TIS Test Laboratory

TIS has its own test rig in its facilities that is capable of performing a wide range of factory production control tests on different type and dimensional properties. Test rig also has the capability of performing various tests required during its R&D projects. Test laboratory of TIS has been established based on requirements of EN ISO 17025.

Some technical properties of test rig in TIS Test Laboratory are listed below.

- Axial load capacity: 15000 kN
- Horizontal load capacity: 1500 kN
- Peak horizontal velocity: 100 mm/sec
- Horizontal displacement capacity: ±500 mm
- Stability and consistency even for very small horizontal velocities (<0.1mm/sec)
- Keeping vertical load constant for the entire horizontal displacement and velocity range.

Quality System and Quality Control

Quality control principles specified in EN 1337 and EN 15129 are being strictly implemented in the production facility of TIS. Certificates of each batch of raw materials are being checked, dimension controls of device components are evaluated in each stage of manufacturing and the entire production system is inspected carefully. TIS has not only CE certificate according to EN 15129 and EN 1337 but also Integrated Management System (IMS) combined by procedures defined in ISO 9001, ISO 14001 and ISO 18001.

Factory Production Control Plan

The main objective of TIS in using a factory production control (FPC) is to make the entire production process, from raw material to final assembly of the components, run smoothly and systematically. In order to achieve this, TIS capitalize on standards such as EN ISO 9001, ISO 14001, ISO 18001, EN 15129 and EN 1337.

In FPC, certificates of each batch of raw material are checked and those certificates are recorded.

During production, dimensions of every single component, whether produced or processed, are checked and these inspections are recorded. Since this system is also electronically monitored, possible flaws of production are minimized. In addition, because of this system, traceability of each component of pot bearings produced by TIS is achieved as stated in EN 1337.

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ÖZEL YAPIM

CE

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Teknolojik İzolatör Sistemleri

HAYATA BAĞLAR!

SPHERICAL BEARING

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TIS SPHERICAL BEARING (TSB)

Description

TIS Spherical Bearing (TSB), produced by TIS Teknolojik İzolatör Sistemleri A.Ş., is a structural bearing which is used for connecting different structural elements (substructure and superstructure) and controlling force and displacement demands developed between the structural elements. The working mechanism of TSB is to transfer the forces developed on the superstructure to the substructure with desired rate, and to allow the rotations on the substructure and the other movements developed by the actions listed below.

- Loads
- Shrinkage and expansion in concrete
- Seismic effects
- Tenperature changes

TSB devices are designed according to the requirements applicable to relevant parts of EN 1337, mainly EN 1337-2 and EN 1337-7.

Bearing Types

TSB devices are produced in three different types according to the force and displacement interactions that need to be accommodated. TSB's that TIS A.Ş. produce are listed below.

- Fixed spherical bearing : TSB-FX
- Free sliding spherical bearing : TSB-FS
- Guided sliding spherical bearing : TSB-GS

TSB-FX

TSB-FS

TSB-GS

TSB-FX

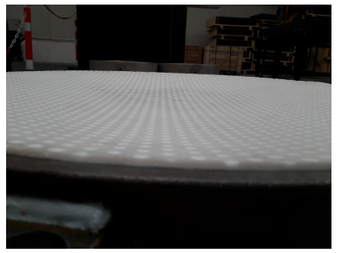
TSB-FX consists of a concave backing plate having a dimpled PTFE sheet on its curved surface, a chromium-plated convex calotte on the backing plate, and a pot-shaped upper plate at the top. This type of bearing resists horizontal displacement demands in any direction and only allows superstructure to rotate about any horizontal axis. PTFE plate resists vertical forces with its high compressive strength and allows rotation of the calotte and upper plate with the lubricants inside the dimples of PTFE. The contact between the backing plate and upper plate transfers the horizontal forces on the superstructure and the upper plate connected to it, to the substructure.

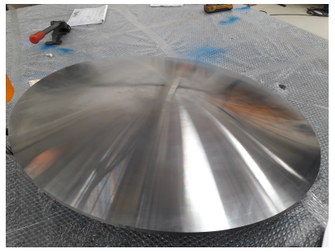
TSB-FS

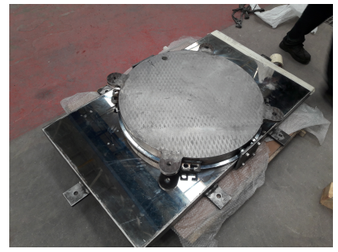
TSB-FS consists of a concave backing plate and chromium-plated convex calotte, just used in TSB-FX, and an upper sliding flat plate that is free to slide on top of the calotte in any horizontal direction. This sliding surface is composed of a dimpled PTFE sheet fixed in a recess on the calotte and a polished stainless steel fixed on the lower surface of the upper sliding plate. This sliding surface allows the superstructure to move freely in any horizontal direction relative to the substructure, with the low friction provided by the lubricant in the dimples of PTFE sheet. Besides, the horizontal forces on the superstructure are not transferred to the substructure.

TSB-GS

TSB-GS is almost the same as TSB-FS but this type of bearing has a guide in the middle of the top of the PTFE-placed calotte, in the direction of the design movement. Besides there is a canal in the middle of the upper sliding plate that the guide is placed and slide inside. The guide allows the superstructure to move only in the direction of the design displacement and prevents it to move in all other horizontal directions and while doing that, transfers the horizontal forces developed in those directions to the subassemblage and to the substructure with the contact between the guide and sliding plate.







Materials

Backing plate, calotte, guide and upper sliding plates of the TSB devices are produced from S355 structural steel. It is advantageous to use S355 structural steel for both design and production of the devices since it is a well-known material. This material has also proven its performance under various structural loads.

PTFE sheet, placed on the backing plate and calotte, ensures the transmission of vertical forces to the sub-structure and provides high resistance against the friction resulting from continuous rotational movements, with its high compressive strength and dimples filled with lubricant.

Dimpled PTFE sheets, having a compressive strength of 90 MPa, is used in TSB-GS and TSB-FS devices and lubricants are used to provide high compressive strength against vertical loads and low friction for sliding movements.

Composite material with a compressive strength of 200 MPa and a low friction coefficient is used on the sides of guides in TSB-GS in order to resist high horizontal loads transferred from upper sliding plate to the guide.