



Expansion joints

mageba expansion joints – for lasting driving comfort



TENSA® FINGER Type RSFD robust, reliable, quiet



mageba
Switzerland www.mageba.ch



Expansion joints

Product characteristics & benefits

Principle

The mageba TENSA®FINGER RSFD cantilever finger joint has proven itself for use in bridges with heavy traffic loading and for movements between 60 mm and 500 mm. The joint's robust steel edge profiles have strong anchor loops for concreting to the main structure, resulting in excellent fatigue resistance. The cantilevering finger plates are connected to the steel profiles by pre-tensioned friction-grip bolts. Beneath the finger plates, a watertight drainage channel, which is dimensioned to facilitate all joint movements, is connected to the edge profiles. The TENSA®FINGER expansion joint is suited to both asphalted and concreted road surfacing.

For greater movements, together with high traffic loading, mageba recommends the statically better suited TENSA®FINGER GF sliding finger joint, to minimise the transfer of moment to the supporting structures.

Properties

Noise-reducing surfacing

The geometry of the cantilevering fingers avoids a straight transverse gap in the carriageway. The wheels of over-rolling vehicles thus maintain constant contact with the expansion joint's surface, reducing the noise caused by impacts with the gap edge. This results in low noise emissions and high driver comfort. TENSA®FINGER cantilever finger expansion joints are thus ideal for use on bridges near residential areas or in other noise-sensitive zones.

Surface profiling

To improve the ability of vehicle wheels to grip the surface of the joint's finger plates, they can optionally be delivered with a 2mm-deep surface pattern. This improves traffic safety, especially on joints with large movements and thus large surface areas.

Drainage channel

Beneath the expansion joint, a watertight drainage channel of flexible material or stainless steel is attached. This features rounded end-pieces at both ends, and a flexible discharge outlet at its low point for connection to the bridge's drainage system. The channel can be easily flushed clear of any gathered sediment during periodic bridge cleaning activities. To facilitate this, an external hose connection point can optionally be provided in the non-trafficked part of the joint. If desired, the channel can also be delivered with a dirt-repellent surface, reducing cleaning effort to an absolute minimum.

Shuttering plates

Steel shuttering plates not only provide support to the fresh concrete during pouring, considerably reducing construction effort, but also serve as a connection surface for the drainage channel. They can alternatively be made from stainless steel to enhance their durability.



- 1 Interlocking of the cantilevering fingers
- 2 Expansion joint surface featuring grip-enhancing pattern
- 3 Drainage channel with shuttering plates
- 4 Hose connection point for cleaning of drainage channel

Benefits

- Robust, durable construction with well-proven design
- Use of high-quality materials ensures a long service life
- Optimised life-cycle costs due to high product quality
- Improved noise protection thanks to interlocking of cantilever fingers
- 100%-water tightness thanks to specially developed drainage channel
- Adapts easily to suit different road surfacing thicknesses

Material properties & dimensions

Materials

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

- Edge profiles of S235 and S355 steel
- Finger plates of S355 steel
- Drainage channel of EPDM, soft PVC or stainless steel, according to customer preference

Corrosion protection

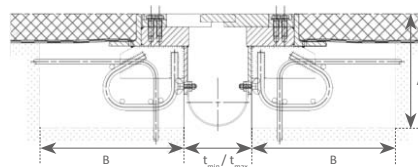
The steel profiles are treated with corrosion protection systems based on ISO 12944 as standard, or on applicable national standards (e.g. ZTV-ING, ASTRA, RVS, ACQPA) as required.

Main dimensions

Type RSFD-A (for asphalt connection)

- Expansion joint for asphalted roads with surfacing thicknesses of between 50 and 250 mm
- Edge profiles feature flanges for connection of deck waterproofing membrane
- Well-proven, fatigue-tested loop anchorages

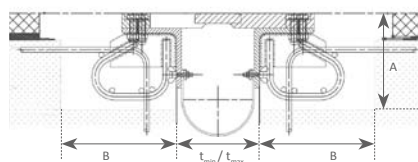
Cross-section: Type RSFD-A



Type RSFD-B (for concrete connection)

- Expansion joint for concreted roads or footways
- Well-proven, fatigue-tested loop anchorages

Cross-section: Type RSFD-B



- 1 RSFD joint with asphalt connection
- 2 Waterproofing with membrane connection flange
- 3 RSFD joint with concrete connection

Type	Movement capacity	A RSFD-A*	A RSFD-B	B	t _{min}	t _{max}	Weight RSFD-A*	Weight RSFD-B
	mm	mm	mm	mm	mm	mm	kg/m	kg/m
RSFD 60	60	≥ 295	≥ 240	≥ 270	70	130	112	75
RSFD 80	80	≥ 295	≥ 240	≥ 270	70	150	130	82
RSFD 100	100	≥ 295	≥ 240	≥ 270	70	170	129	93
RSFD 120	120	≥ 325	≥ 242	≥ 270	84	204	179	102
RSFD 140	140	≥ 295	≥ 242	≥ 270	84	224	154	120
RSFD 160	160	≥ 295	≥ 250	≥ 270	88	248	187	143
RSFD 180	180	≥ 325	≥ 284	≥ 305	108	288	198	176
RSFD 200	200	≥ 325	≥ 284	≥ 305	102	302	213	203
RSFD 250	250	≥ 330	≥ 296	≥ 305	132	382	254	250
RSFD 300	300	≥ 335	≥ 306	≥ 305	142	442	294	290
RSFD 350	350	≥ 350	≥ 320	≥ 305	190	540	375	328
RSFD 400	400	≥ 360	≥ 330	≥ 305	240	640	429	382
RSFD 450	450	≥ 365	≥ 335	≥ 318	174	624	498	443
RSFD 500	500	≥ 370	≥ 350	≥ 368	144	644	583	504

*) For 80mm asphalt layer thickness



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.

Tests and national approvals

TENSA®FINGER cantilever finger joints have been subjected to extensive testing and analysis to verify their properties and performance. The anchorage, for example, has been thoroughly tested in dynamic fatigue tests, with 2 x 10⁶ load cycles at a frequency of 2.75 Hz and loads of up to 140 kN. Under this loading, the anchorage fulfilled the demanding requirements of the Austrian RVS 15.45 standard. The system has been awarded national approvals in numerous countries around the world, such as 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.

Related products

The following mageba products can be used in combination with TENSA®FINGER cantilever finger joints:

- **ROBO®DUR:** Strengthening ribs of special mortar, which reinforce the asphalt adjacent to the joint. These reduce rutting while increasing driver comfort and the durability of the joint
- **ROBO®CISILENT:** Noise-protection system, consisting of mats placed beneath the joint to reduce noise emissions
- **ROBO®GRIP:** Anti-skid coating with high coefficient of friction, preventing skidding of over-rolling vehicles in wet conditions
- **STATIFLEX®:** Strengthening strip of quick-hardening polymer concrete along the side of an expansion joint, which reduces rutting, increasing driver comfort and joint durability

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, www.mageba.ch, you will find further product information, including reference lists and tender documentation.

Reference projects TENSA®FINGER RSFD



Viaducto de Trapagaran (ES)



Can Tho Bridge (VN)



Andrej Sacharovbruggen (NL)



Audubon Bridge (USA)



Weyermannshaus (CH)



Unterlandautobahn (CH)

mageba expansion joint types



Single gap joints



Cantilever finger joint



Sliding finger joints



Modular expansion joints



engineering connections®