

Arsan[®]



Precise Connections
Since 1957

ASG TUNNEL SEGMENT GASKETS

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Arsan[®]

Precise Connections - since 1957

Reliable Solutions

AR-EX Single & Modular Expansion Joints

ASG Tunnel Segment Gaskets

Atlas LRB Seismic Isolators

Atlas Structural Bearings

SEM Expansion Joints

Dilatation Profiles

Pipe Gaskets

Waterstops

Precise Connections

Since 1957

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 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.



Tunnel Segment Gaskets

Arsan Sement Gaskets offer a wide range of solutions:

- EPDM gaskets classic (glued-in)
- EPDM gaskets anchored (cast-in)
- Hybrid gaskets out of EPDM with separate hydrophilic rope
- Co-extruded gaskets out of EPDM profiles and integrated hydrophilic flat strip

The internal design of the profiles allows easy compressibility and provides good water tightness between tunnel segments for the lifetime of tunnels.



Arsan engineers have developed more than 50 different profiles to suit different requirements for:

- Utility Tunnels,
- Metro Line Tunnels,
- Sewage Water Tunnels,
- Hydro-Energy Tunnels
- Rail and Road Tunnels

In addition to the standard geometries, ARSAN is ready to study and manufacture new profiles and gaskets upon request and provide customized solutions.

The design and development of these gaskets is supported by the use of finite-element-simulation software, which enable us to optimize the geometry for the working conditions of the individual tunnel project.



Advantages of Arsan Segment Gaskets

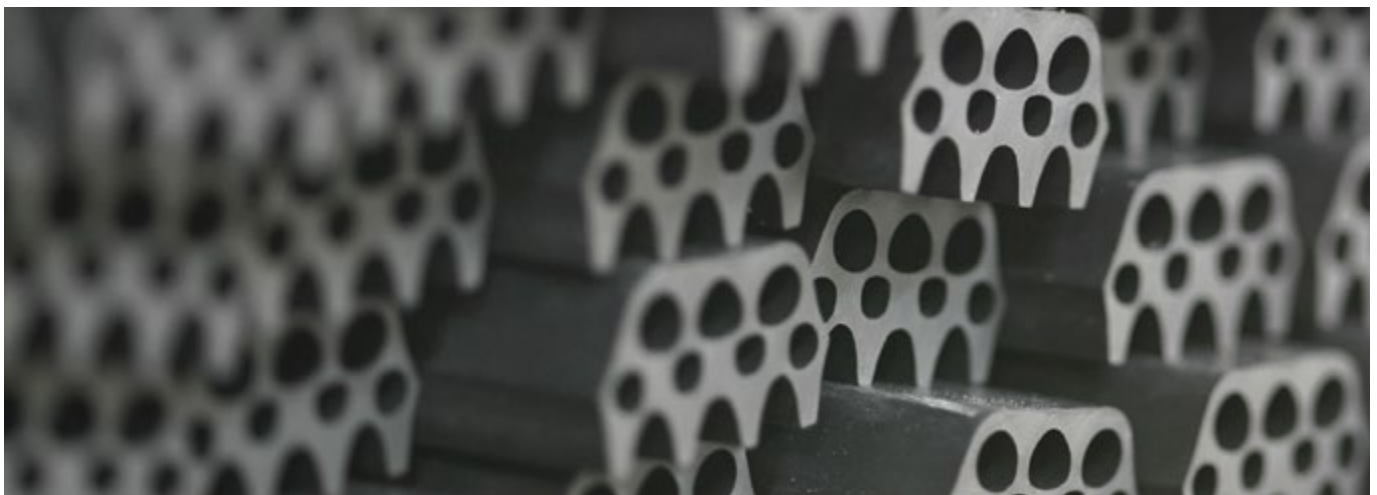
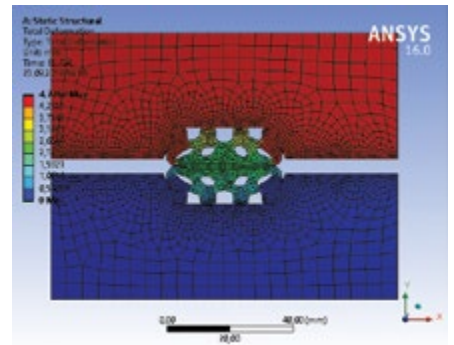
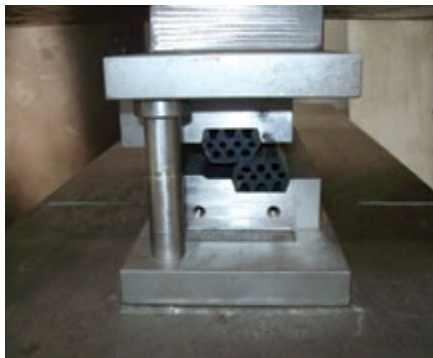
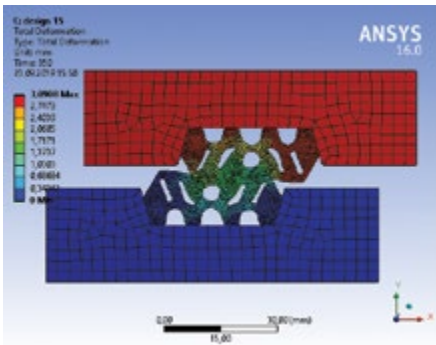
- Easy to fit to the concrete segments
- Stable against high water pressures
- Excellent EPDM rubber compound for 120 years lifetime performance
- High resistance to typical ground and ground water conditions
- High resistance to sewage water





Design of Arsan Segment Gaskets

Arsan engineering department designs the tunnel segment profiles according to project requirements and customer specifications. The fundamental criteria for the correct design is water pressure resistance for a given groove at the connection of concrete segments. Before the serial production, the profile is simulated on the simulation software which enables us to confidently predict how our product will operate. After this development stage, the initial serial production is run and the whole tests are performed for the approval of the design.



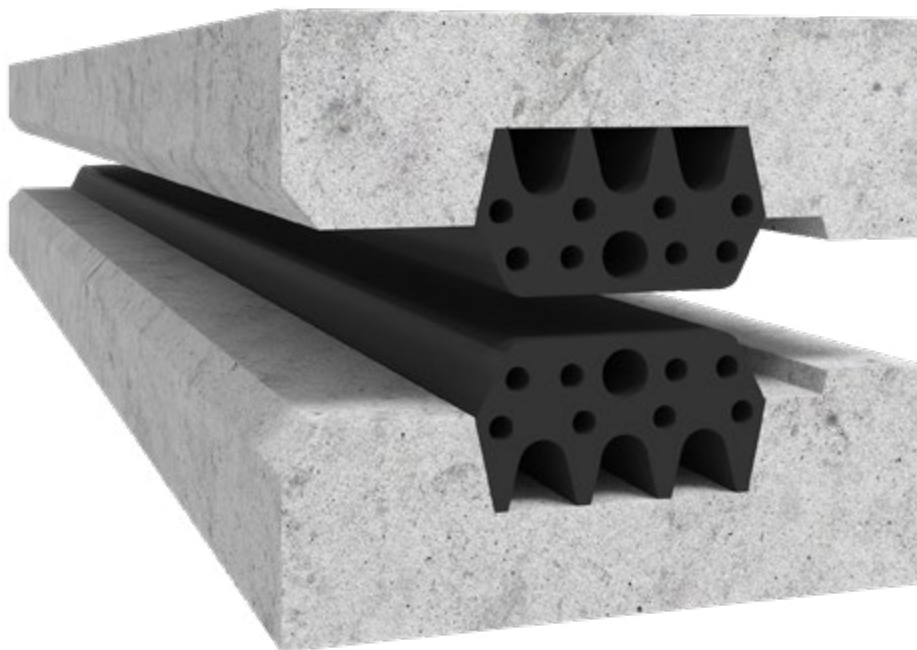
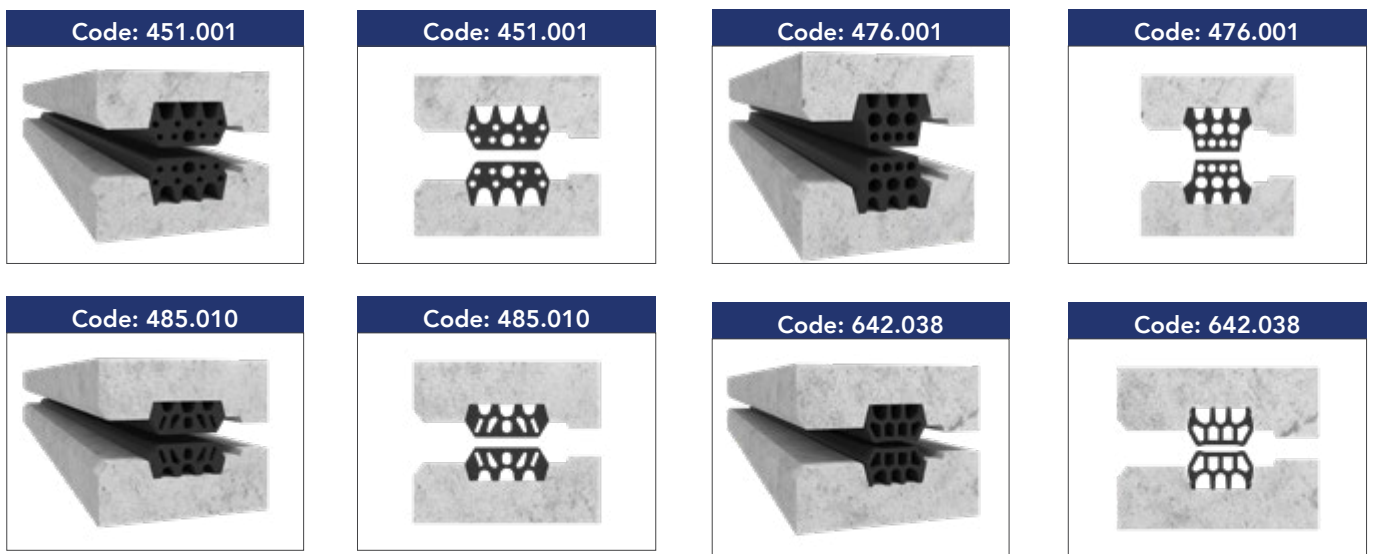
Glued Gaskets

Glued-in gaskets are still most commonly used. They are glued into pre-formed grooves in the concrete segments by the use of an adhesive (ARSAN ADH-57).

Arsan manufactures a range of profiles which are compatible with all existing groove dimensions.

The following table comprises Arsan's glued-in gaskets' standard range. Further profiles are available or can be developed on request to meet specific design requirements.

All ASG gasket corners are soft due to a minimum amount of injected rubber volume in injection molds.

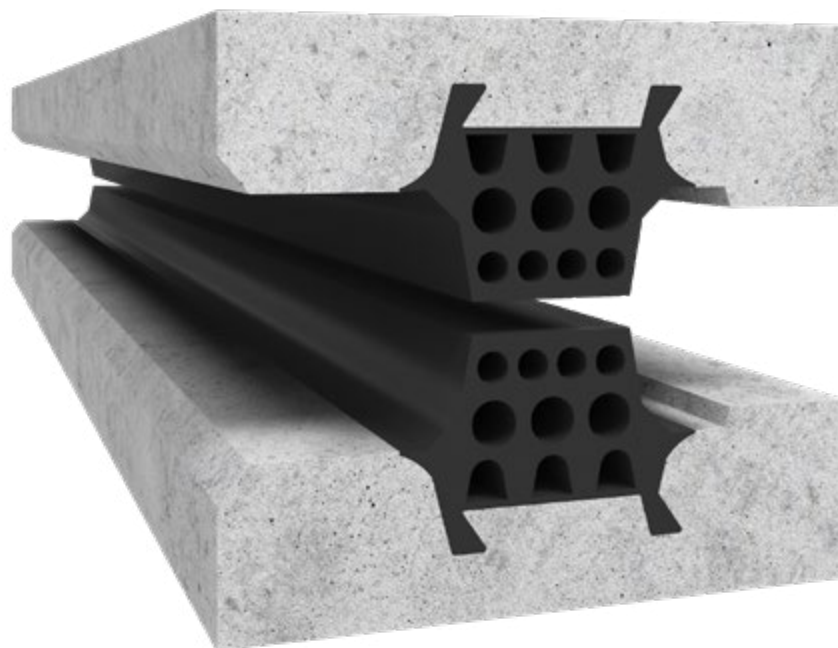
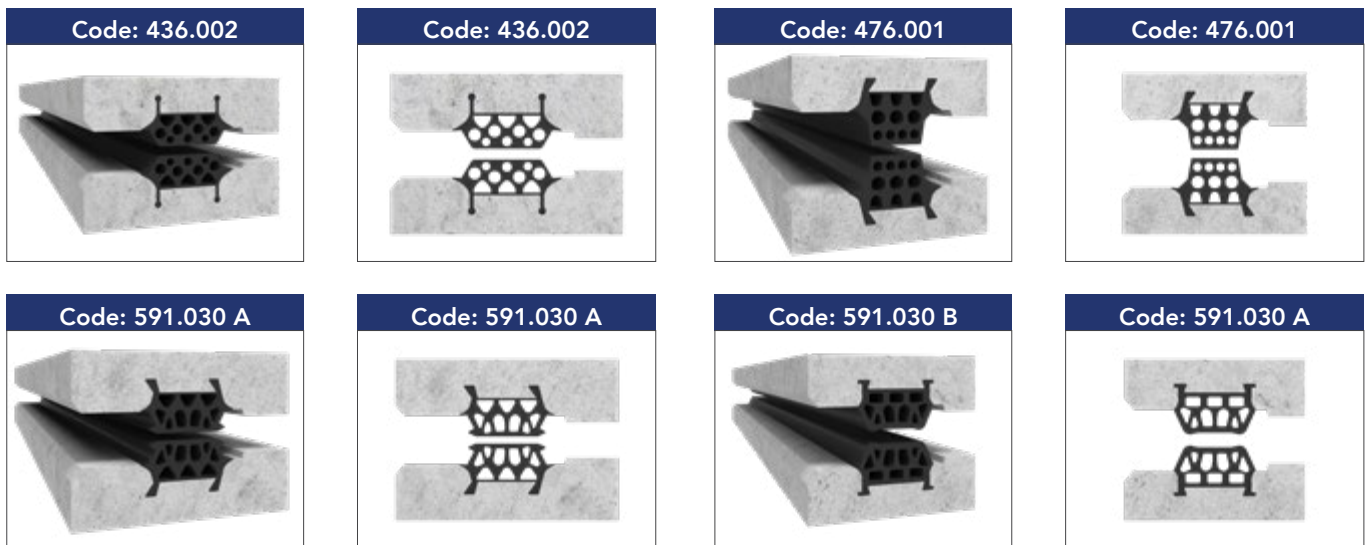


— Anchored Gaskets

Anchored gaskets are mounted inside the segment’s formwork before casting. The anchors offer a perfect fixation of the gasket to the concrete segment and an improved water tightness performance.

It gives safer work conditions for the operators and provides cost savings due to the elimination of the gluing process.

All ASG gasket corners are soft due to a minimum amount of injected rubber volume in injection molds.

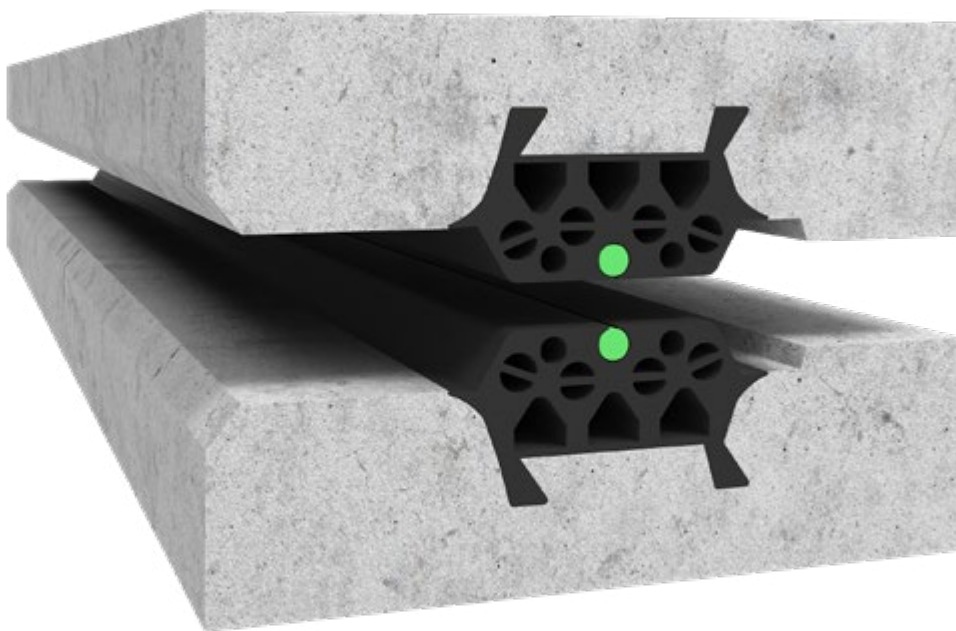
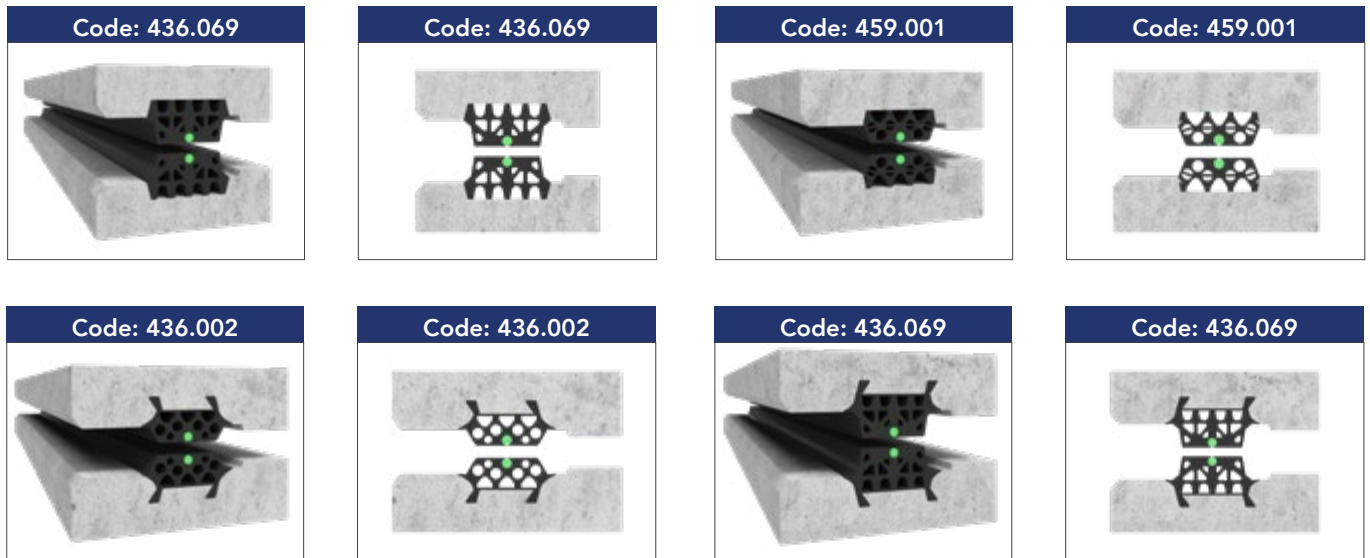


Hybrid Gaskets

Arsan hybrid gaskets are developed to meet a demand for a double security seal, by adding - separately and in the latest moment in the construction site area - a hydrophilic rope on top of the EPDM gasket, which have been earlier fixed in the concrete segment yard.

There are solutions available for glued-in gaskets and for anchored gaskets. The hydrophilic rope is produced from an EPDM elastomer and super absorber compound with high swelling capacities.

All ASG gasket corners are soft due to a minimum amount of injected rubber volume in injection molds.

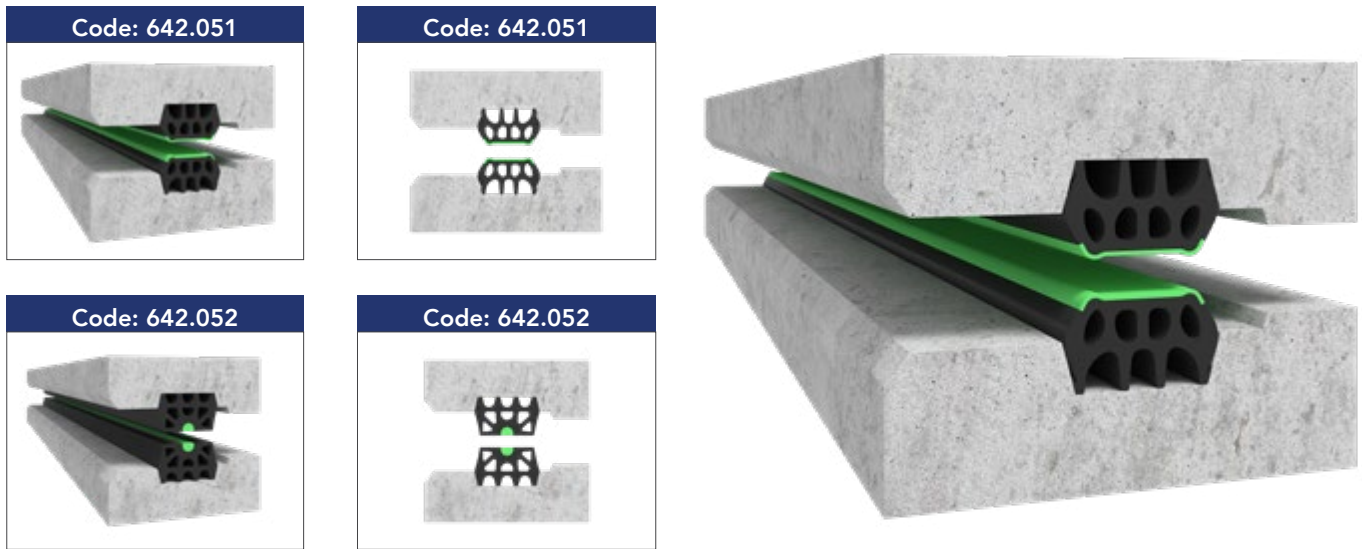


Co-Extruded Gaskets

Arsan co-extruded gaskets are developed to meet a demand for a double security seal, by adding – already during extrusion and vulcanization- a wide hydrophilic strip on top of the EPDM gasket.

The hydrophilic strip is produced from an EPDM elastomer and super absorber compound with high swelling capacities.

All ASG gasket corners are soft due to a minimum amount of injected rubber volume in injection molds.

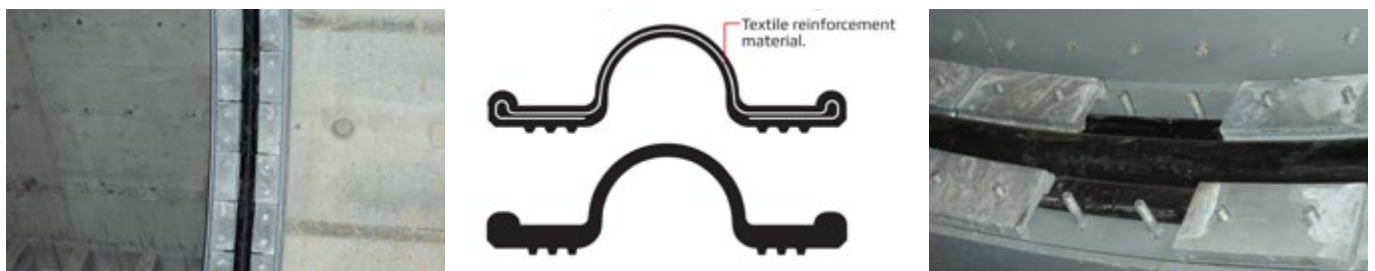


Omega Seals in Bored Tunnels

To meet the need of miners working in compressed air and to eliminate the risk of collapse of tunnel face, tunnel boring machines (TBM) are developed for such purpose. In bored tunnels with precast segments which are places together to form rings, creating an interlocking system which ensures a safe and secure concrete shell for the tunnels installed with waterproofing material as ASG.

At the end of bored tunnels, connection between station should have the continuity. Arsan Omega Seals are supplied as a closed ring. The waterproofing of the joint is further reinforced by installing an omega seal, covered and installed with a steel plate as shown in below photo at the right corner.

The expected lifetime of Arsan Omega Seals is at least 120 years. The operating temperature is within -30°C and +80°C.



Testing

Arsan guarantee that gaskets has excellent waterproofing performances and reliability for a long-life service. The design and the continuous study of elastomer seals are supported by in-house test with state-of-the-art technology and machineries.

Tests on ASG

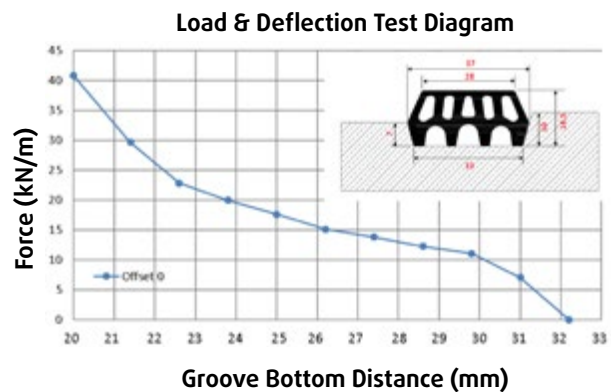
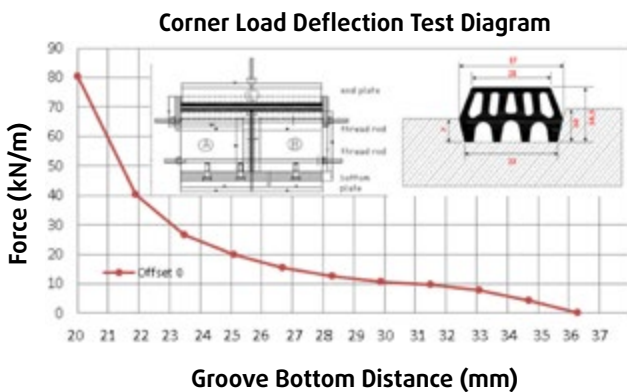
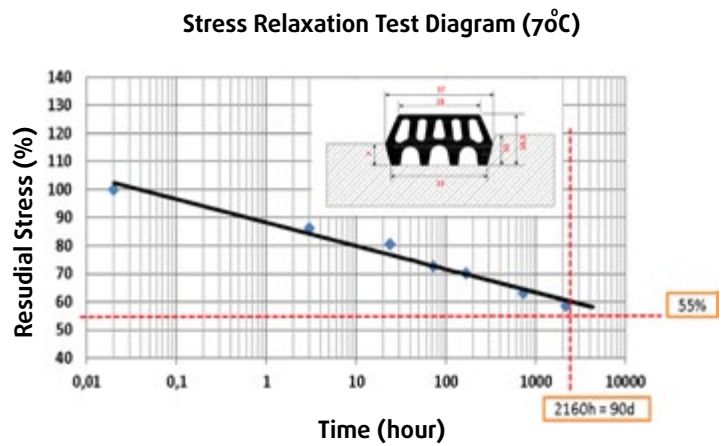
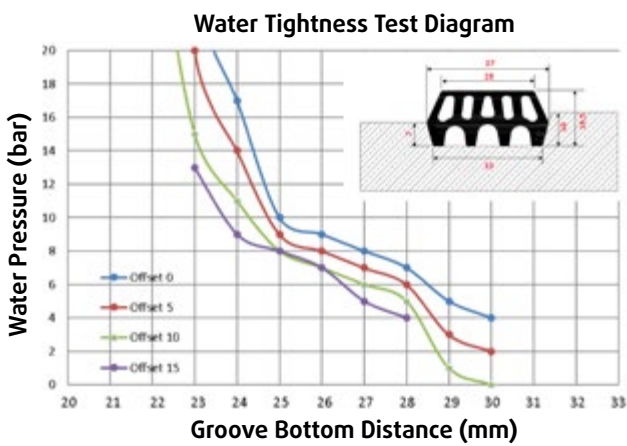
- ✓ Hardness
- ✓ Tensile Strength and Elongation at Break
- ✓ Compression Set
- ✓ Artificial Ageing
- ✓ Load Deflection Tests on Profile and on Corners
- ✓ Stress Relaxion Test
- ✓ Recovery Test
- ✓ Water Tightness Test
- ✓ Chemical Analysis and Chemical Resistance Tests



ASG stands out with its long service life, economic, effective and watertight features.

The most important feature of the segment gaskets is to provide water tightness. Underground water pressure is formed at laboratory, and tested by simulating the effect of the gaskets under pressure.

This is the effective way to prove our customers that the gasket has resistance against the water pressure. In order to be sure about the gaskets certainty, test pressure always has to be bigger than the real underground water pressure.



Since 1957

Tunnel Segment Gaskets supplied by ARSAN are in successful service in many tunnels. Our gaskets keep tunnels watertight, thus contributing significantly to uninterrupted operation, protection of electromechanical equipment and of course long service life of the tunnel.



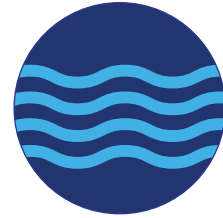
ROAD



METRO



RAIL



WATER | SEWER

Member of
STUVA



Riyadh Metro Line



Bakirkoy-Kirazlı Metro Tunnel



Tabriz Metro Line 1-2



Sofia Metro Line 2



Kabatas-Mahmutbey Metro Line



Yenikapi-Alibeykoy Wastewater Tunnel



Uskudar-Umraniye-Cekmekoy Metro Line



Halkali - Istanbul New Airport Metro Line



Suruc Water Transmission Tunnel



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