Arsan®

Precise Connections - since 1957



ATLAS® SPHERICAL BEARING

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www.arsankaucuk.com.tr



Arsan is a leading manufacturer in Structural and Seismic Bearings, Expansion Joints and various type of Pipe Gaskets and Tunnel Segment Gaskets for infrastructure and building construction sectors. Arsan continues to develop with its policy focused on continuous improvement since 1957. Research and development department of Arsan works on innovative projects continuously. Arsan's vision is to be worldwide reliable supplier of structural products. Currently, 60% of total production is exported and 85% of this turnover is generated from Europe. In addition to these European countries, Arsan exports to more than 50 other countries as well.

Structural bearings include all types of elastomeric bearings, guided and restraint bearings, pot bearings, spherical and cylindrical bearings. All types of structural bearings have CE Certificate.

Arsan supplies seismic isolation systems for bridges and buildings using lead rubber bearing (CE) and friction pendulum systems. Arsan test laboratory is equipped with to carry out qualification and acceptance tests on structural bearings and seismic isolators. The factory production control tests are carried out in Arsan Factory according to the project requirements specified in the standards or client requests.

Expansion joints for bridges comprises mat expansion joints, single gap expansion joints, and modular expansion joints. Expansion joint type and design are determined as per project requirements.

Tunnel segment gaskets are designed by Arsan engineers and offer excellent water pressure resistance. Various types of pipe gaskets are also provided.

Design and drawings of all structural products are prepared by Arsan Engineers. Thus, Arsan is a reliable manufacturer for structural products with its experience, capacity in manufacturing and efficient engineering solutions.

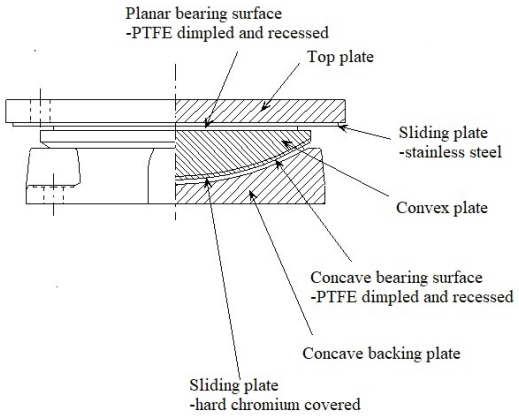
Arsan Factory is located in Sakarya (Turkey) and head office is in Dudullu/Istanbul (Turkey). Arsan Factory is equipped with various production methods such as extrusion, compression and injection for rubber products. Rubber compound tests are also performed in Arsan R&D laboratory. Moreover, most tools required to produce rubber products are built in house with metal machining. In addition, designing and producing molds, machining and assembly of structural bearings and expansion joints are completed by Arsan.

ATLAS® SPHERICAL BEARINGS

COMPONENTS

Atlas® Spherical Bearings consist of a concave backing plate and a convex plate is placed on top of this, which, thanks to its polished hard-chromium plated surface, can slide within the lower part, thus allowing rotations about every axis.

The curved contact surface has low friction which is achieved by means of PTFE that is bonded to the concave surface and is in contact with hard-chromium plated surface. Sliding capabilities in horizontal direction are provided by incorporating a plane sliding interface at the top of the bearing. This flat sliding surface is achieved by use of PTFE.



Dimpled Lubricated PTFE Sheet

Dimpled lubricated PTFE manufactured from unfilled sheet has the lowest friction coefficient under all load conditions. The dimples function as reservoirs that store grease for continuous lubrication. It is used at the flat and curved sliding interface. Certified silicone grease lubricate, which maintains its consistency and remains effective even at -35°C, is used. To keep frictional resistance as low as possible, the lower surface of the sliding plate features a polished stainless steel sheet.





Ferroxyl Test

Ferroxyl Test on Hard Chromium Covered Sliding Plate

The ferroxyl test is used to evaluate the porosity of chromium deposits on steel substrates after being dipped into the test solution a filter paper is placed over deposit. Ferroxyl indicator is a solution containing potassium hexacyanoferrate (III) and phenolphthalein. It turns blue in the presence of Fe^{2+} ions. The filter paper is removed after some time washed and dried any pores show themselves as blue spots on test paper. The presence of no blue spots on hard chromium plating means that steel is properly covered with chromium.

SPHERICAL BEARINGS

DESIGN CRITERIA

- Custom Designed for the project according to the required vertical and horizontal load carrying capacities.
- Has a rotational capacity up to 0.05 radians.
- If required can be regulated for free horizontal movements in one direction or in all directions.
- Has long service life under dynamic loads.

DESIGN STANDARDS

ATLAS Spherical Bearings are designed according to European Standards and has a CE Quality Certificate. If required, spherical bearings can be designed according to AASHTO LRFD or other international standards.

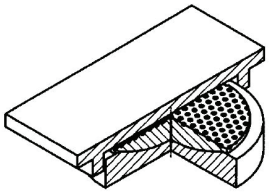
Standards used for design are:

EN 1337-1 General Design Rules
EN 1337-2 Sliding Elements
EN 1337-7 Spherical and Cylindrical PTFE Bearings
AASHTO LRFD Bridge Design Specification

TYPES OF SPHERICAL BEARINGS

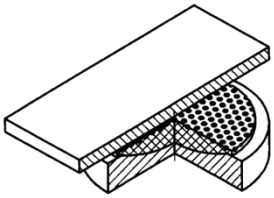
FIXED SPHERICAL BEARINGS

Fixed spherical bearings allow rotation about any axis and prevent transversal movement.



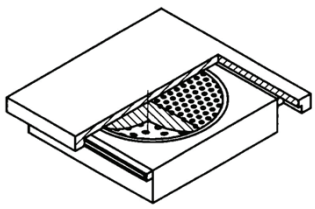
FREE SLIDING SPHERICAL BEARINGS

Free sliding spherical bearings allow horizontal movements in any direction. Sliding capabilities are provided by incorporating a plane sliding interface at the top of the bearing. This flat sliding surface is achieved by use of PTFE in contact with stainless steel, where the stainless steel plate is located above the PTFE so that accumulated dirt and dust falls off during sliding.



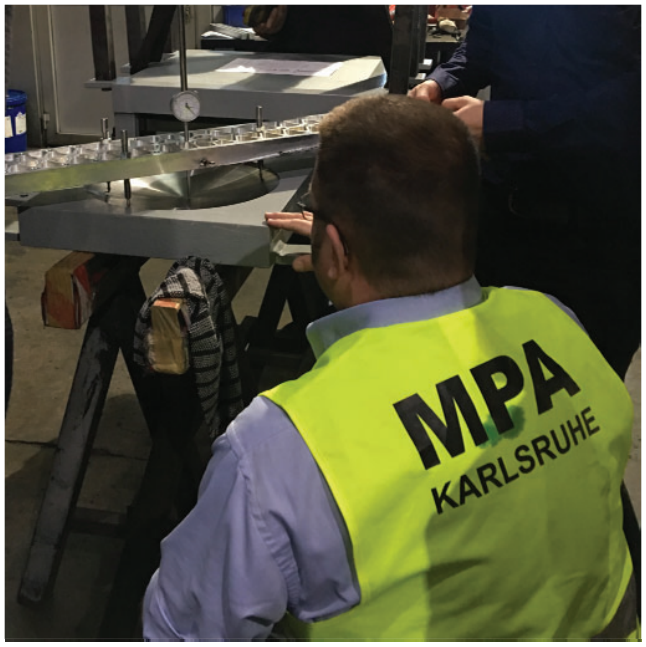
GUIDED SPHERICAL BEARINGS

Guided sliding spherical bearings permit sliding in one direction and are restrained against translation in the orthogonal direction by a guiding system.



SPHERICAL BEARINGS

INSPECTION & INSTALLATION









ATLAS® Spherical Bearings are systematically and regularly inspected by an independent certification body (MPA Karlsruhe) according to EN standards.

Installation instruction of ATLAS® Spherical Bearings are provided and ARSAN offers supervision service of installation. The supervision is highly recommended to ensure proper installation of the devices.

CORROSION PROTECTION

In order to protect spherical bearings from environmental effects, corrosion protection measures are defined clearly in EN 1337-9. Steel parts which are exposed to external effects must be protected against corrosion.

Standard corrosion protection is as follows:

- Sandblasting SA3
- Galvanizing with zinc metal spray
- 2 or 3 layers coating according to painting classifications

Special precaution must be taken to protect surfaces since hard chrome plating is not resistant to chlorine or fluoride in acid solution and may be damaged by airborne particles existing in industrial environments.
Additional measures must be taken for protection against electrolytic corrosion at locations where other types of metals are used.

PROTECTION AGAINST DIRT

The sliding surface must be protected against dirt by suitable materials. Such protection materials should be easily removable in the event of inspection. Sliding surfaces should be cleaned before installation. During installation process, greasy surfaces must be protected against dirt.

WARRANTY

Spherical bearings manufactured by ARSAN are guaranteed for 10 years from delivery date, provided that bearings are transported, tored and installed in accordance with EN standards.

MAINTENANCE AND INSPECTION

Maintenance and inspection of spherical bearings must be realized visually at the frequency of structure inspection. Spherical bearings should also be inspected after natural disasters such as large-scale accidents and earthquakes which will affect the structure.

According to EN 1337-10 there are two types of inspections to be carried out for spherical bearings.

- Regular Inspection
- Main Inspection
- Whether adequate displacement capacity is available for the type of spherical bearing and the temperature of the structure,
- Existence of visible defects such as cracks, misplacement, unexpected movement and deformation,
- Status of platform where bearing is placed and the connections,
- Corrosion protection, dust protection and gasket condition,
- Condition of sliding surfaces,
- Contacts with neighboring structural elements,
- The adequacy of the distance between pot and piston (s1min and s1max)

should be examined.

STORAGE

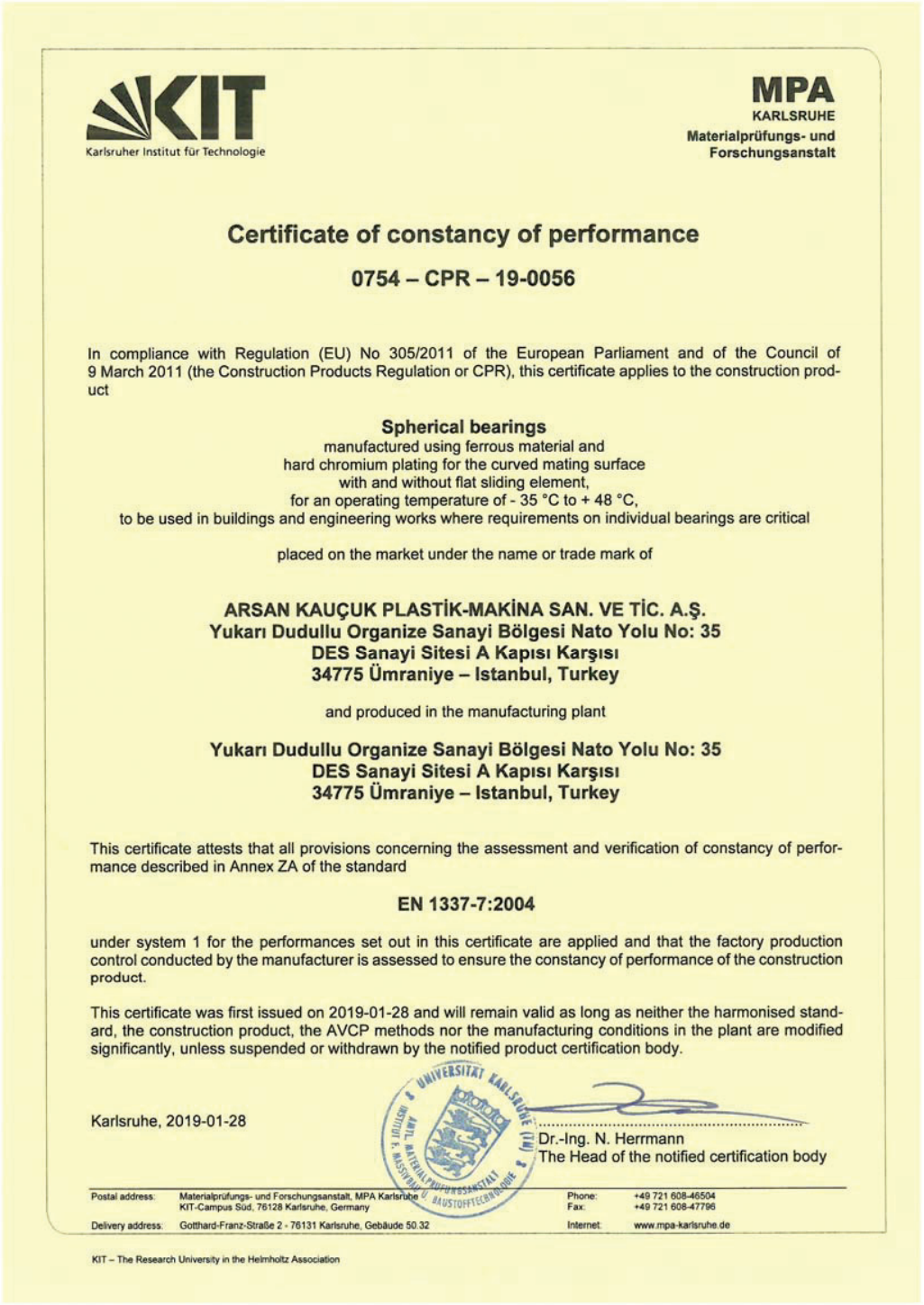
Bearings are sent to site as ready for installation and it is recommended to install bearings immediately. If the installation cannot be done immediately, bearings must be stored in a way that they are protected from dust, dirt, impact and other harmful effects.

INSTALLATION

Installation instruction is sent for each type of bearing that has been delivered to site. In case an exceptional installation method required, ARSAN engineers can develop a project specific installation method.

SPHERICAL BEARINGS

CE CERTIFICATE



KIT
Karlsruher Institut für Technologie

MPA
KARLSRUHE
Materialprüfungs- und
Forschungsanstalt

Certificate of constancy of performance

0754 – CPR – 19-0056

In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product

Spherical bearings
manufactured using ferrous material and
hard chromium plating for the curved mating surface
with and without flat sliding element,
for an operating temperature of - 35 °C to + 48 °C,
to be used in buildings and engineering works where requirements on individual bearings are critical

placed on the market under the name or trade mark of

ARSAN KAUÇUK PLASTİK-MAKİNA SAN. VE TİC. A.Ş.
Yukarı Dudullu Organize Sanayi Bölgesi Nato Yolu No: 35
DES Sanayi Sitesi A Kapısı Karşısı
34775 Ümraniye – Istanbul, Turkey

and produced in the manufacturing plant

Yukarı Dudullu Organize Sanayi Bölgesi Nato Yolu No: 35
DES Sanayi Sitesi A Kapısı Karşısı
34775 Ümraniye – Istanbul, Turkey

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 1337-7:2004

under system 1 for the performances set out in this certificate are applied and that the factory production control conducted by the manufacturer is assessed to ensure the constancy of performance of the construction product.

This certificate was first issued on 2019-01-28 and will remain valid as long as neither the harmonised standard, the construction product, the AVCP methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body.

Karlsruhe, 2019-01-28

Dr.-Ing. N. Herrmann
The Head of the notified certification body

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Internet: www.mpa-karlsruhe.de

KIT – The Research University in the Helmholtz Association

ATLAS® Spherical Bearings are fully compatible with EN standards (EN 1337-7) and have CE certificate approved by MPA Karlsruhe so means that the manufacturing facilities are systematically and regularly inspected by an independent certification body. The CE certificate proves that all requirements of the relevant European Standard are fulfilled during design and production of bearing.



Arsan®

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