engineering connections® – since 1963

Declaration Of Performance

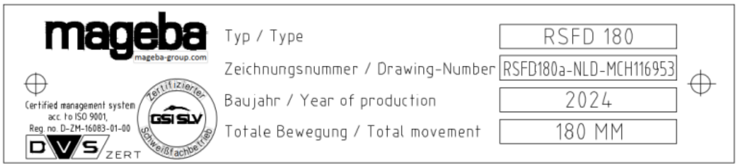
TENSA®FINGER RSFD180a-NLD-MCH116953

Version : 2.0

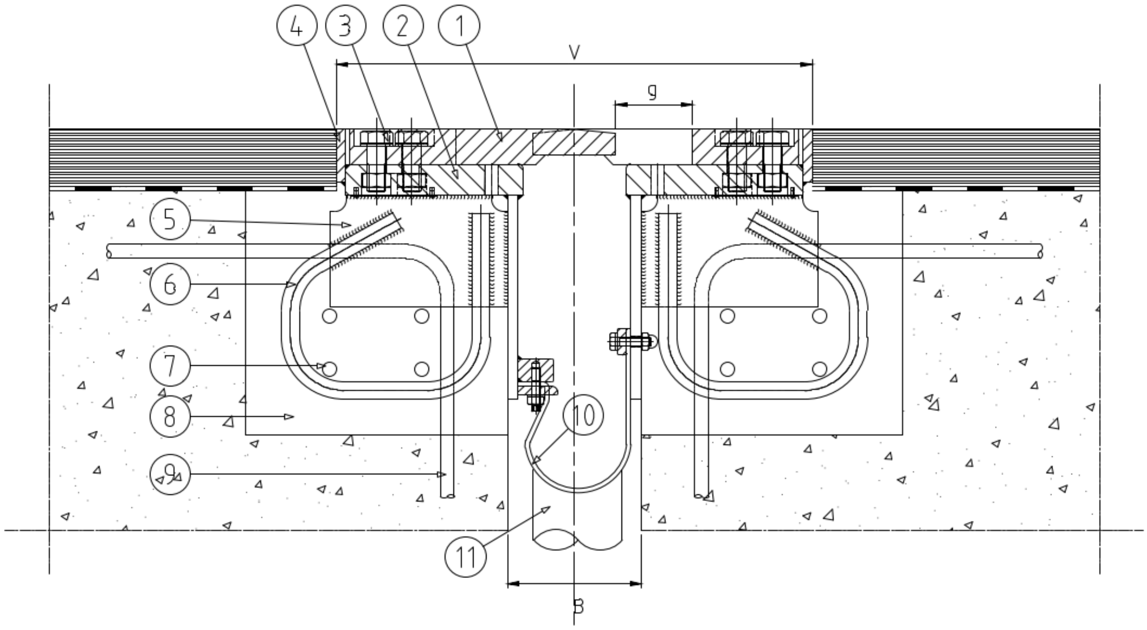
structural bearings | expansion joints | seismic devices | vibration damping | structural monitoring

Contents

1 GENERAL

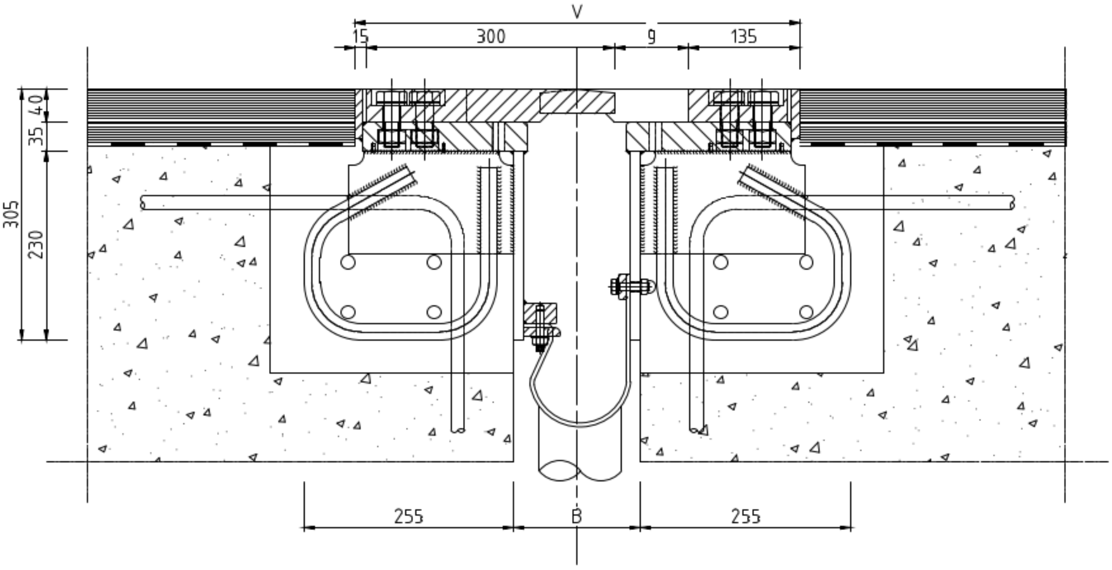
A	**Product name**	:	TENSA®FINGER RSFD180
B	**Manufacturer**	:	mageba SA Solistrasse 68 8180 Bülach Switzerland
C	**Concept Number RTD1007-1**	:	2.1a2
D	**System Description**	:	Steel cantilever finger joints joint with triangular shaped fingers and a steel substructure anchored in a concrete substructure by loop anchors and a subsurface flexible water drainage system. According to drawing TENSA®FINGER RSFD180a-NLD-MCH116953-B.
E	**Identification**	:	Identification number RSFD180a-NLD-MCH116953 Identification plate mechanically connected to the expansion joint in a non-driven part of the joint.  mageba mageba-group.com Certified management system acc. to ISO 9001, Reg. no. D-ZM-16083-01-00 DVS ZERT zertifizierter Schweißfachbetrieb GSI SLV Typ / Type: RSFD 180 Zeichnungsnummer / Drawing-Number: RSFD180a-NLD-MCH116953 Baujahr / Year of production: 2024 Totale Bewegung / Total movement: 180 MM

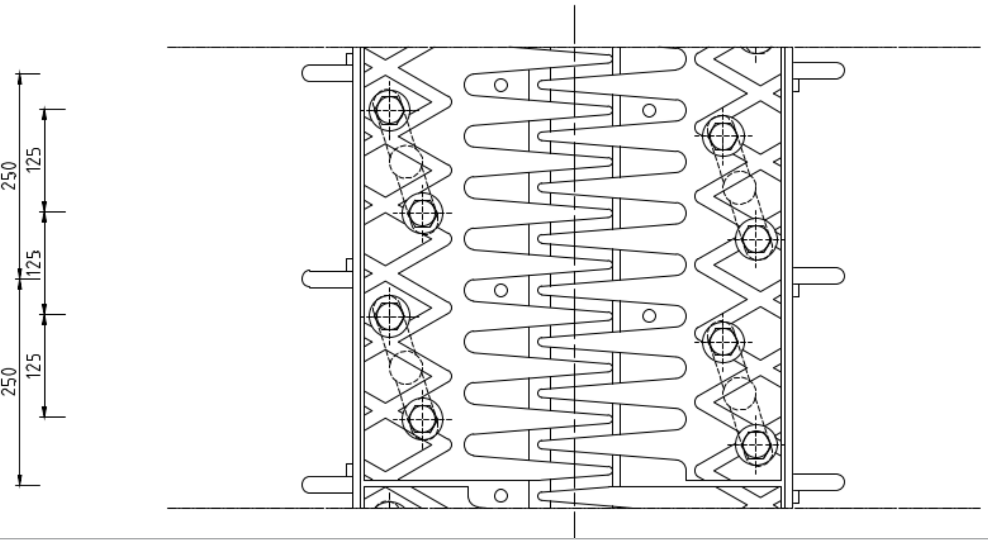
F System Components



Pos.	Description	Size	Material
1	Cantilever finger plate	300x992x40mm	S355 J2+N or AR
2	Substructure	200x35mm + 415x12mm	S355 J2+N or AR
3	Bolt/nut assembly	M20x55	10.9/10 HV HDG [EN14399-4]
4	Back strip	60x10mm	S355 J2+N or AR
5	Anchor plate	200x125x15mm	S555 J2+N or AR
6	Anchor loop	Ø20	S355 J2+N or AR
7	Coupling reinforcement	Ø16	B500B
8	Concrete	-	C50/60 or higher
9	Structures reinforcement	Ø16	B500B
10	Drainage channel	5mm	EPDM
11	Down pipe	Ø100x200mm	EPDM

G Structure geometry :





B*	Structural gap
V	Joint width in running surface
g	Pre-setting value (joint gap)

	Fully closed	**Middle position**	**Fully open**
g (pre-setting value)	**0 mm**	**90 mm**	**180 mm**
V (joint width in surface)	**450 mm**	**540 mm**	**630 mm**
B (structural gap)	**64 mm**	**154 mm**	**244 mm**

2 INTENDED USE

A	**Traffic category** :	Traffic category 1 acc. to RTD1007-2:2014 table NB.5-4.5 ($N_{obs,a,ai} = 2,0 \cdot 10^6$)
B	**Design life system** :	40 years
C	**Design life components** :	- Anchorage (embedded in structure) : 100 years (RTD1001:2017) - Structural steel elements : 40 years - Plastic and rubber components : 15 years
D	**Maintenance** :	- Every year, cleaning of the drainage channel, preferably after the winter period - Every 25 years*, replacement of drainage channel. Preloaded bolt sets to be replaced when loosened. **advised intervals*
E	**Displacement capacity** :	Ux = 180mm Uy = ± 7.8mm @ 0mm gap Uz = ± 5mm (10mm for bearing replacement) *Values are standard values at full closure of the expansion joint. Transverse capacity will increase with opening of the expansion joint.*
F	**Operating range** :	Installation angle : 60° to 120° Longitudinal slope : ≤ 4% Temperature range: -40°C to +100°C

3 MECHANICAL RESISTANCE AND STABILITY

A	**Mechanical resistance**	:	Characteristic SLS, ULS and ALS loads				
			Vertical load	Lane 1	Q_{1k} =	300kN	RTD 1007-2:2014, Table B1.1
				Lane 2	Q_{2k} =	200kN	RTD 1007-2:2014, Table B1.1
				Lane 3	Q_{3k} =	100kN	RTD 1007-2:2014, Table B1.1
			Horizontal (breaking/acceleration) load:		Q_{lk} =	120kN	RTD 1007-2:2014, B1.2.2.1 [2]
			Horizontal (centrifugal) load:	Lane 1	Q_{tk1} =	60kN	RTD 1007-2:2014, B1.2.2.2 [4]
				Lane 2	Q_{tk2} =	40kN	RTD 1007-2:2014, B1.2.2.2 [4]
				Lane 3	Q_{tk3} =	20kN	RTD 1007-2:2014, B1.2.2.2 [4]
			Vertical impact load:		Q_{vks} =	100kN	RTD 1007-2:2014, B1.2.2.3
			Horizontal impact load:		Q_{lks} =	15kN	RTD 1007-2:2014, B1.2.2.3 [5]
			Vertical wheel load footway:		Q_{fwk} =	35kN	RTD 1007-2:2014, B1.2.1.2
			Accidental vertical wheel load on curb:		A_{dV} =	0kN	RTD 1007-2:2014, B1.2.2.4.2
			Accidental horizontal wheel load on curb:		A_{dH} =	10kN	RTD 1007-2:2014, B1.2.2.4.2
B	**Resistance to fatigue**	:	Infinite Working Life Model: FLM1$_{EJ}$ ψ0d = 0.6				
C	**Partial factors**	:	γ_{M0} =	1.00	NEN-EN 1993-2+C1/NB, Section 6.1 [Table NB.2]		
			γ_{M1} =	1.00	NEN-EN 1993-2+C1/NB, Section 6.1 [Table NB.2]		
			γ_{M2} [bolted joints]=	1.35	RTD 1007-2:2014, clause 5.2.3.2 [Table 5.1]		
			γ_{M2} [other components]=	1.00	RTD 1007-2:2014, clause 5.2.3.2 [Table 5.1]		
			γ_{M3} =	1.25	NEN-EN 1993-2+C1/NB, Section 6.1 [Table NB.2]		
			$\gamma_{M3,ser}$ =	1.10	NEN-EN 1993-2+C1/NB, Section 6.1 [Table NB.2]		
			γ_{C} =	1.50	NEN 1992-1-1, Section 2.4.2.4		
			α_{cc} =	1.00	NEN 1992-1-1, Section 3.1.6		
			k1 =	0.85	NEN 1992-1-1, Section 6.8.2		
			α_{Qi} =	1.00	NEN 1992-2, Section 4.3.2		
			γ_{Mf} (bolted-joints) =	1.35	RTD 1007-2:2014, clause 5.2.3.2 [Table 5.2]		
			γ_{Mf} (other-component) =	1.15	RTD 1007-2:2014, clause 5.2.3.2 [Table 5.2]		
D	**Cleanability**	:	Cleanable	EAD 120111-00-0107 clause 2.2.5			
E	**Water tightness**	:	Watertight	EAD 120111-00-0107 clause 2.2.6 *Assessment according to:* *EAD120109-00-0107 Annex D, Clause D4*			

4 SAFETY IN USE

A	**Allowable surface gaps and voids**	:	EAD 120111-00-0107 clause 2.2.9 a. vehicles: no restrictions b. cyclists: restrictions, special measures to be added project specific c. pedestrians: no restrictions, special measures to be added project specific is advised.

Category	Prism	Angle to traffic direction	Requirement
General	Sphere D=100mm	any	vertical displacement <100mm
Vehicles	100x200mm	any	vertical displacement <10mm
	65x220mm	-20° to +20°	vertical displacement <10mm
	45x350mm	-20° to +20°	vertical displacement <10mm
Cyclists	100x200mm	any	vertical displacement <10mm
	20x220mm	-20° to +20°	vertical displacement <10mm
Pedestrians	Disk D=80mm	any	vertical displacement <20mm

B	**Level differences in the running surface**	:	Without any imposed horizontal deformations and in unloaded condition the difference in the levels of the running surface of the joints from the ideal line between the two adjacent pavements in the traffic direction shall not be greater than 5mm.Steps shall not be greater than 3mm (without considering surface texture and discontinuities due to gaps and voids).
C	**Skid resistance**	:	+ acc. to RTD1007-1
D	**Drainage capacity**	:	EAD 120111-00-0107 clause 2.2.11 Q_0 = 56l/s for standard size outlet 100x200 (equiv. D=Ø139mm) k_0=1.0 h=2000mm

5 PROTECTION AGAINST NOISE

A	**Noise emission**	:	Emission levels above the expansion joint acc. to RTD1007-1

Speed vehicles	Noise emission [GLW]
80 km/h	82.0 dB(A)
90 km/h	83.1 dB(A)
100 km/h	84.1 dB(A)
110 km/h	85.0 dB(A)
120 km/h	85.8 dB(A)
130 km/h	86.6 dB(A)

ASPECTS OF DURABILITY

A	**Corrosivity category**	:	EN ISO 9223 corrosivity category C5
B	**Durability**	:	EN ISO 14713-1 Durability “VH” Very High
C	**Corrosion protection system**	:	Hot Dip Galvanized acc. to EN ISO 1461 with increased zinc layer thickness of 140µm acc EN ISO 14713-1