

# ARFEN BRIDGE EXPANSION JOINTS



**ARFEN BRIDGE AND CONSTRUCTION TECHNOLOGIES**

**IND. TRADE. CO. LTD**

[www.arfen.com.tr](http://www.arfen.com.tr)

# ARFEN BRIDGE AND CONSTRUCTION TECHNOLOGIES

## IND. TRADE. CO. LTD

### ***CORPORATE***

Arfen has started to operation from 1999 for create trust as a company that finds solutions to the customer's technical needs and requirements.

Arfen made agreements with international partners, so that brings international experiences to our country about bridge bearings, bridge expansion joints, seismic isolators and post-tensioning etc.

Arfen as a construction material manufacturers, is exporting product to 35 countries internationally as well as nationally.

Arfen makes technical meetings with the customer to find solutions and most economical design for their needs in the subject of Arfen. It also makes required applications and maintenances in the construction site if client requests.

Arfen is a technical manufacturer uses more than 21 years of engineering experience, which is a company in Turkey with name and patent rights of self-developed products. Arfen brings revenue to our country by exporting engineering products to 35 different countries.

Arfen makes design and production to meet the requirements of international standards under ISO-9001 Quality Management System.

Arfen provides more economical alternatives for customers with experienced engineers and high technical knowledge.

All bearings are manufactured according to EN-1337-3 and all isolators are manufactured according to EN-15129. Bearings and isolators can be manufactured according to different national standards as well, if customer requests. All other products are manufactured in accordance to TSE (Turkish Standard Institute) and international standards. Quality control tests are carried out in the Arfen laboratory.

We will continue to give service to "Finding Solution" for our customers.

**Arfen Bridge and Construction Technologies Ind. Trade. Co. Ltd.**

# GENERAL INFORMATIONS

An expansion joint or movement joint are the structural elements added to the system to make the displacements that occur due to the expansion and contraction of the temperature, and the earthquake on the surface where it is mounted. They are commonly found between sections of buildings, bridges, sidewalks, railway tracks, piping systems, ships, and other structures.



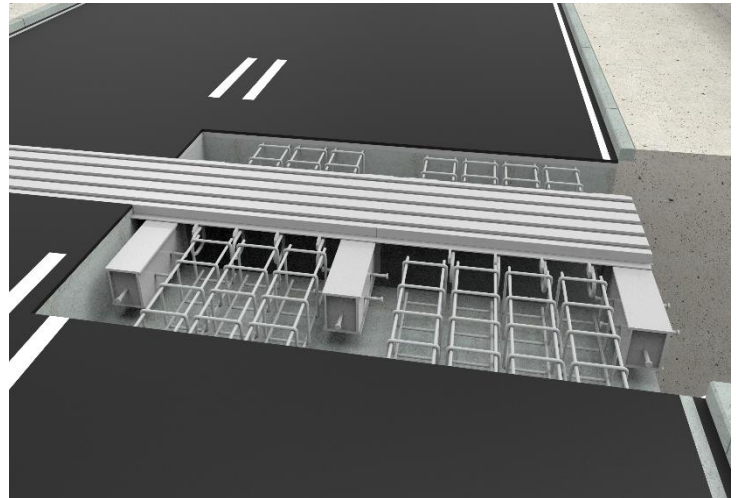
Bridge expansion joints are designed to allow for continuous traffic between structures while accommodating movement, shrinkage, and temperature variations on reinforced and prestressed concrete, composite, and steel structures.

A watertight system, is designed on a modular basis and can be tailored to satisfy the specific requirements of almost any structure



**Modular multiple-gap expansion joints can accommodate movements in every direction and rotations about every axis.**

**The individual gaps are sealed by watertight elastomeric profiles. Certain joints feature so-called "sinus plates" on their surface, which reduce noise from over-passing traffic.**



# SINGLE SPAN STEEL EXPANSION JOINTS



Arfen single-span steel expansion joints are used in transverse direction at the bridges, with a total movement capacity of 80 mm or 100 mm, the bearing assembly is connected to the structure by means of the ropes and the rubber strip sealing element for watertightness is used.

The steel profiles in this system consist of extrusion profiles. Our expansion joints are designed according to ISO 9001 quality standards, according to DIN 1072 and AASHTOH30-S24 load standards, the anchorage elements used in manufacturing are produced in accordance with EN 10025 standard and rubber waterproof seal EN standards.



Bridge expansion joint elements are specially produced according to the project details. The expansion joint is made in such a way that the piece consists of two parts, one piece or the one to be approved. Unscrewed undercoats are applied unexpectedly after sanding in SA2 1/2 to prevent corrosion of steel profiles. At least 80 micron zinc based primer and at least 100 micron chlorine rubber or epoxy based paint will be coated against corrosion and external effects.

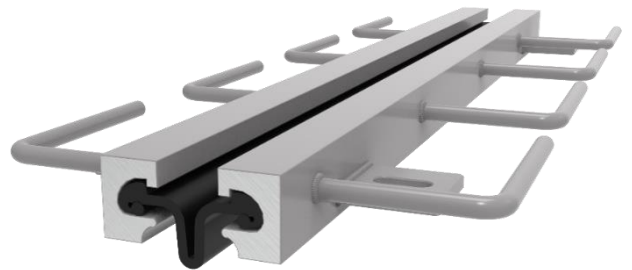
All rubber (NR-CR) elements to be used in expansion joints are manufactured according to the relevant EN and DIN norms. The waterproofing of the joint system is provided in one piece with the appropriate sealing element. The sealing element is manufactured so that it will fit into the housing which continues along an entire profile. They are planned and manufactured in such a way that they will not tear, break, stand out and touch the vehicle wheel surfaces due to dynamic movements (traffic, seismic loads), removable from the place where necessary (maintenance, repair, replacement) to prevent surface waters from flowing down or leaking.



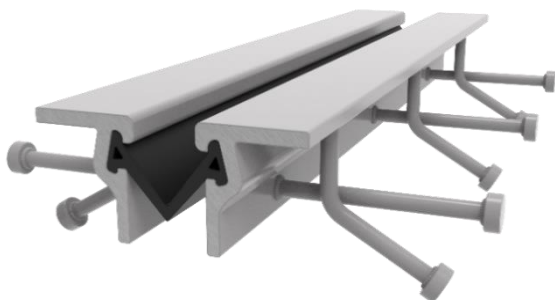
BE 80 GD



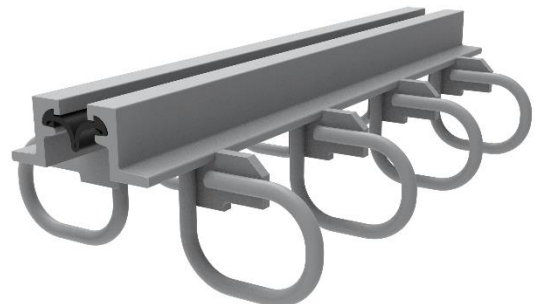
BE 80



BE 80-2



BE 80-3



BE 80 TM-1

Pay attention to the following points when installing expansion joints:

- The existing equipment on the table on which the expansion joint is to be placed should be checked and revised according to the project according to need.
- In the case of existing joints in the joint cavity, in the case of longitudinal distribution fittings, these assemblies will be dismantled and replaced after the joint assembly so that the joint element can be placed.
- The joint spacing should be cleaned very well.
  - In the event of the cutting of an auxiliary fitting, additional auxiliary fittings shall be inserted.
- After the joint installation space has been properly prepared, the expansion joint element will be installed using a mobile crane or similar work machine.
- The upper elevations of the longitudinal profiles of the expansion joint should be 3 mm below the asphalt wear layer, according to the topographic measurements to be made.
- After the adjustment of the joints, the expansion joint will be fixed to the upper structure by making a spot weld between the anchorage grouts in the expansion joint and the equipment in the joint gap.
  - Concrete casting will be done up to the level of the asphalt wear upper layer of the expansion joint. In this way, the expansion joint will be coiled with concrete.
- The most important phase of the assembly process in terms of structural durability and longevity is the concrete casting process and it must be done very carefully.
- After the concrete has reached the required strength, the lifting plates on the expansion joint will be dismantled and the concrete will be cured and the road traffic will be opened at least 3 days later.



# RAILWAY TYPE EXPANSION JOINTS

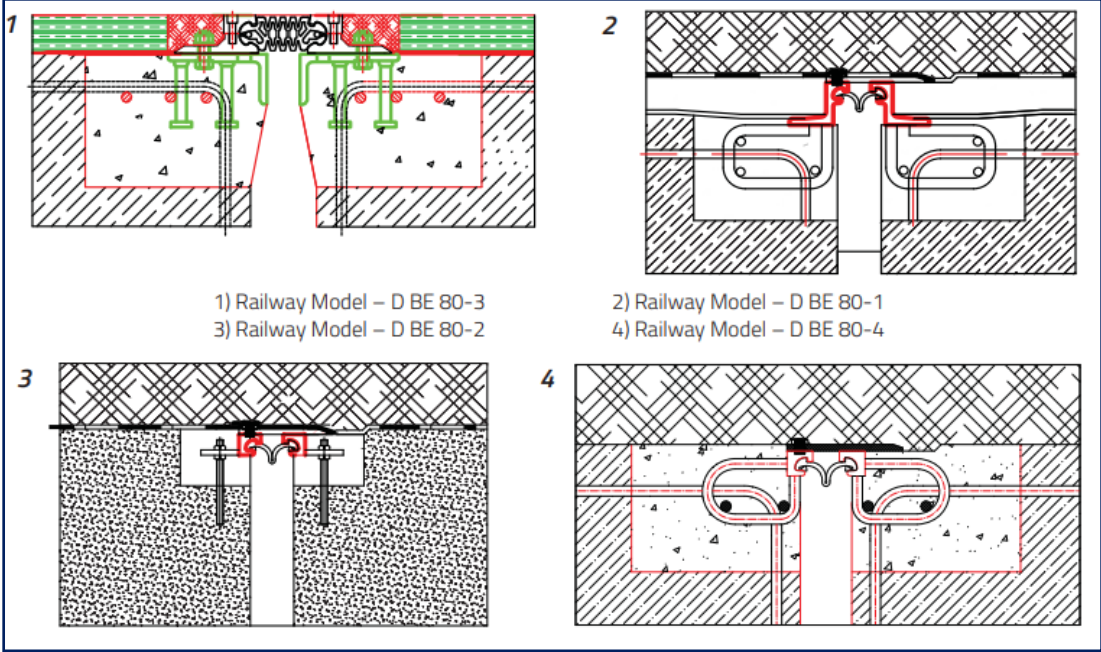


Such expansion joints developed by Arfen are used in railways. The expansion is similar to that of the single-span steel expansion. The product consists of steel edge profiles and rubber seals to provide impermeability. In addition, the joint gap is covered with a lid (ballast) to prevent gravel or foreign matter from entering. Also, if requested, higher production capacity ( $> \pm 50$  mm) is produced specifically for projects that require it.

Our railway expansion joints are designed according to ISO 9001 quality standards, DIN 1072 and AASHTO. The anchorage elements used in manufacturing are manufactured in accordance with EN 10025 standard and rubber waterproofing gasket EN standards.

*As Arfen,*

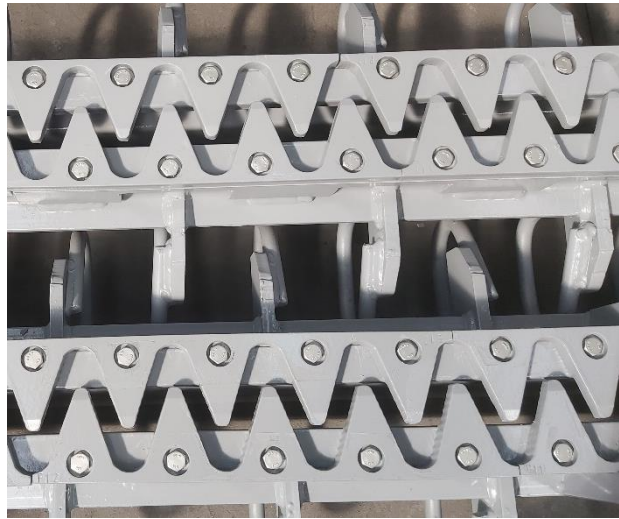
*We have several types of expansion joints that we have developed for railways.*



## SOUND INSULATED EXPANSION JOINTS

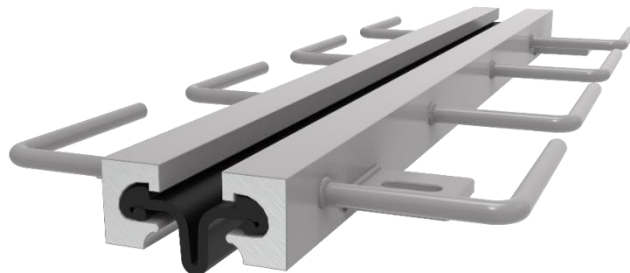


Arfen has developed a sound-insulation expansion joint model to reduce the noise generated as the vehicles pass over the expansion joint. In this model, it is aimed to reduce the traffic noise significantly by using sinus plates. The vehicle wheels do not fall into the gap as they pass over the sinus-plated expansion joints, so no wheel impact noise is generated. The sinus plates in this model are produced as welded or bolted to the customer's request.



## STRIP SEAL EXPANSION JOINTS

This expansion joint can be used with elastomeric concrete in places where it is necessary to open the traffic immediately. Depending on the temperature of the environment, the vehicle can pass through the expansion joint after 1-5 hours. Optionally, it can be used with normal concrete. Expansion joint has long service life. After only 15 years, the rubber seal may need to be replaced. The system has a movement capacity of up to 127 mm. Joint is assembled together with special anchors and epoxy.



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## MODULAR EXPANSION JOINTS

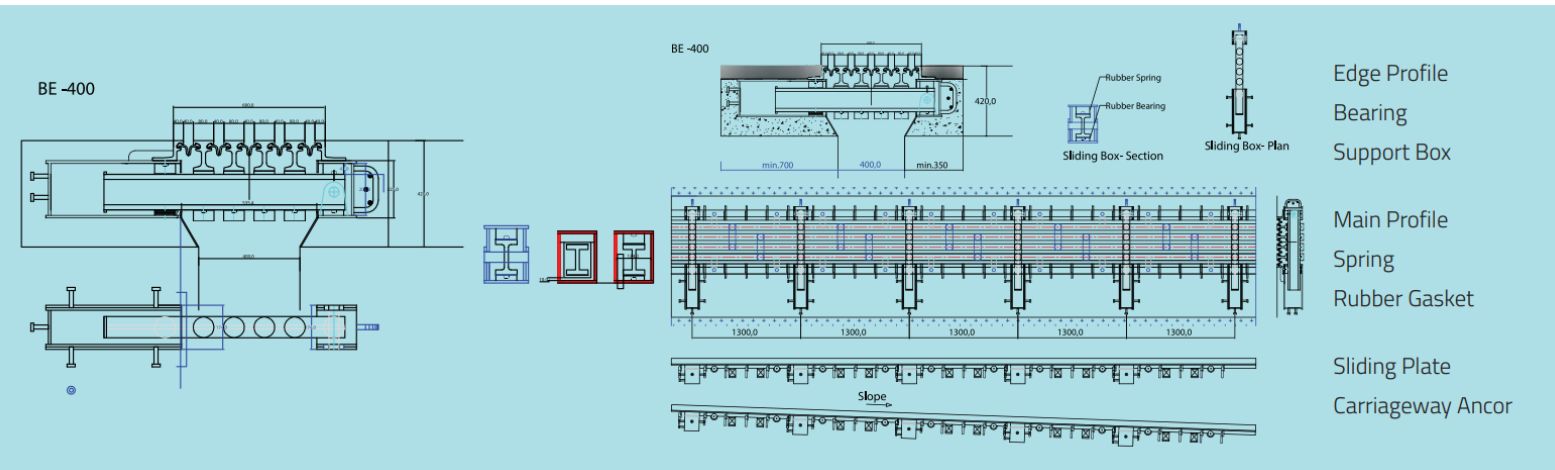
*The modular expansion joints* are designed taking into consideration the required movement capacity. This type of expansion joints is used in situations where the movements to take place on a bridge exceed the single-span joint capacity. Sealing is provided by rubber gasket. Thus, water and chemicals are prevented from damaging infrastructure and superstructure. In addition, the steel elements are resistant to corrosion and have high fatigue strength. They radiate less noise.

Each of our expansion joints is subjected to static calculations based on the EN and AASHTO H30-S24 load standards. Also used steel and rubber material are produced according to EN standards. Modular joints are produced accordance to ISO 9001.

*The modular expansion joint* consists of multiple pieces to provide greater than 80 mm movement. It has horizontal moving capacities which continue such as 160 mm, 240 mm, 320 mm, 400 mm, 480 mm, 560 mm, etc. and maximum capacity 1200 mm for use in the transverse direction in the bridges, the carrier is fixed to the structure by means of structured ropes.

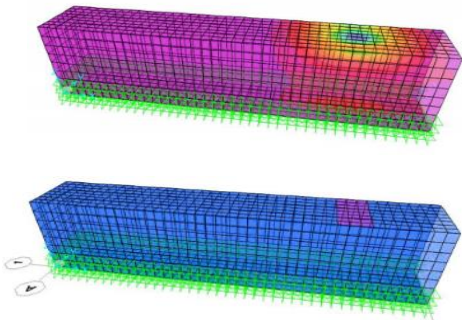


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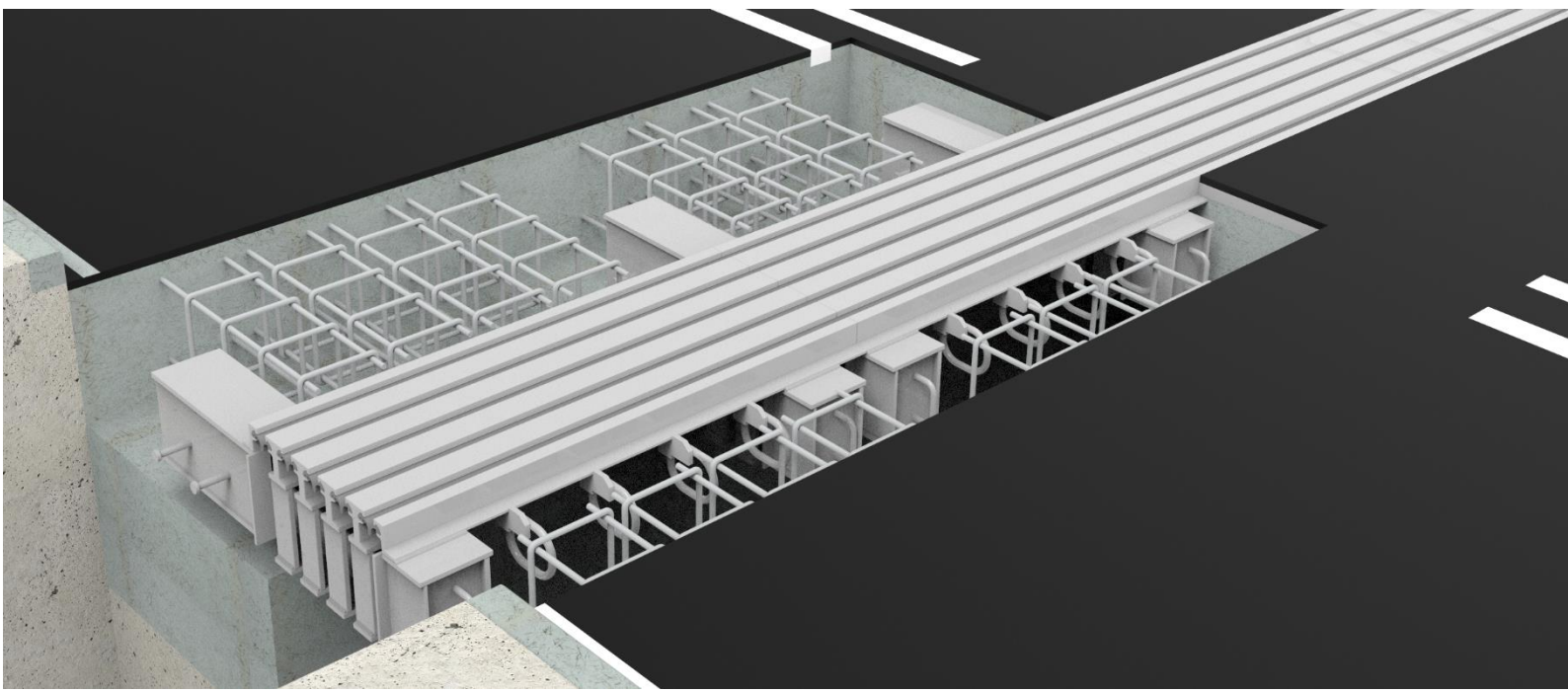


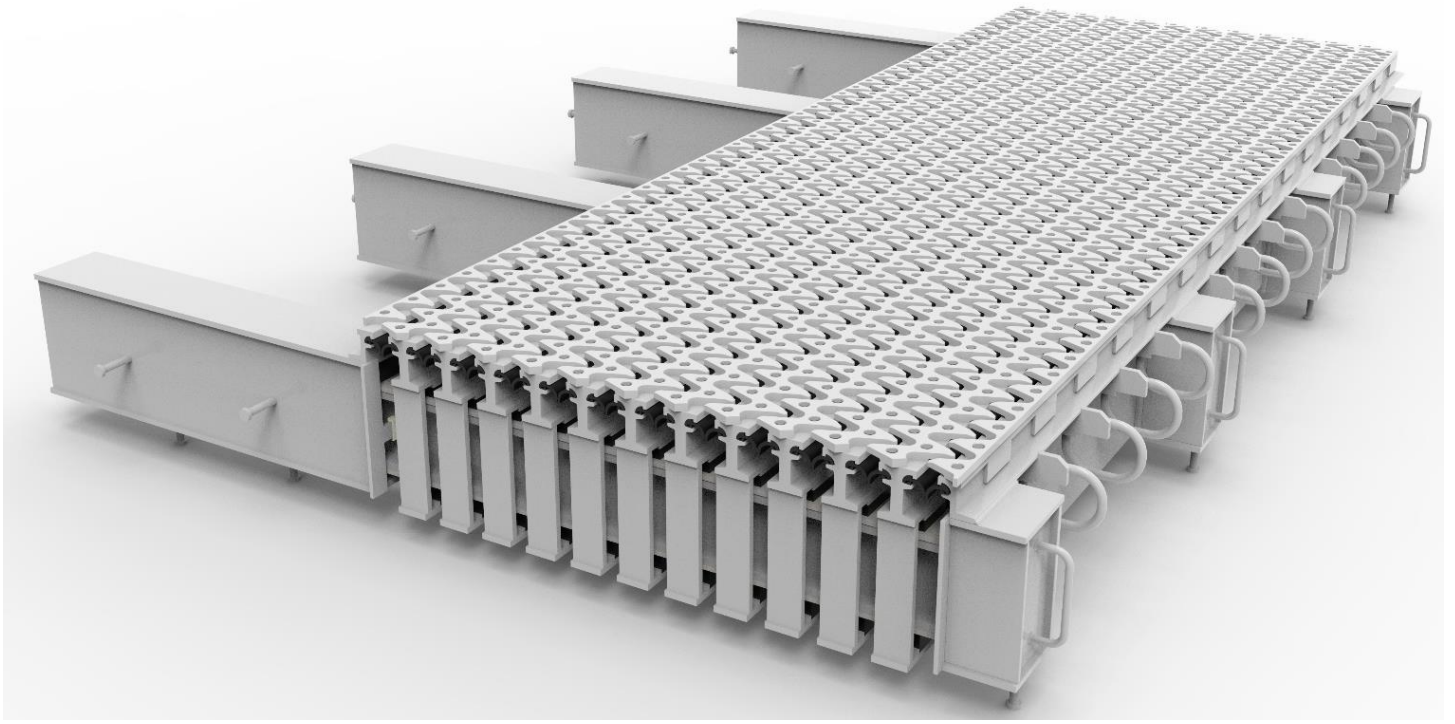
- The assembly phase of the modular expansion joints is very important for the joint life and in particular the following points should be taken seriously. Transverse and longitudinal equipment must never be cut in the application area. All longitudinal bars must be fixed to stirrups. Care will be taken to ensure that the expansion joint is positioned and fixed in accordance with the project plan cross-section. No matter how strong the system is, if the point of connection of the expansion joint is weak and it is not properly connected to the bridge system.

- The expansion joint should be fixed between 10-20 °C temperature. The asphalt wear layer (or concrete) on the side of the expansion joint must be at least 3 mm higher than the expansion joint. Box elements must be well supported with concrete. Particular attention should be paid so that there is no air gap at the bottom of the expansion joints.



Arfen joints are analyzed under the desired loads and delivered in accordance with the standards, together with the analysis reports for the project.

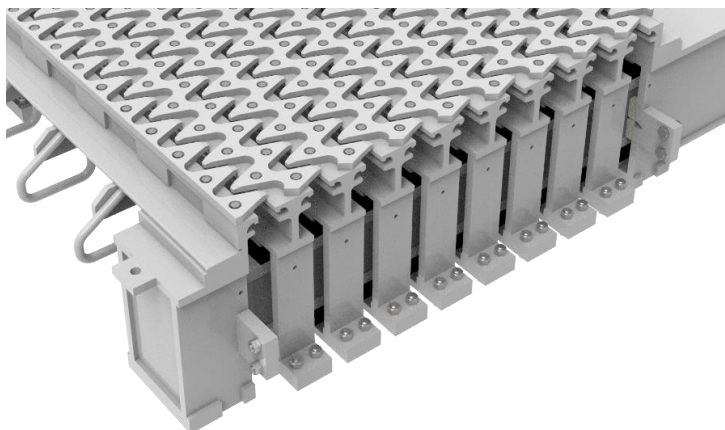




## SOUND ISOLATION MODULAR EXPANSION JOINTS

*Arfen* has developed a modular expansion joint with sound isolation. Thanks to this lesson, sound isolation was achieved at the joint, regardless of the number and weight of vehicles passing along the road. Thanks to the 10-20-30mm thick plates placed on the joint, the sound level that can occur has been minimized.

	Specification	Standard
Edge Beam	S235JR	EN10025 (DIN17100)
Centre Beam	S355JR	EN10025 (DIN17100)
Anchor	S235JR	EN10025 (DIN17100)
Joist(Transverse Beam)	S235JR	EN10025 (DIN17100)
Rubber Seal	EPDM	DIN53505, DIN53504
Sliding Surface	Stainless Steel 1.4401 PTFE	DIN17441, DIN53455, DIN53505,DIN53479



TYPE	Range of Movement (mm)
<i>BE160</i>	160
<i>BE240</i>	240
<i>BE320</i>	320
<i>BE400</i>	400
<i>BE480</i>	480
<i>BE560</i>	560
<i>BE640</i>	640
<i>BE720</i>	720
<i>BE800</i>	800
<i>BE880</i>	880
<i>BE960</i>	960
<i>BE1040</i>	1040
<i>BE1200</i>	1200

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# CERTIFICATE



## European Technical Assessment

ETA 18/0822  
of 09/03/2021

### General Part

Technical Assessment Body issuing the  
ETA:

İTBAK İnşaat Teknik Değerlendirme  
Araştırma ve Belgelendirme AŞ.  
Mustafa Kemal Mah. 2123. Cadde Cepa Ofis  
No: 2-D Daire 901-902 Çankaya 06530  
Ankara Türkiye  
+90 312 285 63 80

Trade name of the construction product

ARFEN BE GENLEŞME DERZLERİ  
BE80TM1, BE80 and BE80TM Single-Seal  
Expansion Joints

Product family to which the construction  
product belongs

Nosing expansion joints for road bridges

Manufacturer

Arfen Köprü ve Yapı Teknolojileri San. ve  
Tic. A.Ş

Manufacturing plant(s)

Çerkeşli OSB mah. İmes 3 Bulvarı, No 27,  
41455 Dilovası / Kocaeli / TÜRKİYE

This European Technical Assessment  
contains

30 pages including 6 Annexes which form an  
integral part of this assessment.

This European Technical Assessment is  
issued in accordance with regulation  
(EU) No 305/2011, on the basis of

European Assessment Document (EAD)  
120109-00-0107 "Nosing expansion joints  
for road bridges" edition August 2019

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Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.



İTBAK İNŞAAT TEKNİK DEĞERLENDİRME ARAŞTIRMA VE BELGELENDİRME A.Ş.

18-12-0131

ETA 18/0822 of 09/03/2021

İTBAK Construction Technical Assessment Research and Certification Inc.

page 1 of 30

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## WELDING CERTIFICATE

Certificate No.: 0408-CPR-TA02905

<b>Manufacturer</b>	<b>ARFEN KÖPRÜ VE YAPI TEKNOLOJİLERİ SAN. TIC. LTD. ŞTİ.</b> <b>Çerkeşli OSB Mahallesi İmes 3 Bulvarı No:27</b> <b>Dilovası / KOCAELİ / TÜRKİYE</b>
<b>Factories</b>	see above
<b>Standard</b>	EN 1090-1:2009+A1:2011 EN 1090-2:2018
<b>Execution Classes</b>	Up to EXC 2
<b>Welding Processes</b> <small>(According to ISO 4063)</small>	141 - Tungsten Inert Gas Welding 135 - Metal Active Gas Welding
<b>Parent Metals</b>	S235 -S275-S355 and AISI 316 acc. to EN 1090-2, Table 2 and 3
<b>Responsible Welding Coordinator</b>	Telat CANKUR, 10.07.1993, IWE
<b>Deputies</b>	-
<b>Confirmation</b>	It is confirmed that all procedures for the execution and supervision of welding work are available.
<b>Remarks</b>	This welding certificate is only valid within the scope of and in connection with FPC Certificate No.: 0408-CPR-TA02905
<b>Valid from</b>	13.03.2019 (first day of issue)
<b>Next Surveillance</b>	12.03.2021

Leonding PLACE      18.06.2020 DATE



Mastnak Alexander DI  
CERTIFICATION BODY



TÜV AUSTRIA SERVICES GMBH  
Deuschstraße 10  
A-1230 Wien



## CERTIFICATE

of conformity  
of the factory production control  
No.: 0408-CPR-TA02905

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9<sup>th</sup> March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product:

**Components for Steel structures**

harmonised Standard	execution class	declaration method
EN 1090-1:2009+A1:2011	Load bearing steel components with corrosion protection up to EXC 2 acc. EN 1090-2	1 and 3a acc. Tab. A.1 of EN 1090-1

produced by or for

**ARFEN KÖPRÜ VE YAPI TEKNOLOJİLERİ SAN. TIC. LTD. ŞTİ.**  
**Çerkeşli OSB Mahallesi İmes 3 Bulvarı No:27**  
**Dilovası / KOCAELİ / TÜRKİYE**

and produced in the manufacturing plant (s) (additions on page 2)  
**ARFEN KÖPRÜ VE YAPI TEKNOLOJİLERİ SAN. TIC. LTD. ŞTİ.**  
**Çerkeşli OSB Mahallesi İmes 3 Bulvarı No:27**  
**Dilovası / KOCAELİ / TÜRKİYE**

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard (s)  
**EN 1090-1:2009+A1:2011**  
under system 2+ are applied and that  
**the factory production control fulfills all the prescribed requirements set out above.**

This certificate was first issued on 13.03.2019 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonized standard, used to assess the performance of the declared characteristics, do not change, and the product, and the manufacturing conditions in the plant are not modified significantly. The next surveillance is due on 12.03.2021.


Leonding PLACE      18.06.2020 DATE



Mastnak Alexander DI  
CERTIFICATION BODY



TÜV AUSTRIA SERVICES GMBH  
Deuschstraße 10  
A-1230 Wien



### TÜRK STANDARLARI ENSTİTÜSÜ

#### TÜRK STANDARLARINA UYGUNLUK BELGESİ

### TURKISH STANDARDS INSTITUTION

#### CERTIFICATE OF CONFORMITY TO TURKISH STANDARDS

<small>Markanın İsmi</small>	<small>Description of the Mark</small>
TSE	TSE

<b>BELGE NUMARASI</b> <small>REFERENCE NUMBER OF LICENCE</small>	001183-TSE-01/02
<b>BELGENİN İLK VERİŞİ TARİHİ</b> <small>DATE OF FIRST ISSUE OF LICENCE</small>	28.02.2006
<b>BELGENİN SON GEÇERLİLİK TARİHİ</b> <small>LICENCE VALID UNTIL</small>	11.03.2022
<b>BELGE SAHİBİ KURULUŞUN ADI</b> <small>NAME OF THE LICENCE HOLDER</small>	TELAS LASTİK SANAYİ VE TİCARET ANONİM ŞİRKETİ
<b>BELGE SAHİBİ KURULUŞUN ADRESİ</b> <small>ADDRESS OF THE LICENCE HOLDER</small>	ORGANİZE SANAYİ BÖLGESİ ÇEVRE SANAYİ SİTESİ 5 BLOK NO 38-40 İKİTELLİ / K.ÇEKMECE İSTANBUL/TÜRKİYE
<b>ÜRETİM YERİ ADI</b> <small>NAME OF THE MANUFACTURING PLACE</small>	TELAS LASTİK SANAYİ VE TİCARET ANONİM ŞİRKETİ
<b>ÜRETİM YERİ ADRESİ</b> <small>ADDRESS OF THE MANUFACTURING PLACE</small>	ORGANİZE SANAYİ BÖLGESİ ÇEVRE SANAYİ SİTESİ 5 BLOK NO 38-40 İKİTELLİ / K.ÇEKMECE İSTANBUL / TÜRKİYE
<b>İPTAL EDİLEN BELGE NUMARASI (Varsa)</b> <small>INDICATION OF SUPERSEDED LICENCE (if any)</small>	001183-TSE-01/01
<b>TESCİLLİ TİCARİ MARKASI</b> <small>REGISTERED TRADE MARK</small>	telas lastik san. ve tic. a.ş
<b>İLGİLİ TÜRK STANDARDI</b> <small>RELATED TURKISH STANDARD</small>	TS EN 681-1 / 14.04.1999
<b>BELGE KAPSAMI</b> <small>SCOPE OF LICENCE</small>	PLASTOMERİK CANTALAR-SU VE DRENAJ UYGULAMALARINDA KULLANILAN-LASTİK SERTLİK SINIFI 40-60-70-90 (K.G:11.05.2016) OLAN, KULLANIM TIPI WC OLAN

e-imza ile signed  
11.02.2021

Belgelendirme Merkezi Başkanı Adına  
**AHMET NURSI KARTAL**  
TSE İSTANBUL BELGELENDİRME MÜDÜRÜ

1. Bu belge belgelendirilen kuruluş, ürün ve/veya hizmetin belgelendirildiği şartları karşılamak üzere geçerlidir.  
2. Bu belge, her belgelendirme işlemi için geçerlidir. İşletme veya kuruluşun belgelendirme şartları değiştiğinde, belgenin süresi otomatik olarak sona erer.  
3. TSE, TÜRKİYE BELGELENDİRME MERKEZİ'NE BAĞLI BİR ENSTİTÜDÜR. Adres: Çarşıbaşı Yenimahalle Mahallesi, Çarşıbaşı, Beşiktaş, İstanbul / Türkiye. Telefon: +90 212 362 12 31 / 362 12 32 / 362 12 33 / 362 12 34 / 362 12 35 / 362 12 36 / 362 12 37 / 362 12 38 / 362 12 39 / 362 12 40 / 362 12 41 / 362 12 42 / 362 12 43 / 362 12 44 / 362 12 45 / 362 12 46 / 362 12 47 / 362 12 48 / 362 12 49 / 362 12 50 / 362 12 51 / 362 12 52 / 362 12 53 / 362 12 54 / 362 12 55 / 362 12 56 / 362 12 57 / 362 12 58 / 362 12 59 / 362 12 60 / 362 12 61 / 362 12 62 / 362 12 63 / 362 12 64 / 362 12 65 / 362 12 66 / 362 12 67 / 362 12 68 / 362 12 69 / 362 12 70 / 362 12 71 / 362 12 72 / 362 12 73 / 362 12 74 / 362 12 75 / 362 12 76 / 362 12 77 / 362 12 78 / 362 12 79 / 362 12 80 / 362 12 81 / 362 12 82 / 362 12 83 / 362 12 84 / 362 12 85 / 362 12 86 / 362 12 87 / 362 12 88 / 362 12 89 / 362 12 90 / 362 12 91 / 362 12 92 / 362 12 93 / 362 12 94 / 362 12 95 / 362 12 96 / 362 12 97 / 362 12 98 / 362 12 99 / 362 13 00 / 362 13 01 / 362 13 02 / 362 13 03 / 362 13 04 / 362 13 05 / 362 13 06 / 362 13 07 / 362 13 08 / 362 13 09 / 362 13 10 / 362 13 11 / 362 13 12 / 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