

Spherical Bearings



Description

Our Spherical Bearings are designed to carry combinations of vertical loads, horizontal loads, longitudinal and transversal movements and rotations and they are used in steel and concrete road and railway bridges. The bearing is composed by steel elements coupled with PTFE surfaces to allow movement and rotations. One side of the internal median plate is machined as a spherical surface to allow tilting movement (rotation) whilst on the other side a flat sliding surface is obtained to allow displacements. Depending on whether the bearing is fixed, guided sliding or a free sliding, they accommodate vertical loads and corresponding horizontal forces, as well as movements in longitudinal or transversal directions..

Load Combinations

- Spherical Bearings can carry very high loads, over 100.000 kN The bearings are designed for combined maximum vertical and horizontal loads. The standard range of bearing is designed to have an horizontal load $\leq 15\%$ of the maximum vertical load with a maximum rotation of ± 0.02 rad (other load and rotation combinations are provided on request). In order to define the correct bearing, our engineers take into account the designed load effects, rotations, displacements and type of fixings.

Quality Of Materials

- **Austenitic Steel Sheet** : The austenitic steel used for sliding surfaces is X5CrNiMo17-12-2 in accordance with EN 10088-2 1.4401 with a minimum thickness of 1.5 mm
The roughness is $Ry5i \leq 1 \mu m$
The hardness $\geq 150 HV1$ and $\leq 220 HV1$
- **Ptfe** : These bearings use only virgin PTFE without regenerated or filler materials. The minimum thickness of PTFE is 4.5 mm and varies in according with the bearings size.
- **Ferrous Material For And Piston** : The piston and if applicable the sliding plate are manufactured from ferrous material in accordance with EN 10025 standard.
- **Concrete Pressure** : According to EN 1337-7 the allowable concrete pressure depends on the relative dimensions of the bearing structure interface to the total support area and the characteristic strength of the concrete.

Specification

- **FRICTION OF THE BEARINGS** :The reaction of the bearing to the movement can be mathematically calculated by considering friction coefficient between stainless steel and PTFE to be 0,03. The exact friction coefficient between stainless steel and PTFE is determined in according to EN 1337-2.
- **CORROSION PROTECTION** :Steel components exposed to the elements are protected against corrosion. It adapts the corrosion protection in accordance to the aggressiveness of the environment in which the bearings are to be installed and to each customer's requirements. The standard corrosion protection according EN 1337-9 is as follows: – sandblasting SA2.5 grade – two components high thickness epoxy zinc paint: 250 µm The high resistant corrosion protection (metallization) is as follow: – sandblasting SA 2.5 grade – metal spraying to 85 µm with Zn/Al 85/15 – sealing: Epoxy sealer 20-25 µm – top coat: Polyurethane paint 100 µm
- **DUST PROTECTION** :The dust protection around the sliding plate ensure the cleaning of the sliding surfaces to minimize the friction during sliding and guarantee the durability of the PTFE sliding material.