

Arsan[®]

Precise Connections - since 1957

ATLAS POT BEARING

ATLAS POT BEARING

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.

Expansion joint type and design are prepared according to project needs.

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 operates in its facility in Ferizli, Sakarya, with a closed area of 35,000 square meters on an area of 60,000 square meters

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.





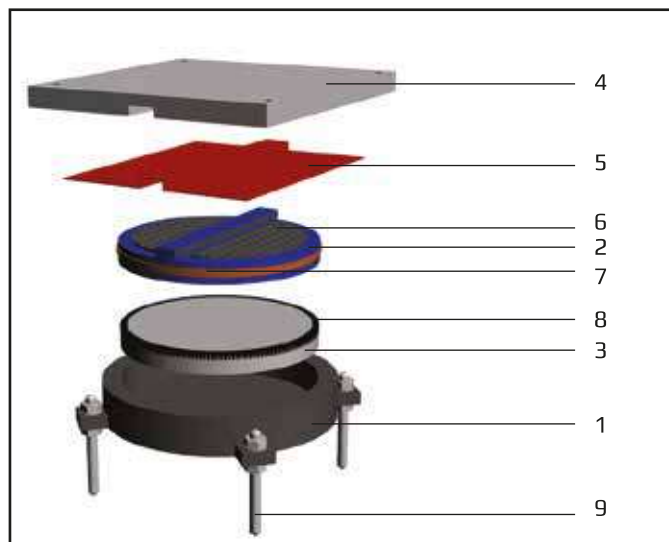


ATLAS POT BEARING

ATLAS Pot Bearing is used for structures such as bridges and viaducts which are exposed to different rotational and displacement effects, and is designed according to EN 1337-5, AASHTO LRFD .

POT BEARING WORKING PRINCIPLE

ATLAS Pot Bearings consist of a steel pot, an elastomeric pad in this pot, and a steel piston element that transmits the vertical load and rotational effects of the superstructure on the elastomeric pad to the substructure. The elastomeric pad can safely accommodate rotational effects up to 0.03 radians by a viscous fluid motion in the pot.



The horizontal and vertical forces transferred from superstructure are transferred to the pot by the piston. If required, pot bearings can make free horizontal movements in one direction or in all directions. The horizontal movement is provided by a special PTFE material placed on the piston with low friction and high pressure resistance.

DESIGN CRITERIA

- Custom Designed for the project according to the required vertical and horizontal load carrying capacities.
- Has a rotational capacity up to 0.03 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 Pot Bearings are designed according to European Standards and has a CE Quality Certificate. If required, pot 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 1337-5 Pot Bearings

AASHTO LRFD Bridge Design Specification

ATLAS POT BEARING TYPES

Pot bearings can be manufactured as fixed, sliding in one-direction or free sliding depending on the requirements of projects. Each type of pot bearings can safely meet rotational movements up to 0.03 radians.

ATLAS-F (Fixed Pot Bearing)

ATLAS-F type pot bearing is blocked for horizontal movements and can work on rotational motion up to 0.03 radians. They transmit the vertical and horizontal forces from the superstructure to the substructure safely through anchor bolts and plates.



ATLAS-F

ATLAS-U and ATLAS-G (Guided Pot Bearing)

ATLAS-U and ATLAS-G type pot bearings are, sliding type with horizontal movement in one direction by guides placed in the center (ATLAS-U) or placed at sides (ATLAS-G) of the piston. The movement in the perpendicular direction to the guide is prevented while a free movement is provided in the direction of the guide. The unidirectional horizontal movement is achieved between lubricated PTFE and stainless steel placed on the piston.



ATLAS-U



ATLAS-G

ATLAS - S (Free Sliding Pot Bearing)

Free sliding pot bearing are used in order to reduce the horizontal forces transmitted to the infrastructure and horizontal movement in all directions. Free horizontal movement is provided between lubricated PTFE and stainless steel placed on the piston.



ATLAS-S

POT BEARING COMPONENTS

ATLAS Pot Bearings consist of elastomeric pad, sliding material, stainless steel, connection plates and anchorage elements

Components	Material
Sliding Plate	S355
Piston	S355
Pot	S355
Elastomeric Pad	NR
Lubricant	Silicone
Anchorage Bolts	10.9

NOTES: These components may vary according to project requirements.

Structural Steel

Compliant to EN10025-2 standard, 3.1 Certified, S355 quality structural steel. According to the requirements of the project special design can be made by using structural steel in different qualities. The structural steel for required size of the pot bearing is machined by modern CNC machines in ARSAN plants.



Elastomeric Pad

Elastomeric pad is produced from natural rubber (NR) according to the criteria specified in EN 1337-5. It is placed in the pot under high pressure and temperature in accordance with the standard and dimensions determined by the design. Arsan produces highest quality elastomeric pad by its rubber over 60 years.



PTFE (Polytetrafluoroethylene)

Standard PTFE has a characteristic compressive strength of 90 MPa. In sliding type of pot bearings, surfaces that come in contact with stainless steel play a key role due to the high pressure resistance and low friction properties. They are used with 3.2 certified oil channels or straight in accordance with EN1337-2 standard.



Stainless Steel

Stainless steel is a material that contacts with PTFE directly and provides smooth and low-friction sliding action in sliding types of pot bearings.



ATLAS-F Fixed Pot Bearing



P : Axial Load
V_{x,y} : Design Shear Force
θ : Rotational Capacity
B : Pot Bearing Width
D : Piston Diameter
H : Pot Bearing Height
W : Pot Bearing Weight

	P (kN)	V_{x,y} (kN)	θ (rad)	B (mm)	D (mm)	H (mm)	W (kg)
ATLAS - F1	1000	141	0,010	310	210	52	15
ATLAS - F2	2000	283	0,010	400	300	58	30
ATLAS - F3	3000	424	0,010	485	365	64	45
ATLAS - F4	4000	566	0,010	575	425	71	65
ATLAS - F5	5000	707	0,010	630	480	76	85
ATLAS - F6	6000	849	0,010	700	525	85	115
ATLAS - F7	7000	990	0,010	750	565	92	150
ATLAS - F8	8000	1131	0,010	790	610	98	180
ATLAS - F9	9000	1273	0,010	800	640	101	205
ATLAS - F10	10000	1414	0,010	850	680	107	240
ATLAS - F12	12000	1697	0,010	925	740	116	310
ATLAS - F14	14000	1980	0,010	1000	810	124	400
ATLAS - F16	16000	2263	0,010	1050	860	133	480
ATLAS - F18	18000	2546	0,010	1125	910	141	575
ATLAS - F20	20000	2828	0,010	1150	960	146	655
ATLAS - F25	25000	3536	0,010	1300	1100	164	1000
ATLAS - F30	30000	4243	0,010	1375	1180	182	1250
ATLAS - F40	40000	5657	0,010	1675	1440	200	2000
ATLAS - F50	50000	7071	0,010	1875	1625	233	3050
ATLAS - F75	75000	10607	0,010	2075	1850	279	4650

ATLAS-S Free Sliding Pot Bearing



P : Axial Load
θ : Rotational Capacity
B : Pot Bearing Width
L : Top Plate Short Edge Length
C : Top Plate Long Edge Length
V1 : Longitudinal Displacement Capacity
V2 : Transversal Displacement Capacity
H : Pot Bearing Height
W : Pot Bearing Weight

	P (kN)	θ (rad)	B (mm)	L (mm)	C (mm)	V1 (mm)	V2 (mm)	H (mm)	W (kg)
ATLAS -S1 - 50/20	1000	0,010	310	210	370	± 50	± 20	71	25
ATLAS -S2 - 50/20	2000	0,010	380	280	450	± 50	± 20	82	50
ATLAS -S3 - 50/20	3000	0,010	440	340	500	± 50	± 20	91	75
ATLAS -S4 - 50/20	4000	0,010	485	380	540	± 50	± 20	98	100
ATLAS -S5 - 50/20	5000	0,010	535	430	575	± 50	± 20	101	120
ATLAS -S6 - 50/2	6000	0,010	575	460	610	± 50	± 20	107	150
ATLAS -S7 - 50/20	7000	0,010	625	490	640	± 50	± 20	112	175
ATLAS -S8 - 50/20	8000	0,010	650	520	670	± 50	± 20	113	190
ATLAS -S9 - 50/20	9000	0,010	675	550	700	± 50	± 20	121	230
ATLAS -S10 - 50/20	10000	0,010	730	580	750	± 50	± 20	128	275
ATLAS -S12 - 50/20	12000	0,010	790	630	800	± 50	± 20	143	370
ATLAS -S14 - 50/20	14000	0,010	850	680	850	± 50	± 20	151	455
ATLAS -S16 - 50/20	16000	0,010	930	720	920	± 50	± 20	164,5	560
ATLAS -S18 - 50/20	18000	0,010	975	760	960	± 50	± 20	178,5	680
ATLAS -S20 - 50/20	20000	0,010	1025	800	1000	± 50	± 20	186,5	800
ATLAS -S25 - 50/20	25000	0,010	1150	900	1100	± 50	± 20	210,5	1125
ATLAS -S30 - 50/20	30000	0,010	1250	960	1200	± 50	± 20	240,5	1550
ATLAS -S40 - 50/20	40000	0,010	1405	1150	1350	± 50	± 20	266	2300
ATLAS -S50 - 50/20	50000	0,010	1550	1250	1460	± 50	± 20	325	3450
ATLAS -S75 - 50/20	75000	0,010	1850	1550	1750	± 50	± 20	406,5	6450

ATLAS-U Guided Pot Bearing



- P** : Axial Load
V_{x,y} : Design Shear Force
θ : Rotational Capacity
B : Pot Bearing Width
L : Top Plate Short Edge Length
C : Top Plate Long Edge Length
V1 : Longitudinal Displacement Capacity
H : Pot Bearing Height
W : Pot Bearing Weight

	P (kN)	V_{x,y} (kN)	θ (rad)	B (mm)	L (mm)	C (mm)	V1 (mm)	H (mm)	W (kg)
ATLAS - U1 - 50	1000	141	0,010	375	265	425	± 50	100	55
ATLAS - U2 - 50	2000	283	0,010	450	335	475	± 50	109	90
ATLAS - U3 - 50	3000	424	0,010	505	385	535	± 50	115	120
ATLAS - U4 - 50	4000	566	0,010	580	430	600	± 50	123	160
ATLAS - U5 - 50	5000	707	0,010	630	480	635	± 50	128	200
ATLAS - U6 - 50	6000	849	0,010	685	525	680	± 50	134	250
ATLAS - U7 - 50	7000	990	0,010	735	555	720	± 50	144	300
ATLAS - U8 - 50	8000	1131	0,010	775	590	750	± 50	154	360
ATLAS - U9 - 50	9000	1273	0,010	785	625	760	± 50	163	415
ATLAS - U10 - 50	10000	1414	0,010	835	660	800	± 50	170	485
ATLAS - U12 - 50	12000	1697	0,010	910	730	860	± 50	191	665
ATLAS - U14 - 50	14000	1980	0,010	975	785	910	± 50	202	805
ATLAS - U16 - 50	16000	2263	0,010	1025	840	950	± 50	218	980
ATLAS - U18 - 50	18000	2546	0,010	1100	900	950	± 50	223	1100
ATLAS - U20 - 50	20000	2828	0,010	1150	960	1020	± 50	247	1425
ATLAS - U25 - 50	25000	3536	0,010	1275	1065	1030	± 50	275	1840
ATLAS - U30 - 50	30000	4243	0,010	1350	1150	1140	± 50	316	2540
ATLAS - U40 - 50	40000	5657	0,010	1625	1400	1395	± 50	347	4150
ATLAS - U50 - 50	50000	7071	0,010	1825	1600	1495	± 50	424	6515
ATLAS - U75 - 50	75000	10607	0,010	2075	1840	1770	± 50	500	10225

ATLAS-G Guided Pot Bearing



- P** : Axial Load
V_{x,y} : Design Shear Force
θ : Rotational Capacity
B : Pot Bearing Width
L : Top Plate Short Edge Length
C : Top Plate Long Edge Length
V1 : Longitudinal Displacement Capacity
H : Pot Bearing Height
W : Pot Bearing Weight

	P (kN)	V_{x,y} (kN)	θ (rad)	B (mm)	L (mm)	C (mm)	V1 (mm)	H (mm)	W (kg)
ATLAS - G1 - 50	1000	141	0,010	375	315	425	± 50	86	50
ATLAS - G2 - 50	2000	283	0,010	430	365	475	± 50	92	70
ATLAS - G3 - 50	3000	424	0,010	500	405	535	± 50	98	100
ATLAS - G4 - 50	4000	566	0,010	580	460	600	± 50	111	140
ATLAS - G5 - 50	5000	707	0,010	625	495	635	± 50	117	170
ATLAS - G6 - 50	6000	849	0,010	685	530	680	± 50	133	235
ATLAS - G7 - 50	7000	990	0,010	735	570	720	± 50	139	275
ATLAS - G8 - 50	8000	1131	0,010	775	600	750	± 50	148	330
ATLAS - G9 - 50	9000	1273	0,010	800	630	760	± 50	157	380
ATLAS - G10 - 50	10000	1414	0,010	840	660	800	± 50	163	450
ATLAS - G12 - 50	12000	1697	0,010	925	730	880	± 50	164	550
ATLAS - G14 - 50	14000	1980	0,010	975	770	910	± 50	194	740
ATLAS - G16 - 50	16000	2263	0,010	1025	810	950	± 50	208	890
ATLAS - G18 - 50	18000	2546	0,010	1100	860	1020	± 50	212	1020
ATLAS - G20 - 50	20000	2828	0,010	1150	900	1030	± 50	235	1270
ATLAS - G25 - 50	25000	3536	0,010	1275	990	1140	± 50	259	1720
ATLAS - G30 - 50	30000	4243	0,010	1350	1080	1190	± 50	297	2310
ATLAS - G40 - 50	40000	5657	0,010	1625	1265	1400	± 50	324	3560
ATLAS - G50 - 50	50000	7071	0,010	1825	1440	1570	± 50	337	4690
ATLAS - G75 - 50	75000	10607	0,010	2100	1710	1820	± 50	432	8470

CORROSION PROTECTION

In order to protect pot 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

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

MAINTENANCE AND INSPECTION

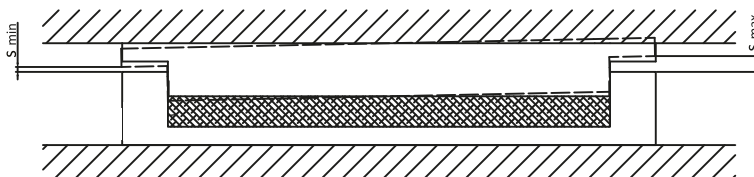
Maintenance and inspection of pot bearings must be realized visually at the frequency of structure inspection. Pot bearings should also be inspected after natural disasters such as large-scale accidents and earthquakes which will affect the structure.

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

- Regular Inspection
- Main Inspection

In regular Inspection;

- Whether adequate displacement capacity is available for the type of pot 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 (s_{1min} and s_{1max}) should be examined.



The main inspection can be done less frequent than regular inspections. During main inspection, examinations carried out at regular inspections must be done more detailed. It is recommended that the first main inspection to be done after 1 year service life of structure.

STORAGE

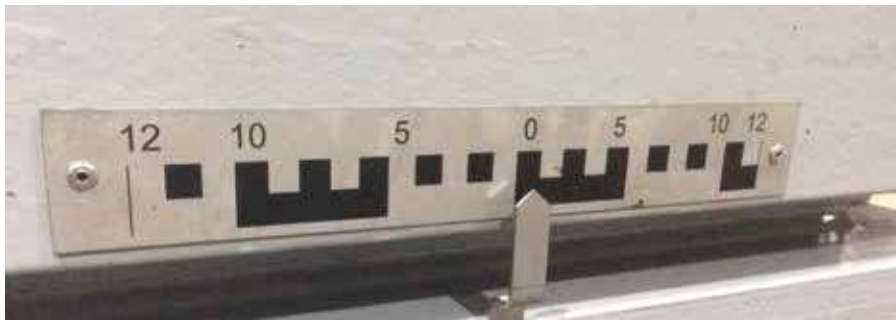
Bearings are sent to site as ready for installation and it is recommended to install bearings immediately. If the installation cannot be done immediately, bearings must be stored in a way that they are protected from dust, dirt, impact and other harmful effects.

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.


DISPLACEMENT SCALE

Displacement scale is placed on the sliding type pot bearings showing horizontal displacements.




PRODUCT LABELING

Each pot bearing has a label on it with technical details of its type, properties and installation details.

 CE EN 1337-5 0754-CFR-16-0156 www.arsankaucuk.com.tr TURKEY	Bearing Type	APM G	NEd,max [kN]	52200
	Order Number	YIS-16-633	Hxy,max [kN]	6850
	Year of Production	2017	Vx [mm]	0
	Location	P1	Vy [mm]	± 330
	Intended Use	GLIDED	qmax [red]	0,015
	Serial Number	0012		



CE CERTIFICATE



KIT
Karlsruher Institut für Technologie

MPA
KARLSRUHE
Materialprüfung- und
Forschungsanstalt

Certificate of constancy of performance
0754 – CPR – 16-0156

In compliance with Regulation 305/2011/EU 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

pot bearings
with elastomeric pad manufactured using the compound H100025,
with POM seal as internal seal,
with and without flat sliding element,
for a minimum operating temperature of - 35 °C with sliding element,
for a minimum operating temperature of - 40 °C without sliding element,
to be used in bridge structures or any other structure with comparable support conditions where requirements on individual bearings are critical

produced by or for

ARSAN KAUCUK PLASTİK MAKİNA SAN. VE TİC. A.Ş.
Yukarı Dudullu Organize Sanayi Bölgesi Nato Yolu No:35
DES Sanayi Sitesi A Kapısı Karşısı
34775 Ümraniye – İstanbul, Turkey
and produced in the manufacturing plant

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

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


EN 1337-5:2005

under system 1+ for the performances set out in this certificate are applied and that the construction product fulfils all the prescribed requirements for these performances.

This certificate was first issued on 2016-07-26 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonised standard, used to assess the performance of the declared essential characteristics, do not change, and the construction product, and the manufacturing conditions in the plant are not modified significantly, unless suspended or withdrawn by the notified product certification body.

Karlsruhe, 2016-07-26

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69126 Karlsruhe, Postfach 10155 Karlsruhe, Germany
Delivery address: Hübner-Platzstraße 2 - 76131 Karlsruhe, Germany 30 33



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

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KIT - Universität für Technik, Naturwissenschaften und Ingenieurwissenschaften an der Heinrich Heine Universität

ATLAS Pot Bearings are fully compatible with EN standards and have CE certificate approved by MPA Karlsruhe. The CE certificate proves that all requirements of the relevant European Standard are fulfilled during design and production of bearing.

