



Expansion joints

Infrastructure | Buildings | Industrial structures

mageba expansion joints – for lasting driving comfort



TENSA[®] CRETE Type RE and RE-LS

easy to install, noise-reducing, durable



mageba



Features & Benefits

Introduction

The TENSACRETE type RE and RE-LS single-gap joint systems are expansion joints for gap widths up to 3" (76 mm) for the RE type and 4" (101 mm) for the RE-LS type (these values can vary depending on the construction standard).

Type RE-LS is also equipped with a noise-reducing surface in the form of "sinusoidal plates". This results in noise reduction of up to 80 %.

The steel edge profiles of the TENSACRETE expansion joints are anchored in ROBOFLEX waterproof polymer concrete. The joints are suitable for new constructions as well as for refurbishment projects. A major advantage is the fast and cost-effective installation of the system, because the joint is only installed in the cross-sectional area of the wearing surface and no further interference with the underlying carrying construction takes place.

Area of Application

The TENSACRETE expansion joint is mainly used for asphalt and concrete connections and can be installed on virtually all new and existing bridges. Due to its low installation depth, it is particularly suitable for retrofitting in cases where bituminous expansion joints are rolled out or are fissured as a result of intensive use. The same applies to the replacement of worn mat joints (e.g. those damaged by heavy snow clearing equipment). The fast installation time of TENSACRETE expansion joints and the additional possibility of phased assembly combine to reduce traffic congestion.

Product Characteristics

- Movements in all three axes and rotations of the bridge are possible without constraints
- Gap widths, depending on the standard, up to 3" (76 mm) for RE type and 4" (101 mm) for RE-LS type
- Short setting time of concrete, with traffic able to pass over again in just 4 or 6 hours after installation
- Lane-by-lane installation is possible – resulting in reduced traffic congestion
- Easy adaptation to various materials and thicknesses of adjoining structures

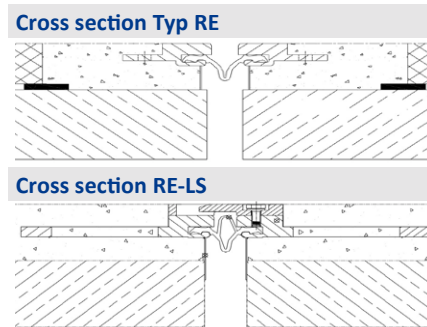
- Joints are 100 % water-tight
- Resistant to wear and chemicals
- Up to 80 % noise reduction with the noise-reducing sinusoidal plates for the RE-LS type

Anchoring

No additional reinforcement or anchoring is necessary with the TENSACRETE expansion joints. All loads are transmitted directly through the bond between the polymer concrete and the substructure. To allow the transmission of forces into the adjacent structural elements, the surface of the recess must have a minimum tensile bond strength of 220 psi (1.5 N/mm²) for concrete or 440 psi (3.0 N/mm²) for steel. ROBOFLEX should not be applied to new concrete within 14 days of pouring.

Installation

The installation of the TENSACRETE expansion joints and the insertion of the ROBOFLEX polymer concrete must be carried out by qualified and certified personnel. The on-site coordination of these activities is carried out by our experienced project managers.



Customer Benefits

- Ideal replacement for bituminous expansion joints and mat joints
- Minimal traffic impacts for refurbishment projects
- Quicker and easier installation than conventional joints
- No impact on the main structure
- Improved noise protection through noise-reducing surface
- Work can be carried out by own qualified personnel



1 TENSACRETE expansion joint RE type
 2 TENSACRETE expansion joint RE-LS type
 3 Damaged bituminous expansion joint
 4 Damaged mat expansion joint

Material Properties & Installation

Materials

The following high-quality materials are used in the manufacture of TENSAGRIP expansion joints:

- Edge profiles available in the following grades:
 - ASTM A36 Grade 36
 - ASTM A709 Grade 36
 - ASTM A709 Grade 50
 - ASTM A588 Grade 50
- Sealing profile in Neoprene tested according to ASTM D5973
- Hybrid profiles with stainless steel top flange can also be supplied on request

Corrosion Protection

The steel edge profiles are treated with corrosion protection systems based on hot dip galvanizing ASTM A-123 / AASTHO M111, or any applicable painting systems approved by the responsible Department of Transportation (D.O.T).

Water-tightness

The TENSACRETE expansion joint is 100 % water-tight due to mageba's proven sealing profile. This sealing profile has been in use for decades, and is continuously enhanced and optimized. The profile has special sealing points to prevent the ingress of water. Should the sealing profile become damaged by external mechanical impact, it can be replaced in a fast and cost-effective manner.

ROBOFLEX Polymer Concrete

The measured material properties of the ROBOFLEX polymer concrete are as follows:

	Metric	Imperial
Compressive strength (Prism 40x40x160 mm, 28 d)	at least 22.3 N/mm ²	3,240 psi
Tensile strength (Prism 40x40x160 mm, 28 d)	at least 7.4 N/mm ²	1,080 psi
E modulus (Prism 40x40x160 mm, 28 d)	at least 55 N/mm ²	7,980 psi
Bond to sand-blasted steel	at least 3.0 N/mm ²	440 psi
Bond to sand-blasted concrete	at least 1.5 N/mm ²	220 psi
Pot life	at least 10 minutes	

The application surface temperature and air temperature for the installation of the ROBOFLEX polymer concrete must be between 46.4 °F and 86 °F (8 °C and 30 °C).

Depending on the temperature, the polymer concrete will be ready to withstand traffic loads within 4 to 6 hours curing time.

Installation Process

After uncovering the recess – by removing the previously laid asphalt layer or the old joint – the next steps for the installation of TENSACRETE expansion joint are as follows:

1. Surface preparation

Pre-treatment (e.g. sand blasting) of concrete or steel surface in the recess so that it reaches the tensile bond strength of 220 psi (1.5 N/mm²) for concrete or 440 psi (3.0 N/mm²) for steel.

2. Setting up the profiles

Lining and leveling of the edge profiles.

3. Laying the polymer concrete

The ROBOFLEX polymer concrete is mixed, poured and cured to form a smooth carriageway surface. Due to its excellent distribution properties, no cavities are left and no additional compaction is necessary. The polymer concrete reaches the compressive strength required to withstand the traffic loads within 4 to 6 hours (depending on temperature).

4. Sealing profile

Insertion of the mageba sealing profile over the entire length of the joint if the latter has been installed in stages (e.g. lane-by-lane). Otherwise, the sealing profile is previously installed in the factory.



- 1 Exposed recess
- 2 Positioned RE-LS type expansion joint
- 3 Mixing of the ROBOFLEX polymer concrete
- 4 Laying of the ROBOFLEX polymer concrete



Expansion joints

Quality & Support

Quality

For five decades, mageba expansion joints have proven their worth in thousands of structures under the most demanding conditions. In addition to the product properties, the extensive experience of our well-qualified manufacturing and installation staff also contributes to the high quality and durability of the products.

mageba has a process-oriented quality system. In addition, its quality is regularly inspected by independent testing institutes. mageba factories are AISC certified for Major Bridges (CPT, STD, SPE) and also maintain AWS certifications for D1.1 and D1.5.

Testing

The ROBO®FLEX polymer concrete has been specially developed for the TENSA®CRETE expansion joints. The ROBO®FLEX polymer concrete has undergone extensive testing conducted in collaboration with the University of Innsbruck (Austria) with regard to wear and tear, loading and durability. The tests showed that ROBO®FLEX is capable of withstanding 2 million load cycles at loads of up to 35.9 kips (160 kN) without failure. The failure occurred in each case in the underlying support structure, rather than at the interface between ROBO®FLEX and concrete, or steel surface respectively.

The durability of the TENSA®CRETE expansion joints has been proven on numerous bridges worldwide for over 10 years now, which is the best reference for quality and durability.

Tenders

The following text elements can be used for the preparation of tender documents with RE type TENSA®CRETE expansion joints:

- Delivery and installation of a water-tight expansion joint structure made of steel with polymer concrete anchoring in accordance with the static and constructive requirements
 - Installation over the entire superstructure width
 - Overall dilatation: 3" (76 mm)
 - All steel surfaces should be prepared at the factory with SA 3 sandblasting quality grade
 - Fatigue strength verification by an independent testing authority (at least 2x10⁶ cycles under traffic-related loads)
 - Type designation: mageba TENSA®CRETE RE type or equivalent
 - Polymer concrete: mageba ROBO®FLEX or equivalent
 - Bill of quantities based on the construction length in the horizontal axis profile
- Additional / alternative for the RE-LS type:
- Design of the joint using a noise-reducing surface

- Overall dilatation: 4" [101 mm]
- Type designation: mageba TENSA®CRETE RE-LS type or equivalent

Quotations

In order to be able to provide a quotation we require the following data:

- A detailed drawing of the adjoining areas (cross and longitudinal sections of the bridge)
- Expansion joint movement range, including the direction of movements
- Noise reduction requirements

Execution Planning

In addition to the previously provided information, we need the following documentation when an order is confirmed:

- Layout plan of the construction
- Pre-setting values
- Drawings showing services
- Other particulars

Customer Support

Our product specialists will be pleased to advise you in the selection of the optimal solution for your project, and to provide you with a quotation.

On our website, mageba-group.com, you will find further product information, including reference lists and tender documentation.

Reference Projects with mageba Expansion Joints



Audubon Bridge, LA (US)



New NY Bridge, NY (US)



Bayonne Bridge, NY (US)



Golden Ears Bridge (CA)



Port Mann Bridge (CA)

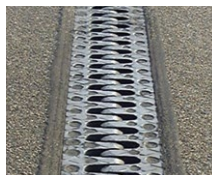


Pont de Beauharnois (CA)

mageba Expansion Joint Types



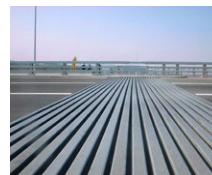
Single Gap Joints



Cantilever Finger Joint



Sliding Finger Joints



Modular Expansion Joints

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