

Expansion-joint sealing cushions (valve) for refurbishing bridges and tunnels



Photo Main Station, Vienna, Austria
Source: Architekten24 Foto © Unger Steel Group Renée Del Missier

Main Station, Vienna

Expansion joint length 27 m
Sealing against the passage of water

Time taken 45 min
Installation carried out by: ARGE/ ÖBB-Austria



Railway bridge over the B522 road

Expansion joint length 46 m
Sealing against water and stones falling from a height of 7.5 m

Time taken 360 min Installation carried out by: DB Netz AG

History of air-inflated sealing cushions

Cable sealing (Telecommunication sector)



- Successfully tested since December 2006!
- Up to 2015, 50.000 sealing cushions installed in Germany, Switzerland, Austria, USA and Japan.
- Approved by Deutsche Telekom AG
- Fulfills the technical requirements of T-Com TS 0307/96, British Telecom LN 584 and France Telecom ST/FTR&D/7644

➔ Further development to seal expansion joints

- Successfully tested since January 2011!
- Sealing cushion lengths up to 23 m. With several cushions, adaptable to over 100 m
- 64 units installed for German Rail network (DB Netz AG) and 17 units for Austrian Rail (ÖBB AG). (Status 2015).



Advantages of the system

1. Long service life

due to **extremely low diffusion rate**,
only 2.7 mbarl/ year!

Test result: GEMTEC

Diffusion rate of sealing cushions with a valve end-cap

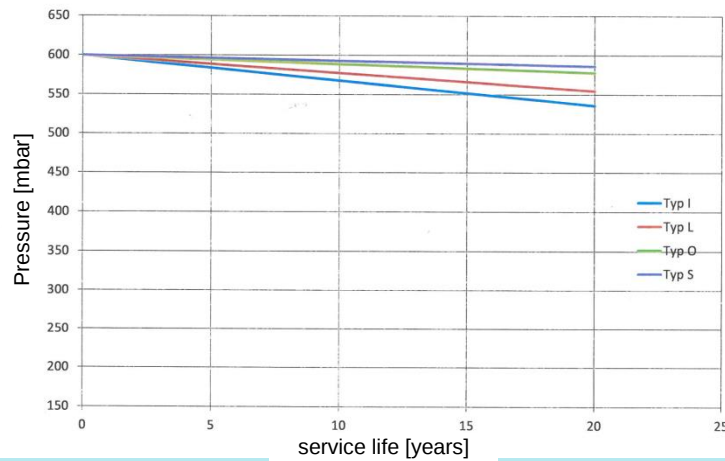
Sample No. 1:

5.5×10^{-8} mbarl/sec
= 1.5 mbarl/year

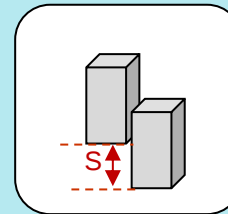
Sample No. 2 :

6.2×10^{-8} mbarl/sec
= 2.7 mbarl/year

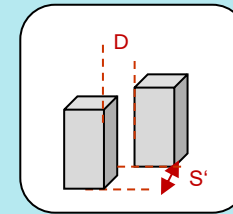
Loss of pressure during service life



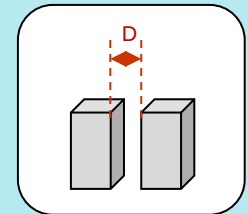
2. Optimum adaptation to joint movement



Settling



Shear



Expansion

3. Usable independently of the joint type

straight – angled – curved

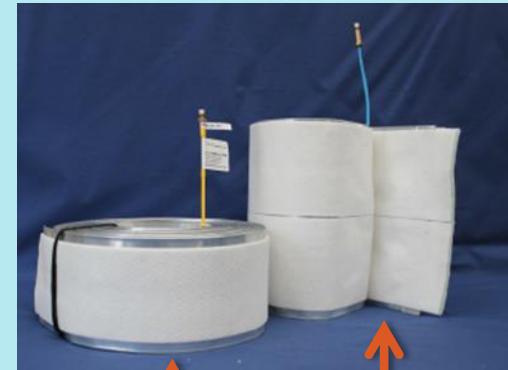
4. Installation is independent of weather or ambient temperature

Advantages of the system

5. Efficient and economical

- Installation time ≤ 10 min/ m
- Easy to remove for bridge inspection work
- Reusable (4 x)
- Simple tightness monitoring (with protocol)
- Lightweight
Type S approx. 0.74 kg/ m
Type L approx. 0.32 kg/ m

6. Applicable for joint widths from 2 to 16 cm



Type L
2 cm to 7 cm

Type S
2 cm to 16 cm

Two types are available, depending on the joint width and area of application (water column):

Type L

Sealing cushion width 135 mm

Sealing against pressing water for

Nominal joint width 2 – 5 cm

Sealing area/contact surface 10 – 6 cm

Type S

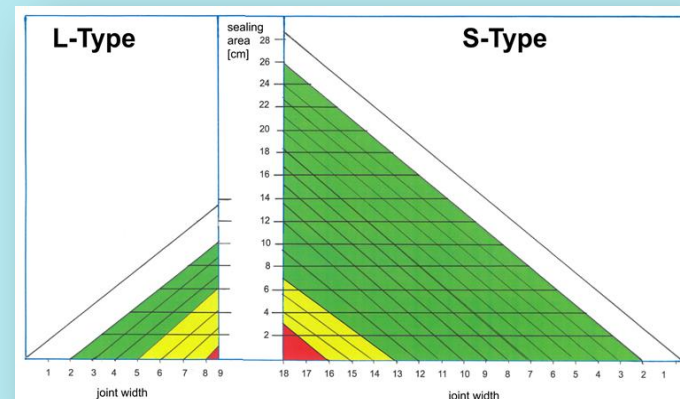
Sealing cushion width 285 mm

Sealing against pressing water for

Nominal joint width 2 – 15 cm

Sealing area/contact surface 26 – 6 cm

Types L and S are available in lengths from 0.25m to 23m and can be used in combination.



Example	joint width [cm]	Sealing area [cm]
Type L	5	6
	7	~ 2,5
Type S	5	21
	16	3

Diagram: Effect of interaction between sealing area/ contact surface on the joint width to be sealed

- Sealing against non-pressing water/ temporary accumulation of water seepage
- Sealing against water seepage with no accumulation
- Sealing against ground moisture

Further information

We would be pleased to send you
**product information or descriptions
of our pilot projects!**

WO03/09 Sealing against the passage
of water, for the

Deutsche Bahn AG –

Regional area West/Central

WO03/12 Sealing in the Main Station,
Vienna

WO03/14 Sealing against the passage
of water and falling stones
on the B522 road, Hannover

Function models for real-life conditions

- Demonstration of sealing techniques
- For the qualification and further training of construction supervisors and installation staff



We can advise you!

Contact partner:

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