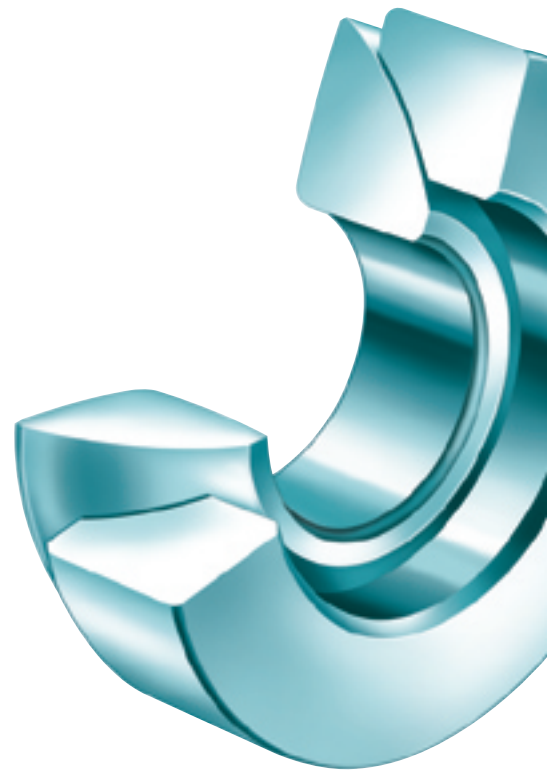
... in water

Moisture is the major enemy of most bearings, but this poses no problem for spherical plain bearings with the PTFE sliding layer. The PTFE fabric has a strong adhesive bond, and appropriate admixtures in the sliding layer protect the bearing's functionality and service life from moisture.

For sluice system designers, this is still another reason to consider our maintenance-free bearings for a design's bearing positions. When the nearly 1,000-ton, 100-meter-long sluice gates pivot or move up and down, they impose powerful radial and axial stresses on the spherical bearings. That's the time for ELGES's heavy-duty bearings, such as those with 320-mm inside diameters. The special sliding contact of PTFE fabric and hard chrome gives our maintenance-free spherical plain bearings high load-carrying capacity and long service life, even under harsh environmental conditions. And if they have to be really tough, you can also get our spherical plain bearings in corrosion-resistant steel.

Shipbuilders will also find these bearings worth looking into. An example here would be twin-hull ships, a type of ship with an efficiently designed opening mechanism for bulk transport. Large hydraulic cylinders provide easy opening and closing, and reliably secure the hulls during unloading. Depending on the size of the ship, the

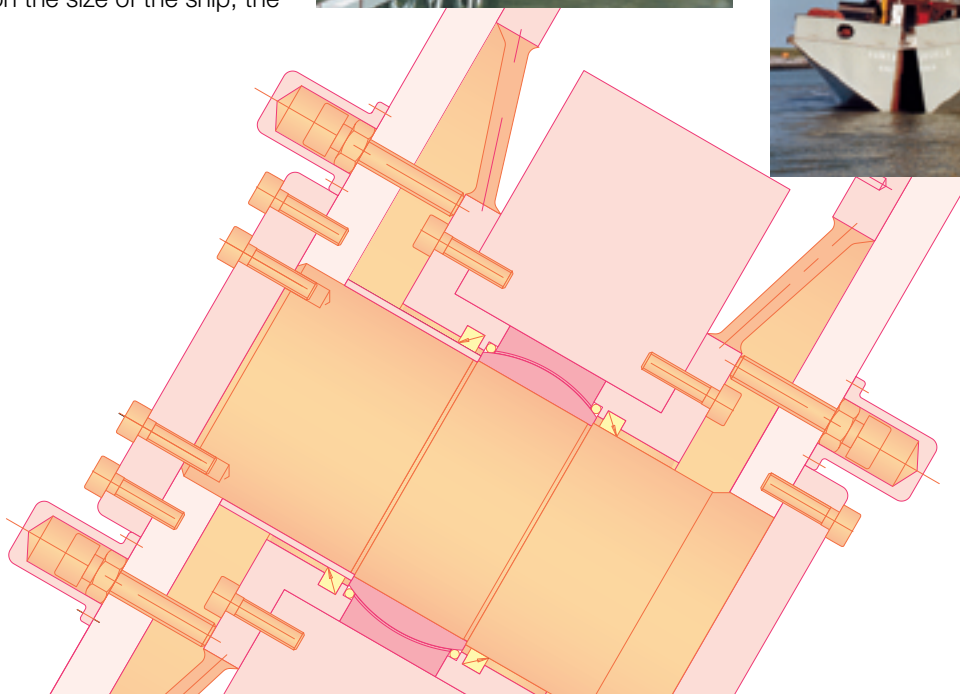
stress points for these cylinders are equipped with ELGES GE 400-600 DW large-scale spherical plain bearings. Special characteristics of these bearings include easy installation and dismantling due to the unilaterally bolted, radially split outer ring. Truly economical, and a true INA product.



Maintenance-free spherical plain bearings with PTFE fabric in a lift gate on the Hartel Canal in the Netherlands



Special vessel for discharging gravel: Bottom washouts can be filled economically



... and in the air



Ship crane: designed for maximum loads

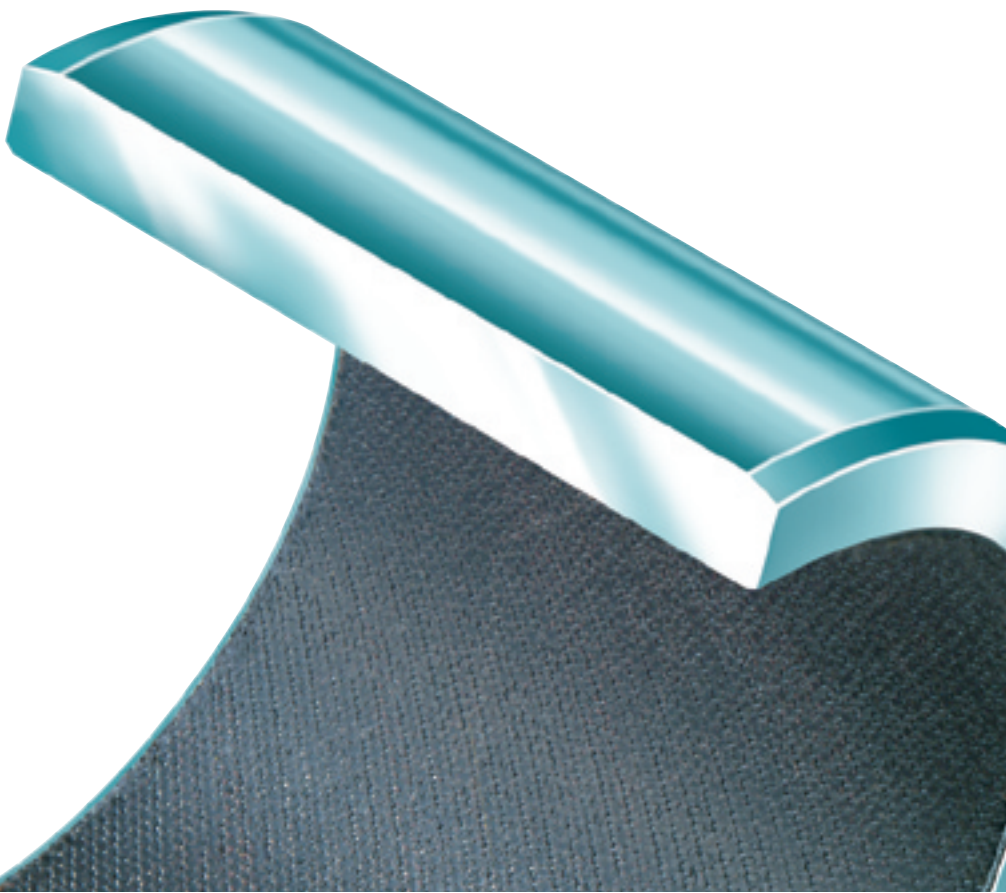
Giant offshore platforms are erected in an oil field in the North Sea. Booms on the big floating cranes move loads of 4,000 tons. And at boom stress points ELGES large-scale spherical plain bearings show what they can do. Here our really big bearings are at work. They are capable of handling very heavy loads, even though they're quite small in terms of mass when the ratio of dynamic load rating to bearing mass is considered. But in this application, there is another feature of our bearings that is important: their high operational dependability. A damaged bearing here would be a disaster, resulting in long downtimes and high costs, since repairs are time-consuming and can only be performed in dock.

The way the freight container in the harbor floats through the air on the crane hook may look easy, but the loads on the bearing positions in the linkage system of big slewing portal cranes, with their double-link boom systems, are very one-sided, i.e., the load zone is always in the same

bearing section. Since lubrication is next to impossible, we naturally use our PTFE-padded spherical plain bearings. This means you don't have to worry about maintenance on the spherical plain bearings in your cranes.

That's not only good for the environment, but also makes good financial sense. And you can put the time you save to good use, for instance by reading our Catalog 236. There you'll find all you want to know about our maintenance-free large-scale spherical plain bearings and much more. The catalog also contains important information on our maintenance-free ELGES guide sleeves.

Incidentally, the exact definition of the size of our large-scale spherical plain bearing is not really all that important. It doesn't matter whether we're talking 100, 300, 600, or even 1,000 mm (yes, we can even supply these). Our main concern is that our maintenance-free spherical plain bearings meet our customers' satisfaction.



Slewing portal crane with double-link boom system: Tightly sealed ELGES bearings withstand aggressive environmental forces



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