



Expansion joints

Infrastructure | Buildings | Industrial structures

# mageba expansion joints – for lasting driving comfort



## **TENSA® GRIP Types RS and RS-LS** custom-made, watertight, durable



**mageba**



# Product characteristics & benefits

## Principle

TENSA®GRIP single-gap expansion joints of types RS and RS-LS consist of robust steel edge profiles and a replaceable elastomeric seal. They are suited to both asphalted and concreted road surfacing, and their anchorages are designed accordingly. TENSA®GRIP expansion joints were developed for use in bridges with heavy traffic loading, and can readily meet the challenges of snowploughs and vehicles with exceptionally heavy loads.

## Properties

TENSA®GRIP Type RS expansion joints facilitate movements of up to 80 mm, but this value can vary depending on the relevant design standard. On request, movements of up to 200 mm can be facilitated by the use of special sealing profiles. Thanks to the welded design, asphalt surfacing of any thickness can be accommodated.

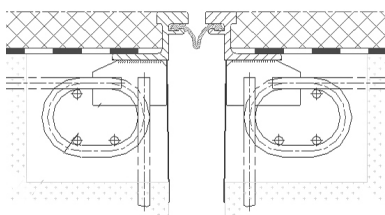
TENSA®GRIP Type RS-LS joints feature so-called "sinus plates" on their surface, which reduce noise from over-rolling traffic by up to 80 %. The use of these surface plates also enables the movement capacity to be increased to 100 mm.

## Types

### TENSA®GRIP Type RS-A

- Expansion joint for asphalted roads with surfacing thicknesses between 50 and 300 mm
- Edge profiles feature flanges for connection of deck waterproofing membrane
- Well-proven, fatigue-tested loop anchorages

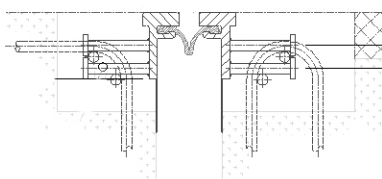
#### Cross-section Type RS-A



### TENSA®GRIP Type RS-B

- Expansion joint for concreted roads or footways
- Edge profiles do not feature flanges for connection of deck waterproofing membrane, and are anchored by horizontal studs

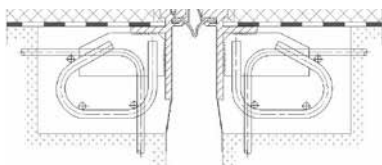
#### Cross-section Type RS-B



### TENSA®GRIP Type RS-LS

- Expansion joint with bolted-on, noise-reducing „sinus plate“ surfacing
- Movement per gap: 100 mm

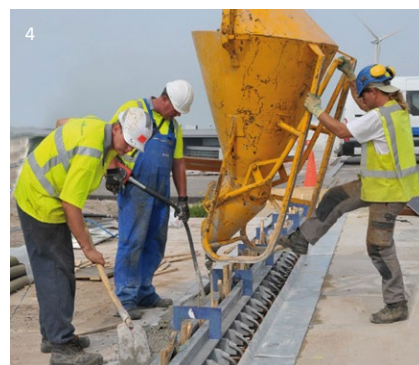
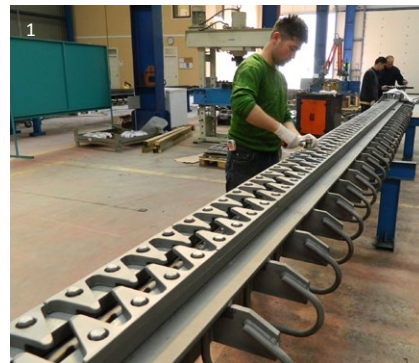
#### Cross-section Type RS-LS



- 1 Production of a TENSA®GRIP RS-LS expansion joint in the factory
- 2 Installation of the joint on site
- 3 TENSA®GRIP RS joint after placing in position
- 4 Placing of concrete to secure the joint

## Benefits

- Robust, durable construction with long-proven design
- Use of high-quality materials ensures a long service life
- 100%-watertightness thanks to specially designed sealing profile and connection flanges for deck waterproofing membrane
- Improved noise protection by use of noise-reducing surfacing
- Adapts easily for different road surface thicknesses





# Specifications & options

## Materials

The following high-quality materials are used in the manufacture of TENSA®GRIP expansion joints:

- Edge profiles of S235 steel; hybrid profiles with stainless steel can also be supplied on request
- „Sinus plates“ of S355 steel
- Sealing profile of EPDM or CR

## Corrosion protection

The steel edge profiles are treated with corrosion protection systems based on ISO 12944 as standard, or on applicable national standards (e.g. ZTV-ING, ASTRA, RVS, ACQPA) as required.

## Noise-reducing surfacing

The use of „sinus plates“ reduces the noise from over-rolling traffic by up to 80 % by covering the straight transverse gap in the carriageway. The wheels of over-rolling vehicles thus maintain constant contact with the expansion joint's surface, eliminating the noise caused by impacts with the gap edge. The special shape of the sinus plates also enables motorcycles and bicycles to cross the joint safely. TENSA®GRIP expansion joints featuring sinus plates are ideal for use on bridges near residential areas or in other noise-sensitive zones.

The bolting (instead of welding) of the sinus plates to the edge profiles of the joint enables the sealing profile beneath to be easily and quickly replaced if necessary.

Because the sinus plates allow the gap movement to be increased to 100 mm, the use of more complex or costlier alternative joint types can be avoided in this movement range.

## Watertightness

The TENSA®GRIP expansion joint is 100 % waterproof thanks to the well-proven mageba sealing profile. The profile has provided reliable service in many bridges over a period of several decades. It has a number of special sealing points, which prevent the passage of water through the joint. Should the sealing profile ever become damaged due to external mechanical influences, it can be quickly and inexpensively replaced.

## Hump profile

As an alternative to the standard sealing profile with a „V“-shaped cross-section, the so-called „hump profile“ can be used if desired. This profile features an additional asymmetric hump above the „V“. Thanks to its special shape, the hump retains its height as the joint opens and closes. The hump profile keeps the joint gap free of dirt and debris, and in particular of stones and other large objects. This optimises maintenance and cleaning effort while the joint is in service.

## Footway and edge area

The TENSA®GRIP expansion joint can be easily adapted in the footway/edge area of the bridge to the bridge's geometry. It can be secured either by anchor loops or, where space is limited, by anchor studs. Kerbs can be detailed at the edge of the carriageway, and cover plates provided if necessary. Openings can also be provided to allow utilities to be directed through the edge profiles of the joint.

## Shuttering plates

Steel shuttering plates, attached to the bottom of the joint's edge profiles, provide support to the fresh concrete during pouring, considerably reducing construction effort. They can alternatively be made from stainless steel to enhance their durability.



- 1 Sinus plates
- 2 TENSA®GRIP RS joint in footway area
- 3 TENSA®GRIP RS joint with horizontal bends
- 4 TENSA®GRIP RS joint with kerb detail and pipe openings



# 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-orientated quality system that is certified in accordance with ISO 9001:2008. Quality is also regularly inspected by independent institutes, such as the materials testing body (MPA) of the University of Stuttgart. mageba factories are certified for welding in accordance with ISO 3834-2, and according to the current steel construction standard EN 1090.

## National approvals

The TENSA®GRIP system and its components have been extensively tested for suitability and performance. The system has been awarded national approvals in numerous countries around the world, including Germany, Switzerland and Austria.

## Installation

The expansion joint is pre-assembled in the factory and fixed at the desired pre-setting value (gap width) by cross-beams. mageba installation technicians precisely position the joint on the main structure, and fix its anchorages to the structure's reinforcement. The concrete is then poured, fully securing the joint to the bridge.

TENSA®GRIP expansion joints can be installed in sections, to suit phasing of the construction work. Field splices are prepared in the factory, for welding on site. A single elastomeric sealing profile is then usually pre-installed in the first section of joint, and the rest is inserted on site for the remaining sections, after welding. This ensures continuous watertightness across the full width of the bridge. As an alternative, individual sealing profiles can be pre-installed in all joint sections and vulcanised together on site, but this requires considerably more effort.

## Related products

The following mageba products can be used in combination with the TENSA®GRIP system:

- **ROBO®DUR:** Strengthening ribs of special mortar, which reinforce the asphalt adjacent to the joint. These reduce rutting, increasing driver comfort and the durability of the joint
- **STATIFLEX®:** Strengthening strip of quick-hardening polymer concrete along the side of an expansion joint, which reduces rutting, increasing driver comfort and joint durability
- **ROBO®MUTE:** Noise-protection system, consisting of mats placed beneath the joint to reduce noise emissions

## 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](http://mageba-group.com), you will find further product information, including reference lists and tender documentation.

## Reference projects TENSA®GRIP Types RS and RS-LS



Westrandweg (NL)



2nd Penang Bridge (MY)



Sihl Bridge (CH)



Langenargen (DE)



Europe Bridge (AT)



Can Tho Bridge (VN)

## mageba expansion joint types



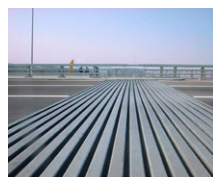
Single gap joints



Cantilever finger joint



Sliding finger joints



Modular expansion joints



engineering connections®