TOGE TSM BS

For new in-situ concrete construction on road bridges

Approval
Approved by building authorities as shear-connector.

Impermeability
Verification of the impermeability of the system without or after alternating load.

Installation
Fast and safe installation.

Force Transmission
Transmission of forces in existing concrete by the undercutting technique in combination with chemical mortar.

Force transmission in new concrete via shear studs (hexagonal head or shear stud washer).

Approval

Approval
General type approval / General technical approval Z-21.1-1799.

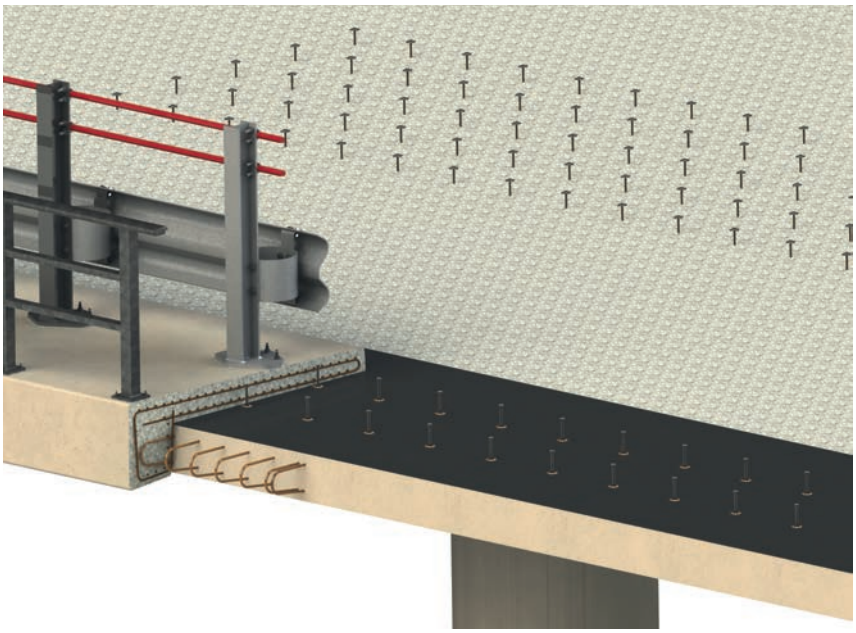
General type approval / General technical approval Z-21.1-1880.

Base Material
Application in cracked and non-cracked concrete of strength classes from C20/25 to C50/60.

Headshapes & Material

	Steel, zinc-plated	Steel, anti-corrosion coated	Steel, stainless A4
 Bridge cap anchor for new construction TSM BS			✓
 Injection mortar and accessories			

Application Examples



Fastening of new bridge caps road bridges with the TOGE TSM BS 16

Detail

Product Overview

Steel, stainless A4

Item nr.	Designation	Depth of drill hole h_o	Embedment depth of anchor h_{nom}	Max. thickness of fixture t_{fix}	Packing Unit
741 162 300	TSM BS 16x230 SW27	110 - 170 mm	100 - 160 mm	-	25
741 162 750	TSM BS 16x275 SW27	110 - 170 mm	100 - 160 mm	-	25
741 222 900	TSM BS 22x290 SW15 M24	110 - 210 mm	100 - 200 mm	-	20
741 222 902	TSM BS 22x290 SW15 M20	110 - 210 mm	100 - 200 mm	-	20

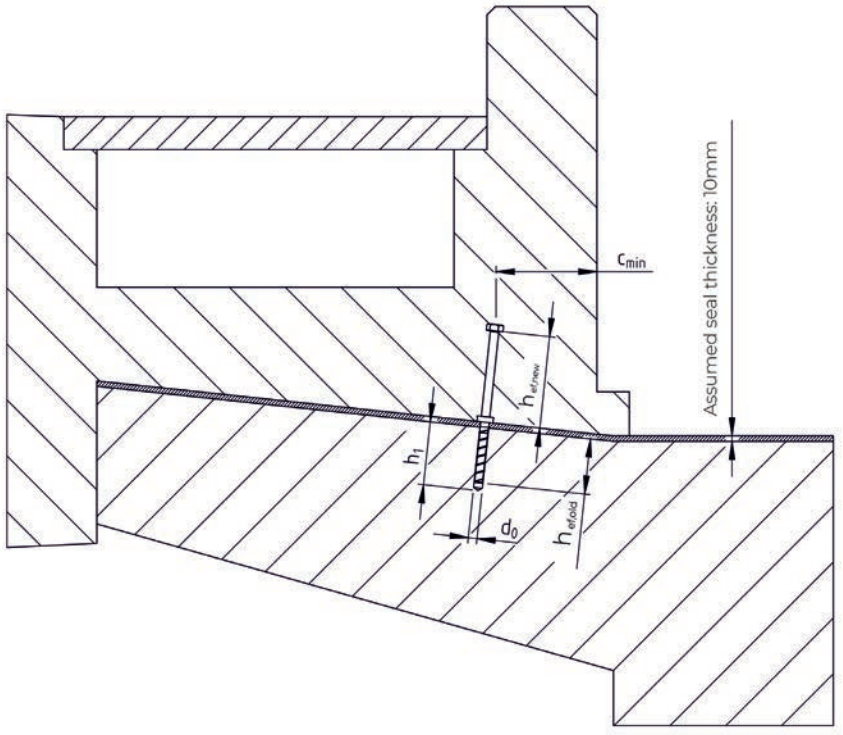
Composite Mortar CF-T 300V

Chemical special mortar
Vinylester styrene-free, suitable for concrete screws

Item nr.	Designation	Packing Unit
222 222 003	Cartridge CF-T 300 V	1
222 223 001	Mixing nozzle CF-T 300 V	1
222 222 004	Squeezing pistol for CF-T 300 V	1

Processing instructions composite mortar

Temperature in ground	Processing time	Mind. curing time in dry borehole	Mind. curing time in wet borehole
≥ -5°C	60 min	360 min	720 min
≥ 0°C	60 min	180 min	360 min
≥ 5°C	60 min	120 min	240 min
≥ 10°C	45 min	80 min	160 min
≥ 20°C	15 min	45 min	90 min
≥ 30°C	5 min	25 min	50 min
≥ 35°C	4 min	20 min	40 min



Anchoring in the superstructure for new in-situ concrete construction Cap anchor TSM BS

Anchor size			TSM BS 16		TSM BS 22
Screw length	**L**	**[mm]**	**230**	**275**	**290**
Nominal diameter of drill bit	d_0	[mm]	16		22
Depth of drill hole	h_0 ≥	[mm]	110		110
Effective anchorage depth	$h_{nom} = h_{ef}$ ≥	[mm]	100		100
Minimum edge distance	C_{min} ≥	[mm]	70		80
Minimum spacing	S_{min} ≥	[mm]	70		80
Minimum base material thickness	$h_{min,alt}$ ≥	[mm]	h_{nom} + 70		h_{nom} + 80
Hexagonal drive	SW	[mm]	27		17
Design value of tension load in cracked and non-cracked concrete C20/25 [1) 2)]	$N_{Rd,c}$ ≥	[kN]	26,5		26,5
Design value of shear force for steel failure without lever arm [1) 2)]	$V_{Rd,s}$	[kN]	76,8		85,6
Design value of shear force for steel failure with lever arm [1) 2) 3)]	$V_{Rd,s,M}$ ≤	[kN]	46,3		77,9
Nominal torque of tangential screwdriver		[Nm]	≤ 650		≤ 1000

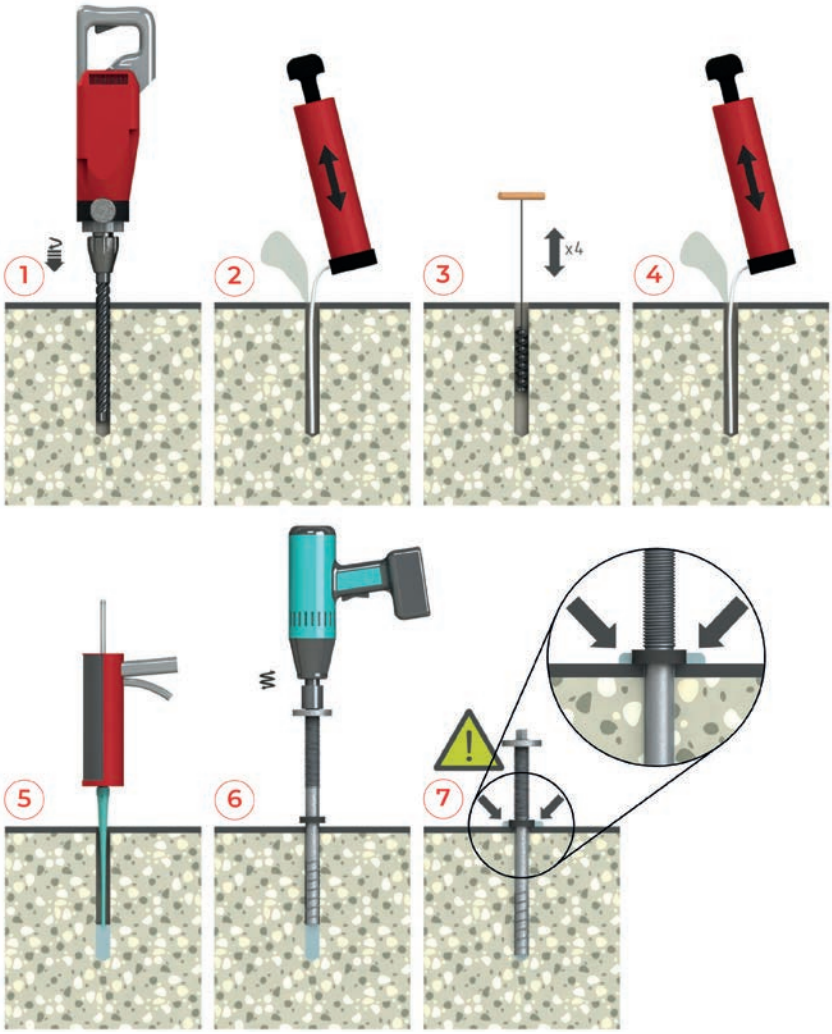
[1)] For the determination of the design values, the partial safety factor from the approval was taken into account on the resistance side.
[2)] The specified values apply regardless of center distances and edge distances.
[3)] For the determination of the shear force with lever arm bituminous waterproofing membrane of 8mm was applied.

Anchoring in the cap for new in-situ concrete construction
Cap anchor TSM BS

Anchor size			TSM BS 16		TSM BS 22
Screw length	**L**	**[mm]**	**230**	**275**	**290**
Effective anchorage depth	$h_{ef,new}$	[mm]	40 - 205		
Minimum edge distance	$C_{min} \geq$	[mm]	1,5 x $h_{ef, new}$		
Minimum spacing	$S_{min} \geq$	[mm]	3 x $h_{ef, new}$		
Minimum base material thickness	$h_{min, new} \geq$	[mm]	$h_{ef, new}$ + Concrete Cover		
Hexagonal drive	SW	[mm]	27		17
Diameter head bolt	d2	[mm]	27		36
Design value of tension load in cracked and non-cracked concrete C20/25 [1) 2)]	$N_{Rd,c} \geq$	[kN]	6,7		6,7
Design value of shear force for steel failure without lever arm [1) 2)]	$V_{Rd,s}$	[kN]	64,0		71,3
Design value of shear force for steel failure with lever arm [1) 2) 3)]	$V_{Rd,sM} \leq$	[kN]	38,6		64,9

[1)] For the determination of the design values, the partial safety factor from the approval was taken into account on the resistance side.
[2)] The specified values apply regardless of center distances and edge distances.
[3)] For the determination of the shear force with lever arm bituminous waterproofing membrane of 8mm was applied.

Installation Instructions



1) Create borehole diameter.
2) Thoroughly blow out the borehole.
3) Brush the borehole 4x.
4) Thoroughly clean borehole again.
5) Discard three full strokes of composite mortar – then inject composite mortar.
6) Screw in concrete screw.
7) After reaching the screw-in depth, the composite mortar must emerge at the concrete surface.