

# 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

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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

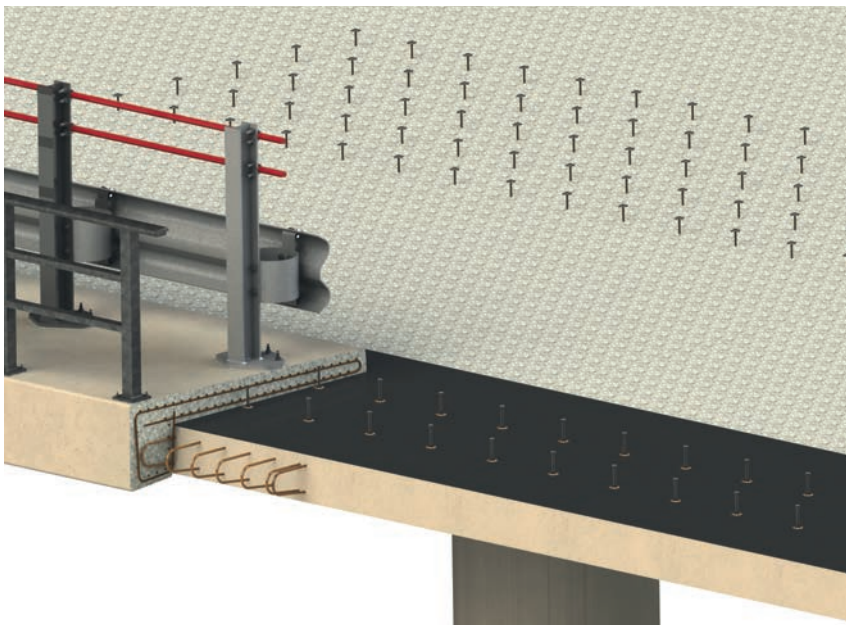


Bridge cap anchor for new construction TSM BS



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 $h_0$	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

## Composite Mortar CF-T 300V

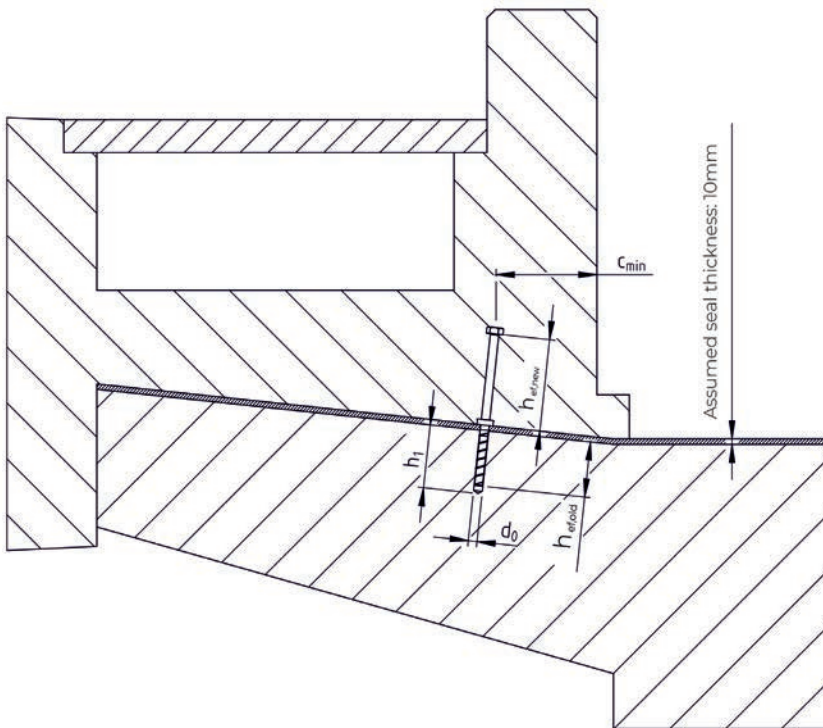
Chemical special mortar  
Vinylester styrene-free, suitable for concrete screws



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
$\geq -5^{\circ}\text{C}$	60 min	360 min	720 min
$\geq 0^{\circ}\text{C}$	60 min	180 min	360 min
$\geq 5^{\circ}\text{C}$	60 min	120 min	240 min
$\geq 10^{\circ}\text{C}$	45 min	80 min	160 min
$\geq 20^{\circ}\text{C}$	15 min	45 min	90 min
$\geq 30^{\circ}\text{C}$	5 min	25 min	50 min
$\geq 35^{\circ}\text{C}$	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
	L	[mm]	230	275	290
Screw length	L	[mm]	230	275	290
Nominal diameter of drill bit	$d_0$	[mm]	16		22
Depth of drill hole	$h_0 \geq$	[mm]	110		110
Effective anchorage depth	$h_{nom} = h_{ef} \geq$	[mm]	100		100
Minimum edge distance	$c_{min} \geq$	[mm]	70		80
Minimum spacing	$s_{min} \geq$	[mm]	70		80
Minimum base material thickness	$h_{min,alt} \geq$	[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 <sup>1) 2)</sup>	$N_{Rd,c} \geq$	[kN]	26,5		26,5
Design value of shear force for steel failure without lever arm <sup>1) 2)</sup>	$V_{Rds}$	[kN]	76,8		85,6
Design value of shear force for steel failure with lever arm <sup>1) 2) 3)</sup>	$V_{Rds,M} \leq$	[kN]	46,3		77,9
Nominal torque of tangential screwdriver		[Nm]	$\leq 650$		$\leq 1000$

<sup>1)</sup> For the determination of the design values, the partial safety factor from the approval was taken into account on the resistance side.

<sup>2)</sup> The specified values apply regardless of center distances and edge distances.

<sup>3)</sup> For the determination of the shear force with lever arm bituminous waterproofing membrane of 8mm was applied.

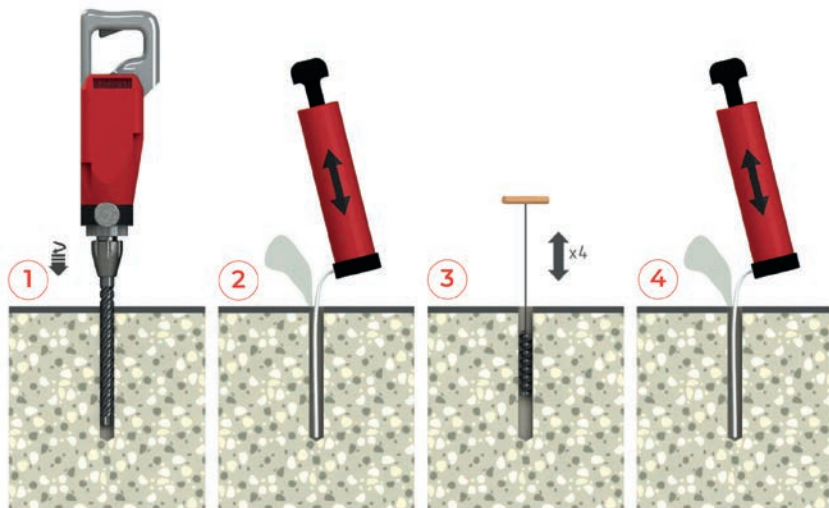
## Anchoring in the cap for new in-situ concrete construction Cap anchor TSM BS

Anchor size			TSM BS 16		TSM BS 22
	L	[mm]	230	275	290
Screw length					
Effective anchorage depth	$h_{ef,new}$	[mm]	40 - 205		
Minimum edge distance	$C_{min} \geq$	[mm]	$1,5 \times h_{ef,new}$		
Minimum spacing	$S_{min} \geq$	[mm]	$3 \times h_{ef,new}$		
Minimum base material thickness	$h_{min,new} \geq$	[mm]	$h_{ef,new} + \text{Concrete Cover}$		
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 <sup>1) 2)</sup>	$N_{Rd,c} \geq$	[kN]	6,7		6,7
Design value of shear force for steel failure without lever arm <sup>1) 2)</sup>	$V_{Rd,s}$	[kN]	64,0		71,3
Design value of shear force for steel failure with lever arm <sup>1) 2) 3)</sup>	$V_{Rd,sM} \leq$	[kN]	38,6		64,9

<sup>1)</sup> For the determination of the design values, the partial safety factor from the approval was taken into account on the resistance side.

<sup>2)</sup> The specified values apply regardless of center distances and edge distances.

<sup>3)</sup> For the determination of the shear force with lever arm bituminous waterproofing membrane of 8mm was applied.



- 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.

